APA1-1

Laparoscopic Ventral Hernia Repair: Looking back and forward

Anil Sharma

Max Institute of Minimal Access, Metabolic & Bariatric Surgery, Max Superspeciality Hospital, India

Laparoscopic repair of ventral hernia is an accepted modality of treatment that has stood the test of time. The laparoscopic repair is advantageous in terms of shorter hospital stay and lesser wound infection rate. There are clear advantages of laparoscopic repair in elderly and morbidly obese patient. The recurrence rates are reported tobe similar or better than open repair. The advantages of laparoscopic intraperitoneal onlay mesh repair (IPOM) are that it is a standardized technique, reproducible and we have long term results over 25years .However, the intraperitoneal mesh that is required for laparoscopic IPOM repair remains a concern. Recent updated guidelines state that the intraperitoneal placement of prosthesis specifically produced for laparoscopic ventral hernia repair is safe. However, the same guidelines also state that the use of an intraperitoneal mesh is associated with adhesion formation, shrinkage of mesh and chronic pain. In our study at a tertiary referral center, we observed significant morbidity during re-laparoscopy access and also adhesion related morbidity from previous intraperitoneal mesh implantation. We know that the underlay approach for mesh placement in hernia repair is best. This entails mesh to be placed in the intraperitoneal, extraperitoneal or retrorectus location. Experience with Rives-Stoppa open repair of abdominal wall hernias indicates a low rate of recurrence. The laparoscopic retrorectus repair of abdominal wall hernias appears to combine all the advantages of laparoscopic approach and retrorectus placement of mesh. Further effort to develop a laparoscopic approach to the retrorectus space for treatment for abdominal wall hernias is likely.

AKL1-1

Evolution of Herniology

Pradeep Chowbey
Institute of Minimal Access, Metabolic & Bariatric Surgery, Max Super Speciality Hospital, India

Hernia repair today has a vast number of surgical options. In addition to the choice of approach (open vs laparoscopic, anterior vs preperitoneal), the plane where placing the mesh (in front of the trasversalis fascia vs preperitoneal space), and the fixation device (tacks vs staples vs sutures vs glue vs sutureless), surgeons can select among a wide range of prosthesis.
Laparoscopic repair can be performed for most hernias today and easily qualifies itself as a safe, feasible, patient friendly and cost effective technique. It is well accepted today that inguinal hernia is a local manifestation of a generalized disorder of collagen synthesis which has lead to a number of centers including ours to perform a simultaneous bilateral inguinal exploration and mesh placement. Choosing the proper biomaterial can determine the success of an operation and prevent biomaterial-related complications. Modern advances in hernia repair are credited with reduced recurrence rate, so surgeons' attention is shifted from preventing recurrence to the new topic of chronic pain after surgery.
The laparoscopic repair of ventral / incisional hernias offers all the advantages of a minimally invasive procedure to patients as it saves them the insult of large incisions and the associated wound related complications. The technique of laparoscopic repair involves intraperitoneal onlay mesh placement and in selected cases, partial or total extraperitoneal mesh placement. The laparoscopic approach affords the surgeon the ability to clearly define the margins of the hernia defect and to identify additional defects that may not have been clinically apparent preoperatively.

AKL1-2

Hernia: A Metabolic Disease?

Davide Lomanto
Khoo Tech Puat Advanced Surgery Training Centre, Yll Som National University, Singapore

Hernia occurs as a result of a mechanical disparity between the intra-abdominal pressure and the resistance of the abdominal musculature. Various biological mechanisms leading changes in fascial pathology or failure of the surgical wound are involved.
Literature review shows that certain genetic or systemic disorders involving extracellular matrix and connective tissue abnormalities may predispose patients to develop a hernia. It is known that an acute laparotomy wound failure invariably leads to incisional hernia formation. It may not be wrong to assume that while primary hernia may occur due to congenital defects in extracellular matrix in certain patients, those with failed laparotomy and hernia repairs who develop incisional hernia may have an acquired defect in extracellular matrix. These acquired defects can lead to secondary fascial pathology like wound healing failure, abnormal fibroblast production, errors in wound remodelling and wound ischaemia. Acquired collagen defects are also known to occur in nutritional deficiencies, smoking, etc.
Understanding of this complex mechanism is paramount and will probably be the most important key to solve the problem of recurrence and provide a better repair in patient with abdominal wall hernia. It is with this aim that we need to invest more in the understanding of tissue matrix biology which may help us to improve results after hernia repair surgery. Future research in hernia should focus on modifying these factors.

AKL1-3

Basic anatomy of the fascial arrangement in the inguinal region

Tatsuo Sato
Tokyo Ariake University of Medical and Health Sciences, Japan

For surgical procedures precise knowledge of anatomy is important, and in hernia surgery in particular, understanding of the minute anatomy of the inguinal region is critical. In recent years in Japan, in addition to knowledge of the muscular and ligamentous construction of the inguinal region, the fascial arrangement has been regarded as critical for hernia surgery. Fortunately we have gained increased knowledge of fascial stratification, however, this region still holds many controversial concepts. Thus, we must return to the basic structural arrangement in order to establish ultimate quality surgical procedures. The basic approaches to integrate a comprehensive understanding of the inguinal fascial arrangement will be presented. For example, in the "onion theory", taking a horizontal section of the abdominal region, the circular layers are divided into two groups by the abdominal muscular mass; each group is then subdivided into three structurally unique layers [inner (1-3), outer (1'-3')]. The 1 and 1' layers are the dense membranes, 2 and 2' are soft layers containing organs, vessels and nerves, 3 and 3' are the fascial layers which directly sandwich the muscle mass. In particular, it is 2 & 2' the external soft layers (between the skin and innominate fascia) and internal soft layer (between the peritoneum and transversalis fascia) which are important as they serve as neurovascular passageways. These two layers are each divided into superficial and deep sub-layers according to the vascular passage. Here, to enlighten the understanding of this stratification, cadaveric dissection in the inguinal region is shown.

AKL1-4

Herniasurge World Guidelines for inguinal hernia repair

Marc Miserez
University Hospitals of the Katholieke Universiteit Leuven, Belgium

AKL1-5

UPDATE ON WORLD HERNIA GUIDELINES: HOW DOES IT APPLY TO APHS SURGEONS?

Sathien Tumtavitikul
Department of Surgery, Vichaiyut Hospital, Bangkok, Thailand

The World Guidelines for Management of Groin Hernia was formulated by international expert group of surgeons (Herniasurge Group) with representations from EHS, AHS, APHS, Australasian, AMEHS, EAES, IEHS and Editor Hernia as steering Committee. The guidelines are the result of extensive research of level 1 published literature, using Evidence Medicine rules. Final consensus was sought on all statements and recommendations by the Herniasurge members.
This world guidelines will be an excellent reference of good clinical practice for APHS surgeons in management of groin hernias. The guidelines will encourage the APHS surgeons to strife for the improvement of own outcomes, data gathering as well as stimulating scientific research and publication in this field. The guidelines can also be a reference for implementing national health policies on hernia management of APHS member countries.

AKL1-6

EBM and Hernia Registry

Ferdinand Köckerling
Vivantes Clinical Center Spandau, Germany

In the past the majority of surgical innovations were accepted on the basis of non-randomized trials. Sir Alfred Cushieri has spoken about the introduction of laparoscopic cholecystectomy as the "greatest unaudited procedure in the history of surgery". Specifically hernia surgery has experienced rapid progress in recent years. By virtue of the ever-expanding number of medical devices used in hernia surgery, the surgical techniques are of such a broad variety that they can scarcely be evaluated in a randomized controlled trial. But by consistently recording details of the different surgical techniques in a prospective registry, any problems or complications related to particular variants of the technique can be identified at an early stage. Additionally, more than 100 different surgical techniques have been described for the treatment of inguinal hernias. The ultimate aim of a hernia registry is to improve quality across the entire spectrum of hernia surgery. It has been revealed than in Denmark, there was a significant reduction in recurrence rate after the introduction of a hernia registry. A surgeon can only become better, if he knows his own results. A further aim for hernia registries is outcome research, monitoring and evaluating how the knowledge gleaned from evidence-based science is implemented in the everyday clinical setting and, ultimately, investigate its effectiveness. In summary, there are many reasons, why quality control in hernia surgery is essential. Data entry needs the precise documentation of all patient-related risk factors and local disease findings.

AKL2-1

The Evolution of Lichtenstein Hernia Repair

Jose Macario V Faylona
Department of Surgery, University of the Philippines-Manila, Philippines

Groin hernia surgery underwent an evolution from the use of tissue repairs to the use of prosthetic implants. Evidence have shown that recurrences are reduced with the use of mesh material. Among the different prosthetic repairs, the Lichtenstein technique is the most popular and the most studied in terms of evidence based literature. The technique of Lichtenstein repair underwent an evolution from the time it was started in 1984 until it was reported in 1989. Different techniques evolved from the Lichtenstein technique as well as modifications in the prosthetic materials used which will be discussed in this presentation.

AKL2-2

Self Adhering Mesh For Laproscopic Inguinal Hernia Repair

Barlian Sutedja
Department of Surgery, Gading Pluit Hospital, Indonesia

Inguinal hernia repair is the most commonly performed general surgery operation worldwide. The techniques to repair inguinal hernias have evolved over the past 30 years from primary open tissue repair to open mesh repairs.
Recently the endo-laparoscopic mesh repair has gain increasingly the popularity as an alternative treatment, especially for bilateral inguinal hernia and recurrence inguinal hernia after open procedure. The mest fixation in endo-laparoscopic inguinal hernia repair is still debatable. Mesh fixation is widely believed important for mest stabilization and consequently for early recurrence prevention. But the mechanical fixation with metal or synthetic tacks or clips are implicated as a cause of early post operative pain and chronic pain.
Fibrin glue or cyanoacrylate for non mechanical mesh fixation has been showed a good result and it can also eliminate the complication caused by mechanical devices. However using glue increased the operation time and cost. Self adhering mesh was introduced to the market in 2006, started with the mesh for open inguinal repair with good outcome and later also for laparoscopic approach.
The purpose of this paper is to review the mesh fixation methods and to present our early experience of our laparoscopic inguinal hernia repair with self adhering mesh.

AKL2-3

Open inguinal hernia repair for recurrent and complicated hernias

Giampiero Campanelli [1,2], Marta Cavalli[2], Andrea Morlacchi[2], Piero Bruni[2]
[1]*Departement of Surgery, University of Insubria, Italy*
[2]*Istituto Clinico Sant'Ambrogio, Milano, General and Day Surgery Unit, Center of Research and High Specialization for the Patologiesof Abdominal Wall and Surgical Treatment and Repair of Abdominal Hernia, Italy*

TOP repair adopts the principle, proposed for the first time by Stoppa and later by Wantz, to place a large prosthetic mesh over myopectineal orifice
Indications: - Recurrent inguinal hernia R2, (Campanelli classification): first recurrence, above the pubic tubercle, medial reducible hernia with a small (<2 cm) defect in thin patient;
- Recurrent inguinal hernia R3, (Campanelli classification): big defect (inguinal eventration) or multi-recurrent hernias or non-reducible recurrent hernia;
- Chronic post-operative pain;
- Giant inguinal hernia
- Femoral hernia.
Surgical steps: - Transversal lateral incision, 2 cm below the ASIS
- Opening of the anterior sheet of rectus muscle aponeurosis and of the external oblique aponeurosis and splitting of the fibers of internal oblique and transversus muscle laterally.
- Retraction of the rectus muscle medially and approach of the preperitoneal space.
- Identification of the psoas muscle, of the nerves, of the iliac vessels, of the Cooper ligament and the Retzius space and eventually removal of mesh/plug
- Isolation of the cord and identification and reduction of the inguinal hernia sac
- Verify the presence of femoral sac
- Placement of a flat mesh synthetic or biological
- Suture of the aponeurosis
This technique allows: - To operate in a virgin field
- The completely and safe view of the region
- The possibility of approach to the abdominal cavity, if necessary
- The identification of the three nerves and eventually the removal of mesh h and plug, in case of chronic post-operative pain

AKL2-4

TEP vs TAPP repair of groin hernia- experience of over 1000 cases at a tertiary care centre

Mahesh C Misra, VK Bansal, Asuri Krishna, Subodh Kumar Kumar, Hemanga Bhattacharjee
Department of Surgical Disciplines, All India Institute of Medical Sciences, India

Abstract: TEP and TAPP are standard techniques for laparoscopic repair of groin hernia. There have been many studies comparing TEP vs TAPP in terms of safety and efficacy, however there are conflicting reports of advantages of one over the other. We present our experience of more than 1000 TEP and TAPP cases.
Methodology: This study is retrospective analysis of prospectively maintained database of all patients who underwent laparoscopic groin hernia repair in a single surgical unit. Patient's demographic profile, hernia characteristics were noted. Clinical outcomes included the operation time, intraoperative and postoperative complications, length of postoperative hospital stay, hernia recurrence, chronic pain (defined as pain that persisted for more than 3 months), recurrence, seroma and wound infections. Patients were followed up in the outpatient clinic by the attending surgeons during the postoperative course.
Results: Over ten years duration, TEP repair was performed in 841 patients and TAPP on 542. Mean age of patients was 50.7 years (range 17-86 years). Both the techniques were comparable in terms of operative time, intraoperative complications and post operative outcomes. However there was a significantly higher pain scores (p value <0.05) at 24 hours in the TAPP group. The incidence of seroma was higher in TEP and scrotal edema was more common after TAPP repair. Both the techniques were also comparable in terms of QoL, testicular function and sexual functions
Conclusion: In conclusions both TEP and TAPP repair are comparable and should be considered as complementary procedures.

AKL2-5

Large Ventral Hernia and need for component separation

Abhay N. Dalvi[1,2]
[1]*Minimal Access Surgery, GlobaL Hospital, India*
[2]*General Surgery, Seth G S Medical College & KEM Hospital, India*

Large ventral hernias (LVH) (> 10 cm in any direction) are an enigma. Continuing search has led us to important conclusions understanding abdominal wall anatomy, restoring a physiologic abdomen (choosing correct procedure), prevent perioperative complications and provide long term quality of life. Reconstruction of midline (buttressed with or without prosthesis) and a physiological abdomen is the endpoint in LVH. Component separation (CS) has evolved from Ramirez's anterior separation to Fabian (Internal Oblique) and Novitsky (Posterior CS). IPOM Plus has replaced conventional IPOM in the era of laparoscopic repair (MIS). Open CS followed by laparoscopic IPOM and reports of total laparoscopic CS are in literature. Reduction of LVH can lead to intra-abdominal hypertension (IAH) or even Abdominal Compartment Syndrome (ACS) in the immediate perioperative period or be the cause for recurrence in the long term. CS is an answer for both. The vascular supply of the abdominal wall is important for prevention of wound morbidity. Three zones in the abdominal wall described by Johnson et al emphasize the importance while performing open CS. The comparison of MIS with open CS by Ghali et al shows superiority of MIS technique in preventing these problems. The importance of core group muscle strengthening is gaining importance in post-operative care. CS (open or MIS) with or without prosthesis is therefore important in providing a physiologic abdomen and long term quality life in patients with LVH. Giant hernia (> 20 cm) require abdominal reconstruction while those in between are best left to individual surgeon-patient assessment.

AKL2-6

PROs (Patient reported outcome measures). The good, the bad and the ugly

Andrew C de Beaux
Department of General Surgery, Royal Infirmary of Edinburgh, United Kingdom of Great Britain and Northern Ireland

"The ultimate measure by which to judge the quality of a medical effort is whether it helps patients (and their families) as they see it. Anything done in health care that does not help a patient or family is, by definition, waste, whether or not the professions and their associations traditionally hallow it."
(Berwick 1997)
A patient-reported outcome (PRO), is a series of questions that patients are asked in order to gauge their views on their own health. PROMs are completed by patients themselves to allow their own assessment of their health and health-related quality of life PROMs questionnaires do not ask about patients' satisfaction with or experience of health care services, or seek their opinions about how successful their treatment was.
The purpose of health care is not just to minimise the harm caused by its activity, but also to produce health and social benefits for patients and society. Despite a century of developments in medical technology, and vast improvements in the ability of medical science to prevent, diagnose and treat disease and ill health, attempts to measure the outputs of health care in terms of their impact on patients' health have barely progressed beyond Florence Nightingale's time. More than 100 years ago, she suggested a simple three-point health-related outcome measure for her patients: relieved; unrelieved; and dead.
This lecture explores what is good about PROs, what is bad, and where PROs can be misleading, with a particular focus on hernia surgery.

AGL1-1

Physiopathology of inguinal region and hernia genesis: opening a window to the future of hernia repair

Giuseppe Amato[1], Piergiorgio Cal[3], Enrico Erdas[3], Fabio Medas[3], Francesco Podda[3], Giorgio Romano[2]
[1]*University of Cagliari - Italy, Postgraduate School of General Surgery, Italy*
[2]*Department of General Surgery and Urgency, University of Palermo, Italy*
[3]*Department of Surgical Sciences, University of Cagliari, Italy*

Despite advances in materials and techniques, the dilemma of hernia genesis remains undisclosed. Etiology and pathogenesis of inguinal hernia still represents an open question. One question regards the discrepant numbers of inguinal hernia incidence between women and men. Is this connected to the gender related differences in pelvis conformation between the two sexes?
Recent studies on the functional anatomy of the groin supported by histological evidence has shown an unexpected world that needs to be interpreted. Significant damage to muscle fibers (ranging from hyaline degeneration along with fibrosis to fatty dystrophy) were detected. These changes, associated to chronic inflammatory infiltrate, venous fibrosis and congestion, medial hyperplasia with sub-occlusion of the artery, nerve atrophy and fibrosis, demonstrate a common trait: that of chronic compressive injury.
It would logically appear that no other source of chronic compression exists in the lower abdomen but visceral impact. Therefore, by considering the different outlines of the pelvis, it can be assumed that the vector forces originating from the orthostatic posture produce a steady visceral impact in the abdominal cavity, affecting the lower pelvis in women and the inguinal backwall in men. This seem to be culprit of the protrusion disease that, in women, mainly produces pelvis prolapse and, in men, inguinal hernias.
Consequently, to respect the physiology of the groin, surgical treatment of inguinal hernia should be performed with fixation free, dynamic compliant devices to achieve:
1) Permanent protection the inguinal backwall from visceral impact
2) Regeneration of the damaged inguinal barrier

AGL1-2

The efficacy and Safety of Cremaster Muscle splitting When Seperating Spermatic Cord in Inguinal Hernia Repair with PHS

Haechang Cho
Hernia Center, Daegu Fatima Hospital, Daegu, Korea, Republic of Korea

Purpose: Dissection of the hernia sac is the basic step in inguinal hernia surgery. At first, it is necessary to separate the spermatic cord from the hernia sac. If poorly understood about the spermatic cord, it causes limitation touse mesh, as well as injury of the surrounding structure in inguinal hernia repair. the aim of this study was to assess the efficacy and safety of method that minimally splits the cremaster muscle in the repair of inguinal hernia with PHS.
Methods: We had analyzed 417 patients undergoing inguinal hernia repair at Daegu Fatima Hospital from January 2006 to April 2016. We retrospectively reviewed the medical records.
Results: The mean age of 2417 patients was 54.9 years. Right inguinal hernias were more frequent (71.9%). Hospital stay over 3 days was 379 cases (15.7%). Among these, There were 13 cases postoperative complication that was affected by prolonged hospital stay. The most frequent complication was Hematoma (54%). There were no postoperative recurrences and chronic pain.
Conclusion: In my opinion, minimally splitting of the cremaster muscle offers more safety, more efficacy in the repair of inguinal hernia with PHS.

AGL1-3

1993-2013: TWENTY YEARS OF TRABUCCO'S SUTURE LESS HERNIOPLASTY

Francesco Abbonante, Giuseppe Tomaino
Plastic Surgery /Department of Surgery, Catanzaro City Hospital, Italy

Background: SUTURES LESS TRABUCCO'S TECHNIQUE, is really important because it is the unique technique of hernioplasty that requires the positioning of prosthesis without any system of anchorage to the tissues.
Methods: Since 1993 we have begun to make, in the Catanzaro City Hospital, systematically, procedures of hernioplasty with the original technique of Trabucco: Sutures Less tension Free "Sliding Mesh "Hernioplasty. The welness of all patients has been the appeal of other patients and the number of surgeries has increased tenfold since we started to perform sutureless technique under local anesthesia and immediate patient discharge. We make the original technique, standardized. It requires the use in preperitoneal fat of the internal inguinal ring, of a bidimensional plug, T4, and, under the external oblique fascia, of preshaped 10 cm x 4,5 cm polipropylene mesh. It stay flat in the inguinal region without sutures, screw or glue because it is more heavy than other light meshes existing in commerce.
Results: Hertra mesh not submitted to wrinkles and shrinkage, cover completly inguinal region. The main point of our technique is positioning the mesh without application of points in such way that the mesh is free to slide on the muscles and to adapt in position of confort (Sliding mesh).
Conclusion: In the last twenty years we have been performed more than 3.000 procedures of hernioplasty with quickly dismission of the patients. Follow up shows confort of the patients.

AGL1-4

Groin hernia repair after radical prostatectomy and adenomectomy: 498 cases. Long term outcome versus long term outcome for patient without prostatectomie" French database results

Marc Soler
Department of Parietal Surgery, Clinique Saint Jean, France

From September 1st, 2011 to April 15th, 2016, 14,254 groin hernias in 12,089 patients (18-101 years old) have been operated on including: -10,287 patients [18 79 years old] in the "control" group. -498 patients [36-96 years old] in the prostatectomy and open adenomectomy group -335 after radical prostatectomy -163 after open adenomectomy Results There were more bilateral hernias in the prostatectomy group There were less laparoscopic procedure in the prostatectomy group but the percentage of TAPP procedure is more important The rate of medical and local complications is the same in the two groups The rate of the per operative complications is the same in the two groups Post-operative pain at 8, 30, [90-180] days is the same in the two groups At two years the satisfaction rate is the same in the two groups There were less ambulatory setting in the prostatectomy group The emergency surgery rate is the same in the two groups. Conclusions: In the prostatectomy group there are more bilateral hernias. The surgeons preferred not to do laparoscopic procedure, but if they choose laparoscopy, they prefer the TAPP technique. We can observe less ambulatory setting in the prostatectomy group The groin hernia repair after prostatectomie don't give more post-operative pain or more complication. The two years follow up is as good in both groups. A complete statistical evaluation will be given.

AGL1-5

In which cases of TAPP-repair is mesh-fixation needed? A prospective analysis of 11.228 male patients included in the Herniamed Registry

Franz Mayer[1], Michael Lechner[1], Klaus Emmanuel[1], Henning Niebuhr[2], Ren Fortelny[3], Gernot Khler[4], Reinhard Bittner[5], Ferdinand Kckerling[6]
[1]*Department of Surgery, Paracelsus Medical University Salzburg, Austria,*
[2]*Hanse Hernia Center, Germany*
[3]*Department of General, Visceral and Oncological Surgery, Wilhelminenspital, Austria*
[4]*Department of General and Visceral Surgery, Sisters of Charity Hospital, Linz, Austria,*
[5]*Hernia Center, Winghofer Medicum, Germany*
[6]*Department of Surgery and Center of Minimally Invasive Surgery, Vivantes Hospital Spandau,Germany*

Introduction: IEHS-Guidelines of endoscopic hernia repair reveal that there is no necessity for routine mesh-fixation in TEP-technique whereas in TAPP-repair mesh fixation can be omitted only at larger defects nevertheless the level of evidence for this recommendation in cases of TAPP-repairs is weak.
Methods: Analysing prospective data from the Herniamed Registry the authors wanted to find an answer to the question in which cases mesh-fixation is necessary in TAPP-repair of primary inguinal hernia of men with regards to defect-size and location (according to the EHS-Classification), presence of risk factors. In the period September 01, 2009, to January 31, 2014, 11,228 male patients were operated on with the TAPP technique for a primary unilateral inguinal hernia and were followed up for 1 year.
Results: Mesh was fixed in 66.1 % of patients included. Unadjusted analysis did not show any significant difference in recurrence rate (0.88 % with fixation vs. 1.1 % without fixation; $p = 0.259$). Multivariable analysis of all potential influence factors (age, ASA, BMI, risk factors, defect size, mesh fixation, localization of defect, mesh size) did not identify any factor that influenced recurrence on 1-year follow-up with the exception of medial and combined defect localization versus lateral localization of the defect ($p<0.001$).
Conclusion: By fixing the mesh and implanting a larger mesh, it was possible to reduce the recurrence rate significantly only in large medial hernias in this series ($p = 0.046$). In all other situations no mesh-fixation can be recommended.

AGL1-6

Standardization of TEP Safety efficacy and cost effectivity

Rajesh Khullar
Institute of Minimal Access, Metabolic & Bariatric Surgery, Max Super-Speciality Hospital, India

Minimally invasive surgery for groin hernias is now well-established. The pre-peritoneal space can be approached trans-abdominally or by extra-peritoneal route. Our preferred approach is bilateral TEP for all groin hernias. In our experience of nearly 2000 groin hernias repaired over the last 5 years, we have been following a standardized surgical protocol, especially for certain key steps such as the creation of the extra-peritoneal space, dissection technique and preparation of the mesh for deployment and easy handling in the limited potential space available.
Intra-operative complications are almost negligible when this standardized surgical protocol is followed. In the post-operative period, the only complication seen is occasional urinary retention requiring catheterization. Patients are advised regarding the appearance of seroma and that no intervention is required for this.
The standardization helps us to keep the costs economical. All ports and instruments used are re-usable. The pre-peritoneal space dissector is indigenously prepared using the fingers of a size 8 sterile glove. The mesh used is polypropylene as there is no contact with intra-abdominal viscera.
The biggest advantage of the TEP approach is that it covers entire myo-pectineal orifice, ensuring a nearly zero % recurrence rate. We are also firm proponents of bilateral repair.

AGL1-7

A Prospective Randomized Comparison of Testicular functions, Sexual functions and Quality of Life Following Laparoscopic Totally Extra Peritoneal (TEP) and Trans Abdominal Pre-Peritoneal (TAPP) Inguinal Hernia Repair

Virinder Kumar Bansal, MC Misra, Asuri Krishna, Pratik Manek, Rajeshwari subramaniam, Rajesh Sagar, Atin Kumar, Anand Kumar Kumar
Department of Surgical Disciplines, All India Institute of Medical Sciences, India

Background: There is very scant literature on the impact of inguinal hernia mesh repair on testicular and sexual functions following inguinal hernia repair. This randomized study compares TAPP and TEP in terms of testicular and sexual functions, quality of life and chronic groin pain.
Methods: 160 patients with uncomplicated groin hernia were randomized to TAPP or TEP. Testicular functions were assessed by measuring testicular volume, testicular hormone levels pre operatively and at 3 months follow up. Sexual functions were assessed using BMSFI and quality of life was assessed using WHO-QOL BREF scale pre operatively and at 3 months and 6months post operatively.
Results: Median duration of follow up was 13 months. Mean pre-operative pain scores and chronic groin pain was similar at follow up. Testicular resistive index and volume did not show any significant change at follow up. No significant difference was observed in testicular resistive index and volume when comparing TEP and TAPP group at 3 months (p value >0.05). There was a statistically significant improvement in the sexual drive score, erectile function and overall satisfaction following laparoscopic inguinal hernia repair. Quality of Life showed a significant improvement at follow up. QOL was comparable between TEP and TAPP.
Conclusions: Laparoscopic groin hernia repair improves the testicular functions, sexual functions and quality of life but TEP and TAPP repair are comparable in terms of these long term outcomes.

AGL1-8

Laparoscopic Inguinal Hernia repair will ever become Gold standard

Uday M Muddebihal
Department of General and Minimal Access Surgery, Manipal Hospitals, India

Inguinal Hernia is the most frequently encountered clinical situation requiring surgery in men all over the globe. You can judge the worth of a surgeon by the way he does a hernia.
Controversy is not new in the history of Inguinal hernia repair. As early as the Middle ages, surgical history documents conflicting views concerning the appropriate hernia repairs.
Every stage in the evolution of hernia repair has continued to generate controversy including the introduction of Laparoscopic hernia repair, first in 1982 by Ger. In 1990 the Laparoscopic hernia repair achieved enough notice to ignite controversy.
Surgeons who were pushed in to doing Laparoscopic Cholecystectomy accepted it with open arms as it was beneficial to the patients. Same surgeons have rebelled against being similarly pushed in to Laparoscopic hernia repairs as they do not see much benefit to patients.
The said advantage of the Laparoscopic repair of less post operative pain, cost effective,early return to work are easily matched by open procedure. Another benefit of open procedure can be performed under any anesthesia for all age groups as a day care surgery by all ranks of surgeons.
By for the most widespread obstacle to the adoption of Laparoscopic hernia repair as a procedure of choice is the fact that it turns relatively simple outpatient procedure in to a rather complex,expensive, time consuming, with a few complications which are unheard in open procedure.
Are surgeons satisfying their ego or it is really beneficial to the patients. Literature review.

AGL1-9

Recurrent inguinal hernia repair Should we follow the Guidelines?

Ferdinand Köckerling
Vivantes Clinical Center Spandau, Germany

Introduction: On the basis of six meta-analyses, the Guidelines of the European Hernia Society (EHS) recommend laparo-endoscopic recurrent repair following previous open inguinal hernia operation and, likewise, open repair following previous laparo-endoscopic operation. So far no data are available on implementation of the guidelines or for comparison of outcomes. Besides, there are no studies for comparison of outcomes for compliance versus non-compliance with the guidelines.
Patients and Methods: In total, 4,812 patients with elective unilateral recurrent inguinal hernia repair in men were enrolled between September 1, 2009, and September 17, 2014 in the Herniamed Registry. Only patients with one-year follow-up were included.
Results: Out of the 2,482 laparo-endoscopic recurrent repair operations 90.5 % of patients, and out of the 2,330 open recurrent repair procedures only 38.5 %, of patients, were operated on in accordance with the Guidelines of the EHS. Besides, on compliance with the guidelines multivariable analysis demonstrated for laparo-endoscopic recurrent repair a significantly lower risk of pain at rest (OR=0.643 [0.476; 0.868]; p=0.004) and pain on exertion (OR=0.679 [0.537; 0.857]; p=0.001). Comparison of laparo-endoscopic and open recurrent repair in settings of compliance versus non-compliance with the guidelines showed a higher incidence of perioperative complications and re-recurrences for recurrent repairs that did not comply with the guidelines.
Conclusion: The EHS Guidelines for recurrent inguinal hernia repair are not yet being observed to the

AGL1-10

COMPLEX GROIN HERNIA:MANAGEMENT STRATEGIES

Pradeep Chowbey
Institute of Minimal Access, Metabolic & Bariatric Surgery, Max Super-Speciality Hospital, India

To share our experience of Endoscopic Total Extraperitoneal repair in cases of complicated groin hernias i.e. incarcerated / large irreducible / sliding / recurrent hernias. Endoscopic approach for groin hernia has evolved rapidly over the past decade. We adopted the total extraperitoneal repair early as we believe in preserving the sanctity of the coelomic cavity. Once well versed with the approach we have found it to be an efficient method for treating complicated groin hernias as well. For partially reducible hernias, we take a total extraperitoneal approach where in contents are reduced under vision after opening the hernial sac. In case of large irreducible and sliding hernias, we take a combined approach in which contents are reduced under direct vision through a trans abdominal approach and followed by a total extraperitoneal repair. Even recurrences after an anterior repair are treated by a similar approach. Except strangulated hernias, there are, at present, no strict exclusion criteria for a total extraperitoneal approach which should be considered the approach of choice for minimal invasion and maximal exposure.

AGL1-11

Complicated Inguinal hernias: Strangulated, Incarcerated and Obstructed hernias

Sathien Tumtavitikul[1], Ajjana Techagumpuch[2]
[1]*Department of Surgery, Vichaiyut Hospital, Bangkok, Thailand*
[2]*Faculty of Medicine, Department of Surgery, Thammasat University, Thailand*

Complicated inguinal hernias (acute incarcerated, strangulated and obstructed hernias) are found predominantly in aged population which frequently associated with coexisting diseases. Since the "watch and wait" protocol become an optional management in asymptomatic and mildly symptomatic inguinal hernia, the average yearly rate of irreducibility associated with non-operative approach is 0.4% (max 2.7%), and a significant increased in need for emergency repair, which has been reported in association with higher risk of adverse event and mortality. Whereas early diagnosis and management still play an important role to ensure a good outcome, presenting symptoms may vary and sometimes misleading especially in femoral hernia. This review article focus on how to make a diagnosis, investigation and assessment. Consideration in surgical management each particular steps including peri-operative preparation, timing of surgery, assessment method to evaluate of bowel viability and prothesis repair in potentially contaminated field which has been more reported will all be defined, so as the option in surgical approach which has been changed by the impact of the era of laparoscopic surgery.

AGL1-12

Laparoscopic and CTA Measurements of inguinal Area to estimate mesh size for preperitoneal inguinal herniorrhaphy

Xiaojian Fu, Qiyuan Yao
Department of Surgery, Huashan Hospital of Fudan University, China

Purpose: Surgical repair is the only method to cure adult inguinal hernias. The aim of inguinal hernia surgery is to achieve the reinforcement of the myopectineal orifice (MPO) with mesh. However, there is little data about the dimensions of the MPO and the mesh size is still a critical problem undergoing discussion. This clinical study is to estimate the mesh size for preperitoneal inguinal herniorrhaphy by Laparoscopic and CTA Measurements of inguinal area.
Methods: 89 patients, 131 groin areas in Chinese adults were measured by Laparoscopic and CTA Measurements to deduce the mesh size needed for preperitoneal inguinal herniorrhaphy in Chinese population.
Results: The distance from the internal inguinal ring to the anterior superior iliac spine is 5.9±1.1 cm in laparoscopic group (5.9±0.7cm in CTA group, $P>0.05$); to the pubic tubercle, 4.8±0.9 cm (5.4±0.4cm, $P<0.05$); to the pectineal ligament, 3.1±0.6 cm (2.9±0.5cm, $P>0.05$), and to the apex of the inguinal triangle, 4.4±1.4 cm (4.2±1.0cm, $P>0.05$).There is significant differences between distance from the internal inguinal ring to the pubic tubercle in different gender (females>males, $P<0.05$). The length and width are not significantly correlated with height, BMI, hernia type or interspinal diameter.
Conclusions: The recommended size of the patch that can fully cover the inguinal area defects in the Chinese is 14 cm×12 cm. The size of the patch needed is not correlated with height, BMI, hernia type or interspinal diameter.

AGL2-1

Hernia and Arts

Rolf U. Hartung[1,2,3]
[1]Department of Surgery, Dubai Healthcare City - BR Medical Suites, United Arab Emirates
[2]Department of Surgery, Mediclinic City Hospital, United Arab Emirates
[3]Department of Surgery, Medeor Hospital, United Arab Emirates

Hernias have been documented in history by ancient artists and physician on drawings, paintings, and sculptures. The most famous but involuntary document with an inguinal hernia is the painting of the Vitruvian Man by Leonardo Da Vinci. The treatment of hernias became a relevant matter of interest for painters in the 16th Century with the famous painting Practica Copiosa of Kaspar David Stromayr. Textbooks of hernia surgery contain a beautiful collection of drawings to explain anatomy and surgical techniques.
The State of the Art in Hernia Surgery has changed over centuries. While watching hernia surgery as an apprentice has been the method of choice for at least 2000 years, books and publications became the usual media for students, residents and surgeons. With the introduction of the internet 4 decades ago the State of the Art in hernia surgery is now documented in presentations with pictures and videos accessible to everybody who is interested mainly patients, students and professionals. To learn the State of the Art training centers and virtual reality have been established in order to facilitate teaching and learning for big groups of physicians.
Martial arts and hernias are a topic of discussion combatants and physicians are not yet familiar with. How much physical stress by martial arts repaired hernias can tolerate and when physical exercise can be restarted after a State of the Art hernia repair with mesh.

AGL2-2

SUTURE LESS "SLIDING MESH TECHNIQUE" IS UNIQUE REALLY "TENSION FREE " TECHNIQUE IN VENTRAL HERNIAS

Francesco Abbonante
Plastic Surgery / Department of Surgery, Catanzaro City Hospital, Italy

The abdominal wall hernias are subject to complex forces that tend to push the bowel uniformly throughout the whole area of the abdominal wall, according to the Law of Pascal: when there is an increase in the pressure at a point of a fluid confined, this increase is also transmitted at every point of the container.
Returning to the concept of described law, it can be said that increasing the volume of the omentum, the thickness of the fat around bowel and the intestinal contents for obesity and overeating, the pressure exerted by them is transmitted with uniform thrust over the entire surface of the abdominal wall. In those cases with scare of abdominal wall after surgery the stiffness of abdominal wall doesn't resist to intrabdominal pressure and it breaks down during efforts.
To protect the abdominal wall by the thrust of the viscera is required plastic surgery with mesh which ensures uniform restraining force distributed over the entire wall. The mesh, according to Ermanno Trabucco's SUTURELESS HERNIOPLASTY, must be free to slide and fit on the muscular wall without fixing means, stitches, clips (SLIDING MESH) in a position of comfort given by equilibrium between intrabdominal pressure and muscles - mesh complex. After a few days the mesh will be incorporated in this position of comfort, without tension, patient's own. SLIDING MESH plasty has the advantage of a complete uniformity of distribution of pressure, and will minimize the risk of recurrence. The author presents many cases of sutureless incisional hernioplasty.

AGL2-3

LAPAROSCOPIC VENTRAL HERNIA REPAIR

Errawan R. Wiradisuria
Premier Bintaro Hospital, Indonesia

Ventral hernia has variety of clinical characteristic by the size of facial defect, location of hernia, content of hernia, distance to the bone structure and etiology of the hernia. Incisional hernia is the most common type of ventral hernia, results from poor wound healing in a previous surgical incision healing. The prevalence of incisional hernia is 11 to 20% after laparotomy surgery and about 50% develop within the first 2 years.
Laparoscopic repair of ventral hernia become a promising alternative uncomplicated ventral hernia treatment and has gained popularity for its advantages in comparison with open procedure. Reduced incidence of the wound infections, shorter hospital stay and lower recurrence rate become the main superiority.
The principle of the laparoscopic ventral hernia repair technique is tension free repair and proper overlap of the defect. Certain prosthetic mesh placed into the abdominal cavity is the fundamental theory assumption of every laparoscopic ventral hernia repair. Many meshes have been specifically produced to avoid adhesion formation with the abdominal viscera or possibility of recurrence cases and therefore to be implanted intraperitoneally.
However, there are absolute contraindication to perform the laparoscopic surgery and some special condition which need surgeon's consideration for the probability to obtain safe access. Various technique and procedure are available for the surgeon, but the best choice always return to patient-oriented management.

AGL2-4

Ventral Hernia repair: Defects and donuts - the importance of the mesh:defect area ratio

Andrew C de Beaux
Department of General Surgery, Royal Infirmary of Edinburgh, United Kingdom of Great Britain and Northern Ireland

Aims: Recurrence/pseudo recurrence remains a problem after laparoscopic ventral hernia repair (LVHR). A 5 cm mesh overlap has been suggested as the goal to minimise this, although there is little evidence to support the 5 cm rule.
Methods: In a bridging LVHR, intra-abdominal pressure pushes against the unsupported mesh with a force proportional to the area of the defect. The forces which keep the mesh in place come from mesh fixation and tissue ingrowth - proportional to the area of mesh in contact with the abdominal wall.
Results: When a 2 x 2 cm round VH defect is repaired with a 12 x 12cm mesh, the mesh:defect area ratio (M: DAR) is 36. With a 20 x 20 cm round mesh over a 10 x 10 cm defect, the M: DAR is 4. Despite the same 5cm overlap in both cases, the difference in M: DAR indicates the second mesh has 36/4 = 9x less relative area for ingrowth and is more likely to displace.
Conclusion: As hernia defects get larger, maintaining the M:DAR is more important than a 5 cm overlap. The optimum ratio is not known but around 16, when the mesh is four times the radius of the defect, is likely adequate. This has implications for the maximum defect size that can be repaired laparoscopically.

AGL2-5

Mesh induced visceral complications after IPOM (intraperitoneal onlay mesh) repair for ventral and incisional hernia

George P Yang
Department of Surgery, Adventist Hospital, Hong Kong

Intraperitoneal onlay mesh (IPOM) repair remain the most commonly performed laparoscopic repair technique for ventral and incisional hernia. The technique involves placing a synthetic mesh in the peritoneal cavity. Although these meshes have undergone special treatment making it "compatible" for intraperitoneal placement, however many have noticed that different patients react differently to these materials and many surgeons now starting to recognize this particular category of complication, namely the mesh induce visceral complications after IPOM technique. We report our experiences in the mesh induced visceral complications after IPOM repair. Together with the analysis from clinical literatures, the safety of IPOM technique with the placement of these meshes in the peritoneal cavity remains a concern among surgeons.

AGL2-6

PPOM - The Pre-peritoneal onlay mesh repair, an alternative laparoscopic approach for ventral and incisional hernia

George P Yang
Department of Surgery, Adventist Hospital, Hong Kong

Mesh induced visceral complication after IPOM has been reported in many literatures. Despite the special treatment to the synthetic meshes making them more compatible to be placed in the peritoneal cavity, some patients still develop reaction to the mesh leading to major morbidity which could be a major surgical challenge.
The pre-peritoneal onlay mesh repair (PPOM) differs from IPOM in having the mesh place in the pre-peritoneal cavity just like laparoscopic repair for groin hernia. We report our first series of patients with PPOM for their ventral and incisional hernia using this technique.
This technique may be an alternative to IPOM in laparoscopic ventral and incisional hernia repair.

AGL2-7

TAR Technique for Difficult Ventral Hernias-Our Experience

Shivaram HV
Surgery & Allied Specialities, Aster Cmi Hospital, India

Ventral hernia repair is one of the commonest surgical procedures done by any general surgeon. Recurrence rate after repair is about 15%. Certain ventral hernias are difficult to repair due to massive size and large defect. Multiple techniques exist for this difficult situation. No one technique is the "best" or "gold standard" for all patients.
TAR- Transverse abdominis Release technique is an extension of Stoppa's repair beyond the rectus sheath laterally and it is a posterior component separation technique.The advantages of TAR are many: it is not limited by the rectus sheath laterally;extensive lateral dissection in the space between transversus muscle and underlying transversalis fascia/peritoneum can be done. Even the defects more than 20 cm can be repaired.
During the year 2015 -16 we have repaired 24 cases of complex hernias by TAR technique. There were 14 females and 10 male patients in the age group 35 to 60 years. The TAR was performed under general anesthesia with epidural analgesia for post operative pain relief. In all the cases we were able to close the abdomen without any tension and there was no post operative respiratory problems. Post operative stay was 5 to 7 days.
For Massive ventral hernia TAR technique appears to be a good option.This technique gives a good abdominal wall reconstruction with a large mesh prosthesis sandwiched in a muscular plane without any tension.

AGL2-8

Tailoring ventral hernia repair & role of component seperation

Jaideepraj Rao
Department of General Surgery, Tan Tock Seng Hospital, Singapore

Laparoscopic surgery is now being increasingly being done for inguinal hernias due to its advantages of decreased pain and early return to daily activities. Ventral hernias, especially incisional hernias can be challenging to treat due to various factors like obesity, multiple previous surgeries, large defect and loss of domain. There is no standard method of ventral hernia repair. The surgery can be done laparoscopically or in an open fashion. The mesh can be placed in on-lay manner, sublay or intraperitoneal. Nowadays, it is recommended to close the fascial defects prior to placing mesh even in laparoscopic repairs. This can be challenging especially in large defects. Component separation may play an important part in this repair. Ventral hernia needs to be tailored to individual patients.

AGL2-9

Infections in laparoscopic hernia surgery

Ramesh Agarwalla
Coordinator GI Surgery, Fortis Hospitals, India

Introduction: Infection is the bane of any hernia surgery. It prolongs hospital stay, increases laboratory costs, and usage of antibiotics. It may require additional interventions and minimally invasive surgery may become maximally invasive Surgery. It increases the overall morbidity and mortality of the patient.
Materials and Methods: TEP was done in groin hernias. Polypropylene mesh 15 x 12 cm was used in all cases with 2-point fixation. Dual mesh was used in Ventral hernias with 4 corner suture fixation and the rest by absorbable tackers.
Results: TEP was done in 106 cases of groin hernias operated in last 1 year. There was no incidence of mesh infection in these cases. We treated 5 cases of mesh infection in 5 cases of TEP done for groin hernia outside. Laparoscopic Ventral hernia was done in 102 cases of ventral hernia. We had one mesh infection and treated 3 cases done outside.
Conclusion: All precaution should be taken to prevent mesh infection. Mesh infection usually leads to explantation of mesh converting a minimally invasive procedure to maximally invasive procedure.

AGL2-10

Complications of laparoscopic hernia repair - How to avoid & How to manage

Uliargoli V Rao, Uday Muddebihal, Wasim Dar
General & minimally Invasive Surgery, Manipal Hospital, India

Complications following laparoscopic hernia surgery is not very common. It may be patient related or procedure related. Many of the complications can be avoided by taking care while performing the procedure. When they do occur per operatively like bleeding, injury to hollow viscus, the surgeon may need to alter the course of the operation and may even end up converting in to open repair. Infection is the main complication during post operative period. It is important to identify those patients who may be at higher risk of developing complications - associated co morbid conditions, large irreducible hernia, so called battlefield abdomen etc.
This paper highlights the incidence, diagnosis and management of the complications with our own experience of more than 100 patients who underwent laparoscopic hernia repair.

AGL2-11

Muscle- aponeurotic plication associated with dermolipectomy in the treatment of ventral hernias and recti diastasis A functional and aesthetic approach

Marco Faria Correa
Medical Director- Plastic Surgeon, Plastic Surgery Pte Ltd, Singapore

The author presents more than 30 years of experience in treating small, median and large size abdominal wall deformities like hernias -ventral, incisional, umbilical and rectus diastasis, using open methods for muscle aponeurotic rectus plication associated with abdominal dermolipectomy in different versions like lower transverse excision and vertical dermolipectomy.
With a representative number of patients up to 20 years follow-up presenting with successful results and a series of secondary surgeries repairing unsuccessful cases, the author presents an in-dept. study of his personal experience as well as a bibliography review of the different stitching methods of plication, with the use of different sutures material, and the long term evaluation of the efficacy and longevity of the muscle-aponeurotic plication by abdominal wall CT scan and linear ultrasound.
With an analysis of the trans-operative findings in secondary cases, his conclusion of what was the reason for failure and what should be the ideal material and method for muscle aponeurotic abdominal wall plication is discussed.

AGL2-12

Laparoscopic repair of paraesophageal hernia: tips and tricks

Deepraj S Bhandarkar
Department of Minimal Access Surgery, Hinduja Hospital, India

Over the past two decades laparoscopic repair is increasingly becoming the gold standard in the management of paraesophageal hernias (PEH). The operation, however, remains a challenging one to perform as it is often performed in frail, elderly patients, the anatomy is invariably distorted and may be difficult to appreciate, a large sac needs to be dealt with, a shortened esophagus may be encountered and closure of a wide hiatus may pose problems. This presentation highlights tips and tricks the surgeon must use to deal with a) the contents (which are often intrathoracic, b) the sac, c) the esophagus, d) the hiatus and e) the stomach.
The contents need careful handling and reduction with the help of delicate instruments. The sac must be separated by means of a circumferential incision around the hiatus, dissected from the mediastinal structures, everted and excised. Extensive esophageal mobilization to ensure at least a 3cm intra-abdominal length is required and special strategies must be employed to deal with a shortened esophagus. The hiatus is closed with non-absorbable sutures and may require reinforcement with prosthetic material; however, the latter remains a controversial issue. A fundoplication is usually fashioned but alternatives to retain the stomach intra-abdominally include an anterior gastropexy or placement of a gastrostomy tube.
It has been shown that one of the most important factors determining successful outcome of a laparoscopic repair of a PEH is surgeon experience, and this remains an operation to be undertaken only by experienced laparoscopic surgeons.

AGL2-13

Hernias in rural Nepal: an exclusive pictorial review

Shailesh Adhikary[1,2]
[1]*Surgery, B.P. Koirala Institute of Health Sciences, Nepal*
[2]*Surgery, Ghopa Camp, Dharan, B.P. Koirala Institute of Health Sciences, Nepal*

Background: Ventral and groin hernias are quite common and may be simple to treat. However, in Nepal where resources are limited and to those living in Himalayas; as they walk for three, four days to reach the nearest health care center, by the time they reach it gets ruptured, strangulated or obstructed. Due to illiteracy, low income and ignorance some have huge hernias and few even develop a faecal fistula due to inadvertent injury while working. We present a pictorial review of all the external or internal hernias with a wide range of strange manifestations, which were quite unique in their own perspective.
Objectives: To present a pictorial assay of different hernias and their complcations
Analyze the risk factors
Results: The three-year study had 63 patients;53 (84.1%) males and 10 (15.8%) females. The average age was 49.23+/-21.4 years (range 10 days-85 years). The average duration of hernia was 6.36+/-4.57 years (range 5 hours-30 years). The median duration of complications was 4 days (range 5 hours-15 years). There were 7(11.11%) mortalities. The morbidity rate was (n 21) 33.33% and the risk factors identified for mortality were: age >65 years (p0.004), inguinal hernias (p<0.001), presence of co-morbid diseases (p<0.001), strangulation (p0.007), bowel resection (p<0.001); and for morbidities:type of hernia (p<0.001), presence of a comorbid diseases (p0.013), and bowel resection (p0.002)
Conclusion: Elderly males with comorbids were at risk. Health education, awareness may help reduce complications, mortality.

AGL2-14

LVHR vs PCS-TAR for central abdominal hernias. Small series from India

Arun Prasad, Abhishek Tiwari, Mustafa Kamal Salarzai
Department of Minimal Access & Robotic Surgery, Apollo Hospital, India

Introduction: Laparoscopic ventral hernia repair has been accepted as a good procedure. Long term results show an increasing number of recurrences. With larger hernias, there is little improvement in abdominal shape. Some patients also complain of lack of functional benefits. Of late, we have seen component separation as an alternative treatment. Anterior component separation did not give very good results but results of posterior component separation with transversus abdominis release addresses the problem of shape and function regain.
Material and Methods: Between Jan 2015 and Dec 2016, we have done 45 central abdominal ventral hernia repairs with a follow up of over 9 months. Patients were given the choice of LVHR and PCS-TAR. There were 24 and 21 cases respectively. Laparoscopic repair involved adhesiolysis, placement of dual mesh, fixation with mechanical fixator device along with transfacial corner suturing. Open PCS-TAR involved excision of redundant skin and sac, creation of space between transversus and internal oblique, placement of large mesh followed by layered closure.
Results: Duration of surgery, hospital stay, post operative pain, return to work, seroma formation, infection, satisfaction with shape, functional recovery and recurrence were compared within the two groups. There was higher recurrence rate in the LVHR group. Operative time, seroma formation and satisfaction with shape was more in the PCR-TAR group.
Conclusion: Results of defects smaller than 5 cm were comparable. For large ventral hernias with loss of domain/ shape, PCS- TAR is an acceptable option and may give better results than LVHR.

AVS1-1

Optimum layer of preperitoneal dissection for TEP

Norihito Wada, Toshiharu Furukawa, Yuko Kitagawa
Department of Surgery, Keio University School of Medicine, Japan

Background: In order to recognize anatomical landmarks and to create an optimum space for mesh placement during laparoscopic totally extraperitoneal (TEP) hernioplasty, we have to understand the precise anatomy of the preperitoneal and posterior rectus space. Microanatomical information can be obtained from recent laparoscopic surgery which provides good visualization and magnification of the operative field. Here we show the surgical anatomy of the preperitoneal space for TEP surgery.
Methods: We usually make a single incision in the lower abdomen. After incising the anterior rectus sheath, the transversalis fascia with overlying rectus muscle can be observed and be easily dissected from underlying superficial preperitoneal fascia (PF) covering preperitoneal fat. CO2 insufflation of preperitoneal space makes a good visualization of posterior wall of the transversalis fascia. This space of Retzius was extended between the pubic symphysis and epigastric vessels. Dorsally the obturator canal can be observed in this space. Beneath the attenuated posterior rectus sheath, superficial PF was opened in the direction of spermatic sheath. The peritoneal edge was identified and hernia sac was isolated from the cord structures dissecting between preperitoneal fat and deep PF. The superficial PF was divided along the epigastric vessels. Then, an optimum space for mesh deployment was created.
Results: The mean operating time was 171 minutes for bilateral hernia. No intraoperative complications other than 10% of peritoneal injury were observed.
Discussion: In order to obtain the optimum layer of dissection, the color of fat tissue and the running pattern of capillary vessels should be carefully observed.

AVS1-2

Standardizations of totally extraperitoneal (TEP) laparoscopic inguinal hernia repair using tumescent anesthesia

Yoshihide Chino, Masaki Fujimura, Isao Sato, Makoto Mizutani, Tomotake Tabata, Tomoyuki Tagi, Shoichi Takayama, Shigeyoshi Shimaoka, Minoru IIda
Endoscopic Surgery Center, First Towakai Hospital, Japan

Introduction: For laparoscopic inguinal hernia repair procedures, TAPP is more popular than TEP. This is due to the difficulty of parietalization of the anatomical membrane during operations. The aim of the current study is to show our standardized technique using tumescent anesthesia (t- TEP), and the safety of this technique.
Method: Operative procedures: First the Retzius space was dissected and the pubic bone was identified. After the inferior epigastric vessels had been identified, liquid injection was performed. The injection volume was 1 to 2ml each time. At the lateral side of these vessels, we were able to find the peritoneal edge (PE) more easily than when using traditional TEP procedures. Dissection was continued along the hernia sac. We could easily find the seminal cord and testicular vessels. Finally a 3D soft mesh was inserted and fixed with absorbable tackers. Abdominal observation after operation made it possible to confirm the appropriate mesh fixation. Operation times and complications were compared t-TEP with traditional TEP.
Results: Operation time for t- TEP was shorter than that of the traditional TEP. There was no major damage to the peritoneum during operations and conversions to open repairs. Groin pain was lower in the case of t- TEP.
Conclusion: We suggest that tumescent anesthesia is a safe and practical procedure for TEP, and t-TEP contributes to reduced postoperative pain and shorter operative times.

AVS1-3

One stage three steps laparoscopic treatment for strangulated obturator hernia: totally extraperitoneal repair followed by intestinal resection by hybrid laparoscopic and open surgery

Chin-Yao Lin
Department of Surgery, Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taiwan

Although total extraperitoneal preperitoneal repair (TEP) is widely used for inguinal, femoral and obturator hernia treatment, but mesh repair is not routine used for strangulated hernia treatment if intestinal resection is required due to the risk of postoperative mesh infection. Two stage TEP repair in these cases was reported with good results. We reported a case with one stage three steps laparoscopic treatment for strangulated obturator hernia.
A 91 year-old female was diagnosed left incarcerated obturator hernia at other hospital one week ago. She was transferred to our hospital for second opinion. She has history of old TB, but no previous abdominal surgery. She complaint abdominal fullness and blood test showed leukocytosis (WBC 26510/ uL). Abdominal CT revealed an incarcerated left obturator hernia.
She received emergency intraperitoneal laparoscopic exploration under general anesthesia. Three ports were inserted at supraumbilical, and right and left lower lateral abdomen. Intraoperative findings showed incarcerated left obturator hernia, right obturator hernia and bilateral direct inguinal hernia were also found. After reduction the small intestine, strangulated part was found. Then we inserted a new port infraumbilical and created preperitoneal space for TEP repair with two pieces of flat malex mesh (15x10 cm in size) and no peritoneal tear. Finally, we extended the umbilical wound and the small intestine was brought out from the abdominal cavity and resected.

AVS1-4

Laparoscopic repair of an irreducible peri-inguinal hernia diagnosed pre-operatively as spigelian hernia in a morbidly obese patient

Hrishikesh P Salgaonkar[1,2], Raymond Hon Giat Lim[1,2], Jia Hao Law [1,2], Davide Lomanto[1,2]
[1]*Minimally Invasive Surgery Centre, Department of General Surgery, National University Hospital Singapore, Singapore*
[2]*Yong Loo Lin School of Medicine, National University of Singapore (NUS), Singapore*

Peri-inguinal hernias are rare defects of ventral lateral abdominal wall, just above the inguinal region. A 79 years/male presented with pain in right lower abdomen during physical activity. A diffuse lump was palpable in right iliac fossa region. No inguinal hernia seen. A CT scan abdomen showed 10 x 14 cm Spigelian hernia with 3.5 cm neck containing bowel loops between the external and internal oblique muscles. BMI was 32.33 kg/m2.
Patient underwent laparoscopic mesh repair of right peri-inguinal hernia. One 10/12mm and two 5mm ports were inserted. Small bowel loops were seen herniating into a 4 cm defect. After reducing the contents, pre-peritoneal space was created and defect seen lateral and cranial to deep ring and hernia separate from the cord structures. Defect was covered with a 20 x 15 cm polyprolelene mesh. Mesh fixed with absorbable tackers and peritoneum closed. No intraoperative complications were noted. Postoperative period was uneventfull. Pain scores were acceptable (1-3). Patient recovered well and was discharged on 2nd postop day. Follow up was uneventfull.
In literature there exist hints to peri-inguinal hernias, i.e. direct lateral hernia. We describe a case of peri-inguinal hernia, pre-operatively diagnosed as spigelian hernia in a morbidly obese gentleman. Surgical repair is the definitive treatment and involves mesh repair of the defect. Excellent visualization and magnification offered by laparoscopy allows us to confirm the diagnosis, combined with benefits of low morbidity, faster recovery and short hospital stay. Laparoscopic mesh repair of peri-inguinal hernia is safe and efficacious.

AVS1-5

Rare Hernia Video Presentation: Laparoscopic repair with self-gripping mesh for Ureterosciatic Hernia

Gen Shimada, Shintaro Sakurai
Hernia Center, St. Luke's International Hospital, Japan

Ureterosciatic hernia is a rarely pelvic hernia and is extremely rare caused of urinary tract infection. We reported sequential urological conservative management and the successful laparoscopic repair with self gripping mesh for symptomatic right ureterosciatic hernia.
A 83 years old female was diagnosed right incarcerated ureterosciatic hernia with pyelonephritis and hydronephrosis. Incarcerated ureterosciatic hernia with pyelonephritis was treated by double J urinary stent and antibiotic therapy. Double J stent was removed after 3 months without recurrence. However incarceration and right flank pain appeared. Double J stent was inserted and incarcerated ureter was reduced. Repeated ureterosciatic hernia was repaired with self gripping mesh laparoscopically. Postoperative course was uneventful for 8 months after surgery.
This video presentation shows intraoperative technique of laparoscopic ureterosciatic hernia repair with self-gripping mesh.

AVS1-6

Laparoscopic Incisional Hernia Repair with Laparoscopic Anterior Component Separation and IPOM repair technique: a Video

Pramod Shinde
Department of Minimal Access Surgery, Kaushalya Hospital & Research Centre, India

Introduction: Midline closure of defect is desirable in order to improve biomechanics of Abdominal wall, improve posture, improve cosmesis, reduce Seroma rates and possibly, reduce recurrence rate.
Closure of Defect of Hernia is not possible in large defects more than 6 cms or rigidity of Abdominal wall.
In such a situation, Component Separation becomes necessary to facilitate or enable midline closure.
Anterior Component Separation can be done Laparosocpically either as a planned part of Surgery, or even as an on the spot decision, if closure cannot be achieved intra-operatively.
Material: This Video presents the Technique of Laparoscopic Anterior Component Separation in a case of Lower Abdominal Recurrent Incisional Hernia, where Laparoscopic IPOM repair was planned and it was discovered intraoperatively that the defect could not be closed. A total Laparoscopic Repair was done including Anterior Component separation, midline closure of defect and IPOM repair. The patient recovered uneventfully.

AVS2-1

The minimal open pre peritoneal approach to treat the umbilical hernia, with a new target mesh, positioned in the pre peritoneal space: Video

Marc Soler
Clinique Saint Jean, Benin

Our preference to treat an ombilical hernia is to put a mesh in the preperitoneal space.
The main difficulty of the technique was to unroll the prosthesis through the small incision.
So we created a new semi rigid and self-expandable mesh.
It is the target mesh: a twelve cm rounded polypropylene mesh with three not knitted and not woven concentric rings. The mesh can be cut.
The main step of the procedure is the preperitoneal space dissection.
A personal prospective study (n=112) is under way, under the control of the French club hernie data base.
Follow up: [15-63] months.
79 men, 33 women
Primary 108, secondary 4
Day surgery, n=106 (88%)
Complications; Seroma, n=2; Ombilical necrosis, n=1; Recurrence, n=1 with a good result after reoperation
Post-operative pain at one month: Visual Analogic scale (VAS)
VAS=0: 96 (86%)
VAS [1-3]: 11 (10%)
VAS [4-7]: 4 (3.5%)
VAS 8: 1 (0.90%)
Post-operative pain between 3 and 6 month (Only the patients with pain at one month are reviewed)
VAS=1-3: 5
VAS=4-7: 1
VAS=8: 1
For all these patients the post-operative pain is less important than the preoperative one
Post-operative pain between 12 and 51 months (All the patients are reviewed at one year)
VAS=4-7: 4 patients
Conclusion: The use of the extra peritoneal mesh is a safe technique. The use of the target mesh make easier to unroll the prosthesis in the Preperitoneal space. The post operative pain rate is very low.

AVS2-2

Abdominal Incisional Hernia Treated by Hybrid Operetion

Keio Song, Ken Hagiwara, Taiki Miyakuni
Department of Digestive Surgery, Nihon University Hospital, Japan

Introduction: Surgery for abdominal incisional hernia has been selected a variety of surgical procedures.
Methods: From 2012, We underwent 11 cases Hybrid Operation. It details the eight cases using the VENTRIO mesh.
1. Make the marking of the hernia.
2. Determine the position of the small incision (4 ~ 5cm). This includes taking into account the overall picture of the hernia, it is important to image the center of the mesh deployment range.
3. previous surgery wounds of the small incision, it is possible that the incision in the sack to reach safely in the abdominal cavity.
4. Attach the wound retractor XS to incision, and then set up a free access XS.
5. Insert 5mm port to observe the abdominal cavity from the side abdominal wall from free access. If necessary the camera, it will be the operation ready switch the operation equipment.
6. adhesiolysis and daughter hernia of observation. The determination of the mesh size.
7. Insert the large mesh than wound retractor part "cigar-roll, half & half method". Do stay tacking.
8. you can see "Look up at The dome of PANTHEON".
9. tacking the entire circumference by the double crown method. "Avoiding dangerous zone in the pubic groin" is important.

Conclusion: 1. Hybrid surgery is easy to diagnose daughter hernia in observation from within the abdominal cavity. In the lower abdomen, knowledge of laparoscopic inguinal hernia repair will be considered useful. 2. skin incision is considered to be the length of the mesh can be inserted minimum.

AVS2-3

Our experience in management of ventral henias in difficult positionslike suprapubic. lumbar,epigastric and subcostal regions

Laxmi Kumari S Kona[1,2], Vijay Bada[2], Bharat Nara[2], Ajay patwardi[2]
[1]*Dept of Minimal Access Surgery, Global Hospital, India*
[2]*Dept of Minimal Access Surgery, Global Hospital, Lakdika Pul, Hyderabad, India*

Traditionally hernias in difficult positions like suprapubic, lumbar, subcostal and post CABG epigastric hernias were seen as a relative contraindication for IPOM or laparoscopic repair, with time and experience these hernias are being tackled laparosopically using a partial TAPP approach. we present our experience of handling these type of cases and show the videos of the surgical management.

AVS2-4

Different varieties of "Component Separation Technique"

Ramesh Punjani
Surgery, Fortis Hospital, India

Component Separation Technique (CST) is an evolving technique for repair of large ventral hernia with loss of domain.
Ramirez designed it first time in 1990. It allows medialization of rectus muscle & closure of the defect without tension.
However, it has its own pitfalls.
Various modifications like perforator preserving CST, Endoscopic CST, Posterior CST, Transverse Abdominis Release (TAR) have evolved.
We Will show short video clippings of different procedures.

AVS2-5

Complex Abdominal Wall Hernia Repair

Jose Macario V Faylona
Department of Surgery, University of the Philippines-Manila, Philippines

One of the most difficult challenges in abdominal wall hernia repair is the repair of complex or combined abdominal wall hernias. It provides a challenge among surgeons as to how to repair the hernia defect with the least recurrence and also restores the abdominal wall physiology. Here we present a case of a 50 ,male who underwent a previous laparotomy due to trauma obtained when he was gored by a water buffalo sustaining intra-abdominal injuries as well as abdominal wall injuries. He presented with a combined incisional and bilateral inguinal hernias together with a hernia over the site where he was gored. A video of the technique of repair will be presented as well as the different options in abdominal wall reconstruction.

ASP1-1

The 8 fold path to attain laparoscopic TEP Nirvana

Jaideepraj Rao
Department of General Surgery, Tan Tock Seng Hospital, Singapore

Laparoscopic surgery is now being increasingly being done for inguinal hernias due to its advantages of decreased pain and early return to daily activities. Inguinal hernias can be repaired either trans-abdominal pre-peritoneal (TAPP) or totally extra peritoneal (TEP). Both repairs are acceptable; however, TEP has some advantages with decrease in incidence of bowel injury and post operative adhesions. TEP repair, however, has a steeper learning curve. This learning curve can be shortened by standardizing the procedure. The new high definition 3D systems may also play a role in decreasing learning curve in laparoscopic surgery. The 8 steps in lap TEP repair is one way of standardizing hernia surgery to decrease learning curve so that minimal access surgery can be adopted more easily.

ASP1-2

Three-dimensional endoscopy improves operative time and hospital stay in laparoscopic inguinal hernia surgery: Evidence from 189 cases

Kenichi Yoshida[1], Naotaka Yamaguchi[1], Yusaku Tanaka[1], Kentaro Sekizawa[1], Kentaro Miyake[1], Yuzo Minegishi[1], Nobuko Segami[2], Yasuo Sato[1]
[1]*Department of Surgery, Social Welfare Organization Saiseikai Imperial Gift Foudation, Inc, Saiseikai Wakakusa Hospital, Japan*
[2]*Department of Anesthesiology, Social Welfare Organization Saiseikai Imperial Gift Foudation, Inc, Saiseikai Wakakusa Hospital, Japan*

Background: Three-dimensional (3-D) endoscopy has been developing remarkably and has become quite useful. Its efficacy has been reported in endonasal surgery, but has not been reported in laparoscopic surgery enough.
Objective: To evaluate the efficacy of 3-D endoscopy in laparoscopic inguinal hernia surgery.
Methods: The subjects were 312 patients who were diagnosed with inguinal hernia and received trans abdominal preperitoneal procedure (TAPP) between May 2013 and August 2015. TAPP using 2-D endoscopy was performed in 123 patients and TAPP using 3-D endoscopy, in 189 patients. We evaluated factors which may influence operative time, such as age (>65), sex, BMI (>25), episode of illness, size of distension (>6 cm), left or right, and type of hernia by univariate analysis. We used multivariate analysis to find out the most influential factor to operative time. We also compared the duration of the procedures, the number of complications, and length of hospital stay between the 2D endoscopy group and 3D endoscopy group.
Results: Operative time was significantly reduced in the 3D endoscopy group compared to the 2D endoscopy group (131.6 vs. 89.8 min, $p<0.001$) and the most influential factor for operative time was 3D endoscopy ($p<0.0001$). The duration for dissection and repair in the procedure using 3D endoscopy was significantly shorter compared to that using 2D endoscopy, and the length of hospital stay was significantly shorter (2.5 vs. 2.9 days, $p<0.01$).
Conclusion: 3-D endoscopy is useful in TAPP with improvement in operative time and hospital stay.

ASP1-3

Three-dimensional endoscopic surgical systems facilitates the safety and rationality in laparoscopic inguinal hernia repair

Hiroki Toma, Toru Eguchi, Kei Fujii, Yu Sato, Takehiro Nishiki, Tomonari Kobarai, Gen Naritomi, Ichio Hirota
Department of Surgery, Harasanshin Hospital, Japan

Introduction: Since its advent in the clinical practice, accumulating evidence verifies the significance of three-dimensional (3D) endoscopic surgical systems in various laparoscopic surgeries. The improvement of surgical skills in the manipulation of deep structures as well as suturing in 3D endoscopic surgical systems possibly facilitates the safety in laparoscopic surgeries. Herein we describe the advantage of 3D endoscopic surgical systems in totally extraperitoneal endoscopic repair (TEP) for adult inguinal hernia, which consequently improves the rationality in TEP.
Procedure: The extraperitoneal space was reached by the optical method using a 10 mm flexible scope from the infraumbilical incision and dissected through additional two 5 mm ports placed in the midline lower abdomen under pneumoperitoneum. The 3D images clearly showed the depth of extraperitoneal space, facilitating the detection and dissection of hernia sac and security of enough space for mesh placement. The myopectineal orifice was covered with the mesh trimmed in trapezoid shape. A self-gripping mesh was also expanded immediately under the 3D images.
Results: There was neither serious intra- nor postoperative complications in the period of 2 years since the introduction of 3D endoscopic surgical systems in TEP in our hospital.
Conclusions: 3D endoscopic surgical systems secures clear vision of fine anatomical structures in the groin region, contributing to the safe and rational repair for adult inguinal hernia.

ASP1-4

TAPP procedure: performed by surgeons in Japan certified by the Endoscopic Surgical Skill Qualification System

Kaisuke Yamamoto, Yuichi Morishima, Diasuke Satomi, Satoshi Fukutomi, Mai Sakakibara, Komei Ishige, Kosuke Sasaki
Department of Surgery, National Hospital Organization Chiba Medical Center, Japan

The transabdominal pre-peritoneal (TAPP) procedure is a rational surgical treatment for inguinal hernia. Few postoperative complications, such as chronic pain, mesh infection and so on, are experienced when this procedure is used. TAPP use has rapidly become widespread in Japan in recent years, but the technical level has not advanced with equally rapidly. The Japan Society for Endoscopic Surgery has established an endoscopic surgical skill qualification system which allows surgeons to master the skills necessary to become supervisory doctors. The inguinal hernia pass rate is approximately 20% annually. Surgeons will not be able to obtain the TAPP qualification unless they have very high technical skills. We will share a 3D video of an operation performed by a qualified surgeon. This form of 3D laparoscopy avoids anatomical misconceptions with the use of stereoscopic vision and is also useful in terms of manipulating forceps. However, if a surgeon has high technical skills for 2D laparoscopy, there would be no difference in outcomes between 2D and 3D laparoscopy. Therefore, 3D laparoscopy may not be needed. It is considered to be highly advantageous for beginners to perform laparoscopic hernia repair.

ASP1-5

Advantage of three dimensional visualization in TAPP

Nozomi Ueno, Taichi Tamura, Shinichi Sou, Tetsuo Maeda, Tomoyuki Wakahara, Kiyonori Kanemitsu, Takurou Yoshikawa, Hiroshi Ashitani, Shinobu Tsuchida, Akihiro Toyokawa
Department of Surgery, Yodogawa Christian Hospital, Japan

TAPP is looked on as technically demanding procedure and its successful repair relies on the grasp of the anatomy of the anterior abdominal wall and inguinal region from the intra-abdominal perspective. But especially pelvic structures are complicated due to their three dimensional location with depth which makes it difficult to understand.
In TAPP as a hernia repair, recurrence and intraoperative complication is to be avoided.
Against recurrence, it requires not only recognition of the main orifice but complete assessment of the potential hernia defects and co-existence type hernia with an orifice simultaneously. The potential defects is detected as "loosens", other than orifice, at the lateral triangle and the Hasselbach's triangle inside the groin. In addition a mesh should provide adequate coverage of the inguinal floor. The inferior edge of the mesh should lie flush against the retroperitoneum and not curl, so that the seminal duct and the umbilical artery is landmark for dissection of peritoneum.
Against intraoperative catastrophic complication, it is important to understand the location of the iliac vessels, genitofemoral and lateral femoral cutaneous nerves, and bladder.
3D visualization has been introduced into the laparoscopic surgery and commented as making big advantage especially in pelvic surgery. In TAPP, this will do at the relative recognition of vessels and prevesical space.
We will show and discuss the advantage through our surgical experience.

ASP1-6

Scar-less laparoscopic hernia repair under the view of 3D scope

Aya Kamei, Eiji Kanehira, Masafumi Nakagi, Kodai Takahashi, Takashi Tanida
Hernia Center, Department of Surgery, Medical Topia Soka, Japan

Introduction: To minimize the trauma in approach route of laparoscopic transabdominal preperitoneal hernia repair (TAPP) for adult inguinal hernia, wedeveloped a new operative technique with the use of two 2mm punctures. Moreover, we verified the safety of Needlescopic TAPP by using 3D scope.
Methods: We developed 6 kinds of new 2mm instruments including grasping forceps, hook shaped electrode, mesh pusher, needle driver, scissors and laparoscope. The needle scopic TAPP was performed with these instruments.
Results: Needlescopic TAPP was stably performed in 80 patients without significant morbidity. There was no recurrence and the operation time was 46.3 minutes in average.
Conclusions: Newly developed 2mm devices showed sufficient performance and durability in needlescopic TAPP. Each of these devices plays an essential role to enable this technique. On the other hand, a meticulous attention must be payed to manipulate these fragile devices. The view of 3D scope may be useful to understand the fine movement of needle devices.

ASP1-7

Impact of 3D laparoscopy on TEP hernia repair

Takeshi Nagahama, Tomoki Aburatani, Chisato Okajima, Yoshitaka Fujimori, Yojiro Okada
Surgery, Kudanzaka Hospital, Japan

Introduction: Recent progress in technology introduced images of 3 dimension into laparoscopic gastrointestinal surgery. Additional sensation of depth greatly contributed to the quality of surgery. However, for TEP hernia repair, most procedure were still carried out by conventional 2D laparoscope. Here we will report our initial series of single incision TEP under 3D laparoscope.
Procedure: Single incision TEP procedure was carried out through 2cm skin incision made at umbilicus. Wound retractor and rubber glove was used to keep pneumatic pressure in the preperitoneal space. All dissection was carried out under laparoscopic observation and there was no blunt dissection. Due to the increased diameter and feature of 3D scope (Olympus 3D Flex Eye) dissection maneuver in the preperitoneal space was a little different from ordinary 2D TEP (Olympus 30 degree 5mm in diameter). Reduction of hernia and repair by mesh was carried out same fashion as original TEP.
Discussion: Adding sense of depth on conventional 2D scope gave us lot more information about boundary space of membrane, fat tissue, vessels, peritoneum, and muscle. Consequently, dissection was precise and easier than conventional 2D scope, while increased diameter of scope resulted more interference and limitation of forceps handling.
Conclusion: TEP under 3D laparoscopy introduced new sensation whereas devices trocar should be more sophisticates.

ASP2-1

Feasibility Of robotic-assisted Laparoscopic Repair Of Different Types Of Hernia: Early Experience Of A Single Center

Tamer Abdelhafez Elbakry[1], Mohamed Soliman Elakkad[1], Nizar Bouchiba[1], John Williams[2], Hany Atalah[2]
[1]*Department of General Surgery, Alwakra Hospital, Hamad Medical Corporation, Qatar*
[2]*Robotic Surgery Division, General Surgery Department, Navicent Health Systems, States of America*

Background: Robotic-assisted laparoscopic hernia repair offers many advantages utilizing endowrist ergonomic movement, depth of perception, 3D magnified high definition images to identify anatomical structures to avoid nerve injury, which eliminate Groin and testicular pain.
Methods: Retrospective analysis of 19 hernia patients operated in AlWakra Hernia Center, Hamad Medical Corporation, Qatar in collaboration with Navicent Health systems Macon, Georgia USA in 2016; group I: 13 inguinal hernia patients, group II: 5 ventral hernia patients (2 para-umbilical hernia & 3 port site incisional hernia), & group III: 1 hiatus hernia patient. They were submitted to robotic-assisted laparoscopic mesh repair of the hernia by da Vinci System, Xi (Intuitive Surgical, USA) using Progrip mesh (Covidien, USA) in group I, Gore Dual mesh (WL Gore & Associates, USA) in group II, & Gore Bio-A mesh (WL Gore & Associates, USA) in group III.
Results: Mean age was 38.8, 52.2, & 54 years, mean operative time was 58.3, 74.4, & 146 minutes for group I,II, & III respectively. One patient (group I) was converted to laparoscopic TAPP due to extensive adhesions. No operative complications recorded. Post-operatively, 1 patient (group II) developed intra-abdominal bleeding from inferior epigastric vessels injury during mesh fixation using fascia closure device He was treated conservatively. Mean length of hospital stay was 1.26 days.
Conclusion: Our early experience revealed that robotic-assisted laparoscopic hernia repair is a safe approach offering better visualization, superior ergonomics, easier intra-corporal suturing. Longer follow up on wider patients range is needed.

ASP2-2

Robotic ventral hernia repair vs laparoscopic repair

Vikas Panwar[1], Mohamed Soliman Elakkad[1], Nizar Bouchiba[1], John Williams[2], Hany Atalah[2]
[1]*Department of Surgery, Max Super Speciality Hospital, India*
[2]*Robotic Surgery Division, General Surgery Department, Navicent Health Systems, States of America*

Robotic surgery for ventral hernia is evolving rapidly. Laparoscopic IPOM (Intra Peritoneal On-lay Mesh) repair has been the gold standard for ventral hernias. We present our early data of Robotic versus Laparoscopic IPOM repair.
We have recently started performing Robotic surgery for Ventral abdominal hernias. Since our follow up is short, we would be comparing the immediate and early (technical) differences between the two types of repair.
In our early experience of 12 patients undergoing Robotic IPOM repair we find that robotic repair is more costly and has longer operative time. The post-operative pain is considerably less on Visual analogue score compared to laparoscopic repair when suturing the mesh to the parities than using tackers and trans-fascial mesh fixation sutures during robotic surgery was done. The hospital stay and return to work showed no significant difference.

ASP2-3

Robotic muscle-aponeurotic rectus plication- Robotic Abdominoplasty

Marco Faria Correa, Taichi Tamura, Shinichi Sou, Tetsuo Maeda, Tomoyuki Wakahara, Kiyonori Kanemitsu, Takurou Yoshikawa, Hiroshi Ashitani, Shinobu Tsuchida, Akihiro Toyokawa
Medical Director- Plastic Surgeon, Plastic Surgery Pte Ltd, Singapore

The author presents his 25 year experience in treating small and median size abdominal wall deformities like ventral hernias, incisional hernias, umbilical hernias and rectus diastasis by doing muscle aponeurotic plication using endoscopic (subcutaneouscopic) methods.With a representative number of patients up to 20 years follow-up presenting with successful results and a series of secondary surgeries for repairing unsuccessful cases, the author presents a deep study of his personal experience as well as a bibliographic review of the different methods of plication, with the use of different sutures materials, abdominal wall CT Scan and linear ultrasound long term evaluation of the efficacy and longevity of the muscle-aponeurotic plication.Also an analysis of the trans-operative findings in secondary cases discussing what kind of sutures and the technique were used in the well succeeded cases and his though of what was the reason for faille in the unsuccessful ones. Pioneer in endoscopy plastic surgery in 1992 the author developed a set of instruments for adapting endoscopic methods to the subcutaneous territory to perform minimally invasive muscle aponeurotic rectus plication.Since 2014 he started with great enthusiasm dedicating to bring the minimally invasive abdominal wall muscle aponeurotic plication/Endoscopic Abdominoplasty to the next level,by using Robotic daVinci Surgical System. So far he has already delivered a few cases of Robotic rectus plication and designed some new instruments to facilitate the method. It is already possible to say that robotic surgery brings important advantages comparing with endocopic methods.

ASP2-4

Robotic Hernia Repair Indian experience

Arun Prasad, Abhishek Tiwari, Mustafa Kamal Salarzai
Department of Minimal Access & Robotic Surgery, Apollo Hospital, India

Introduction: Laparoscopic hernia repair has been widely accepted as a good procedure. However in some patients undergoing robotic abdominal surgery, we see a concomitant ventral or inguinal hernia. Robotic inguinal and ventral hernia repair is a relatively new concept and has been offered to patients.
Material and Methods: Between July 2012 and July 2016, we have had 31 patients who had abdominal wall hernia in addition to the primary problem for which they were undergoing robotic surgery. Patients included those with ventral and inguinal hernias. These patients were those undergoing fundoplication, achalasia surgery, rectopexy, radical prostatectomy and bariatric surgery. For inguinal hernias, robotic TAPP was done with mesh placement and suturing. For ventral hernias, IPOM or extra peritoneal mesh placement was done with suturing.
Results: All patients did well. There were no intraoperative or post operative complications seen. No recurrence has been reported so far.
Conclusion: Patients undergoing robotic abdominal surgery can have robotic mesh repair of a concomitant ventral or inguinal hernia. In inguinal hernias and some ventral hernias staplers are not needed for fixation. Results are comparable to the laparoscopic and open hernia mesh repairs.

ASP2-5

Robotic Surgery & Abdominal Wall Hernia Repair?

Davide Lomanto
Khoo Tech Puat Advanced Surgery Training Centre, Yll Som National University, Singapore

Robotic hernia repair is a novel technique. The advent of robotic surgery has introduced numerous advantages when compared to standard laparoscopic surgery including increased degree of freedom in movements, three-dimensional vision enabling precise suturing, and dissection for mesh placement at difficult angles and to perform complex manoeuvres. By allowing surgeon to performing more challenging types of repairs, such as the endoscopic component separation and pre-peritoneal mesh placement technique potentially eliminating the need for a dual sided mesh or composite mesh, the need of tackers, trans-fascial sutures or mesh deployment devices.
Isolated case reports and retrospective studies have shown robotic technology to be safe and feasible for abdominal wall hernia repair. The use of robotics in ventral hernia repair is still very limited because of the cost associated with the technique. But with proper case selection robotic technology may offer the advantage of lower rate of complications, shorter hospital stay and lower rate of conversion to open particularly for complex cases. Although early results are promising, multi-centre randomized controlled trials and long-term follow up are needed. Cost, experience and outcomes will all likely improve over time as it has with prior technological advances in General Surgery.

AS1-1

Genomics analysis to the pathogenesis in adult inguinial hernia

Xin Nie, Yuan-wen Chen, Zhi-cheng Song, Yan Gu
Department of General Surgery, Hernia and Abdominal Wall Disease Center, Shanghai Ninth Hospital, Shanghai JiaoTong University School of Medicine, China

Objective: To explore the genomics change in the occurrence and development of adult primary inguinal hernia.
Methods: From June 2014 to June 2015,we collected transversalis fascia of 5 patient with ingunial hernia and 5 matched control patients, utilizing gene chips (Affymetrix GeneChip Human Transcriptome Array 2.0) to reveal gene expression profiling.
Results: 1189 mRNAs were showed differently expressed in hernia patients relative to their matched control, with 877 mRNAs upregulated and 312 mRNAs downregulated.
Conclusion: The occurrence and development of inguinal hernia is associated with a multitude of genetic expression. By selecting target differently expressed genes based on the gene array analysis, we can further explore the pathogenesis and mechanism of inguinal hernia development.

AS1-2

A detailed anatomical concept of the inguinal structure recognized on High-vision images of the totally extra-peritoneal repair procedures with tumescent anesthesia of inguinal hernia

Sakata Koichiro, Chijimatsu Hikari, Kijima Daiki, Junya Kondo, Hideto Hayashi
Department of Surgery, JCHO Shimonoseki Medical Center, Japan

Inguinal hernia repair is the most common procedure performed worldwide in general surgery. Although the extra-peritoneal approach (TEP), a laparoscopic hernia-plasty method, has gained in popularity and recommended by the European Hernia Society, TEP is a challenging technique with unfamiliar anatomy of poorly depicted anatomical guides. A more precise anatomical concept of the inguinal structure recorded on High-vision images of the TEP procedures with tumescent anesthesia of inguinal hernia is mentioned. Under the attenuated posterior rectal sheath which continues to the membranous fascia on the posterior rectal sheath and links to the umbilical pre-vesicular fascia, pre-peritoneal space exists. In this space, the pre-peritoneal fascia which contains the hernia sac and spermatic sheath with the ductus deferens and testicular vessels, penetrate the inguinal ring.
This is different from current anatomical descriptions. This concept, identical to the view recorded in the anterior procedures, is available to perform TEP procedure.

AS1-3

Key points on the surgical procedure of midline approach TEP (Totally ExtraPeritoneal Repair): an optimal approach for single port surgery

Naoki Asakage, Junichi Sasaki, Michitaka Kouno, Hirohisa Ookame, Minoru Hatano, Yutaka Kawamura, Katsunori Nishida
Department of Surgery, Tsudanuma Central General Hospital, Japan

In laparoscopic inguinal hernia hernioplasty, TEP is operated without cumbersome procedures such as the peritoneal incision and suture, and TEP is in particular suited for SILS.
In the midline approach where the linea alba is incised to enter the space between the peritoneum and the posterior rectus sheath, the peritoneal side is expanded by carbon dioxide insufflation and a wide working space can be secured with the Retzius space formed between the transversalis fascia and preperitoneal space.
The midline approach TEP is considered to have a significant advantage for SILS in terms of the utilization of a wide working space as well as the merit that the peritoneal repair is unnecessary.
In the midline approach TANKO-TEP, key points on the surgical procedure are as follows: (1) correct incision along the linea alba, development of the Retzius space which will serve as a working space, and establishment of the umbilical platform, (2) confirmation of landmarks between the Retzius space and preperitoneal space bearing in mind a three-dimensional image of the extraperitoneal space, (3) penetration into the preperitoneal space, parietalization, and inspection of the membranous layer (i.e., the superficial layer) in the boundary surface of the preperitoneal space, and (4) securing a space for handling the mesh.
It is also important to understand the three-dimensional structure consisting of the transversalis fascia and the preperitoneal space, forming the extraperitoneal space between the body-wall muscles and peritoneum, and the Retzius space, the artificial cavity formed between the transversalis fascia and preperitoneal space.

AS1-4

The clinical observation of fascia characteristics in TEP procedure

Jun-sheng Li, Zhen-ling Ji
Department of General Surgery, ZhongDa Hospital, Southeast University, China

Background & Purpose: Young surgeons often have inadequate understanding the proper anatomical planes for dissection in TEP procedures, this may either due to the limited, and less agreement among the definition, nature, extent, attachments or functions of the transversalis fascia, or the variations of these structures from patient to patient. We provide here the clinical observations of the various preperitoneal planes during TEP procedure, and it is important for better understanding the knowledge.
Methods: Pictures and video clips of TEP procedure were recorded during operation, the uncommon findings and typical anatomical structures were also noticed. Literatures were reviewed.
Results: There are some variations in the anatomical structures of the preperitoneal space. Transversalis fascia was also found quite distinct from the preperitoneal fascia which ensheathed the cord structures and hernia sac. The Transversalis fascia and the preperitoneal fascia are different in origin with separate individual neurovascular supply. Some patients had complete posterior rectus sheath, extending to the pubic bone, and made the Arcuate line formed on various levels. And this sheath should be incised to create a proper space during TEP.
Conclusion: There is an avascular inter-fascial plane between the transversalis fascia and the preperitoneal fascia, which is the surgical preperitoneal space, and some common anatomical variations should be anticipated and respected during TEP procedure.

AS1-5

A Comprehensive New Definition and New Classification for Corona Mortis: A Clinical View

Mustafa Ates[1], Erdem Kinaci[2], Abzuer Dirican[1], Dincer Ozgor[1], Evren Kose[3], Ramazan Eryilmaz[4]
[1]*Department of General Surgery, Inonu University, Faculty of Medicine, Turkey*
[2]*Department of General Surgery, Istanbul Training and Research Hospital, Turkey*
[3]*Department of Anatomy, Inonu University, Faculty of Medicine, Turkey*
[4]*Department of General Surgery, Akdeniz University, Faculty of Medicine, Turkey*

Background: Although it is famous as an anatomical term, Corona Mortis (CMOR) as a non-standard vascular anatomy, there are no clear definition including possible localizations and related classification of CMOR. Here we provide a new and comprehensive definiton for CMOR and a classification including possible localizations.
Material: The patients who underwent totally extraperitoneal (TEP) hernia repair from July 2014 to February 2016 were evaluated.
Results: 190 of 83 patients were considered. Three zones were described for the localization of CMOR. Zone I: The area on the posterior surface of superior pubic ramus between medial border of inferior epigastric vessels and the lateral border of Cooper's ligament (35%). Zone II: The area on the surface of Cooper's ligament (32%). Zone III: The area on the body of pubic bone medially to medial border of Cooper's ligament (28%).
Conclusion: The vessels derived form inferio epigastric vessels or obturator vessel crossing the body of pubic bone to make an anastomosis with the vessels originated from the contralateral equivalents were firstly identified in the current study. A new definition and a new classification of CMOR based on clinically important localisations were gained to the medical literature with this study.

AS1-6

A New Maneuver to View and to Protect Corona Mortis During Laparoscopic Totally Extraperitoneal Hernia Repair

Erdem Kinaci[1], Mustafa Ates[2], Abzuer Dirican[2], Dincer Ozgor[2], Ramzan Eryilmaz[3]
[1]*Department of General Surgery, Istanbul Training and Research Hospital, Turkey*
[2]*Department of General Surgery, Inonu University, Turkey*
[3]*Department of General Surgery, Akdeniz University, Turkey*

Background: The identification of retropubic vasculature is not easy under the pressure of insufflated gas during totally extraperitoneal (TEP) inguinal hernioplasty. We aimed to present the usefulness of a maneuver that allow the clear identification of retropubic vasculature.
Methods: Vascular anatomy on the retropubic surface in 364 patients who underwent the TEP procedure from January 2005 to September 2015 were evaluated. In patients after July 2014, the pressure in the workspace was decreased from 14 mmHg to 8 mmHg before fixation of the mesh to clearly identify the veins. The results before and after July 2014 were compared.
The number of hemipelvises in the first and second periods were 398 and 77, respectively. The rate of identification of venous corona mortis was 31% in the second period, whereas it was 1.0% in the first period (p=0.000). The identification of thick (5.5% vs. 10.3%; p=0.123) and thin (22.8% vs. 36.3%; p=0.014) arterial structures and their sum were increased in the second period (28.4 vs. 46.7%; p=0.002). The rate of retropubic bleeding was zero in the second period, while it was 1.5% in the first period.
During TEP hernioplasty, the pressure of insufflated gas more than 10 mmHg in the preperitoneal space hinders the correct identification of vessels on the retropubic surface. The proposed maneuver, to decrease the pressure in the workspace to 8 mmHg, can provide clear identification of all vessels, which decreases the potential risk of vascular injury.

AS2-1

Using UHS to repair small and middle abdominal incisional hernia: a report of 24 cases

Pei-ge Wang, Xin-gang Peng
Department of Emergency General Surgery, Affiliated Hospital of Qingdao University, China

Objective: To summarize the clinical experiences of UHS repair on small and middle abdominal incisional hernia.
Methods: The clinical data of 24 cases of small and middle abdominal incisional hernia treated in our hospital from February 2011 to October 2015 were retrospectively analyzed.
Result: All cases were healed with no severe complications, 24 cases were followed up and no recurrence during 4-60 months.
Conclusion: UHS repair is an ideal surgical procedure for abdominal incisional hernia.

AS2-2

Double circular suturing technique for large abdominal wall defects

Ying-han Song[1], Yan-yan Xie[2], Hong-sheng Ma[1], Wen-zhang Lei[2]
[1]*Day surgery center, West China Hospital of Sichuan University, China*
[2]*Hernia Center of Department of Gastrointestinal Surgery, West China Hospital of Sichuan University, China*

Background: It is always difficult to close hernia ring in repairing large incisional hernias and to reconstruct abdominal wall following tumor resections. This study reviews our experience of double circular suturing technique with large abdominal wall defects.
Methods: 253 patients with large incisional hernias and 62 patients with abdominal wall tumors underwent surgery from October 2004 through November 2015. Herein, we presented our experience in closure of large abdominal wall defects using a technique in which we fix hernia mesh with double circular sutures. The variables recorded were classified as patient-related (gender, age, obesity, cough, constipation, diabetes mellitus, and abdominal surgical history) and operation-related factors (size and location of defect, recurrence, wound infection, hematoma, and duration of hospital stay).
Results: All patients who underwent abdominal wall reconstruction using double circular suturing technique were included in the series. Patient-related demographics were analyzed. The mean size of incisional hernia defect was 15.3±4.9 cm and that of abdominal wall defect following tumor resection was 10.4±3.6 cm. The mean time of operation was 80.8±37.6 and 73.2±31.4 minutes. The mean hospital stay was 5 (3 to 14) days. Nine patients had recurrence and two patients had infected mesh removed in incisional hernia group. One patient had recurrence in abdominal wall tumor group. The mean follow-up period was 6.4 (0.5 to 12.1) years.
Conclusion: The double circular suturing technique can be successfully used for large abdominal wall defects with acceptable morbidity.

AS2-3

Early experience with new composite mesh for ventral hernia repair of small defects by open approach

Hrishikesh P Salgaonkar[1,2], Karen Chan[1,2], Sujith Wijerathne[1,2], Eva L S Clara[1,2], Lynette M A Loo[1,2], Rajeev Parmeswaran[1,2], Davide Lomanto[1,2]
[1]*Minimal Invasive Surgery Centre, Department of Surgery, National University Hospital Singapore, Singapore*
[2]*Yong Loo Lin School of Medicine, National University Singapore, Singapore*

Recent advancements in ventral hernia repair in past decade have focused on the development of mesh technology. It is debatable if defects < 3 cm should be repaired with laparoscopy or by using mesh as many surgeons still repair small defects without mesh. This has lead to development of composite mesh specifically designed for small ventral hernia repair by open technique. There is lack of evidence for their outcomes in literature. Our objective was to verify the safety and feasibility of Parietex Composite ventral patch (Covidien, USA) a composite mesh design made of polyester, covered with hydrophilic absorbable collagen film on surface to minimise tissue adhesions. This is a prospective observational case series. This mesh was used in 15 consecutive patients who opted for open ventral hernia repair for defect size < 3 cm. Patient demographics, operative findings, mesh size, postoperative complications were recorded and compared with 12 patients who opted for standard laparoscopic mesh repair by IPOM technique for similar defect size. Pain scores observed at 6, 12 hours, at discharge, 1 week, 1, 3 and 6 months. Visual Analogue Scale (VAS) used for pain assessment. In open repair group mean operative time was 61.7 mins (27106 mins). No significant pain or recurrence noted within the mean follow-up 6 months, 1 patient developed seroma treated conservatively. These findings were comparable with laparoscopy group. Our initial experience showed the safety and efficacy of this new biomaterial. A RCT may be required for further assessment of this novel mesh.

AS2-4

Tailored ventral and incisional hernia repair: The clinical outcomes of 584 consecutive patients with different mesh materials and repair methods

Ching-Shui Huang[1,2]
[1]*Surgery, Cathay General Hospital, Taiwan*
[2]*surgery, Taipei Medical University, Taiwan*

The choice of mesh and repairing method for VIH depends on the size and location of the hernia, patient's risk factors, surgical experience, mesh materials available and the costs. The clinical outcomes of 584 tailored repairs will be presented. Methods: Among the 584 vIH repaired by author from 2004 to 2015, 154 received laparoscopic IPOM repair, 430 received open repair, the later included 143 IPOM (Kugel-Composix, Ventrio ST, Proceed), 94 sublay (retrorectal/ preperitoneal Kugel, Ventrio ST, Proceed), 39 bilayer repair, 57 onlay/interstitial mesh and 35 tissue to tissue repair, 24 IPOM (Ventralex/ PVP) and 38 plug repair (PerFix-light) for small VIH< 2cm. Results: In a follow-up period of one to 11 years, the events rate, recurrence rate and mesh extraction rate of the laparoscopic group were 11%, 6.3% and 1.4%. Open IPOM were 6%, 9.4%, and 3.4%. Sublay were 2.1%, 2.1%, and 1.1%. Double layer were 6%, 0%, and 3%; For small VIH, Ventralex IPOM were 0%, 4.2%, and 0%; Plug group were 15.8%, 5.3%, and 5.3%; Tissue repair group were 5%, 25%, and 0%. Conclusions: Tissue repair has highest recurrence. Sublay augmentation h has the lowest recurrence. Laparoscopic IPOM had similar results as open IPOM, both have high events rate with modest recurrence. Events and recurrences may occur late, even 10 years after repair. For small VIH <2cm, both preperitoneal double layers and IPOM with Ventralex/ PVP were better than plug repair.

AS2-5

The outcome of laparoscopic repair of an abdominal incisional hernia and our hybrid method of incisional hernia repair

Seiichiro Etoh, Takuo Hasegawa, Mamoru Ishiyama, Masaichi Ogawa, Kazuhiko Yoshida
Department of Surgery, The Jikei University, Katsushika Medical Center, Japan

Background: We started to perform laparoscopic repair since June 2012. To evaluate the outcome of laparoscopic repair, we compared the outcome of laparoscopic repair and that of open repair in our institutions.
Method: We retrospectively reviewed 57 patients who underwent laparoscopic repair (n=21: 37%) or open repair (n=36: 63%) between January 2008 and July 2016. The outcome such as age, gender, size of hernia, operating time, length of hospital stay (LOS), blood loss, morbidity and recurrence were reviewed comparatively.
Results: There were no significant differences in terms of age, gender, size of hernia, operating time and LOS. Blood loss is significantly less in laparoscopic repair (P<0.0001). As the morbidity, 2 patients (4%) had surgical site infection (SSI) and 1 patient (2%) had postoperative hemorrhage in open repair, whereas nobody in laparoscopic repair. A recurrence occurred in 3 patients (5%) in open repair and 2 patients (4%) in laparoscopic repair.
Conclusion: The outcome of laparoscopic repair is not inferior to that of open repair in short-term follow-up. Laparoscopic repair may be considered as a choice of the procedure, and hybrid method which is combination of laparoscopic and open repair may also be useful.

AS2-6

A comparision study between Laparoscopic repair and open surgery for curing ventral incisional hernia

De-xin Kang, Wei Liu, Lei Zhang, Hongliang Yu, Ning Ma, Bin Wei
Department of General Surgery, Daqing Oilfield Hospital, China

Objective: To compare the efficacy and safety between laparoscopic and open surgery of incisional hernia.
Methods: A retrospective analysis of 31patients with abdominal wall incisional hernia from Daqing Oilfield Hospital was initiated including 15 cases in the laparoscopic group and 16 cases in the open group.
Result: No significant statistical difference in operation time, hospitalization cost, retention of urine, intestinal injury, postoperative infection and recurrence rate was observed. however, Blood loss, length of stay, postoperative pain in the laparoscope group were significantly superior to the open group. there was statistical difference between two groups. In terms of hospitalization costs, the laparoscopic group was significantly higher than that in the open group, with statistical significance.
Conclusion: Operations of both groups are safe and effective, while Laparoscopic surgery has obvious advantages in shorter hospital stay, less intra-operative bleeding and less postoperative pain.

AS2-7

An investigation about incisional hernia repairs for 5 years

Kei Fujii, Yu Sato, Takehiro Nishiki, Tomonari Kobarai, Hiroki Toma, Gen Naritomi, Ichio Hirota, Toru Eguchi
Department of Surgery, Harasanshin Hospital, Japan

Backgrounds: Recently many surgeons perform repair of abdominal wall hernias by tension-free technique using various prosthesis in open or in laparoscopic surgery. And operations in consideration of various situation, such as the size of an hernia orifice or the degree of adhesion are demanded. We investigated outcomes of abdominal wall hernia repair in our hospital and considered an operation strategy.
Methods: Medical records of patients undergoing incisional hernia repair at Harasanshin Hospital between April 2011 and July 2016 were reviewed. Type of repair technique and prosthesis (mesh), complications and hernia recurrence were recorded.
Results: Thirty four patients' (14 males, 20 females) notes were reviewed. Median age was 63 years (range 34-89 years). The average maximum size of the orifice was 11.1cm (range 1.5-20cm). Median operation time was 132 minutes (range 29-415 minutes). The operative methods were various, such as the simple closure method for 4 patients and the tension-free methods for 25 patients (2 Composix meshes, 5 Prolene Soft meshes, 5 C-qur meshes, 13 Parietex Progrip meshes). Laparoscopic repair technique using PCO meshes were performed for 4 patients. A complication of hematoma was admitted for a patient and none of the patients have recurred.
Conclusion: An appropriate operation needs to be chosen according to the size of the hernia orifice. We used various meshes, but the frequency of the complication or operation time showed no significant difference. Many cases will be piled from now on, and it's necessary to consider the technique which can be a standard operation.

AS3-1

Choosing hernioplasty method due to localization and size of hernia defect in case of treatment of postoperative ventral hernias

Tamaz Gvenetadze
Department of Surgery, Acad. O Gudushauri National Medical Center, Georgia

Background: Surgical treatment of PVH still appears to be urgent problem due to frequent relapses (30-55%) and high mortality (1-7%) after planned operations.
Material & Methods: We chose the hernioplasty method due to localization and size of hernia defect. 125 were operated in 2011-2015 due to PVH of different localization and size. Types of operations performed: "On lay" technique in 68 cases, "Sub lay" - 32 cases, "In lay" - 21 cases, "Sandwich" and Ramires - 4 cases of giant sized PVHs. In case of lumbal hernia we enhanced the size of mesh and fixed it to spinal wide muscle, to inferior edge of costal arch, and to medial edge of rectal muscle at the level of upper spine of ileac bone.
Results: Delayed results were studied in 89 patients within 1-5 years. Only in one case we had to remove the mesh due to suppuration of wound and delayed wound healing. Relapse of hernia were found in 2.
Conclusions: "On lay" technique is used frequently by many surgeons. This method is believed to be universal as it can be employed during any forms and sizes of PVH. This method can be performed easily but it often results in seroma. Localization of implant by technique of "sub lay" or "in lay" is indicated in case of hernia of little or middle size, located at epi/mezogastric region, and also in case of umbilical hernia. In case of giant hernia "Sandwich" and Ramires technique of localization of implant is indicated.

AS3-2

Repair of Ventral Hernia Locating on the Abdominal Border

Hiroshi Hirukawa
Department of Surgery, Tachikawa General Hospital, Japan

Purpose: To assess the outcomes of our surgical approach to the incisional hernia of the abdominal border.
Methods and patients: A defect closure (IPOM plus) was performed in the laparoscopic approach. We employed large mesh at least 5-7cm extending from the edge of incisional hernia in all direction. The mesh extended deep under the diaphragm for subxiphoidal and subcostal hernia and was fixed. A total of 19 consecutive incisional hernia of the abdominal border were operated in the last 5 years in Tachikawa General Hospital, Department of Surgery. Operative procedure, mesh selection, morbidity, mortality and recurrence rate were evaluated.
Results: The hernias were located in subxiphoidal (n=3), subcostal (n=9), suprapubic (n=5), right suprainguinal (n=1), and left suprailiac (n=1). Thirteen patients underwent laparoscopic hernia repair, but 2 patients required open procedures because of intra-abdominal dense adhesion. IPOM plus were performed in 10 patients with subxiphoidal (n=3), subcostal (n=2), and suprapubic hernia (n=5). In other 5 patients, Ponsky-Lin technique (n=3), Rives Stoppa technique (n=1), or transverse abdominis muscle (n=1) were performed. After surgery, seroma was developed in 2 patients (10.5%). However, no mesh infection, no mortality, nor morbidity was observed during the follow up period of 750 days (raging 40~1847 days). The recurrence was observed in 2 (10.5%) patients with subcostal hernias which was repaired by light weight mesh.
Conclusion: IPOM plus using large mesh is a safe and effective for ventral hernia repair located on the abdominal border. The use of heavy weight mesh would be recommended for large hernia.

AS3-3

Laparoscopic repair with transcutaneous closure of defect for large midline incisional hernia extended to bilateral subcostal margins: report of a case

Shingo Tsujinaka[1], Yukio Nakabayashi[2], Rina Kikugawa[1], Nao Kakizawa[1], Nobuyuki Toyama[1], Toshiki Rikiyama[1]
[1]*Department of Surgery, Saitama Medical Center, Jichi Medical University, Japan*
[2]*Department of Surgery, Kawaguchi Municipal Medical Center, Japan*

Laparoscopic repair for incisional hernia extended to subcostal margin may be considered difficult, because it is anatomically adjacent to both rib and diaphragm.
We herein report a case of such patient for whom laparoscopic repair using mesh with transcutaneous closure of defect was successfully carried out.
An 85-year old women was diagnosed with symptomatic incisional hernia after open cholecystectomy. The physical examination revealed 18cm bulging mass that extended to the bilateral subcostal margin. The compute tomography visualized 14×10 cm fascial defect, and that was confirmed intraoperatively with direct measurement.
The patient was placed in a supine position, and four trocars were introduced (two 5-mm and two 12-mm trocars). Following adhesiolysis, a monofilament thread for closure of defect was transcutaneously fashioned from the left to the right side of the defect using a suture passage device. The interval of each thread was 1 to 1.5cm. All sutures were sequentially tied and the knots were buried subcutaneously.
A 25×20cm composite multifilament polyester mesh was selected in ordered to obtain 5cm overlap. Mesh fixation was performed by absorbable tacks with additional full-thickness sutures using non-absorbable monofilament.
The postoperative course was uneventful and the patient discharge home.
Follow-up evaluation was done at 1, 3, 6 and 12 months. Computed tomography was performed at 3 and 12 months. There were no clinically or radiographically significant seroma, mesh bulging, or hernia recurrence at each follow-up.
Our proposed surgical technique is safe and suitable for large incisional hernia extended to bilateral subcostal margins.

AS3-4

Laparoscopic IPOM plus- better method for lateral incisional hernia repair

Sameer Ashok Rege, Yogesh TAkalkar, Shrinivas Surpam, Abhay Narendra Dalvi
Department of Surgery, Seth GS Medical College & KEM Hospital, India

lateral incisional hernia repair pose a challenge to any surgeon. the repair is not only the reduction of contents and closure of the defect, but challenge to deal with the bulge following the weakness of the muscles. in open surgery, it is very difficult to place a sublay or inlay mesh due to proximity of the bony prominences,nerves in the same plane and have a appropriate closure of the defect.
we operated 176 patients with lateral incisional hernia. there were 63 males. age range was between 22 to 76 years. primary surgery of open appendicectomy was done in 62 patients, LSCS and other gynaecological procedures in 87 patients. 3 patients had hernia following iliac crest graft, 5 urology surgery, one following donor hepatectomy.
all surgery were done in general anaesthesia. port placement were decided as per the defect. careful adhesiolysiswas done following which the defect was sutured with intracorporeal continous nonabsorbable sutures. dual mesh was used to reinforce the hernia, the size calculated with 3 cms on either side of defect in an nonapproximated defect. external compression was given to the patient with approriate counselling. followup of month, six months and an year was kept which showed much better cosmetically results. there were no wound infection, recurrence, except of 2 patients forming seroma which were treated conservatively.

AS3-5

Minimally Invasive Approach to Supra-pubic and Non-Midline Lower Abdominal Incisional Hernia an Extended Indication of TAPE Technique

Joe KM Fan, Dominic CC Foo, Jeremy Yip, KK Ng, Oswens SH Lo, Rockson Wei, WL Law
Department of Surgery, Queen Mary Hospital, The University of Hong Kong, Hong Kong

Objective: TAPE technique has been described for the repair of supra-pubic midline incisional hernia with satisfactory outcome. Our aim is to study the feasibility and safety of repairing non-midline lower abdominal hernia as an extended indication for TAPE technique.
Method: Patients with IPOM ventral hernia repair in all affiliated Hospitals of the University of Hong Kong were reviewed. Prospectively collected data were retrospectively analyzed.
Surgical Technique: Peritoneal incision was created just below the defect with pre-peritoneal dissection. Non-adhesive mesh then placed partial intra-peritoneally to cover the defect, and partially cover the whole extra-peritoneal space prepared. Meshes were fixed by tackers for intra-peritoneal part, most inferior fixation points were at peritoneal incision line. Extra-peritoneal part of meshes covered up by the peritoneal flap. Fixation of this part of the meshes were facilitated by the peritoneal flap and subsequent fibrosis and adhesion to the extra-peritoneal structures.
Results: From 1.2008 to 6.2016, among 123 patients reviewed, 3 with lateral lower abdominal hernia requiring extended TAPE repair were included for the analysis with 1 right lower paramedian and 2 post-TRAM flap donor site incisional hernia. All are female patients with mean age of 49.7 years old, mean size of defect was 123.3 cm2 and mean follow-up time of 22.2 months. All patient recovered uneventfully and no morbidity or recurrence noted.
Conclusion: Repair of lateral lower abdominal incisional hernia with this novel modified technique is safe and feasible. A larger case series and longer follow-up is required for validation.

AS3-6

Laparoscopic Management of Post operated lower abdomen incisional hernia

Pradeep Kumar Dewan
Minimal Access, Metabolic and Bariatric Surgery, MAX super speciality Hospital, India

Lower abdomen hernia either after Pfanestial incision or midline lower incisional hernia in not uncommon. The management of these hernias are quite challenging and need different approach. Laparoscopic management by making\ creating a peritoneal flap like in TAPP and fixing the mesh at pubic bone is feasible.

AS4-1

Clinical results of Kugel repair for inguinal hernia on 2718 consecutive cases

Hitoshi Oda
Oda Clinic, Day Surgery Center, Japan

Kugel repair is the minimally invasive open transinguinal preperitoneal approach for inguinal hernia. In my series from January 2003 to July 2016, 2718 patients (2389 males and 329 females, average age 55±15) and 2949 lesions with inguinal hernia underwent Kugel repair. The mean operation time was 23±13 min (median 20 min) and the operation time in patients with recurrent hernia (n=150, 40±28 min) was significantly longer than that in patients with primary hernia (n=2799, 22±11 min, $p<0.001$). Overall, 21 patients (0.7%) recurred after Kugel repair. With respect to complications, intraoperative urinary bladder injury occurred in five cases, massive bleeding in one case, postoperative intestinal obstruction in one case, mesh infection in one case and chronic neuralgia in one case. Four of five cases with urinary bladder injury and one case with postoperative intestinal obstruction were patients with recurrent hernias after preperitoneal prosthetic repairs. Using preperitoneal self-expanding mesh, Kugel repair can cover the entire myopectineal orifice. All types of primary inguinal hernias and recurrent hernias after conventional and Lichtenstein repairs can feasibly be treated by Kugel repair. However, patients with previous preperitoneal prosthetic hernia repairs or a history of prostate cancer surgery should avoid Kugel repair because of the risk of complications due to preperitoneal adhesions.

AS4-2

Mesh fixation with glue versus suture for recurrence and pain in Lichtenstein inguinal hernioplasty

Ping Sun, Xiang Cheng, Zifang Song, Chen Zhang, Ming Li, Shaobo Hu, Qichang Zheng
Hepatobiliary and Hernia Department, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China

Objectives: To determine whether glue can reduce postoperative chronic pain, without increasing the recurrence rate, compared with sutures for mesh fixation in Lichtenstein hernia repair.
Methods: We searched The Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, Web of Science with no language restrictions. Reference lists of identified papers were also checked. All randomised and quasi-randomised controlled trials were considered for inclusion.
Results: Twelve trials with a total of 1987 patients were included in this review. The overall postoperative chronic pain in the glue group was reduced by 37% (OR 0.63, 95% CI: 0.44 to 0.91; low quality of the evidence) compared with the suture group. Hernia recurrence was similar between the two groups (OR 1.44, 95% CI: 0.63 to 3.28; low quality of the evidence). Fixation with glue was superior to suture regarding duration of the operation (SMD -0.37, 95% CI -0.52 to -0.23; moderate quality of the evidence); haematoma (OR 0.52, 95% CI: 0.31 to 0.86; moderate quality of the evidence); and recovery time to daily activities (SMD -0.81, 95% CI: -1.05 to -0.58; moderate quality of the evidence). There were no significant differences between the two groups regard to the adverse events, superficial wound infection, mesh/deep infection, seroma, persisting numbness, postoperative length of stay.
Conclusions: Glue may reduce postoperative chronic pain and not simultaneously increase the recurrence rate, compared with sutures for mesh fixation in Lichtenstein hernia repair.

AS4-3

TAPP repair: A simple and reliable approach in the management of inguinal hernias

Ajit Sinha, Manish Kumar Mishra, Tarun Kalra, Rajesh Kumar Soni
Department of Surgery, VMMC & Safdarjung Hospital, New Delhi, India

Background: Inguinal hernia repair is the most frequent operation in general and visceral surgery worldwide. Two revolutions in inguinal hernia surgery have occurred during recent decades. First was introduction of tension-free open mesh repair by Lichtenstein in 1989, which significantly reduced recurrence rates and the second was application of laparoscopic surgery in the treatment of inguinal hernia during the early 1990s, which led to decrease in postoperative pain and faster recovery along with low recurrence rates. In this cost and cosmesis driven world, TAPP can offer a simpler, easy to learn and reliable approach in the management of inguinal hernias.
Material & Methods: A total of 180 patients with inguinal hernia formed the nucleus of this study. Following thorough assessment, TAPP repair of hernia (direct & indirect) was done. Patients were randomization. In half of them defect was covered with non-absorbable mesh and remainder had appropriate size partially absorbable composite mesh. They were followed up post-operatively till 3 months, both clinically and sonologically, for complications like pain, foreign body sensation, recurrence, seroma formation etc.
Results: Mean operating time was 43 minutes. None of the patients had serious adverse outcomes like vascular or bowel injury, mesh infection, need for conversion or, port-site hernia. Recurrence was noted in 5 (2.6%) patients. On comparing the two arms, patients with composite mesh had significantly less pain, foreign body sensation& seroma formation.
Conclusions: It was observed that TAPP, preferably with composite mesh, can serve as easy and reliable alternative to TEP for addressal of inguinal hernia.

AS4-4

Early experience with anatomical mesh for laparoscopic inguinal hernia repair by totally extra-peritoneal approach

Hrishikesh P. Salgaonkar, Sujith Wijerathne, Lynette M. A Loo, Davide Lomanto
Minimal Invasive Surgery Centre, Department of General Surgery, National University Hospital Singapore, Singapore

Advancements in laparoscopic inguinal hernia repair over the past decade have focused on development of mesh technology, particularly the non-fixation anatomical mesh to improve clinical outcome and lessen post-operative pain. There is lack of sufficient evidence for their outcomes in literature. Our aim was to verify the safety and feasibility of 3DMax mesh (Bard Davol, USA) 10.3 x 15.7 cm and C-Qur TM CentriFX mesh 10.5 x 16 cm (Atrium Medical, USA), both with unique multi-dimensional design made of polypropylene. This is a prospective observational case series. Both mesh were used in 13 consecutive patients' undergoing laparoscopic totally extra-peritoneal (TEP) inguinal hernia repair. Data collected on patient demographic, EHS classification, operative findings, technique used. Pain scores and signs of complication were observed at 6, 12 hours, at discharge, follow-up visits at 1 week, 1, 3 and 6 months. We used Visual Analogue Scale to assess the pain. 19 3DMaxTM meshes were used in 7 unilateral and 6 bilateral hernias and 20 C-QurTM CentriFX meshes were used in 4 unilateral and 8 bilateral inguinal hernias. Standard 3 port TEP approach was used in all patients except 1 in C-Qur TM CentriFX group who underwent single incision TEP. Pain scores, hospital stay, complications rates were similar in both groups within the mean 6 months follow-up period.
In conclusion, our initial experience showed the safety and efficacy of these new mesh in inguinal hernia repair with anatomical design. A RCT may be required for further assessment of these mesh.

AS4-5

Creation of preperitoneal space by retrograde puncture in laparoscopic inguinal hernia repair

Hui-yong Jiang, Rui Ma, Yi-jun Guo, Xue-feng Zhang
Department of General Surgery, General Hospital of Shenyang Military Region, China

Objective: To establish a novel method of creating preperitoneal space in laparoscopic totally extraperitoneal hernia repair (TEP) surgery.
Methods: A transverse incision of 1 cm was made below the umbilicus, the anterior rectus sheath was cut open, and then retractors were used to pull open the rectus abdominis muscle. A 5 mm trocar core was inserted through the incision below the umbilicus, muscle, and punctured at about 8 cm below the umbilicus. A 5 mm trocar was then inserted along the core and delivered to the preperitoneal space. By this method, we created th preperitoneal space. From May 2013 to May 2014, a novel retrograde puncture was used to create the preperitoneal space in laparoscopic TEP in 110 patients.
Results: Of the 110 patients, 1 converted to transabdominal preperitoneal (TAPP) due to pneumoperitoneum caused by broken peritoneum during the retrograde puncture, while preperitoneal space was successfully created in the other 109 patients. The mean time of constructing preperitoneal space was 6 min. No complication including vascular damage was found. The preperitoneal space provided sufficient space for TEP.
Conclusion: The novel retrograde puncture is a fast, safe, and reliable method, and a potential standard procedure to create the preperitoneal space in laparoscopic TEP.

AS5-1

Treatment of a bilateral giant recurrence groin hernia.A case report

Nie Yusheng, Chen Jie
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, China

Introduction: Groin hernias, if treat irrelevantly, can present as giant groin hernias. The further surgery is difficult and complicated.
Presentation of case: This patient is a 73 year old male patient, with an groin hernia history for more than 34 years. He have performed hernia repair surgery for six times at the last 30 years. Unfortunately, it recurrence again and became a giant groin hernia. Physical examination could not see his penis, so urination is very difficult. Preoperative CT examination confirmed hernia containing the whole of the small bowel along with its mesentery.
Discussion: The whole treatment include the pre-operation acclimatization training, the resection of hernia containing, hernia repair, scrotum reconstruction and the prevention of intra-abdominal hypertension.
Conclusion: Integrated and correct surgical plan is important for the successful treatment of this rare surgical case.

AS5-2

Simultaneous single incision approach for inguinal and umbilical hernia

Akiko Umezawa, Michiko Kitagawa, Yosuke Seki, Yoshimochi Kurokawa
Minimally Invasive Surgery Center, Yotsuya Medical Cube, Japan

Back ground: Laparoscopic single incision approach for inguinal herunia is getting popular. It has not only cosmetic advantage but it will decrease the risk of injury for abdominal cavity and organs ultimately with totally extraperitoneal preperitoneal approach (TEPP). And what is more, single incision approach has advantage that it can adapt to any direction. We present case report of simultaneous laparoscopic single incision approach for inguinal and umbilical hernia.
Case: A 60s-year-old man was admitted with reducible bilateral inguinal and umbilical hernia. His BMI was 28.3. We performed laparoscopic single incision TEPP. With circumumbilical incision, short pitch incision (ca. 2cm) made on the anterior layer of rectus abdominis sheath, and platform was placed. Preperitoneal cavity created with balloon. Inguinal hernia was revealed laparoscopically as direct hernia at both side and repaired with formed mesh bilaterally. Continuously, umbilical hernia repair was performed with suture. He leaved hospital on day1 after operation. Post operatively, the clinical course was good without any complication.
Conclusion: This case suggests that laparoscopic single incision approach is feasible not only for bilateral hernia but also other diseases on different site and direction.

AS5-3

A case report of De Garengeot's hernia

Ye Hu
Department of Hernia and Abdominal Wall Surgery, Anhui Provincial Hospital, China

De Garengeot's hernia is a type of femoral hernia that contains appendix. We introduce the rare case of a middle age male patient (male to female ratio of 1: 4) who referred for diagnostic of a groin lump which was operated and found to be a De Garengeot's hernia. De Garengeot's hernia is rare, often an incidental intraoperative finding, difficult to diagnose pre-operatively, however, imaging check is usually required to make a diagnosis. Operation with repairing of the femoral hernia and appendectomy is the effective treatment.
A 45-year-old male patient presented with a 8-day history of a mild painful right groin lump, physical examination revealed 6×3 cm mass in the right groin below the inguinal ligament. The abdomen was soft and no guarding. His laboratory results were within normal limits. Ultrasound check showed a cystic and solid mass. Operation was proceed with epidural anesthesia and found the presence of the appendix in the femoral hernia sac. Appendectomy and repairing of the femoral hernia was performed. Pathology report confirmed an acutely inflamed appendix. The patient recovered well without postoperative complications or signs of recurrence six months after surgery.

AS5-4

Clinical analysis of Stoppa combined with Lichtenstein repair in the treatment of 30 cases of giant inguinal pantaloon hernia

Xiao-bin Li, Zong-ze Li, Zi-wen Liu
Department of General Surgery, Peking Union Medical College Hospital, Chinese Academy of Medicine Sciences & Peking Union Medical College, China

Objective: To investigate the technique of Stoppa combined with Lichtenstein repair in the treatment of giant inguinal pantaloon hernia and evaluate its efficacy.
Methods: 30 patients with giant inguinal pantaloons hernia were performed with combined Stoppa approach and Lichtenstein technique using a 15 cm × 13 cm polypropylene flat mesh (Bard). The operative time, length of stay, postoperative complications and recurrence rate were analyzed retrospectively.
Results: 30 cases recovered well after the operation. The mean operation time was (62.1 ± 7.5) min, and the postoperative hospital stay was 2-10 d, with an average of (3.0 ± 1.2) d. Postoperative complications were improved after conservative treatment, including 2 cases of urinary retention, 2 cases of groin pain, and 4 cases of scrotum edema. The follow-up rate was 96.7% (n=29). Within the follow-up period (range from 8 to 42 months), no recurrence was observed in the patients.
Conclusion: Using Stoppa combined with Lichtenstein repair in the treatment of adult giant inguinal pantaloons hernia is safe and reliable, and the curative effect is satisfactory.

AS5-5

Sliding indirect hernia containing fallopian tube and ovary: a case report

Jie Kang[1], Xian-zhao Deng[1], Bo-min Guo[1], Bo Wu[1], You-ben Fan[1], Xiao-yan Cai[2]
[1]*Department of General Surgery, Shanghai Jiao Tong University Affiliated Sixth People's Hospital, China*
[2]*Department of General Surgery, Gongli Hospital, China*

Even if almost all intraabdominal organs and tissues can be found in the hernia sac, it's rare that ovary and fallopian tube become the content of it, which occurs occasionally in newborn female infants or young patients, an extremely rare occurrence in an adult female. In this report, we introduced a case of a 23-year-old female with a left sliding inguinal hernia. The left ovary and fallopian tube were in the hernial sac. They were reduced to the pelvis successfully and the inguinal hernia was repaired with mesh. Although this situation is very rare, we need to be very careful all the time, without unnecessary injury happened in the surgery.

AS5-6

Large Sliding Inguino-scrotal Hernia of Urinary Bladder: Case Report and Literature Review

Yong-gang Huang, Guo-dong Gao, Ping Wang, Jing Ye, Fang-jie Zhang
Department of Hernia and Abdominal Wall Surgery, Hangzhou First People's Hospital, China

Sliding inguinal hernias of urinary bladder are protrusion of bladder through inguinal canals, most of which are insignificant and diagnosed intra-operatively. While large inguino-scrotal bladder hernias are rare, and commonly present lower urinary tract symptoms, decrease in scrotal size after voiding and 2 stage voiding. We describe and discuss the clinical findings and management of a patient with massive bilateral inguino-scrotal hernias, of which the left side is bladder hernia.

AS5-7

A rare case of small intestine incarcerated to the tunica vaginalis of testis mimicking inguinal hernia incarceration

Yi-wei Qiu, Nan Li
General Surgery Department, Tianjin Medical University General Hospital, China

Background: Small intestine incarcerated to the tunica vaginalis of testis though the internal ring is very rare. Prior to the operation, the patient's diagnosis was inguinal hernia incarceration. After thorough search of the database, we believe this is the first case reported.
Case Presentation: An 85 years old male presented with chief complaints of irreducible right inguinal mass with pain, abdominal pain, severe vomiting for three days. CT scan revealed right inguinal hernia incarceration and the hernia content was small intestine. Laparoscopic exploration revealed a loop of small intestine was indeed incarcerated "through" the internal ring, but not "by" the internal ring. The incarcerated small intestine was not reducible by laparoscopic approach, therefore open laparotomy was performed. The right testicle was reduced to the abdominal cavity with the incarcerated small intestine and part of the small intestine wall was incarcerated to the tunica vaginalis of the testicle. The circulation of the small intestine was restored after relieving from the tunica vaginalis and TAPP was performed after replacing the testicle back to the scrotum. The patient recovered well and was discharged three days after the operation.
Conclusion: Diagnosis of the tunica vaginalis incarceration prior to the surgical procedure is very difficult, as it can have all the same symptoms to mimic inguinal hernia incarceration. And as such, Laparoscopic repair is safe, feasible, and an excellent option to confirm the diagnosis.

AS5-8

Laparoscopic Repair of Inguinal Hernia during Placement of Peritoneal Dialysis Catheter (PDC)

Abdullah Aldahian, Fahad Bamehriz, Omar Al-Obaid
Center of Excellence in Metabolic and Bariatric Surgery, King Saud University Hospital, Saudi Arabia

Background: Laparoscopic placement of PDC is commonly done in the Medical City of King Saud University from 1995. Inguinal hernia may delay or complicate the dialysis. Hereby we report our experience of repairing of inguinal hernia with placement of laparoscopic of PDC.
Patient & Method: There are 160 patients operated in 10 years, we found 8 patients have inguinal hernia and one patient has bilateral inguinal hernia. The neck of the sac is cut and closure of the deep inguinal hernia using 2O monomax suture.
Results: The peritoneal dialysis is done during the surgery and continuous after the surgery.
Conclusion: The technique is feasible, allowing immediate usage of the peritoneal dialysis and can be done for the patients who are going for laparoscopic placement of PDC.

AS5-9

Large size low-grade retroperitoneal liposarcoma masquerading as scrotal hernia: A rare differential diagnosis

Michael N. Lechner[1], Kurosch Borhanian[1], Stefan Mitterwallner[1], Gernot Köhler[2], Klaus Emmanuel[1], Franz Mayer[1]
[1]*Department of General Surgery, Landeskrankenhaus Salzburg, Austria*
[2]*Department of General Surgery, Sisters of Charity Hospital, Linz, Austria*

Spermatic cord lipomas are frequently found in inguinal hernia surgery. They are reduced into the preperitoneal space, resected or left alone when small. Larger lipomatous formations alongside the spermatic cord that are not easily resectable may be part of large retroperitoneal tumors, protruding through the inguinal canal. Despite being a rarity, these masses are often malignant, namely sarcomatous. Complete resection and histological grading define the risk of recurrence, the further course of the condition and clinical outcome. We present a very rare pitfall in a fully documented case of a patient with a large retroperitoneal liposarcoma protruding through the inguinal canal and into the scrotum, thus masquerading as scrotal hernia: It was initially misdiagnosed, discovered during a TAPP procedure and completely resected in a secondary laparotomy followed by Lichtenstein repair of the resulting inguinal defect.
We conclude that poorly defined lipomas along the spermatic cord must give rise to suspicion and that pre-operative imaging must then include the retroperitoneum to avoid incomplete resection by mistake. Clinically suspicious cases should therefore be scheduled for laparoscopic exploration or TAPP-repair rather than for ventral repair techniques.

AS5-10

Primary Omental Fibromatosis Presenting as an Incarcerated Inguinal Hernia Case Series from a Single Institution over 20 years

Joe KM Fan[1,2], Cheng Tian[2], Jeremy Yip[1], Oswens SH Lo[1], Ka Kin Ng[1], Zhong Hui Liu[2]
[1]*Department of Surgery, Queen Mary Hospital, The University of Hong Kong, Hong Kong*
[2]*Department of Surgery, The University of Hong Kong - Shenzhen Hospital, China*

Introduction: Inguinal omental fibromatosis is a rare disease entity that may mimic incarcerated inguinal hernia clinically. We therefore review the incidence of inguinal omental fibromatosis in our center.
Method: From 1.1.1996 to 30.6.2016, all hernia operations performed in all the affiliated Hospitals of the University of Hong Kong were reviewed retrospectively; data were retrieved from patient records inside clinical computer system.
Results: A total of 7039 hernia operations were carried out during the period in which 564 were incarcerated or strangulated hernia operations, among which, 2 cases were of diagnosis of omental fibromatosis, which account for incidence of 0.028% of groin exploration.
Case Report: This was second case in our center - A 26-year-old man was admitted with a history of reducible right groin mass since he was born, the mass had become irreducible for two months. Besides, the patient had no symptoms of bowel obstruction. On palpation, a firm mass was found in the right groin extending to the right scrotum, and could not be reduced completely. Bilateral testes in the scrotum were palpable. Computed tomography scan of pelvic cavity showed that there was herniated omentum entered the right scrotum. The omental mass resected completely and free-tension repair was performed. The histopathological examination revealed that the tumor consisted of spindle-shaped cells that consistent with fibromatosis.
Conclusion: Inguinal omental fibromatosis is rare and which may be part of presentation of syndromal disease like Garden's syndrome, the recurrence is higher than in sporadic cases.

AS5-11

Treatment of inguinal hernia on the transplant side after kidney transplantation: a case report and literature review

Jian-wei Yu, An-bao Teng
Department of General Surgery, The Affiliated Provincial Hospital of Anhui Medical University, China

Case report: The patient was a 51-year-old man who presented with right inguinal swelling and pain for 10 years. He was diagnosed with renal failure secondary to hypertension and undergone living related donor kidney transplantation in 2003. A mesh-plug hernioplasty was performed under a diagnosis of inguinal hernia. The hernia was diagnosed as a sliding indirect inguinal hernia of the bladder. We found that the transplanted ureter was very close to the sac during the operation. Extensive dissection was avoided in order to prevent inadvertent damage to the ureter.
Discussion: The case reported here illustrates the importance of protection of the ureter in the treatment of inguinal hernia on the transplant side in a kidney transplant recipient. The approaches which insert an underlay mesh into the anterior peritoneal cavity, such as mesh plug methods, may damage a transplanted ureter present in this lesion.In contrast, the Lichtenstein operation does not dissect the anterior peritoneal cavity and, thus, is a most suitable method to prevent complications involving the transplanted organs.
Conclusion: Surgeons performing inguinal herniorrhaphy on the grafted side in a renal transplant patient should thus be warned not to injure the ureter or bladder during the operation. This case shows that a Lichtenstein operation is a suitable procedure for avoidance of damage to the transplanted ureter in treatment of a transplant-side inguinal hernia in a kidney transplant recipient. Intraoperatively the key of preventing inadvertent injury is familiar with pathological anatomy and careful exploration.

AS5-12

Transabdominal laparoscopic hernia repair for inguinal hernia with sigmoid colon herniation

Hui-qi Yang
Department of General Surgery, Beijing United Family Hospital, China

Background: The inguinal hernia repair is the common surgery for well trained general surgeons, and laparoscopic transabdominal pre-peritoneal (TAPP) hernioplasty is considered to be a popular technique for inguinal hernia repair. However, some unexpected hernia content, such as sigmoid colon, can cause dilemma even for experienced hernia surgeons.
Aim: To present our experience regarding to TAPP hernia repair for inguinal hernia with sigmoid colon herniation.
Method: From 2012 to 2016, among elective TAPP hernia repair, 3 cases of inguinal hernia with sigmoid colon herniation without obstruction were encountered unexpectedly. Rather than making effort to reduce the hernia content directly with the risk of injuring the herniated organ, routine incising the peritoneum above the hernia defect to develop peritoneal flap as usual. With the hernia sac mobilized, the hernia content gradually reduced back safely without any injury. Mesh (Ultropro 15*10cm, Johnsons&Johnson) was fixed with Securestrap (Johnson&Johnson). The peritoneum was closed with 3/0 v-loc suture.
Result: TAPP hernia repair was successful without complications or conversion to open in all these 3 cases. On average, the operation time was 85mins. All the procedures were managed as day case. The follow up time was 18months, and there was no recurrence.

AS6-1

Needle-type grasper assisted laparoscopic percutaneous extraperitoneal closure (LPEC) in pediatric inguinal hernia repair: a single-center experience with 1,377 cases

Fu-qiang Chen, Su-jun Liu, Jie Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Introduction: Recently, laparoscopic technique had become increasingly popular in the treatment of pediatric inguinal hernia. However, laparoscopic percutaneous extraperitoneal closure (LPEC) is often preferred. We herein describe a novel technique of LPEC assisted by our own patented surgical instrument needle-type grasper, and investigate its effectiveness in clinical practice.
Methods: The laparoscope was placed through a transumbilical incision with a 5-mm trocar. The needle-type grasper was introduced to assist the ligation of internal inguinal ring. Simultaneously, contralateral internal ring was routinely observed to find the occult hernia or patent processus vaginalis (PPV).
Results: From June 2013 to December 2015, a total of 1,896 hernia repairs were performed in 1,377 children (1,143 boys and 234 girls) with the age ranging from 0.9-15 years. Of the patients, there were 519 bilateral hernias and 858 unilateral hernias. 277 patients with clinically unilateral hernia were confirmed to have a contralateral occult hernia or PPV. The complicated or rare cases presented with 19 recurrent hernias, 69 hydrocele, 6 cyst of the round ligament, 8 irreducible hernias, 4 incarcerated hernias, 4 sliding hernias, 2 Amyand's hernias, 1 direct hernia, 1 femoral hernia and 1 saddle hernia. The follow-up time was 6-36 months. 2 umbilical incision dehiscence, 1 urinary retention and 2 recurrence (including 1 femoral hernia) were noted.
Conclusion: LPEC in pediatric hernia is safe and effective, and has the advantages of minimally invasive and improved cosmetic results. In addition, needle-type grasper assisted LPEC can be applied to various conditions of pediatric inguinal hernia.

AS6-2

Modified single-port laparoscopic completely extraperitoneal repair of the patent processus vaginalis in children: a single-institute 10-year experience with 3,568 cases in china

Yu-xuan Mo, Bing-gen Li, Du-hui Gong, Zhi-hua Xie, Yong-hui Peng, Xiang-yang Nie
Department of General Surgery, Hexian Memorial Hospital of South Medical University, China

Background: The principle of the repair of indirect inguinal hernia or hydrocele in children consists of complete ligation of the patent processus vaginalis (PPV). We report our 10-year experience with a modified single-port laparoscopic technique to achieve completely extraperitoneal ligation of PPV without any skip areas.
Methods: A total of 3568 consecutive cases of children with inguinal hernia/hydrocele underwent mini-laparoscopic repair between June 2006 and February 2016. In modified single-port laparoscopic patent processus vaginalis closure (LPS), an orifice of PPV was encircled by extracorporeal suturing with an ordinary taper needle (1/2 Arc 11×34) and Endoclose needle (Auto suture, USA). The clinical data were retrospectively analyzed.
Results: Successful procedure ware achieved in all the patients. During the operations, contralateral patent processus vaginalis was found and subsequently repaired in 786 cases (22.03%). The mean operative time was 10(range 6-14) min in 1791 cases of unilateral repair and 15(range 12-20) min in 1780 cases of bilateral repair. The mean of postoperative hospital stay was 48(range 26-52) h. complications occurred in seven cases (0.63%) and were properly managed, with no major impact on outcome of the operations. There were only 8 recurrent cases in the patients who had been followed-up for 6-36 months. There were no conversion occurred and no serious complication, such as damage to the vas deferens and the gonadal vessels, postoperative testicular atrophy were noted.
Conclusions: Our limited experience suggest that the modified single-port laparoscopic technique could be safe, reliable, effective, and more cosmetically appealing for the management of pediatric inguinal hernia and hydrocele.

AS6-3

A Comparison between Totally Laparoscopic Hydrocelectomy and Scrotal Incision Hydrocelectomy with Laparoscopic High ligation for Cord Hydrocele

Sung Ryul Lee, Byung Seo Choi
Surgery, Damsoyu Hospital, Republic of Korea

Purpose: The purpose of this study is to investigate the feasibility and safety of totally laparoscopic hydrocelectomy with high ligation (TLH) compared to scrotal incision hydrocelectomy with laparoscopic high ligation (SIH) for cord hydrocele (CH)
Methods: From September 2011 to February 2016, 148 patients underwent SIH, and 342 patients underwent TLH for CH. In the TLH group, large hydrocele that could not pass through the internal ring was removed after percutaneous syringe aspiration. Age, laterality of hydrocele, inguinal comorbidities, operation time, surgical complications and recurrences were evaluated.
Results: Every case of CH in this study had spermatic cord cyst and patent processus vaginalis in proximity to hydrocele. The mean age of CH patients were 34.1±22.1 month. CHs are much more common on right side (61.0%) than on the left (35.7%). Bilateral CH occurs in 3.3%. Hernia (8.6%) and cryptorchidism (1.2%) were observed in Inguinal comorbidities. There were no complications except for two cases of wound hematoma in SIH group. There was one case of recurrence (0.7%) appeared in communicating hydrocele in SIH group. There were no significant differences in the age, laterality of hydrocele, inguinal comorbidities, operation time, complications and recurrences between TLH group and SIH groups. The mean operation time in TLH group was 15.1±12.0 minute and there was no intraoperative complication or conversion to open surgery.
Conclusion: TLH for CH is a feasible and safe procedure. Therefore TLH can be one of the surgical options for CH.

AS6-4

Single-Port mini Laparoscopic Herniorrhaphy for pediatric inguinal hernias by hernia forceps and spinal needle: a Simple Method of Hernia Repair in Children

Peng Li, Wei-shan Zhao, Ru-hong Li
Department of General Surgery, The affiliated Yan'an Hospital of Kunming Medical University, China

The clinical effectiveness of laparoscopic high ligation in treatment of inguinal hernial sac in children has gradually been accepted and approved by surgeon, but various methods of repair have been described. Basic principle is to close the internal inguinal ring either by intracorporeal or by extracorporeal suturing. The objective of our study is to describe and evaluate the outcome of a simple technique of internal ring closure by a hernia forceps and a spinal needle. A total of 98 hernias in 70 patients were repaired. A 2-0 prolene thread was passed percutaneously around the internal inguinal ring by threading it though a hernia forceps and a spinal needle under mini laparoscopic control. The suture is then tied extracorporeally in the subcutaneous plane. The 70 patients included 49 boys and 21 girls operated on for inguinal hernia. The age was 1.2 to 10 years. Right-sided hernia was present in 28 cases and left-sided hernia in 24 cases, and 18 cases had bilateral hernia. All surgery was successful without any intraoperative or postoperative complications. The mean operative time was 9 (range 712) min in 52 cases of unilateral repair and 19 (range 1524) min in 18 cases of bilateral repair. This new technique has all the advantages of laparoscopic hernia repair in children (minimally invasive, less pain, less complication, and cosmesis). In addition, the method is simple, It is easy to perfect and to perform and therefore is a worthy choice for pediatric inguinal hernias.

AS6-5

Needlescopic surgery in LPEC for treatment of pediatric inguinal hernia

Yoshiki Morotomi, Hiroaki Hayashi, Tomohiro Kitada
Paediatric Surgery, Osaka City University Medical School, Japan

LPEC (laparoscopic percutaneous extraperitoneal closure) can perform the surgical operation that is equal to the Potts method as a gold standard surgical procedure for pediatric inguinal hernia. The necessary requirements for the radical operation of external inguinal hernia are closure without the gap of the patent internal inguinal ring and high ligation. LPEC can do extraperitoneal simple high ligation of hernia sac completely, but also can deal the contralateral side, too. We operate less-invasive LPEC using needlescopic surgery. We report on a design of the port placement for minimal invasive LPEC and touch upon a handling of a LPEC needle. Two thin ports are inserted through an umbilicus for an idea of transumbilical scopic surgery. We call this procedure transumbilical LPEC (TULPEC). We started LPEC in 2005, experienced 700 cases. 450 of 700 cases are performed with TULPEC. In this way reduce the destruction of the abdominal wall and in operating hours. We use a thin port with Veress needle for an initial port to insert it safety. As LPEC produce complete obstruction of the indirect hernia sac (the remnant of processus vaginalis) circumferentially, also is applied to treatment of communicating hydrocele testis.

AS6-6

Solo surgeon-high ligation for pediatric inguinal hernia

Byung Jo Choi, Won Jun Jeong, Sang Chul Lee
Department of Surgery, Daejeon St. Mary's Hospital, The Catholic University of Korea, Republic of Korea

Purposes: Solo surgeon surgery has been introduced for laparoscopic surgery primarily. Open high ligation for pediatric inguinal hernia is a relatively simple procedure. The aim of this study was to report our initial experience with high ligation for pediatric inguinal hernia repair in 26 patients by a solo surgeon without any assistant.
Methods: Between July 2014 and June 2016, 26 patients underwent solo surgeon-high ligation for pediatric inguinal hernia. The procedures that were performed in solo surgery did not differ from that in standard open high ligation. The self-retaining Lone star retractor replace for first assistant. Patient demographics and operative and postoperative outcomes were assessed.
Results: Solo surgeon-high ligation for pediatric inguinal hernia was successful in all 26 patients. The median operative time and postoperative length of stay were 30 min (range: 2440) and 3.8 hours (range: 1.46.3), respectively. The median incision length was 7 mm (range: 59). There was no perioperative complications.
Conclusions: In our experience, solo surgeon-high ligation for pediatric inguinal hernia using the self-retaining Lone star retractor was safe and feasible. The efficacy warrants further investigation and experience.

AS6-7

The application on two kinds of Self-made needle for using in laparoscopic pediatric inguinal herniorrhaphy

Xue Wang
Department of Surgery, The Fifth People's Hospital of Chengdu City, China

Objective: To explore the clinical value on Self-made double-hole needle which use for laparoscopic pediatric inguinal herniorrhaphy.
Methods: To analyzed the data of postoperative that 1532 cases were reviewed, who were divided into the single-hole needle group (652 cases) and the double-hole needle group (880 cases), All of they were treat by Laparoscopic from April, 2006 to April, 2016.
Results: The average operation time of the group of single-hole needle was 17.7 mins which 4.4ml blood loss; 23 cases suffered small hematoma under the abdominal wall; and 3 patients recurred. The average operation time of the double-hole needle group was 7.4 mins which 1.2ml blood loss; 2 cases suffered small hematoma under the abdominal wall; and 1 patients recurred. Two groups of children staied in hospital with average of 2 days.The operation time, volume of bleeding,rate of complication in double-hole needle group were significantly less than those in the single-hole needle group ($P<0.05$).The hospital stay, recurrence rate was not statistically significant ($P>0.05$).
Conclusion: Self-made double-hole needle in laparoscopic pediatric inguinal herniorrhaphy with short operation time,less trauma, simple operation, in the clinically more efficiently,and that was worth generalizing and applying.

AS6-8

Laparoscopic Percutaneous Extraperitoneal Closure (LPEC) for pediatric inguinal hernia in our institute

Hisako Kuyama, Sadashige Uemura, Atsushi Yoshida, Mayumi Yamamoto
Department of Pediatric Surgery, Kawasaki Medical School, Japan

Dr. Hiroo Takehara and colleagues published a new operative method "Laparoscopic Percutaneus Extraperitoneal Closure (LPEC)" for pediatric inguinal hernia in 2000. It has been adopted as an alternative to traditional methods in a large number of institutions in Japan. This procedure is minimally invasive that enables to close hernia orifice without destroying the inguinal canal structure. In our institute, we have performed 657 cases of pediatric inguinal hernia by LPEC from 2005.
LPEC procedure in our institution is as follows:
1. First port insertion
First port is inserted by "Umbilical center insertion method". This technique can reduce the time for port insertion with no complications.
2. Port setting
A 3-mm laparoscopic dissecting forceps is inserted in the right lateral abdomen. The operator maneuvers the LPEC needle with the right hand.
3. Handling of the needle
LPEC needle holding doubled 3-0 non-absorbable sutures was punctured from the inguinal region just above the internal inguinal ring. The orifice of the hernia sac is closed with circuit extraperitoneal suturing around the internal inguinal ring using the LPEC needle.
4. Closure of the hernia orifice
One of the doubled sutures is lifted, so that the ligature can not to loosen.
All patients had no complication in need of treatment in perioperative period. 3 patients (0.46%) had recurrent hernia or hydrocele after LPEC. LPEC is suitable for pediatric inguinal hernia as a standard operative method with low complication and recurrence rates.

AS7-1

Diaphragmatic Hernia- does approach differ in management

Sameer Ashok Rege[1], Swarup Pal[2], Amandeep Arora[2], Abhay Narendra Dalvi[2]
[1]*Department of Surgery, K E M Hospital, India*
[2]*Department of Surgery, Seth GS Medical College & KEM Hospital, India*

Diaphragmatic hernia require a high degree of suspicion for diagnosis. This is a study of 62 patients over last 14 years in a tertiary referral centre. There were 41 males. 28 of these patients presented in emergency with symptoms as breathlessness, penetrating or blunt trauma, intestinal obstruction, fecothorax and inappropriately placed intercostal drain in the stomach. Isolated diaphragmatic injuries were identified in only 9 patients and all patients were operated through a laparotomy. Average hospital stay was 12.5 days with mortality of 3 patients and morbidity in about 13 patients. 34 patients were laparoscopically operated. 22 patient required only sutures to close the defect, however 10 patients required reinforcement with a dual mesh and 2 patients required neodiaphragm creation. Average hospital stay was 5.7 days with no morbidity.
Conclusion; Diagnosis of diaphragmatic hernia requires high grade of suspicion. Patients with acute presentations are better treated with laparotomy, however laparoscopy may be attempted if facilities and expertise is available.

AS7-2

LAPAROSCOPIC REPAIR OF GIANT PARAESOPHAGEAL HERNIA WITH TOUPET FUNDOPLICATION AND BIOLOGIC MESH: A CASE REPORT

Wei-guo Zhang
Department of Surgery, The First Affiliated Hospital of Dalian Medical University, China

Paraesophageal hernias (PEH) is an uncommon entity, especially GPEH (giant paraesophageal hernias). Giant paraesophageal hernia has been defined as more than one-third of stomach herniating into the throax.
If left untreated, some severe complications such as perforation, bleeding and gastric strangulation, volvulus will occur. With the advent of laparoscopy, GPEH is now being approached with minimally invasive techniques. Although repair of the GPEH is a challenging surgical problem that has been and continues to be heavily debated, remarkable advantages including decreased pain and rapid recovery make laparoscopic repair being routinely performed. Since the first report by Congreve, which proved that laparoscopic repair was feasible and safe.We reported a case of giant PEH, which was successfully treated with laparoscopic repair using biologic mesh and Toupet fundoplication. Intraoperative finding revealed paraesophageal hernia with proximately one half of the stomach in the chest folding upon itself and organoaxially rotating, the large hernia sac filled with clear fluid. It is extremely rare reported in the existing English literature. The complete laparoscopic approach was used to repair the giant hernia. The laparoscopic procedures involved the repair of the paraesophageal hernia using biosynthetic mesh with Toupet fundoplication and gastropexy.
The highlights of our procedure are complete sac excision, esophageal mobilization, mesh hiatoplasty, partial fundoplication and gastropexy.

AS7-3

Laparoscopic repair of hiatal hernia with a novel tailored fundoplication according to symptom and age of patients

Hitoshi Idani, Kanyu Nakano, Soichiro Miyake, Toshihiro Ogawa, Kazutaka Takahashi, Toshihiko Fujita, Naoki Mimura, Yasuo Nagai, Hijiri Matsumoto, Masao Harano
Department of Surgery, Hiroshima City Hiroshima Citizens Hospital, Japan

Background: We have introduced tailored fundoplication according to the patient condition during laparoscopic repair of hiatal hernia. Surgical technique and evaluation of the outcome are described.
Patients and Methods: Computed tomography (CT) was performed for almost all patients to evaluate pneumonia. Nissen or Toupet fundoplication was performed for patients with gastroesophageal reflux disease (GERD) dominant and 90-180°anterior fundoplication was performed for patients with dysphagia dominant. For patients over the age of 75 who had the history of aspiration pneumonia, lateral fundoplication was performed to avoid postoperative dysphagia which can induce aspiration.
Results: From 2000 to October 2015, a total of 147 patients with hiatal hernia underwent laparoscopic repair. Type of hernia was 1: 77, 2:2, 3:41, 4: 27. Nissen, Toupet, anterior and lateral fundoplication was performed for 64, 52, 25 and 6 patients, respectively. 11 patients with mesenterioaxial and 7 patients with organoaxial volvulus were included. Operation time was 143.3 min and conversion to an open surgery was required for 3 patients. There was no mortality. Soft diet was started on 1.5 POD and hospital stay was 9.3 days. Postoperative dysphagia was observed in 16 patients, which was improved within 1 month except for 1 patient underwent Nissen. No dysphagia and aspiration pneumonia was occurred on patients underwent lateral fundoplication. Obvious hernia recurrence was detected in 20 patients in whom, revisional surgery was required on 16 patients. Symptom scores were significantly improved after surgery.
Conclusion: Laparoscopic hiatal hernia repair with tailored fundoplication is safe and effective.

AS7-4

A case of laparoscopic reoperation for recurrent hiatal hernia

Kengo Hayashi, Chikashi Hiranuma, Daiki Kakiuchi, Sho Yamada, Kouichiro Sawada, Masahiro Oshima, Masahiro Hada, Masanori Kotake, Kaeko Oyama, Takuo Hara
Department of Surgery, Kouseiren Takaoka Hospital, Japan

The patient was a 70-year-old female who underwent laparoscopic fundoplication, using the Toupet technique with gastrostomy, at our institution 3 years ago. Her postoperative course was good, and the gastrostomy was removed 2 months after the surgery. Afterwards, however, she started to experience discomfort and epigastric pain, but had no vomiting. Gastrointestinal tract X-ray contrast radiography and computed tomography showed a recurrent esophageal hiatal hernia, with protrusion of the gastric corpus and fornix which was wrapped around the esophagus. Therefore, a laparoscopic reoperation was performed. After dissecting postoperative adhesions, we sutured the esophageal hiatus with 3-0 V-LocTM (COVIDIEN) and reinforced it with a ParitexTM Composite Hiatal Mesh (COVIDIEN). We did not perform fundoplication because the intraoperative upper endoscopy showed that the cardia was not dilated; therefore, we thought that the previous fundoplication was intact. Laparoscopy revealed the presence of an abdominal incisional hernia under the laparotomy scar where the gastrostomy had been performed; therefore, a one-stage repair was performed using a mesh. The postoperative course was good, and the patient was discharged on postoperative day 7. Laparoscopic surgery for esophageal hernia is becoming popular, but reports of surgery for recurrence are scarce particularly in Japan. Postoperative adhesions often make laparoscopy challenging, but this approach has many advantages including good visibility of the surgical field, less blood loss, smaller wounds, and detection of other diseases. Therefore, a laparoscopic approach can be an appropriate choice even for recurrent hiatal hernias.

AS7-5

Management of recurrent hiatal hernia- Mesh repair- To Be Or Not To Be?

Jaideepraj Rao, Kaushal A. Sanghvi
Department of General Surgery, Tan Tock Seng Hospital, Singapore

Introduction: Hiatal Hernia is characterized by a protrusion of any abdominal structure other than esophagus into the thoracic cavity through a widening of the hiatus of the diaphragm.
Body: The prevalence of hiatal hernias and paraoesophageal hernias (PEHs) is lower in Asian populations than in Western populations. Similarly a recurrent hiatal hernia is uncommon. Recurrent hiatal hernia repair is indicated in patients when the symptoms match anatomical findings. The revisional surgery can often be completed laparoscopically in experienced hands. The technical aspects of a recurrent hiatal hernia repair are-
1. Any previous fundoplication should be taken down in its entirety
2. The right and left crura exposed, and the hernia sac excised.
3. Attention should be directed to ensuring adequate intra-abdominal esophageal length.
4.The success of laparoscopic revisional hiatal hernia surgery approaches that of the primary repair.
5. Mesh can be safely used in revisional surgery though there is inadequate and underpowered data to support its use presently. The type of mesh, wether to interpose or do an onlay repair, are some of the questions unanswered in the literature.
Conclusion: However promising results for recurrent hiatal hernia repair are, the recurrence rates are higher compared to primary hiatal hernia repairs. Such surgeries should ideally be done in a tertiary centre by experienced surgeons.

AS8-1

Long term follow-up of anterior approach preperitoneal hernia repair using the Kugel patch

Xue-lu Zhou, Xiao-qiang Yuan
Department of Surgery, Dongguan traditional Chinese medicine hospital, Guangzhou University of Chinese Medicine, China

Background: Despite many advantages of original Kugel hernia repair over other procedures, there exist certain disadvantages of technical difficulty, long learning-curve and high early recurrence. The aim of this study is to explore the outcomes of long term follow-up using anterior approach preperitoneal hernia repair with the Kugel patch and determine its safety and efficacy.
Methods: 581 inguinal hernias were performed in 560 patients, using anterior approach preperitoneal repair. Patients' age and gender, type of hernias, operative time, hospital stay, complications and recurrence were evaluated.
Results: We included 581 hernias, with 354 on right side, 162 on left side and 65 bilateral sides. All hernias were primary. There were 443 indirect hernias, 115 direct hernias and 23 femoral hernias. Mean operative time was 50 minutes; local anesthesia was applied in 530 (91.2%) cases. Postoperative complications affected 50 patients (8.9%). The patients were discharged from 4 to 8 days (with average of 6 days). The averaged follow-up time was 70 months (12~120 mon.). There were three recurrences in the period (0.5%).
Conclusions: The results of long term follow-up with this procedure are safe and effective, easy to learn. We believe that this procedure should be adopted as an alternative method for Chinese patients with inguinal hernias.

AS8-2

Ambulatory groin hernia repair with anterior approaches - 5,000 cases experience in a hernia clinic

Kyosuke Miyazaki
Miyazaki Surgery & Hernia Clinic, Japan

Introduction: Miyazaki Surgery & Hernia Clinic is a specialized center of ambulatory groin hernia repair. The author reports the result of the treatment of over 5,000 cases of adult groin hernias.
Patients and Methods: Between April 2003 and December 2015, the author performed groin hernia repair on 5,012 patients (4,117 males / 895 females: 5,093 diseases). There were 4,759 primary and 334 recurrent groin hernias. The operation methods were decided according to the hernia classification of Japanese Hernia Society. A high ligation was done in the type I-1 (normal internal ring) patients. Rest of the patients underwent tension-free mesh repairs. For the Mesh repair, an inlay mesh repair was selected for the patients where preperitoneal dissection was possible, while others underwent a mesh-plug repair or a Lichtenstein repair. Operation method, operation time, ostoperative recovery, complications were recorded.
Results: Seventy-two diseases were treated with high ligation, 1,750 with modified Kugel Patch, 1,013 with Kugel Patch, 572 with Prolene Hernia System, 564 with Ultrapro Hernia System, 470 with Ultrapro plug and 652 with other devices. The operation time was 50 min. The length of hospital stay after operation was 4.3 hours. The success rate of ambulatory surgery was 99.9%. There were 7 bleedings, 1 surgical site infection, 20 recurrences and 3 neuralgias.
Conclusions: "Tailored approach" of using the different groin hernia repair techniques, depending on the findings of the patient for the ambulatory adult groin hernia had excellent results for all patients.

AS8-3

Effects of non-woven mesh in preperitoneal tension-free inguinal hernia repair: a retrospective cohort study

Yi-ting Liu, Ying-mo Shen, Jie Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: Evaluate the effectiveness of non-woven mesh in preperitoneal tension-free inguinal hernia repair under local anesthesia.
Methods: The medical records of patients who received preperitoneal tension-free inguinal hernia repair under local anesthesia in our hospital from 2012 to 2015 were reviewed. Patients were included if they were repaired with non-woven mesh or woven mesh. Outcome measures were the operation time, length of stay, costs, complications, chronic pain, foreign body sensation and recurrence.
Results: A total of 389 cases were included. 186 cases were repaired with non-woven mesh (observation group), and 203 cases were repaired with woven mesh (control group). There were no significant differences in operation time and length of stay, but the difference in costs had a statistical significance with higher price in observation group. Seroma of inguinal region were occurred in 6 cases of the observation group and 8 cases of the control group with no significant difference and no other complications and recurrence in both groups. No cases was recorded with chronic pain in the observation group and 8 cases in the control group, meanwhile, foreign body sensation was found in 1 case of the observation group and 9 cases of the control group which showed attractive advantages of non-woven mesh.
Conclusions: Preperitoneal tension-free repair for inguinal hernia under local anesthesia using non-woven or woven mesh is available. The costs of non-woven mesh is higher than that of woven mesh, but the incidence rate of chronic pain, foreign body sensation are lower by using non-woven mesh.

AS8-4

Randomized Trial Comparing Self Gripping Semi-Resorbable Mesh (PROGRIP) with Polypropylene Mesh in Open Inguinal Hernioplasty the 6 Years Result

Joe KM Fan, Jeremy Yip, Dominic CC Foo, Oswens SH Lo, WL Law
Department of Surgery, Queen Mary Hospital, The University of Hong Kong, Hong Kong

Objectives: The objective of this randomized controlled trial is to compare the outcomes following self-gripping mesh repair to polypropylene mesh secured with sutures in open inguinal hernioplasty.
Methods: Eligible patients aged 18 to 80 years old, who had primary unilateral uncomplicated inguinal hernia, were randomized into either Polypropylene (PL) group or PROGRIP (PG) group by computer generated code. The primary outcome was the time from mesh placement to end of operation, whereas secondary outcomes included the total operative time, amount of analgesic used, length of post-operative stay, seroma formation, chronic discomfort, chronic pain score and recurrence. The study was registered in www.clinicaltrial.gov carrying ID of NCT00960011. Patients were followed-up in out-patient clinic for 6 years after operation.
Results: From March 2009 to April 2016, 45 patients were included. There was no significant difference regarding patient demographics and hernia characteristics. In the PG group, there was significant reduction in time for mesh placement (11.8+/-3.1 min vs. 21.0+/-6.2 min, $p<0.001$) and total operative time (39.2+/-9.8 min vs. 47.7+/-8.0 min, $p=0.003$). There was one recurrence in PL group and nil in PG group. Although there was a significant difference in paresthesia between 2 groups, the difference disappears with time and comparable from post-operative 1 year onwards. There was no difference in chronic pain, chronic discomfort demonstrated till 6 years after operation.
Conclusions: Use of PROGRIP mesh in open inguinal hernioplasty effectively reduces the operating time with comparable long-term surgical outcome.

AS8-5

COMPARING N-BUTYL-2-CYANOACRYLATE (HISTOACRYL®) AND SUTURES FOR MESH FIXATION DURING LICHTENSTEIN HERNIA REPAIR: A DOUBLE-BLINDED RANDOMIZED TRIAL

Carlos Hoyuela[1,2], Montserrat Juvany[1], Antoni Veres[1,3], Fernando Carvajal[1], Miquel Trias[1], Antoni Martrat[1], Jordi Ardid[1]
[1]*Department of General and Digestive Surgery, Hospital Plató Barcelona, Spain*
[2]*Dept of Surgery, Universitat Autónoma de Barcelona, Spain*
[3]*Dept of Surgery, Hospital de la Cerdanya - Puigcerd, Spain*

Background: Pain is the most likely cause of the delay in resuming normal activities among patients undergoing groin hernia repair. The aim of this study was to determine whether the use of Histoacryl® to fix the mesh instead of sutures reduces acute postoperative pain in patients operated on for inguinal hernias. The secondary objectives were to evaluate the operating time and determine postoperative complications, chronic pain and early recurrence rates during the 1-year follow-up period.
Materials and methods: 370 patients who underwent a Lichtenstein repair were randomized to receive either Histoacryl® or non-absorbable 2/0 sutures (Prolene®) for fixation of the lightweight polypropylene mesh. Postoperative complications, pain and recurrence were evaluated at the medical office by an independent blind observer.
Results: The postoperative pain at 8 hours, 24 hours, 7 and 30 days was less intense when glue was used instead of sutures, with statistical significance ($p<0.001$) in all measures. The operating time was significantly shorter using Histoacryl® (35.2 vs. 39.9 minutes, $p<0.001$). There were no significant differences between the groups in terms of postoperative complications, chronic pain and early recurrences at the 1-year follow-up.
Conclusions: Atraumatic mesh fixation with Histoacryl® provokes less acute postoperative pain than sutures after a Lichtenstein hernia repair. In addition, this method is faster than sutures without the risk of increasing complications or early recurrence rates. However, the differences favouring Histoacryl® appear to have no effect on the chronic pain rate. Histoacryl® could be routinely used for mesh fixation during open hernia repair.

AS8-6

Minimal Open Pre Peritoneal (MOPP) approach, a new technique for groin hernia repair. With a new mesh and a new and specific ancillar. First presentation with a long term results

Marc Soler
Department of Parietal Surgery, Clinique Saint Jean, France

For the treatment of groin hernias we prefer to put a large prosthesis in the pre peritoneal space. With a small incision.
We changed the classic mesh design, giving an asymmetrical ovoid shape, to fully adapt to the wide coverage of the musculo pectineal hole. Two sizes were provided to accommodate the importance of the parietal defect.
After the introduction, the prosthesis is not fixed. Strips are set up on the skin and will be removed during the first postoperative consultation.
Personal data under the control of the French hernia club data base:
850 hernias have been operated between September 2011 and October 2015.
Mean follow up: 860 days
Day surgery: (92.8%), one night staying: (4.64%)
Complications: bladder retention: 2; phlebitis: 1; superficial infection 2; Deep infection?: 1,
Recurrence: 1
Reoperation: 2 with a good result.
Post-operative pain: Visual Analogic Scale (VAS)
Day8: VAS: 0 =54%, VAS [1-3] =36.05%, VAS [4-6] =9.13%, VAS [7-8] =1.28%
Day30; VAS: 0= 81.73%, VAS [1-3] = 13.92%, VAS [4-6] =3.43%, VAS [7-8] =0.9%
Chronic pain
97 patients with pain at one month was rewiened between 3 and 6 months
At 3-6 months: VAS: 0= 79.38%, VAS [1-3]=9.27%, VAS [4-6] =10.30%, VAS [7-8]=11.03%
At two years; No discomfort =97.27, discomfort =2.27%; moderate pain= 0.45%
Patient opinion: Excellent 99.5%, Medium 0.5%
Conclusion: MOPP technique give an excellent result, with a very low chronic pain, recurrence and complication rates.

AS8-7

One of the hybrid surgery, LAH (laparoscope assisted hernioplasty) for ambulatory hernia surgery

Hiroki Imazu
Imazu Surgical Clinic, Japan

Introduction: I perform a LAH operation for an ambulatory groin hernia operation. It's combination conventional mesh repair and laparoscope, and it has the following some merits. 1, shortening of the wound, 2. It is more exact than the naked eye, because of expansion.3.post operative pain is slight. 4. Can go home in a short time.
Method: Basically, I perform the Direct-Kugel method from 1.5-2cm length wound. Until the handling of hernia sac, I perform with used a magnifying glass. After this processing, I detached as much as possible between the peritoneum and prepetitoneal fat tissue layer from a wound using a 3mm diameter laparoscope. After detachment, I measure a detachment range and insert mesh of size as big as possible. The mesh which I insert it in prepetitoneal fat tissue layers, and unfolded enough using a laparoscope.
Result: I was operated on to 1308 patients (1373 lesions). Their sex ratio was 9:1 (males: females), with a mean age of 56.6 years. The type of hernia was indirect hernia 1012 lesions, direct hernia 275 lesions, femoral hernia 10 lesions and combine 23 lesions. All cases average operation time were 57min (with in bilateral) and mean wound length was 1.67cm. All cases came home on the same day and no severe complications.
Conclusions: There was not the case that a day surgery was not possible. The severe complications are not seen after operation, and the inguinal hernia day surgery is basically possible in all cases by LAH.

AS8-8

Prevention of male infertility development after different methods of inguinal hernia repair with the mesh explant

Tamaz Gvenetadze
Department of Surgery, Acad. O. Gudushauri National Medical Center, Georgia

Objectives: The study and comparison of quantitative composition of spermatozoids prior and after Lichtenstein and Gvenetadze operations.
Methods: For the recent 6 years 1000 patients have been operated on by the isolation method. 215 patients
of the reproductive age (19-40 yrs.) with the bilateral inguinal hernias became the object of study. The patients were allocated into two groups. The first group contained those 66 patients (30,7%) who underwent bilateral Lichtenshtein hernia repair. The second group 149 patients (69,3%) on whom bilateral hernia repairs by Gvenetadze method have been utilized. Complete spermomorphocitological investigations have been performed in all groups 2 days prior to surgery, 30 days and six months after surgery.
Results: Oligospermia, reduction of the quantitative sperm composition by 30-35% was revealed only in the first group ($p<0,01$). In the second group no significant differences was registered. 68 patients had children after surgery by Gvenetadze method.
Conclusions: Hernioplasty by Gvenetadze prevents male infertility in all cases especially for bilateral inguinal hernia repair as well as in reproductive age. The given technique is more solid as the posterior wall of the inguinal canal presented by the transverse fascia, mesh and aponeurosis of the external oblique muscle therefore the recurrence rates of hernia is minimized and practically excluded. Based on the foregoing results this method is considered as an effective method of hernioplasty as for young as well for elderly patients.
Keywords: inguinal hernia, spermatic cord isolation, mesh material

AS9-1

Initiative content reduction surgery for giant ventral hernia in an obese Russian patient: A case report

Yu-chen Liu, Jie Chen
Department of hernia and abdominal wall surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Hernias are routine general surgical problems that may present in any age group, regardless of the patient's socioeconomic status. We present a rare case of a giant ventral hernia in a Russian patient with the BMI of 43.8kg/m^2. This is an unusual case and is very rarely reported in China, even Asian. This current case report describes a 56-year-old gentleman who presented to the hospital with a giant ventral hernia complicated with hypertension, coronary disease and diabetes. He was refused by American and European surgeons because of the poor lung function and higher BMI. And we found the length of his small intestine was nearly 10 meters during operation. The literature on large abdominal wall hernias is reviewed, and a technique of initiative content reduction surgery (ICRS) is also presented. ICRS is safe and effective for obese patient's giant ventral hernia associated with loss of abdominal domain. It can reduce postoperative IAH and BMI, and avoid the occurrence of abdominal compartment syndrome, which finally reduce the rate of postoperative complications and recurrence.

AS9-2

Withdrawal

AS9-3

Liver cirrhosis ascites complicated with incisional hernia: case report

Liang Li
Department of Surgery, Peking University Shenzhen Hospital, China

Introdution: We present a special case of hernia with liver cirrhosis, its main complication was abdominal compartment syndrome, and was cured by Transjugnlar Intrahepatic Portosys Temic Stent Shunt (TIPSS).
Methods/Case Report: A 52 years-old lady with liver cirrhosis ascites complicated with incisional hernial. She had 2 times previous abdominal operation, respectively were subtotal gastrectomy and splenectomy. The hernia was between the 2 incisions, its length was 20 cm, and its width was 8 cm, and the skin of hernia thin. The hernial repaired operation was Intraperitoneal Onlay Mesh, used a piece of Proceed mesh, the mesh size was 30.5cm×30.5cm. Two days later, the main complication was abdominal compartment syndrome due to the liver cirrhosis ascites, a tube was used to drainage ascites through abdominocentesis for 7 days.After she leaved hospital,diuretic was required to use, but two months later,the abdominal compartment syndrome happen once again,and the diuretic was on effect.so the Transjugnlar Intrahepatic Portosys Temic Shunt (TIPSS) was performed,after the TIPSS, the ascites was on the decline,twe weeks later, the asctes had not beeen searched by ultrasound.
Conclusion: Liver cirrhosis ascites with incisional hernial is a complex case,aftr the hernial repair operation, the abdominal compartment syndrome which due to the ascites is the main complication, abdominocentesis and drainage ascites is a way to us,but usually is the provisional measures, the Transjugnlar Intrahepatic Portosys Temic Shunt (TIPSS) is the solution.

AS9-4

Progressive Preoperative Pneumoperitoneum Preparation for Surgery of Large Incisional Hernias with Loss of Domain

Chen Shuang
Department of Gastrointestinal Surgery & Hernia Center, The 6th Affiliated Hospital, Sun Yat-Sen University, China

AS9-5

Strategies for functional repair of complex abdominal wall defects

Yan Gu
Shanghai Ninth Hospital, Shanghai Jiao Tong University, Hernia and abdominal wall disease center, China

AS10-1

A Report of 4,445 Cases of Laparoscopic Inguinal Hernia Repair: 15-year Experience from A Single Center

Jian-wen Li, Fei Yue, Min-hua Zheng
Gastrointestinal Surgery and Shanghai Minimally Invasive Surgery Center, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, China

Objective: To perform a systematic evaluation of the clinical effect of laparoscopic inguinal hernia repair (LIHR) retrospectively based on large population of patients.
Methods: The clinical data of 4,445 cases (5,530 hernias) who underwent LIHR at our hospital between January 2001 and December 2015 were analyzed retrospectively. There are 2,402 TAPPs in 2,125 cases, 2,907 TEPs in 2,306 cases, and 21 IPOMs in 20 cases, including 6 cases underwent TAPP and IPOM simultaneously. The 5,330 hernias included 3,216 indirect hernias (60.3%), 1,164 direct hernias (21.8%), 399 recurrent hernias (7.5%), 479 complex hernias (9.0%), and 72 femoral hernias (1.4%). All procedures were accomplished by the same surgical team, and the surgical technique was selected by the surgeons. The median time of follow-up is 51months (range from 7-187 months).
Results: The average operative time is 30.2±11.2min, 27.1±8.7min for unilateral hernia repair, and 43.0±11.0min for bilateral hernias repair. No patient required analgesics. The average length of hospital stay is 1.4±1.1d. 99.4% and 99% of patients returned to normal activities by 2 and 4 weeks, respectively. Totally, there were 12 recurrent cases (0.2%), including 5 after TAPP and 7 after TEP. There are 250 seroma (4.7%), 68 urinary retention (1.3%), transient neuropraxia (0.4%) and 3 paralytic intestinal obstruction (0.1%).
Conclusion: LIHR is a safe and efficient strategy for hernia repair. With systematic evaluation of patients, appropriate selection of surgical procedures, and standardized practice, LIHR could achieve satisfied clinical results.

AS10-2

Modified tumescent TAPP: laparoscopic inguinal hernia repair after the preperitoneal tumescent injection of diluted lidocaine, epinephrine, anapeine, saline solution and a high amount of carbon dioxide gas

Kenichi Tazawa[1], Shunsuke Kawai[1], Soshi Osawa[1], Fuminori Yamagishi[1], Shinichi Sekine[2], Takahiro Manabe[2], Shigeaki Sawada[2], Takuya Nagata[2]

[1]*Department of Surgery, Iitoigawa General Hospital, Japan*
[2]*2nd Department of Surgery, Toyama University Hospital, Japan*

Purpose: Laparoscopic transabdominal preperitoneal inguinal hernia repair (TAPP) is technically difficult and its learning curve is very long for inexperienced or training surgeons, therefore postoperative complications often occur. To simplify the procedure of TAPP and reduce postoperative complication and pain, Dr. Tokumura et. al (Dept. of Surgery, Tohoku Rosai Hosp.) devised a novel procedure TAPP, that is carried out after the inguinal preperitoneal infiltration of diluted lidocaine, ropivacaine, epinephrine saline solution and carbon dioxide (CO2) gas (tumescent TAPP). We add infiltration of a high amount of CO2 gas (150ml) in the procedure of tumescent TAPP. This report aims to describe the author's initial experience with modified tumescent TAPP for inguinal hernia in 99 patients.
Methods: About 120 ml of diluted lidocaine, anapeine, epinephrine solution and 150 ml of CO2 gas were infiltrated into the inguinal preperitoneal space through a transabdominal stung needle before making peritoneal flap in TAPP. Modified tumescent TAPP was performed for 99 patients (72 men, 17 women; amean age, 68.4 years).
Results: Using modified tumescent TAPP, we found that it was easier to recognize the inguinal anatomy and dissect widely the preperitoneal layer and inguinal floor without massive bleeding. The mean operation time of unilateral type was 113.9 min and there were few postoperative complications and minimal pain.
Conclusions: Modified tumescent TAPP makes conventional or tumescent TAPP easier and safer; however, this procedure should be checked exactly by a comparative study with conventional or tumescent TAPP.

AS10-3

The novel technique of TAPP herniorrhaphy for direct inguinal hernia: repair of hernia defect wall

Sung-Ryul Lee

Department of Surgery, Damsoyu Hospital, Republic of Korea

Objective: To evaluate the efficacy of defect wall repair of laparoscopic herniorrhaphy for direct inguinal hernia/
Background: Laparoscopic surgery of direct inguinal hernia conventionally has two ways, TAPP and TEP. In both methods, laparoscopic herniorrhaphy is currently performed using synthetic mesh without repairing the hernia defect.
Methods: Laparoscopic herniorrhaphy (TAPP) had been performed on 187 direct inguinal hernia patients from January 2013 to December 2015. The patients were categorized into two groups as follows: group #1 (those who had conventional TAPP without defect wall repair, "cTAPP"), group #2 (those who had TAPP with defect wall repair, "rTAPP").
Results: We have performed cTAPP on 99 patients. The other 88 patients were operated using rTAPP method. Postoperative hospital stay was significantly shorter in group #2 (10.6±8.42 hours) than in group #1 (27.0±12.3 hours) ($p<0.001$). The mean operation time and postoperative pain were both significantly less in group #2 than group #1 ($p<0.001$). Time to return to daily life for group #1 was 5.19 days which is shorter than 6.64 days of group #1($p<0.001$).
Conclusions: Defect wall repair suture in laparoscopic herniorrhaphy can be carried out for direct inguinal hernia. TAPP surgery with hernia defect wall repair followed by the use of a smaller mesh is an effective method for treating direct inguinal hernia.

AS10-4

Locking methods to prevent recurrent indirect inguinal hernia

Masahiko Kawaguchi, Karin Sadamura, Yoshitaka Iwaki, Masataka Tochimoto, Yuta Horiguchi, Hideaki Kato, Kanae Tawaraya, Toru Watanabe

Department of General Surgery, Yokohama Sakae Kyosai Hospital, Japan

Introduction: Laparoscopic hernioplasty has been a standard procedure for inguinal hernia. However, the recurrence rate is still higher than open procedure with prosthesis. Considering about the recurrence, out-swing-door phenomenon at the inguinal ring, which have been reported by Kawaguchi, should be concerned to prevent recurrence. Then, new procedure at the inguinal ring is developed to lock the swing door. Aim of this study is evaluation of the locking procedure.
Patients and Methods: From April 2013 to November 2014, laparoscopic hernioplasties were included for this cohort study prospectively. Locking procedure. To adhere around the deep inguinal ring, completely dissect around the inguinal ring and firm fixation of prosthesis were performed without nerve injury. Depend on the inguinal area, three procedure were performed: Trans abdominal preperitoneal approach (TAPP), TAPP like but using small prosthesis (TAPlug), and plugging at the inguinal ring (Plug),
Results: Of all inguinal hernioplasty, laparosocopic procedures were performed in 61 in men. Then, sides of inguinal hernia were 15 in right, 14 in left, and 32 in bilateral. Then, 81 lesions were performed laparoscopic hernioplasty. Median surgical time is 110 min in bilateral and 66 min in hemi-lateral. The type of hernia were indirect 45, direct 28 and conbined type 7. The follow up time was median 17 months (IQR: 12 to 25). There were no severe complications and no recurrence.
Conclusions: This study showed inguinal locking procedure effective and feasible for laparoscopic hernioplasty about two years follow.

AS10-5

Acute Post-operative Pain Difference Between Two Mesh-fixation Technique In Laparoscopic Total Extraperitoneal (TEP) Inguinal Hernioplasty In Long-standing Hernia: A Prospective Randomized Clinial Trial

Asma Razak[1], Tuan Nur Azmah Tuan Mat[1], Kalsom Abdullah[1], Hairol Othman[2]
[1]*Department of Surgery, Hospital Sultanah Aminah Johor Bahru, Malaysia*
[2]*Department of Surgery, Universiti Kebangsaan Malaysia Medical Center, Kuala Lumpur, Malaysia*

Introduction: Inguinal hernia repair has evolved towards better outcome on post-operative pain,early return to activities,and low recurrence rate.
Objectives: A prospective randomized trial looking at outcome in post-operative pain, and early recurrence between two mesh fixation methods in laparoscopic TEP inguinal hernioplasty.
Results: 82 laparoscopic TEP inguinal hernioplasties were performed in multi-ethnics patient (median age, 50 years; range 20-78 years). Randomization done into two groups; glue (GG) and tacks (TG) with 40 patients each group. Median duration of symptoms was 7-months with 18 (22.5%) had pre-operative pain. Median hernia size was 3cm. One patient in each group had conversion to open repair. A significant difference was observed between two groups in median duration of surgery (glue 45 vs tacks 39 minutes; p=0.020), post-operative pain score at 1-hour (glue 4 vs tacks 5; p=0.006), and 6-hours (glue 3 vs tacks 4; p=0.012). At 1-week, incidence of seroma formation is significantly higher in GG, 8 (10.0%) vs 2 (2.5); p=0.043, whereas urinary incontinence was higher in TG, 9(11.3%) vs 1(1.3%); p=0.007. No difference in duration of symptoms, hernia size, rescue drug requirement, post-operative hematoma or recurrence. One patient in GG had recurrence at 6-weeks, while another in TG had chronic pain up to 6-months. No incidence of post-operative infection reported. Return time to activities was sooner in GG, 1-week vs 2-weeks in TG; p=0.001.
Conclusions: Mesh fixation with tissue glue in laparoscopic TEP hernioplasty was superior in terms of lesser acute post- operative pain score and post-op urinary incontinence, and early return to normal activities.

AS10-6

Obese Patients Have Comparable Perioperative Outcomes to Non-obese patients inLaparoscopicInguinal Hernia Repairs

Chi-Yun Lan[1], Kai-Yi Tzou[1], Su-Wei Hu[1], Chen-Hsun Ho[1,2], Yi-Te Chiang[1], Wei-Tang Kao[1], Chia-Hung Liu[1,2], Kuan-Chou Chen[1,2], Chia-Chang Wu[1,2]
[1]*Department of Urology, Taipei Medical University-Shuang Ho Hospital, Taiwan*
[2]*Department of Urology, School of Medicine, College of Medicine, Taipei Medical University, Taiwan*

Purpose: To determine the impact of obesity on outcomes of laparoscopic totally extraperitoneal (TEP) inguinal hernia repair in obese patients compared with non-obese patients.
METHODS: This is a retrospective cohort analysis of consecutive patients undergoing TEP inguinal hernia repair between January 2009 and July 2016. Bilateral and recurrent hernias were excluded. Perioperative data including demographics, operation time, pain scale, length of hospital stay, recurrence, and complications were obtained. The perioperative outcomes of obese patients (BMI 25) and non-obese patients (BMI <25) were compared.
RESULTS: A total of 508 patients met inclusion criteria; 298 (59%) and 210 (41%) patients were classified as non-obese and obese resepectively. Demographics were similar in the two groups. The obese group had a slightly longer operative time (111 vs 105 mins, P= 0.262). However, other perioperative outcomes were similar in non-obese and obese patients, including post-operation recurrence rate (1.2% vs 1.3% ,P=0.741), peri-operation complications rate (11.9% vs 12%, P=569), rate of narcotics requirement (5% vs 5%, P=0.976), visual analgesics scale (2.35 vs 2.31, P=0.861) and length of hospital stay(3.13 vs 3.21 days, P=0.791)
CONCLUSIONS: Obese patients does not present inferior perioperative outcomes in laparoscopicinguinal hernia repairs compared with non-obese patient.

AS10-7

SEROMA PREVENTION TECHNIQUE IN TEP- DOES DRAIN HELP?

Debkumar Ray
Minimal Invasive Surgery, Amri Hospitals Salt Lake, India

The incidences of groin seroma in laparoscopic hernia repair(TEP) is documented between 20-30 % which requires aspirations in 20% cases. This is a prospective non randomised trial of a single surgeon over 10 years period. We have routinely used closed suction drain through the top 5 mm port in all cases of TEP since 2011 and before that we never used drain in the former 5 years period. Total number of patients were 750 in 10 years of which bilateral TEP was 650 (total herniae were 1400). Drain group had 450 patients and 300 in the non drain group. Eighty percent herniae were Llyod Nyhus class III &IV. Standard follow up protocol was 7 days,15 days, 3months and one year.
we observed seroma incidences were significantly down to 10% in drain group as compared to 30 % in non drain group.In the drain group only one patient required seroma aspiration twice and the reason behind that was accidental clamping of drain tube for 8 hours post operatively. In the non drain group almost 30 percent of those seromas required aspiration once or twice. Average drain out put in 8 hours was 150 ml (range from 60 -500 ml) Incidence of mesh infection in the drain group was nil but in the non drain group was one in 300 cases (0.3%).
in conclusion, our study has shown routine use of closed suction drain in TEP is safe and significantly reduces post operative seroma and hereby subsequent aspiration .

AS11-1

Long-Term Outcome of 74 Complex Incisional Hernia Repairs Using Hybrid Technique

Yu-long Shi, Jing-lei Liu, Xiao-bi Guo, Guo-dong Lian
Department of Surgery, Shandong Provincial Hospital Affiliated to Shandong University, China

Background: Repair of complex incisional hernias poses a major challenge.
Aim: The aim of this study was to review the outcomes of the hybrid technique repair of complex incisional hernias using a synthetic prosthesis.
Methods: We reviewed patients undergoing the hybrid technique repair of complex incisional hernias from 2010 to 2016 in Provincial Hospital Affiliated to Shandong University.All of these patients experienced early conversion for the dense extensive intraabdominal adhesions. Patients were followed through clinic visits. All patients were followed up for mean 47 months (range 560 months). The data analyzed including patient demographics, operative parameters, complications, and recurrence.
Results: Altogether, 74 patients underwent a hybrid technique repair. There were 45 male and 29 female patients (median age of 69 y) with body mass index between 24.6 and 41.8. The overall size of the fascial defect was calculated between 64 and 198 cm^2. All cases were performed by hybrid technique successfully with a mean operation time of (148.8±13.2) min and a mean time of postoperative hospital stay of (9.6±2.8) days. Abdominal wall pain occurred in 42 cases and all of them relieved basically in one months after the operation. 3 was found recurrence in all of these patients. During the follow-up period, neither wound/mesh infection nor trocar-site hernia occurred.
Conclusion: The hybrid technique was proved to be a safe and minimally invasive measure for complicated incisional hernias.

AS11-2

Hybrid technique for large ventral hernia repair

Yi-wei Qiu, Nan Li
General Surgery Department, Tianjin Medical University General Hospital, China

Introduction: The advantage of laparoscopic repair of ventral hernia has been widely accepted today.However, for patients with large incisional hernia defects, laparoscopic approach alone would be very difficult. In this study, we combined laparoscopic and open techniques in large incisional hernias and showed superior cosmetic and functional results.
Aim: To demonstrate the operating technique and early follow up results of 22 patients with large ventral hernias operated with hybrid technique.
Material and Methods: Twenty two patients suffering from large ventral hernias underwent the hybrid technique for their repairs between January 2014 and March 2016. All of the operation strategies were pre-planned sequential laparoscopic (exploration and enterolysis) -open (removal of excessive skin and hernia sac; closure of the defect)- laparoscopic (IPOM) approaches. All of the procedures were performed using synthetic meshes in all 22 cases, among which, Bard Speramesh were used on 12 patients and Medtronic Parietex Composite$^+$ were used on the remaining patients.
Results: All of the patients recovered well and discharged as scheduled. Two patients had subcutaneous wound infections, no mesh infections were observed.
Conclusions: For patients with large ventral hernias, the hybrid technique is a safe and feasible way to achieve cosmetic and functional results.

AS11-3

Hybrid technique for the treatment of incisional hernia: 58 cases report

Bing Sun, Xian-zhao Deng, Bo-ming Guo, Bo Wu, You-ben Fan, Jie Kang
Department of General Surgery, Shanghai JiaoTong University Affiliated Sixth People's Hospital, China

Objective: To explore therapeutic effect of a combined laparoscopic and open technique (hybrid technique) for the repair of incisional hernia.
Methods: A retrospective analysis was made in 58 incisional hernia during Jan 2011 to May 2016.Results All cases were operated on successfully and recovered uneventfully. The operating time was 40-160 (91.5±30.4) min. The diameter of the hernia ring was 2-25 (7.5±5.7) cm and the mesh size was 150-600 (273.2±108.5) cm, Postoperative complications included incison infection (n=3, 5.8%), seroma (n=2, 3.4%), abdominal pain (n=8, 13.7%), All of them were cured with conservative treatment. Postoperative hospital time was 6-15 (9.3±2.1) days. No patient developed massive haemorrhage, bulging, mesh infection.No recurrence occurced during the follow-up of 3-53 months.
Conclusion: Hybrid technique is a safe and effective procedure for incisional hernia repair especially for large complicated hernias.

AS11-4

TROCARS PLACEMENT IN LAPAROSCOPIC REPAIR OF INCISIONAL HERNIA

Abdullah Aldahian, Fahad Bamehriz
Bariatric Surgery, King Saud University Hospital, Saudi Arabia

Background: Introducing the dual mesh in laparoscopic repair of incisional hernia is done through lateral port size 10mm to 12mm, which needs closure and may weakened the abdominal wall.
Method: We use 5mm trocars in repairing the hernia and introducing the dual mesh through trocar size 10-12mm in the defect (hernial sac), moreover excising the hernial sac and repairing the defect. The procedure is done as day surgery.
Results: The technique is used for 40 patients over 2 years. No infection, lymphocele and no recurrence.
Conclusion: The new technique is easy, logic, through excision of the hernial sac and closure of the defect are preferred. Longer follow is needed to assess the technique.

AS11-5

Hybrid laparoscopic repair of complex ventral hernia

Vandana Mann Soni, Pradeep Chowbey, Rajesh Khullar, Anil Sharma, Manish Baijal
Institute of Minima Access, Metabolic and Bariatric Surgery, Max Hospital, India

Aim: In laparoscopic intraperitoneal ventral hernia repair (IPOM), certain situations like divarication and dense adhesions may preclude sound laparoscopic repair. Several studies talk of limited conversion to manage such complex situations. We present our experience.
Materials and Methods: Data of patients with limited conversion to open was retrieved and analyzed from all patients undergoing IPOM from June 2012 to 2016. Cause for conversion, procedure performed, operative time, mesh size, complications, hospital stay and up to 1 year follow up for recurrence were studied.
Results: In 486 patients of incisional hernia, a partial/ limited conversion was performed in 37 patients. The reason for conversion was, lower abdominal scar with localized rectii divarication - 18 patients, thin redundant skin and sac -10 patients and complex adhesions - 9 patients. In 34 patients an open approximation of defect edges was done through a 6 to 8 cm incision, followed by laparoscopic IPOM repair with a mesh sized to the original defect. In 2 patients due to an inadvertent enterotomy and 1 patient with erosion of mesh into bowel an immediate anatomical repair was followed by laparoscopic IPOM 6 to 12 weeks later. Mean operative time was 126 + 35 mins. Mesh size varied between 20 x 20 cm2 to 20 x 30 cm2, hospital stay averaged 5 + 2.9 days. There were no recurrences in the one year followup period.
Conclusion: Hybrid laparoscopic IPOM repair in complex hernias is feasible, safe and has better cosmesis.

AS11-6

Therapeutic effect of hybrid technique for incarcerated or strangulated incisional hernia repair

Wen Luo, Yong Wang
Department of Hernia and Abdominal Wall Surgery, The Central Hospital of Wuhan, Tongji Medical College of Huazhong University of Science and Technology, China

Objective: To investigate the safety and effectiveness of a hybrid technique for incarcerated or strangulated incisional hernia repair.
Methods: The clinical and follow-up data of 11 cases of hybrid technique for incarcerated or strangulated incisional hernia repair performed from January 2011 to January 2015 at the WuHan central Hospital of University were analyzed retrospectively.
Results: All cases were performed by hybrid technique successfully with a mean operation time of (151.9±65.2) min and a mean time of postoperative hospital stay of (11.7±3.6) days (7-14 days).All patients were followed up for (21.4±12.1) months (12-36months).There was neither obvious seroma nor recurrence nor bulging.
Conclusion: The hybrid technique is safe and effective for incarcerated incisional hernia repair with less complication.

AS11-7

Laparoscopic Ventral hernia mesh repair Hybrid technique: Our experience

Dr Sathish N
Dept of Surgery, Columbia Asia Referral Hospital -Bangalore, India

Abstract Content: Ventral hernias continue to be one of the common cases seen by general surgeons in their out patients. Management of these hernias has evolved over time with no one 'gold standard' procedure that can address all concerns, till date. Hybrid technique is one technique which is slowly gaining acceptance.
Objective: A Retrospective comparative study, to see if hybrid technique is an acceptable alternative to a complete laparoscopic ventral hernia mesh repair in our setup.
Method: 20 cases of primary laparoscopic ventral hernia were compared with 20 cases of ventral hernia operated by hybrid technique. All patients were followed up for one-year post operatively & were compared in terms ofpost-operative pain (visual analogue scale), duration of analgesic requirement & hospitalization, resumption of regular activities and early recurrence.
Conclusion: Hybrid technique matches with total laparoscopic ventral hernia repair on all parameters and appears to be an acceptable alternative in our set-up though long term studies are required before completely replacing it.

AS12-1

The role of laparoscopic repair in incarcerated and strangulated groin hernias

George P Yang
Department of Surgery, Adventist Hospital, Hong Kong

Laparoscopic surgical management for emergency surgical condition has become more popular in recent decades. This is due to the better understanding of laparoscopic abdominal anatomy, better laparoscopic surgical skill training, the much improved laparoscopic instruments, and better anaesthesiology.
Patient with emergency surgical conditions present as a spectrum. This also applies to incarcerated or strangulated hernia patients. Emergency laparoscopic hernia surgery has been performed in many specialized centered. A retrospective comparative analysis has been performed to evaluate open versus laparoscopic management for acute incarcerated or strangulated groin hernias. Result showed lower wound infection rates, lower laparotomy rate, and shorter mean hospital stay for laparoscopic group.
Emergency laparoscopic hernia repair for strangulated groin hernia is feasible in specialized center. Initial analysis showed improved patient outcome over open repair group. A proper designed randomized controlled study should be carried out in specialized center.

AS12-2

The use of prosthetic mesh in the emergency management of the acute incarcerated inguinal hernias: a retrospective study of 167 patients

Jing Liu
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Introduction: Tension-free hernia repair has been regarded as a gold standard treatment for selected inguinal hernias, but the use of prosthetic mesh in incarcerated inguinal hernias is controversial. We performed our study to evaluate the safety of prosthetic mesh repair for emergency cases.
Methods: Patients with acute incarcerated inguinal hernias who underwent emergency prosthetic mesh repair during 2010 to 2015 at our department were included. Patient characters, operative approaches, results and complications were retrospectively analyzed.
Results: A total of 167 patients were included in our study. 122 patients underwent open surgery while the remained 45 patients underwent laparoscopic TAPP. There were 153 males and 14 females, the median age was 54 ± 17 years. The hernia was indirect in 133 patients (79.6%), direct in 15 patients (9.0%) and femoral in 19 patients (11.4%). Non-viable intestinal resection was performed in 14 patients (8.4%), only 2 of which underwent wound infection. Another 3 patients who developed wound infection had viable hernia content. There was no mesh-related infection. Other complications included scrotal seroma/hemotoma in 25 patients (15.0%), pulmonary infection in 10 patients (6.0%), and deep vein thrombosis in 2 patients (1.2%). There were 2 perioperative mortalities. During the median follow-up of 34 ± 19 months (range from 6-77months), 2 recurrences were recorded in our study.
Conclusion: The use of prosthetic mesh in the treatment of acute incarcerated inguinal hernia is safe. Non-viable intestinal resection cannot be regarded as a contradiction of the mesh repair.

AS12-3

The effect analysis of incarcerated/strangulate treatment with preperitoneal tension-free herniorrhaphy

Jin-xin Cao, Ming-gang Wang, Ying-mo Shen, Shuo Yang, Yi-lin Zhu, Jie Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: To analyze the effect of preperitoneal tension-free herniorrhaphy for the incarcerated and(or) strangulated hernia.
Methods: During Mar. 2012 to Mar. 2015, 63 incarcerated and(or) strangulated hernia patients (incarcerated hernia group) and 1,036 primary inguinal hernia patients (primary inguinal hernia group) accepted preperitoneal tension-free herniorrhaphy in our department, A retrospective analysis was conducted to compare and evaluate the clinical data between the two groups.
Results: The operation time (42±8min),length of stay (4.0±2.6d) and time return to work (9.0±3.3d) in incarcerated hernia group were higher than primary inguinal hernia group (38±4min) (3.0±0.6d) (8.1±2.5d) and had statistically significant difference ($p<0.01$). The blood loss (9.5±13.9mL) in the operation in incarcerated hernia group were little higher than primary inguinal hernia group (7.2±3.5mL) but no significant difference ($p=0.148$). there were 2 infection case and 7 sceotal seroma cases (11.1%) in incarcerated hernia group and 1 infection case and 93 scrotal seroma cases (9.0%) in primary inguinal hernia group, all patients recovered after treatment, there were 1 recurrence in incarcerated hernia group and 4 cases in primary inguinal hernia group. No chronic pain and secondary operation in both groups.
Conclusion: The preperitoneal tension-free herniorrhaphy is an alternative approach for the treatment of incarcerated and (or) strangulated hernia.

AS12-4

Results of mesh repair in the emergency management of the incarcerated abdominal hernias

Jun Zhang, Qi-lu Qiao
Department of Surgery, Peking University First University, China

Objective: to study the curative effect of mesh repair in the incarcerated abdominal hernias.
Methods: The clinical data of 30 patients with abdominal incarcerated hernia from January 2011 to January 2016 who received mash repair were reviewed in this study, and 30 patients receiving conventional neoplasty were also reviewed. All patients' general condition, hernia type, duration of acute incarceration, postoperative complication, follow-up were compared.
Results: The incidence rate of complications encountered by mesh repair group was as same as the controlled group (16.7%vs20%, $p<0.05$). The recurrence rate in the tension-free herniorrhaphy (0%) was lower than the conventional neoplasty group (6.7%).
Conclusion: The use of mesh repair in the emergency management of the acutely incarcerated abdominal hernias is safe.

AS12-5

Surgical Treatment of 65 Incarcerated Inguinal Hernias Cases in Single Center

Shao-jie Li, Jian-xiong Tang
Department of General Surgery, Hernia and Abdominal Wall Surgery Center, Huadong Hosptial Affiliated to Fudan University, China

Objective: To evaluate the clinical factors and features of incarcerated inguinal hernias and individualized treatment.
Methods: The clinical data of 65 cases of incarcerated inguinal hernias from Jan. 2013 to Dec. 2014 in Department of General Surgery, Hernia and abdominal wall surgery center, Huadong Hosptial affiliated to Fudan University were analyzed retrospectively.
Results: Among 65 cases, 29 cases performed emergency operations while other 36 cases are selective. We found strangulation of intestine in 7 cases. 6 cases had complicatios with 3 pulmonary infection, 1 incision infection, 1 heart failure, 1 paralysis intestinal obstruction and 1 obturator hernia case of recurrent. An 87 years-old patient died of severe pulmonary infection and heart failure postoperatively.
Conclusion: The prevention of incarcerate inguinal hernia is much more important than the treatment and individualized treatment should be used for different cases. Tension-free hernioplasty is safe and effective for incarcerated inguinal hernia. For female patients, the emergency operation is necessary because of the high incidence of femoral hernia and obturator hernia.

AS12-6

The application of laparoscopy assisted partial enterectomy in the herniorrhaphy of strangulated hernia

Jin-long Li, Gang Han
Department of Gastrointestinal, Nutritional and Hernia Surgery, Second Affiliated Hospital of Jilin University, China

Objection: To explore the technical feasibility and safety, and clinical efficacy of laparoscopy assisted partial enterectomy (LAPE) in the tension-free herniorrhaphy of strangulated hernia.
Method: All the patients who received partial enterectomy and herniorrhaphy because of srangulated hernia from January 2010 to December 2014 were separated to 2 groups randomly. One was the experimental group in which the 28 patients were performed LAPE and tension-free herniorrhaphy with a mesh, and the other was the control group in which the 39 patients were performed enterectomy and Bassini herniorrhaphy openly.
Result: The hernia recurrence and chronic pain or discomfort in the experimental group are lower than which in the control group significantly. There is no significantly difference in the average operation time, post-operative mortality rates and incisional infection between the two groups.
Conclusion: The patients in experimental group have less complication of hernia recurrence and chronic pain or discomfort and the technique of LAPE plus tension-free herniorrhaphy with a mesh is safe and effective.

AS12-7

Open combined with TAPP hybrid surgery in the treatment of inguinal incarcerated hernia: a retrospective analysis of 35 cases

Xue-dong Xu, Wei-guo Zhang, Jia Wang, Yu-wen Li, Zhang-hui Deng, Wei-de An
Department of General Surgery, The First Affiliated Hospital of Dalian Medical University, China

Objective: To investigate the clinical value of open combined with TAPP hybrid surgery in the treatment of incarcerated inguinal hernia, and to summarize surgical experience.
Methods: A retrospective analysis was conducted on the surgical data and following treatment of 36 patients with incarcerated inguinal hernia undergoing open combined with TAPP hybrid surgery between January 2015 and July 2016.
Results: All 36 patients received TAPP surgery combined with open surgery, with 35 patients cured. Among them, 13 patients had incarcerated hernia combined with blood circulation disorder, 21 had no blood circulation disorder, and 1 had intestinal perforation and died later, with the cause of death irrelevant to surgery.
Conclusion: For patients with incarcerated inguinal hernia but no contraindications to laparoscopic application, TAPP surgery should be selected positively for detection; for patients with difficulty in releasing incarcerated substance, TAPP surgery should be combined with open surgery to achieve satisfactory efficacy.

AS12-8

Disasters in laparoscopic hernia surgery and their management

Jaideepraj Rao
Department of General Surgery, Tan Tock Seng Hospital, Singapore

Laparoscopic surgery is now being increasingly being done for inguinal hernias due to its advantages of decreased pain and early return to daily activities. Inguinal hernias can be repaired either trans-abdominal pre-peritoneal (TAPP) or totally extra peritoneal (TEP). Laparoscopic repairs pose its unique set of complications many of which are not seen in traditional open hernia repair. We present a series of cases of complications like bleeding, trocar injury, intestinal obstruction and recurrences and their management.

AS12-9

The effect of the laparoscopic totally extraperitoneal inguinal hernia repair (TEP) on male serum testosterone concentration and testicular blood supply

Bao-jun Zhou, Yu Zhen, Shao-wei Ma
Department of Gastrointestinal Surgery & Hernia and Abdominal Wall Surgery, The Second Hospital of Hebei Medical University, China

Objective: To investigate the male serum testosterone concentration and testicular blood supply of the patients with unilateral inguinal hernia after laparoscopic totally external inguinal hernia repair (TEP).
Methods: There were 34 male patients who received TEP from April 2013 to April 2014, the follow indexes were compared at 1 day before operation, 4th week and 24th week after operation: 1.WBC; 2.serum testosterone; 3.testicular temperature; 4.testicular volume (TV); 5.diameter of testicular artery, systolic peak of blood flow velocity (PSV), end-diastolic blood flow velocity (EDV) and resistance index (RI) in testicular artery; 6. diameter of spermatic vein, blood flow velocity in the spermatic vein and other indicators.
Results: The WBC of 4th week after operation was higher than the WBC of before operation [$(6.27\pm0.22)\times10^9$/L vs $(5.33\pm0.20)\times10^9$/L; p=0.008],; While the WBC of 24th week after operation was similar to the WBC of before operation [$(5.48 \pm 0.23) \times 10^9$/L vs $(5.33 \pm 0.20) \times 10^9$/L; p= 0.900). The serum testosterone concentration, testicular size and temperature of the affected side and the unaffected side, index of the testicular artery and vein observation had no statistically significant differences at 1 day before operation, 4th week and 24th week after operation compared each other ($P > 0.05$).
Conclusion: The TEP operation has no significant effect on male serum testosterone concentration and testicular blood supply.

AS12-10

The Cause and Treatment of Complications for Scrotum Seroma of Inguinal Hernia in Patient

Chun Yang
Department of Gastrointestinal Surgery, Sichuan Provincial People's Hospital, China

Seroma formation following open or laparoscopic mesh repair of inguinal hernia is common, albeit with no impact on recovery. Chronic postsurgical seroma is a major clinical problem, which can significantly influence the patient's quality of life.
Objective: To explore the cause of seroma, prevention and treatment of postoperative complications of inguinal hernia. Methods: We analyzed 74 cases with postoperative complications of inguinal hernia in this paper. There were scrotum seroma in 22 cases.
Result: The rate of seroma after inguinal hernia mesh repair can reach 30%. The reasons for posthernioplasty seroma are often unclear. It has been linked to nerve injury and nerve entrapment, but there is also association between the rate of seroma and the type of mesh used for hernia repair. As there are >160 meshes available in the market, it is difficult to choose a mesh whose usage would result in the best outcome. Different mesh characteristics have been studied, among them weight of mesh has probably gained the most attention. The choice of adequate therapy for scrotum seroma after inguinal hernia repair is controversial. The European Hernia Society recommends that a multidisciplinary approach at a pain clinic should be considered for the treatment of scrotum seroma. Resection of entrapped nerves, mesh removal in the case of mesh related seroma or removal of fixation sutures can be beneficial after inguinal hernia surgery.
Conclusion: The main cause resulting in complications was in correct operation. Improving operative skill, timely and correct treatment of complications are the key for prevention and treatment of complications.

AS13-1

Advanced TEP-Beyond the Learning Curve

Rajesh Khullar
Institute of Minimal Access, Metabolic & Bariatric Surgery, Max Super Speciality Hospital, India

Endoscopic hernia repair is an established surgical procedure. TEP is an advanced minimally invasive surgery, with a steep learning curve. Certain situations may present a challenge even to an experienced surgeon.
A "difficult patient" may be one who is morbidly obese which makes entering the extra-peritoneal space challenging as well as dissection. In a patient who is very muscular the potential space may not open up freely. The body habitus may create difficulties when there is a short lower abdominal segment between the umbilicus and pubic symphysis. A previous surgical scar may also make dissect in difficult.
A "difficult hernia" includes large complete indirect inguinal hernias as well as irreducible, obstructed and sliding hernias. A recurrent hernia especially after previous TEP / TAPP may have excessive fibrosis and distorted anatomy. A previous lower abdominal scar may also pose certain difficulties.
In all these situations TEP becomes even more challenging, but with patience sand persistence, it is usually possible to complete surgery.

AS13-2

Complex groin hernias: Is Laparoscopic approach safe and feasible?

Hrishikesh P Salgaonkar[1,2], Sujith Wijerathne[1,2], Eva L S Clara[1,2], Tan W Boon[1,2], Lynette M A Loo[1,2], Asim Shabbir[1,2], Davide Lomanto[1,2]

[1]*Minimal Invasive Surgery Centre, Department of Surgery, National University Hospital Singapore, Singapore*
[2]*Yong Loo Lin School of Medicine, National University Singapore, Singapore*

Laparoscopic repair of groin hernias is widely accepted approach over open due to lesser pain, faster recovery, better cosmesis and decreased morbidity. However, there is still debate on its use in large inguino-scrotal hernias, recurrent hernias and history of lower abdominal surgery anticipating adhesions and difficulty in dissecting extensive hernia sac. Retrospective analysis of prospectively collected data was done of patients undergoing laparoscopic repair of large inguino-scrotal, incarcerated groin hernia, recurrent cases after open or laparoscopic repair and history of previous lower abdominal surgery.
Method: Between January 2013 to July 2015, 89 patients with large inguino-scrotal hernias, recurrent hernia, history of lower abdominal surgery, incarcerated femoral hernia underwent laparoscopic inguinal hernia repair. Patient characteristics, operating time, surgical technique, conversion rate, complications and recurrence recorded.
51 patients had large inguino-scrotal hernia, 22 recurrent hernia (17 previous open, 5 previous lap), 14 history of lower abdominal surgery (4 LSCS, 6 Appendectomy, 2 prostatectomy, 2 midline laparotomy), 1 incarcerated femoral hernia, 1 meshoma removal. 75 patients underwent total extraperitoneal (TEP) repair, 9 transabdominal pre-peritoneal (TAPP), 5 needed conversion to open. Mean operation time was 74 min for unilateral and 118 mins for bilateral hernia. Seroma formation seen in 19 patients, 2 minor wound infections treated conservatively.
Conclusion: We conclude that the laparoscopic approach can be safely employed for the treatment of complex groin hernias; surgical experience in laparoscopic hernia repair is mandatory with tailored technique in order to minimize morbidity and achieve good clinical outcomes with acceptable recurrence rates.

AS13-3

Endolaparoscopic Repair of large Inguino-Scrotal Hernia: Technique and Results

Rakesh K Gupta[1,2], Davide Lomanto[1]

[1]*Department of Surgery, B.P. Koirala Institute of Health Sciences, Nepal*
[2]*MISC, Dept of Surgery, National University Hospital Singapore, Singapore*

Background: Laparoscopic treatment of large Inguino-Scrotal hernia is uncommon and still controversial. The authors here present their experience with endolaparoscopic repair using a tailored approach, which we experienced, as lead to preventing intra/post operative complication.
Methods: A retrospective review was undertaken to evaluate the authors' experience with this procedure over a 3-year period. We have performed a total of 129 groin hernia repairs in 105 patients with M: F= 98:7 and mean age 41.97±20 (16-85). The surgery for all was started laparoscopically using the TEP approach. Eight nine of the cases were completed this way, whereas three were converted to the open procedure. Eight patients were converted to TAPP. Three patients in TEP and 2 patients in TAPP required a combined open approached for content reduction.
Results: The mean operative time was 65 min (range, 20-120 min), and the length of hospital stay was 1.14 ± 0.35 days (range, 1-5 days). During a follow-up period of 6 to 34 months, there was no recurrence. Sixteen patients develop Seroma, 4-wound infection, 2 orchitis and 1 patient develop mesh infection.
Conclusions: Familiarity with the anatomy involved leads to the conclusion that the tailored laparoscopic approach in large Inguino-scrotal hernias can be used without hesitation even in cases of acutely irreducible hernia. This emphasizes - surgeon's experience and comfort level should dictate the choice of the safest repair for the patient.
Key words: Inguino-scrotal hernia; large; Laparoscopic repair

AS13-4

Reducing complications in laparoscopic hernia surgery and their management

Jaideepraj Rao, Yeo SW Charleen

Department of General Surgery, Tan Tock Seng Hospital, Singapore

The laparoscopic repair of inguinal hernias was first introduced in the 1990s, and since then has evolved into an attractive option for hernia repair. Increasingly, surgeons are also starting to utilise laparoscopic hernia repair for difficult and complicated hernias. We present videos of complicated hernias managed successfully in a laparoscopic manner.
Additionally, while the complications of hernia repair have dramatically reduced over the years with the development of newer and more effective repair techniques, recurrence rates remain around 2-3%. We present the common complications of laparoscopic hernia repair, and factors influencing the rate of complications.
A retrospective analysis was performed on all patients who underwent laparoscopic inguinal hernia repair in our institution from 2014-2016. Data collected include patient demographics, operative details and the complication rates. Particular focus was placed on whether primary defect repair in direct inguinal hernias reduced the complication rates.
Primary suture repair of the hernia defect in laparoscopic direct inguinal hernia repair may potentially reduce recurrence rates and seroma formation. Complicated inguinal hernias can be successfully managed laparoscopically.

AS13-5

Analysis of tension-free herniplasty for inguinal hernia patients complicated with ascites in 22 cases

S.W. Yang[1], B. Wu[2], W.Z. Lei[1], Y.H. Song[1], Yong Wang[1]
[1]*Department of Gastrointestinal Surgery, West China Hospital, Sichuan University, China*
[2]*Department of Radiology, West China Hospital, Sichuan University, China*

Objective: To analyses the clinical effect of 22 cases of inguinal hernia patients complicated with ascites which underwent tension-free hernia repair.
Methods: The clinical data of 22 inguinal hernia patients with ascites were retrospectively analyzed from November 2009 to November 2014 in West China Hospital. All inguinal hernia patients were operated by the way of tension-free hernia repair (Gilbert way) with the local anesthesia, and been followed up 24 months.
Result: Twenty-two case of inguinal hernia patients with ascites were included in the study, and 16 case of patients were male and the others were female, and the mean age of all patients was 57 years (range from 20-79 years), and according to liver function of Child's score for each of patients, 6 case of patients (27.3%) of live function were Child's class A, and 8 case of patients (36.4%) of live function were Child's class B and 8 case of patients (36.4%) of live function were Child's class C. According with hernia size of Gilbert's classification for each patient, inguinal hernias were classified as type II in 8 patients and type III in 14 patients. After operation, the operative complications were present including seroma in three cases of patients and hematocele in one case of patient, and there was no recurrence after 24 months of follow-up in all patients.
Conclusion: The tension-free herniplasty including Gilbert's operation way is feasible for the symptomatic inguinal hernia patients complicated with ascites, and be recommended even in the patients with refractory ascites.

AS13-6

The experience of surgical treatment of complex inguinal hernias

Jun-sheng Li, Zhen-ling Ji
ZhongDa Hospital, Southeast University, ZhongDa Hospital, Southeast University, China

Background: The gold standard for the repair of inguinal hernias is the Lichtenstein repair (anterior approach). Complex inguinal hernia treatment is a challenge for general surgeons. However, when multiple recurrent hernias, giant hernias, hernia in cirrhotic patients or incarcerated/strangulated hernias are present, it is necessary to choose different approaches.
Methods: We choose open preperitoneal procedure for giant hernias. In the treatment of inguinal hernia with cirrhotic disease, the hernia situation and patient's general condition should both be considered, since the life expectancy is limited and occurrence of incarceration is uncommon, and an anterior procedure with closed drainage would be a proper option in selected severe ascetic patients, however, the operation should be performed in femoral hernia in female with cirrhosis. Prosthetic mesh is not a contraindication in selected strangulated inguinal hernia.
Results: Our experience with the open preperitoneal approach using meshes seems a safe procedure for giant inguinal hernias. Furthermore, surgical repair is safe even in patients with refractory ascites and poor hepatic function (B/C). We did not detect mesh infection in patients of emergent hernia repairs.
Conclusion: Giant hernias can be safely repair by preperitoneal procedure. Patients with cirrhosis often have limited hepatic reserve and tolerate physiologic stress very poorly, thus, surgery should be reserved in some selected cases. The current data showing the safety of prosthetic repair in emergent cases.

AS13-7

Treatment outcome of TEIPOM (transabdominal extra-intraperitoneal onlay mesh repair) for post-prostatectomy inguinal hernia

Shunsuke Hayakawa[1], Tetsushi Hayakawa[2], Kawori Watanabe[1], Shiro Fujihata[1], Hirotaka Miyai[1], Akira Yasuda[1], Minoru Yamamoto[1], Hidehiko Kitagami[1], Yasunobu Shimizu[1], Moritsugu Tanaka[1]
[1]*Department of General Surgery, Kariya Toyota General Hospital, Japan*
[2]*Laparoscopic Hernia Surgery Center, Kariya Toyota General Hospital, Japan*

Background: We use a surgical technique involving the use of a mesh employed for abdominal wall incisional hernia repair with an adhesion-preventive layer on one of its sides for post-prostatectomy inguinal hernia. We call this surgery TEIPOM. We evaluated the surgical outcome.
Methods: A mail-based questionnaire survey was conducted to determine the severity of resting pain, discomfort from the mesh (each of which was rated on a 0-10 point scale), and the frequency of recurrence. The above were compared between two groups: the N-group (Normal), consisting of 1497 patients who underwent unilateral transabdominal preperitoneal repair (TAPP), and the AP group (After Prostatectomy), consisting of 72 patients who underwent unilateral TEIPOM after radical prostatectomy.
Results: The response rate to the questionnaire was 79.6%. In the N-group and AP group, the median ages were 60.1 and 70.0 years, ($p < 0.01$), the surgery times were 88 and 77 minutes ($p < 0.01$), and the postoperative lengths of hospital stay were 1.1 and 1.0 days ($p = 0.53$), respectively. The results of the questionnaire survey revealed recurrence rates of 0.26% and 0%, scores for severity of resting pain of 0.4 and 0.2 ($p = 0.24$), scores for pain upon movement of 0.5 and 0.4 ($p = 0.51$), and scores for discomfort from the mesh of 0.6 and 0.5 ($p = 0.67$).
Conclusion: TEIPOM is a useful surgical technique in post-prostatectomy inguinal hernia patients.

AS13-8

Operation case study of Inguinal hernia after radical prostatectomy for prostate cancer

Yoshiko Honda[1], Nagato Shimada[1], Yu Yoshino[1], Takayuki Suzuki[1], Hironori Kaneko[2], Yoshihisa Urita[1]
[1]*Department of General Medicine and Emergency Care, Toho University Omori Hospital, Japan*
[2]*Department of Gastrointestinal Surgery, Toho University Omori Hospital, Japan*

Background: Observational data indicates that radical retropubic prostatectomy (RRP) for prostate cancer may induce inguinal hernia (IH) formation. After RRP it is difficult to operate due to postoperative adhesion, especially preperitoneal mesh repair to exfoliate underside of the inferior epigastric artery and vein.
Purpose: To compare the incidence of IH after RRP (open laparotomy: O group) and LRP (Laparoscopic operation include robot assisted:L group).
Methods: We studied cases of IH developed after RRP for 12 years. And compared O group with the L group.
Results: Over 12 years we checked 39 cases (42 lesions: bilateral 3 cases/rt. 24 cases/lt.12 cases) were IH developed after radical prostatectomy. We split these into 2 groups of operative procedure, 20 lesions of O group and 22 lesions of L group. The average term from prostatectomy to IH development was 26 months in O group, and it was 13 months in L group. The average term was shorter for L group than O group. For 11 O group lesions we used the following devices, Mesh Plug (MM)/ Perfix Plug (PP), needs a comparatively narrow exfoliation space. And used Ultrapro Hernia System (UHS) with trimming on 4 lesions, Direct Kugel Patch (DKP) on 5 lesions. In L group we used MM/PP on 15 lesions, UHS (with trimming) on 4 lesions and DKP on 3 lesions.
Conclusions: We compared O group with L group for IH development. There is no difference of adhesion in the preperitoneal space of L group and O group after the prostate cancer operation.

AS13-9

A NEW STRATEGY FOR REPAIR OF INGUINAL HERNIA DEVELOPPED AFTER ROBOT- ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY

Toshihiro Ogawa, Hitoshi Idani, Yasuo Nagai, Naoki Mimura, Yasuhiro Komatsu, Soichiro Miyake, Michihiro Ishida, Daisuke Satoh, Daisuke Sumitani, Yasuhiro Choda, Kanyu Nakano, Masao Harano, Hiroyoshi Matsukawa, Yasutomo Ojima, Masazumi Okajima
Department of Surgery, Hiroshima City Hiroshima Citizens Hospital, Japan

Background: Surgical procedures for inguinal hernia developed after robot- assisted laparoscopic radical prostatectomy (RALP) have not yet been established. We have introduced a new strategy for repair of inguinal hernia developed after RALP and evaluated the outcome.
Surgical technique:
1. When the preperitoneal space was fully dissected and it was possible to close the peritoneum, transabdominal preperitoneal repair (TAPP) was performed.
2. When the preperitoneal space could not be fully dissected due to scar formation caused by dissection during RALP and it was impossible to close the peritoneum, Parietex Composite (PCO) Mesh or Symbotex Composite Mesh was fixed to the Cooper's ligament and cephalad side was directly fixed to the abdominal wall and the caudal side was sutured and covered with the peritoneum (partial intraperitoneal onlay mesh: PIPOM).
3. When the Cooper's ligament could not be detected at all or adhesion of sigmoid colon was severe, hernia was repaired by anterior approach.
Methods: From April 2014 to August 2016, fourteen patients with inguinal hernia after RALP underwent hernia repair and its outcome was evaluated.
Results: There were 8 right indirect hernias, 2 left indirect hernias and 4 bilateral indirect hernias. Three bilateral hernias were diagnosed by laparoscopy. TAPP, PIPOM and anterior approach were performed on 4, 6 and 4 patients, respectively. There has been no recurrence.
Conclusion: Our new strategy including TAPP and PIPOM is safe and effective although further examination in a large number of patients and long term follow up will be needed.

AS13-10

A case of seroma mimicking hernia recurrence after laparoscopic partial intraperitoneal onlay mesh repair for inguinal hernia developed after robot assisted laparoscopic radical prostatectomy

Yasuo Nagai, Hitoshi Idani, Toshihiro Ogawa, Kanyu Nakano
Department of Surgery, Hiroshima City Hiroshima Citizens Hospital, Japan

We have introduced laparoscopic partial intraperitoneal onlay mesh (PIPOM) for a choice of treatment of inguinal hernia developed after robot assisted laparoscopic radical prostatectomy (RALP). We present a case of inguinal seroma after PIPOM mimicking a hernia recurrence, which was confirmed and successfully treated by anterior approach.
A 65 year-old man presented to our clinic with a chief complaint of right inguinal swelling six months after RALP. Low density area (LDA) was detected at the right inguinal region by computed tomography which was consistent to the findings of seroma. However, since the LDA was also detected continuously into the abdominal cavity and hernia recurrence could not completely be excluded, we performed laparoscopy first. By laparoscopy, there was no adhesion to the mesh and right inguinal lesion was clearly observed. The mesh was beautifully incorporated and no hernia recurrence was detected. The seroma was confirmed at the surface of the mesh which continued to the inguinal canal. Then we resected the seroma with hernia sac by anterior approach. The symptom completely disappeared after surgery. The surgical strategy for inguinal hernia after RALP has not yet been established. We have newly developed PIPOM using SymbotexTM mesh fixed by absorbable tacks to the anterior abdomen and by sutures to the dissected peritoneum. This is the first case of PIPOM confirmed by laparoscopy after surgery. We believe that PIPOM is safe and effective laparoscopic treatment for inguinal hernia after RALP and laparoscopy is useful even for seroma for the case of suspected hernia recurrence.

AS14-1

TEP treatment for incisional hernia

U-Chon Chio, Kuo-Hsin Chen, Jiann-Ming Wu, Ying-Da Chen, Chao-Man Loi, Yin-Jen Chang, Tiing-Foong Siow, Tzu-Chao Lin, Shu-Yi Huang
Division of General Surgery, Far Eastern Memorial Hospital, Taiwan

Purpose: Laparoscopic onlay mesh repair has been used successfully to reduce the postoperative recovery and associated wound complications. However, tissue ingrowth to the raw surface of the onlay mesh might not be as good as that after retromuscular polypropylene mesh repair. Extraperitoneal mesh herniorrhaphy has been proved to be beneficial in surgical result and was widely used in inguinal hernia repair. Therefore, TEP repair was attempted for incisional hernia repair.
Materials and Methods: Incisional hernia with abdominal wall defect less than 10cm in diameter was included. Retromuscular space was created by manual telescope dissection and hernia sac was pulled back or transected, a polypropylene mesh was implanted over the intact peritoneum. Peritoneal tear was always closed. Midline fascial defect was closed whenever possible. Patient demographic profile and perioperative results were analyzed from a prospectively collected data base.
Results: From September 2008 to June 2016, twenty five patients with incisional hernia underwent totally extraperitoneal herniorrhaphy were enrolled. Mean diameter of hernia sac was 7.3cm. All procedures were completed endoscopically without open conversion. Mean operation time was 132 minutes. Mean blood loss was 12 cc. Mean hospital stay length was 1.9 days. Post operation morbidity included subcutaneous seroma and hematoma but no wound or mesh infection, which was treated conservative. After mean following up for 30 months, one obese patient developed recurrence.
Conclusion: From this preliminary experience, totally extraperitoneal dissection of retromuscular space and mesh placement is a safe and effective technique for incisional hernia repair.

AS14-2

Endoscopic TEP Rives - Stoppa repair, a single centre experience

Saurabh Misra
Minimal Access and Bariatric Surgery, Apollo Hospitals, India

Introduction: E-Rives Stoppa repair is a relatively new method of repair of moderate-ly large ventral hernias. We present our early experience with this form of surgery from a single unit.
Material and Methods: 10 patients were operated with the technique of endoscopic Rives-Stoppa, between January 2015 and May 2016. All patients had primary ventral hernias between the sizes of 2 and 5 cm. The usual contents of the hernia was the omentum. All patients were operated electively, thus emergency admissions were not considered. The average operating time in the patients were 130 minutes. In 8 patients, a 10 x 15 cm self fixating mesh (Progrip TM. Medtronic/Covidian) was placed without tackers and in two patients, a 15 x 15 cm Polypropylene mesh was placed and secured using the fibrin glue. Average pain score was < 3 (VAS) for all patients for the first 24 hours while it remained < 2 during the follow up visits. Average stay in the hospitals were 1.7 days. The cost of the surgeries were 2/3 of the traditional IPOM. There were no complications or recurrences during the follow-up period.
Conclusion: Endoscopic - Rives Stoppa technique has shown great promise, not only in terms of reduction in early post operative pain but also in reducing the overall surgical cost to the patient! We feel, that with time, we will be able to reduce our surgical time, and standardise our technique.

AS14-3

e-TEP: a new approach to abdominal wall reconstruction

Ramana B[1], Igor Belyansky[2]
[1]*Department of Surgery, Belle Vue Clinic, India*
[2]*AWR, Anne Arundel Medical Center, United States of America*

Abdominal wall reconstruction for complex abdominal defects has always been the domain of the open surgeon. Only in the recent times has there been an attempt to replicate the open component separation techniques by minimally invasive approaches, usually robotic. The authors present a series of 70 cases of posterior component separation techniques including Transversus Abdominis Release (TAR) and Rives-Stoppa repair using the e-TEP approach. They share the techniques used in these procedures.

AS14-4

Management of huge defects following extensive abdominal wall neoplasm resection: classification and immediate reconstruction

Jian-jun Yang, Zhi-cheng Song, Hui-chun Wang, Zhi-yuan Zhou, HZ Huo, DQ Gong, Yan Gu
Department of General Surgery, Shanghai Ninth Hospital, Shanghai JiaoTong University School of Medicine, China

Objective: We report our experience in extensive resection and immediate reconstruction in treatment of patients with abdominal wall neoplasms based on a simple and practical classification of abdominal wall defects.
Methods: Between January 1999 to December 2015, 112 patients with abdominal wall neoplasms were treated with extensive resection which included a >3 cm tumor-free margin, this led to a huge abdominal wall defect, the mean size of defects was 211.58 ± 89.3 cm2. All patients were performed immediate abdominal wall reconstruction including primary sutures or free skin graft for Type I defects, component separation(CST) with or without mesh reinforcement for Type II defects and pedicled or vascularized myocutaneous flap with or without mesh or prosthetic + biological mesh with or without CST for Type III defects.
Results: The average follow up was 76.86 ± 21.22 months, There was no severe morbidity after the operation. 3 patients developed flap necrosis, other major wound complications were identified in 9 patients and local neoplasm recurrence was observed in 20 patients including 12 primary neoplasm and 8 secondary neoplasm patients.,25 patients developed distant metastasis including 10 primary neoplasm and 15 secondary neoplasm patients. There was 4 patients developed hernia.
Conclusions: Strategy based on the abdominal wall defect classification system for immediate reconstruction of huge abdominal wall defects seems to be safe and effective in treatment of patients with abdominal wall neoplasms.

AS14-5

Abdominal wall reconstruction using human dermis biologic mesh after resection of recurrent fibrosarcoma of the rectus muscles

Nizar Bouchiba, Tamer Elbarkry, Ahmad Elfaki, Eltahir Elfatih, Mohamed Soliman Elakkad
Department of Surgery, Alwakra Hospital Hamad Medical Corporation, Qatar

The Fibrosarcoma is a tumor composed of malignant fibroblasts in a collagen background. In general terms it occurs as a primary or secondary bone tumor but more rarely as a soft-tissue mass. It is a locally invasive neoplasm with a high recurrence rate. The treatment of fibrosarcomas involves a combination of adequate surgical resection with a cuff of normal tissue and Adjunctive therapy, to improve local control. In case of large soft tissue tumors the challenging reconstruction of the subsequent defect is one important step in the management. The authors report a case of 31 years old gentleman with a history of resected firbrosarcoma in the left rectus muscle, who presented 2 years later with painless mass in the anterior abdominal wall. After investigation with ultrasound, CT scan and MRI it was diagnosed as 7 cm recurrence in the right rectus muscle.
The patient had "en bloc" excision of the tumor (taking the full thickness of the abdominal wall from the skin till the peritonea) with 3 cm safety margin around the tumor. Keeping a defect of about 20x15 cm. the abdominal wall reconstruction was done by human dermis biologic mesh used as substitute flap. After component separation a second light weight mesh was placed between the large muscles.
The postoperative was uneventful. Histologic findings were consistent with the diagnosis of fibrosarcoma and the patient had adjunctive radiotherapy. After one year of follow up the patient is in remission.

AS15-1

The Essentials of Writing a Surgical Manuscript

Anil Sharma
Max Institute of Minimal Access, Metabolic & Bariatric Surery, Max Superspecialty Hospital, India

The different types of surgical manuscript possible for publication include Letter to the editor, Case report, Surgical technique (How I do it), Cohort study, Case control study, Randomised controlled trail, Review article and Editorial. A formal consent of a proposed study protocol first needs to be obtained from the local Institutional ethics committee. All clinical trails need to be registered. The basic structure for writing a surgical manuscript consists of the IMRAD structure which stands for Introduction, Methods, Results and Discussion .The Introduction comprises a brief lesson on the proposed subject available in literature and the problem that was addressed in the study. The method section comprises the story of what the authors did and this should be arranged in a logical framework of time. The Results section is the story of the main findings of the study. In the Discussion section, the first paragraph summarises the methodology and results of the study. Also the discussion segment includes a synopsis of similar studies (and how the present study fits in), strengths and limitations of the study and implications of the current study on future research, future policy and clinical practice. The role of a Biostatician is important for protocol development, data management, and study implementation and monitoring. The contents of the manuscript need to be short and precise. The language should be clear and words / phrases should be simple. Generally, the shorter the manuscript the better.

AS15-2

How to improve the chances for getting your paper published in Hernia

Marc Miserez
University Hospitals of the Katholieke Universiteit Leuven, Belgium

AS15-3

Electronic publishing in biomedical journals

Deepraj S Bhandarkar
Department of Minimal Access Surgery, Hinduja Hospital, India

Journals in printed format have been the traditional mode of dissemination of scientific knowledge. The disadvantages of the print journals include a) time consuming peer review process, b) lag between submission and publication, c) distribution limited to paid subscribers and d) problems associated with archiving and storage of the journals. With the explosion in the computer technology and worldwide web, electronic publishing of biomedical journals has become the norm over the past several decades. This online and web based publishing is either standalone or complements the print version of the journal. This presentation examines and highlights the pros and cons of electronic publishing of biomedical journals.

AS16-1

Laparoscopic Approaches for Parastomal Hernia Repair of Permanent Colostomy: A Seven-year Follow-up with Low Chronic Pain and Recurrence Rate

Yu-long Shi, Xiao-bo Guo, Jing-lei Liu, Hong-jun Liu, Le-ping Li
Department of General Surgery, Shandong Provincial Hospital Affiliated to Shandong University, China

Aim: To assess the treatment and prevention of parastomal hernia using a laparoscopic repair technique.
Methods: From January 2007 and January 2014, we retrospectively reviewed 184 patients who underwent a permanent colostomy. As a routine oncologic follow-up, abdomino-pelvic computed tomography was used to examine the occurrence of the parastomal hernia. The parastomal hernia was repaired by laparoscopic approach using prosthetic material. The associations of age, sex, pain, recurrence, body mass index (BMI), history of steroid use and comorbidities to the development of the PH were analyzed. The 7-year cumulative incidence rates of parastomal hernia were compared according to clinical variables using a Kaplan-Meier analysis.
Results: Our data showed that our postoperative recurrence was very low (3.95%). We found that moderate pain was 12 patients (15.79%), and severe pain was 5 patients (6.58%). During follow-up, 76 patients developed a PH and the 7-year cumulative incidence rate of a parastomal hernia, obtained by using the Kaplan-Meier method. In the multivariate COX analysis, route of stoma creation, BMI, radiation history, and diabetes mellitus were all independent risk factors for the development of a parastomal hernia.
Conclusions: The significant risk factors of a parastomal hernia were as follows: route of stoma creation, BMI, radiation history, and diabetes mellitus. Laparoscopic approach is an effective and simple procedure to correct parastomal hernias with acceptable complication rates and is feasible even in the parastomal hernia patients.

AS16-2

The effect analysis and experience shared of parastomal hernia treatment with HyPER/SPHR technique (with 96 cases report)

Yi-lin Zhu
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: This article aimes to explore the effection of parastomal hernia treatment with HyPER/SPHR technique (hybrid parastomal endoscopic re-do), and share the operation experience and skills.
Material and methods: Clinical data of 96 patients with parastomal hernia who were underwent the operation with HyPER/SPHR technique from Oct. 2014 to Jun. 2016 in Beijing Chao-Yang Hospital of Capital Medical University were retrospectively analyzed.
Results: All patients completed the operation successfully, 53 of them were male and 43 were female, average age 66.8±9.0y, BMI (Body Mass Index) 25.5±2.7, primary disease was rectal cancer(86 cases), bladder cancer(8 cases), colon cancer(1 case) and recurrence after parastomal hernia operation(1 case). All patients found the mass around the stoma, 28 of them got pain, 15 patients had the incarceration or obstructive symptoms. The operation time was 114.1±48.2min, blood loss 17.2±16.7ml. 60 patients had the abdominal wall remodeling in the opeartion and 93 patients got peritoneal and/or subcutaneous drainage tube for a few days. The LOS(length of stay) was 20.0±7.2 d. poor healing of the incision was found in 7 patients and healed after treatment, intestinal obstruction was found in 1 patient and return to the operation, 1 patient got intestinal mucosal necrosis of stoma and 1 patient recurrence.
Conclusion: The HyPER/SPHR technique to treat parastomal hernia was safe and effective with the good effect and low recurrence. It is a good parastomal hernia treatment to choose.

AS16-3

Laparoscopic Parastomal Hernia Repair: The Better Outcomes with Primary Fascial Defect Closure Sugarbaker Technique

Kongpon Tangpanitandee, Worawit Kattipatanapong, Jakrapan Wittayapairoch, Rapheephat Tanompetsanga, Krit Kitisin, Suppa-ut Pungpapong, Chadin Tharavej, Patpong Navicharern, Suthep Udomsawaengsup
Minimal Invasive Surgery unit, Department of Surgery, King Chulalongkorn Memorial Hospital, Thailand

Background: Parastomal hernia is one of the most common complication following stoma formation, which high incidence of recurrence and relatively poor outcomes. The Modified Sugabaker technique has been shown to result in lowest recurrence rate. Many studies suggest that primary fascial closure in laparoscopic ventral hernia repair seem to reduce the recurrence and seroma formation rates. We perform the defect closure add on to modified Sugarbaker technique and compare to non-closure group.
Methods: Retrospective review of patients who underwent laparoscopic parastomal hernia repair between 2009 and 2015. These patients were divided into modified Sugarbaker technique (non-closure) and modified Sugarbaker plus primary fascial closure. The patient demographics, postoperative morbidity, pain score and recurrence rate were compared.
Result: Thirty-two parastomal hernia repairs were performed in last seven years. 26 laparoscopic parastomal hernia repair with modified Sugarbaker technique were reviewed.19 (73.1%) of 26 repairs were in the defect closure group and 7 (26.9%) in non-closure group. There was no difference in demographic data and early post-operative pain. No recurrence hernia in defect closure group and one case recurrence in non-closure group (14%). 2 seroma formation were occurred in non-closure group compared to one in defect closure group (28.6% vs 5.3%). One patient in defect closure group had internal hernia due to adhesion of prosthetic mesh.
Conclusion: Laparoscopic parastomal hernia repair with primary fascial closure is feasible and safe. It may to reduce the recurrence and seroma formation than non-closure Sugarbaker technique.

AS16-4

Laparoscopic modified keyhole plus repair for parastomal hernia: Single centre experience from India

Parthasarathi R, Samrat V Jankar, Sarvani M, Darshan S Nayak, Sandeep C Sabnis, Senthilnathan P, Rajapandian S, Praveen Raj P, Palanivelu C
Department of Surgical Gastroenterology, GEM Hospital & Research Centre, India

Introduction: Laparoscopic parastomal hernia repair has been reported in literature which is associated with low morbidity and acceptable recurrence. The objective of the present study is to present our experience over past 15 years of our modified keyhole plus repair technique for parastomal hernia.
Material & Methods: A retrospective review of last 15 years data of patients who underwent laparoscopic modified keyhole plus repair for parastomal hernia.
key steps:
1. Removal of hernia sac
2. Closure of the defect with non-absorbable suture
3. Proper fixation of composite Mesh with a central keyhole slit
4. Mesh fixation with both trans fascial sutures and tackers

Results: Total 19 symptomatic parastomal hernia patients underwent this procedure among which 15 were end colostomy hernias, 1 was end ileostomy hernia, 2 cases were post ileal conduit and 1 was suprapubic cystostomy. 2 patients underwent additional IPOM for ventral hernia. 8 patients had BMI > 30 kg/m2. The mean operative time was 108 minutes. Mean hospital stay was 3 days. Median follow up was 2 years. Seroma in 4 patients. There was no mesh infection. 1 patient presented with asymptomatic recurrence after 3 year of surgery.
Conclusion: Laparoscopic key hole plus repair for parastomal hernia seems safe, effective and feasible with good cosmetic and functional outcome with acceptable recurrence.
Key words: Parastomal, Keyhole plus, Colostomy, Ileal conduit.

AS16-5

Laparoscopic Paraileostomal Hernia Repair

Kai He, Qiyuan Yao
Department of General Surgery, Huashan Hospital, Fudan University, China

Aim: Paraileostomal hernia (PISH) is a major clinical problem. The aim of this study is to evaluate the laparoscopic PISH repair.
Method: The demographics, perioperative preparations, operative procedures and the follow-up data will be presented in this report.
Results: We received 17 PISH patients from Jan 2005 to Dec 2015 including 13 of ileal conduit and 4 of ileostomy. We performed 'laparoscopic Sugarbaker' on 12 PISH patients including 11 ileal conduit and 1 ileostomy, 'Lap-re-Do Sugarbaker' on 2 PISH patients of ileostomy, and 'Lap-re-Do Keyhole' on 1 PISH patient of ileostomy. 'Suture repair' had to be performed on 2 PISH patients of ileal conduit because of emergent incarcerated PISH or serious intraperitoneal adhesion detected during laparoscopic procedures with high risk of unrecognized enterotomy. The mean operating time was 89.4min and the mean length of postoperative hospital stay was 6.1 days. 14 patients performed by 'laparoscopic Sugarbaker' or 'Lap-re-Do Sugarbaker' technique were observed without recurrence, while another 3 patients after suture repair or 'Lap-re-Do Keyhole' technique were observed as recurrence in one year postoperatively. Postoperative complications including 4 incompletely ileus, 3 seroma, and one after puncturing seroma complicated with subcutaneous abscess with re-operation of incision drainage. No unrecognized enterotomy or mortality occurred in this series.
Conclusions: 'laparoscopic Sugarbaker' and 'Lap-re-Do Sugarbaker' technique can be considered as a clinical choice for PISH patients of ileal conduit and ileostomy, while the operative technique shall be improved to reduce the incidence of postoperative complications. Any procedures involved 'Keyhole' technique are not recommended.

AS16-6

Lap-re-Do Sugarbaker is the ideal option for PSH

Steven Yao Qiyuan
General Surgery, Fudan University, China

AS17-1

Clinical characteristics of recurrent cases with inguinal hernia after Kugel repair

Hitoshi Oda
Oda Clinic, Day Surgery Center, Japan

Kugel repair is the minimally invasive open transinguinal preperitoneal approach for inguinal hernia. In my series from January 2003 to July 2016, 2718 patients (2389 males and 329 females, average age 55±15 years old) and 2949 lesions with inguinal hernia underwent Kugel repair. Overall, 21 patients (0.7%) recurred after Kugel repair. All of the recurrent patients were males. Four patients had the operation during a learning curve period. Six patients relapsed within 3 months after Kugel repair. According to the classification of Japanese Hernia Society, more than 50% (12 cases) of recurrent cases were classified in type II-1. After simultaneous bilateral inguinal hernia repair, 9 cases of 231 cases recurred at a higher rate of 3.9%. Following the repair for direct inguinal hernia, 5 cases had the relapse of indirect inguinal hernia. Of patients with postoperative giant hematoma or seroma, 5 patients recurred. The mechanisms of recurrence after Kugel repair are considered as follows: 1) insufficient dissection around the pubis and the cavity of Retzius or oversight of concomitant type II-1 hernia; 2) insufficient dissection of the vaginal process or oversight of small indirect inguinal hernia; 3) mesh migration during simultaneous bilateral inguinal hernia repair; 4) mesh migration under the pressure of postoperative giant hematoma or seroma; 5) insufficient parietalization of the testicular vessels and the spermatic cord; and 6) inadequate mesh size. In order to prevent recurrence of inguinal hernia after Kugel repair, Kugel patch must be self-expanded in preperitoneal space as covering the entire myopectineal orifice.

AS17-2

TEP treatment for recurrent inguinal hernia

U-Chon Chio, Kuo-Hsin Chen, Jiann-Ming Wu, Ying-Da Chen, Shu-Yi Huang, Tzu-Chao Lin, Tiing-Foong Siow, Chao-Man Loi
Division of General Surgery, Far Eastern Memorial Hospital, Taiwan

Background: This study is to assess whether TEP approach shows benefits in recurrent inguinal hernia repair.
Methods: Retrospective reviewed patients with recurrent inguinal hernia underwent TEP or Lichtenstein approach. The operative outcome measures: chronic inguinal pain, post op stay, return to normal daily activities, re-recurrent rate and intraoperative factor.
Results: Since 2001/9 ~ 2016/6, there was 148 patients with recurrent inguinal hernia underwent TEP repair(bilateral 20; Right 74; Left 54). Mean operation times were 139.8 minutes in bilateral recurrent hernia and 100.9 minutes in unilateral recurrent hernia. Mean post op stay was 1.6 days. Mean duration of return to normal daily activities was 5.4 days. There was two patient has re-recurrent of hernia. As compare to patient with recurrent inguinal hernia underwent Lichtenstein apporach, significantly less chronic pain (12.1 % vs. 21.5 %) and earlier return to normal daily activities (5.4 vs. 7.3 days). Operative time was significantly longer in laparoscopic operations (100.9 vs. 54.2 min, unilateral).
Conclusions: TEP treatment for recurrent inguinal hernia showed reduced chronic inguinal pain and an earlier return to normal daily activities but significantly longer operative time.

AS17-3

Clinical characteristics and Choices of Laparoscopic Procedures for Recurrent Inguinal Hernias: A Report of 330 Cases

Fei Yue, Jian-wen Li, Min-hua Zheng
Gastrointestinal Surgery, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, China

Objective: To summarize the clinical characteristics of recurrent inguinal hernia and investigate the choice of laparoscopic procedures.
Methods: The clinical data of 352 recurrent inguinal hernias in 330 patients between January 2001 and December 2014 were analyzed retrospectively. There were 317 male and 13 female patients with a median age of 66 years old and an average BMI of 23.2±2.9kg/m^2. In this group, 307 were primary recurrent hernias while the remaining 45 were multiple recurrent ones. The same surgical group accomplished all procedures and conducted a follow-up with a median time of 59 months.
Results: (1) Direct inguinal hernia was more frequent in recurrent hernias (52.8%) than in primary ones (21.9%) (P=0.000). (2) The procedures consisted of whole myopectineal orifice repair or defect repair only. The latter group required a higher rate of mesh fixation (P=0.000). (3) Recurrent hernias after ligation, sclerotherapy, suture repair, Lichtenstein repair, plug and patch repair, and preperitoneal repair were treated with appropriate procedures, including TAPP, TEP and IPOM. (4) The operation time was 39.5±13.4min. The VAS at 1-day was 2.4±1.1. The length of hospital stay was 1.7±1.4d. 99.7% patients returned to normal activities within 2 weeks. Totally, we had 1 (0.3%) recurrence.
Conclusion: Laparoscopic repair of recurrent inguinal hernias is a safe and effective procedure. Repairing the whole myopectineal orifice or defect only should be selected after intraoperative evaluation. The selection of procedure depends on the factors including previous surgical approach, space of mesh placement and surgeons' personal experiences.

AS17-4

Trans-Inguinal Posterior Prosthetic Repair (TIPP) for Recurrent Groin Hernia

Chun-Hao Lee[1], Ching-Shui Huang[1,2]
[1]*Department of Surgery, Cathay General Hospital, Taiwan*
[2]*Professor in Surgery, Taipei Medical University, Taiwan*

Both laparoscopic and TIPP can be used to treat recurrent groin hernia successfully if posterior wall was re-enforced with mesh.
444 patients with 482 sides of recurrent groin hernia were repaired with TIPP technique from 2001~2015, M: F=15.4:1, Age: 11 ~ 98y/o (mean: 60.3 y/o). The recurrent groin were classified according to Gilbert Classification. The VAS (0-5) pain scores were recorded at postoperative day 1, 6, and 90, then followed annually for recurrence and chronic pain. Three types of TIPP mesh were used: Plug and patch (147) for discrete or small recurrence, PHS/UHS (171) for moderate to severe posterior wall failure, and Kugel/Modified Kugel Patch (164 sides) for severe posterior wall failure, Results: Right: Left: bilateral=225: 191:66; direct: indirect: combined=220: 201: 61; Time from last repair to current repair: 55.2 months. Operation time: 44 min; previous failed repair: Bassini: 138, Shouldice: 41, anterior mesh: 34, endohernia: 27, posterior mesh:13, bilayer: 11, pediatric:9, plug: 10, other tissue to tissue repair: 199. Hospital stay: 0 ~ 4 days (mean 1.36 day). Complication (6%) included urinary retention, testicular atrophy, superficial wound infection, and hematoma/seroma. Mean post-operative VAS score at postop day 1, day 6 and day 90 were: 1.35, 0.8, and 0.2. The incidence of chronic inguinal pain was 4.8%. There were 8 re-recurrences (1.7%) in the follow-up period (1-10 years).
TIPP repair is an effective repair for recurrent groin hernia.

AS17-5

The surgical selection for recurrence inguinal hernia repair

Hong-guang Ma
Department of General Surgery, China-Japan Friendship Hospital, China

The optimal treatment for recurrent inguinal hernia is of concern due to the high frequency of recurrence. Some surgeons recommend laparoscopic repair of recurrent inguinal hernias, whereas others prefer an open repair. Since 1990, there have 6 literatures on meta-analysis, comparing Lichtenstein and laparoscopic hernioplasty in recurrent inguinal hernia repair. Their common conclusion is that the laparoscopic and open procedures are equally quick to perform with similar recurrence rates and postoperative pain. However, the laparoscopic procedures have advantages of lower postoperative wound infection rates and quicker return to normal work compared to open techniques. In the specialized laparoscopic centers, Laparoscopic and open procedures could be performed with equal operation time and complications. The EHS recommendation for recurrent hernias is straight forward: 'Modify technique in relation to previous technique. If previously anterior, consider open preperitoneal mesh or laparoscopic approach. If previously posterior, consider Lichtenstein operation'. As the saying goes, "if three people do one thing, it will end up with three results". Which method is the best selection? Just like primary inguinal hernia repair there is no golden standard operation, nor do it for recurrent inguinal hernia repair. There is no universal operation for recurrent inguinal hernia. Therefore, the principle of individualization should be taken into consideration when making a choice for recurrent inguinal hernia repair. Surgeon's experience and adept approach are critical for recurrent inguinal hernia repair.

AS17-6

The clinical research of laparoscopic approach of recurrent inguinal hernia repair

Li-sheng Wu, Jian-wei Yu
Department of Hernia and Metabolism of Loss Surgery, AnHui Provincial Hospital, China

Background and Objectives: Treatment for the recurrent inguinal hernia is difficult clinically. The purpose of this study was to examine clinical outcomes of laparoscopic treatment for recurrent inguinal hernia.
Patients and Methods: A retrospective study reviewing the medical records of patients with recurrent inguinal hernia who underwent surgeries from October 2009 to June 2016 was done. Patients were divided into two groups according to surgical procedure (laparoscopic group n=51 or conventional open group n=45).
Results: There were no statistical differences between the two groups relevant to age, time of hernia reoccurrence, or type of hernia reoccurrence. However, in the laparoscopic group the rate of recurrence, hospitalization time, and postoperative pain was more favorable relative to the conventional open group. But, the laparoscopic group required more time in the operating room. There were no statistical differences between the two groups relative to complications or bleeding volume.
Conclusion: Surgical laparoscopic hernia repair for the treatment of recurrent inguinal hernia is preferable over the conventional open method because it has a low hernia recurrence rate, less postoperative pain, and effective.

AS17-7

Discussion of Laparoscopic Transabdominal Preperitoneal Repair for Recurrent Inguinal Hernia

Ming-gang Wang, Ying-mo Shen, Jie Chen, Jin-xin Cao, Yi-lin Zhu, Shuo Yang
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: To explore the surgical techniques and the clinical effect of laparoscopic transabdominal preperitoneal (TAPP) repair for recurrent inguinal hernia.
Methods: Clinical data of 367 cases of recurrent inguinal hernia who were underwent TAPP repair from Mar. 2009 to Mar. 2015 in Beijing Chao-Yang Hospital of Capital Medical University were retrospectively analyzed.
Results: Laparoscopic operations were completed successfully in 365 cases, 2 cases were converted to open surgery. The operation time was (55.7±19.3) min (30-100 min) and the hospital stay was (4.9±2.7) d (2-12d). The rates of postoperative pain, hydrocele, and urinary retention were 4.1% (15/367), 13.1% (48/367), and 1.3% (5/367), respectively. There were no complications such as foreign body sensation, wound infection, and intestinal obstruction, All cases were followed up from 3 to 72 months [(36.5±14.7) months)], 2 recurrent cases was observed and no mesh infection and long-term chronic pain.
Conclusions: Laparoscopic TAPP repair for recurrent inguinal hernia has advantages of minimal invasion and few complications, which is safe and effective.

AS17-8

Transabdominal preperitoneal repair for recurrent inguinal hernia

Matsumura Masaru[1], Taniguchi Ryuta[1], Oniduka Koji[1], Sakamoto Yoshitaka[1], Hirotsu Jun[2]
[1]*Department of Surgery, Moji Medical Center, Japan*
[2]*Department of Surgery, Hirotsu Onaka Clinic, Japan*

There is no specific method that is preferred for repairing recurrent inguinal hernia, because many methods are used for the first surgery. According to the guidelines of the Japan Hernia Society, the anterior approach is recommended in cases where the preperitoneal approach is initially used. This is probably because if laparoscopic surgery is performed after preperitoneal repair, the peritoneum is difficult to detach.
We use tumescent transabdominal preperitoneal repair. We call t-TAPP. T-TAPP involves performing TAPP after injecting a large amount of diluted tumescent analgesics and epinephrine into the preperitoneal space. On using t-TAPP, we found that the peritoneum swells and it is easier to dessect the preperitoneal layer. For repairing recurrent inguinal hernia, we have decided to use t-TAPP only in cases where the peritoneum swells. We treated seven patients all of whom showed peritoneal swelling. We therefore recommend t-TAPP for first-time as well as recurrent hernia.

AS17-9

Study of recurrence forms and their mechanisms after laparoscopic transabdominal preperitoneal (TAPP) inguinal hernioplasty

Masanori Sato, Masashi Nozawa, Takanobu Onoda, Atsuko Matsuyama, Takahiro Watanabe, Tomohito Sato, Norihiko Shiiya, Hidetoshi Wada
First Department of Surgery, Hamamatsu University School of Medicine, Japan

Purpose: To clarify the mechanisms associated with surgical technique leading to hernia recurrence after TAPP repair.
Methods: We made a comparative review of the operation videos for recurrent inguinal hernia and the corresponding primary hernia in 12 patients who had recurrent hernias after TAPP repair. We assessed type of hernia according to Japan Hernia Society classification and surgical techniques such as adequate dissection, mesh coverage and twisting or wrinkling of the mesh at the time of primary repair.
Results: Insufficient coverage with the mesh and/or twisting or wrinkling of the mesh was observed in 7 of 8 cases of type I recurrence. Insufficient dissection was observed in 3 of 3 cases of type II recurrence. Since we provided thorough policy in TAPP repair as to fully cover the myopectineal orifice with sufficient overlap of the mesh, the recurrence rate was decreased to 0.8% (5/590) compared with 4.3% (7/161) before the policy provided ($p=0.05$). All 5 cases with recurrent hernia after the policy were type I recurrence, and the last 3 of those were primary type I-3.
Conclusions: Full coverage of the myopectineal orifice with mesh is essential to prevent type II recurrence. The recent issue is how far we should secure the overlap inferior to the iliopubic tract for type I-3 hernia.

AS17-10

Laparoscopic transabdominal preperitoneal repair (TAPP) is effective for recurrent inguinal hernia

Yujo Kawashita, Takashi Ueda, Naonori Hazeyama, Nobuhiro Shin
Department of Surgery, Endoscopic Surgery, Fukuoka Seisyukai Hospital, Japan

Background: Recurrences continue to be seen after repair of inguinal hernias. The repair of these recurrent hernias is a more complex and demanding procedure because of already weakened tissues and distorted anatomy with a possible high re-recurrence rate. Here we report the efficacy of laparoscopic inguinal hernia repair using TAPP approach.
Methods: A total of 21 recurrent hernias were managed using the transabdominal preperitoneal (TAPP) technique. In the last 3 cases tumescent TAPP was performed, where locally anesthetic solutions were injected just beneath the peritoneum. Patients were followed up for 1 year. Longer follow-up evaluation was performed for the patients who underwent surgery in the initial 3 years. Surgery time, postoperative morbidity, and hernia re-recurrences were analyzed.
Results: Average operation time was 74.5 minutes. There was less pain in the postoperative period enabling faster recovery. Tumescent TAPP further decreased those postoperative pains.
Seroma developed in one patient. At a follow-up assessment after 1 year, one patient still had discomfort, however, there was no re-recurrence during observation period up to 3 years.
Conclusions: The morbidity and recurrence rates for the procedure are as low as for laparoscopic repair of primary hernias. Laparoscopic repair should be considered as first choice for recurrent hernias because it facilitates identification and precise repair of the recurrent hernia.

AS18-1

The accuracy of ultrasound in taking up clinically occult hernia on the other side of unilateral hernia and the characteristic of bilateral hernia including these occult cases

Yasuhiro Obuchi, Erena Fukutomi, Keiko Yamashita, Naoya Fujita, Tomoko Mizuno, Seigo Oyama, Yosuke Ono, Hirotsugu Kawamoto, Norikazu Mataki, Yuji Tanaka
Department of General Medicine, National Defence Medical College, Japan

Aims: There are some cases of unilateral inguinal hernia diagnosed by patients' symptom and clinical findings, in which the other side is also affected. Ultrasound is a non-invasive modality which is useful for diagnosis of inguinal hernia. The aim of this study was to demonstrate the accuracy of ultrasound in diagnosing and the characteristic of bilateral inguinal hernia.
Patients and Methods: A total of 182 patients with a referral diagnosing inguinal hernia, prospectively underwent an ultrasound examination. All patients underwent surgery, and those findings were compared with ultrasound results. Bilateral cases, including revealed by ultrasound examination were analyzed with BMI, age, and the type of inguinal hernia. Clinical follow up after operation was possible with follow up period ranging from 11months to 40 months.
Results: Ultrasound sensitivity for all was 100% with 100% specificity. 16 bilateral cases, including 4 recurrences were obviously diagnosed by clinical findings and ultrasound examination. 10 bilateral cases were at first diagnosed unilateral by clinical findings, then revealed bilateral by ultrasound examination. All of these 10 cases were confirmed the same by inoperative findings. Total 22 bilateral cases, excluding 4 recurrences consisted of 10 cases with bilateral indirect type, eight cases with bilateral direct type, three cases with right side indirect and left side direct, and one case with right side direct and left side indirect.
Conclusions: This study confirms that ultrasound can accurately diagnose inguinal hernias, including occult bilateral inguinal hernia and both sides were the same type in almost all bilateral inguinal hernia.

AS18-2

The usefulness of preoperative ultrasound scan to detect contralateral groin hernia

Ayaka Omori, Kenji Uryuhara, Satoshi Kaihara
Department of Surgery, Kobe City Medical Center General Hospital, Japan

The preoperative evaluation of contralateral groin is important in patients with unilateral hernia. World guidelines for groin hernia management by European Hernia Society recommends ultrasound scan (USS) for the evaluation of suspected or occult groin hernia, with its high sensitivity and specificity, 0.815 and 0.945, respectively. We routinely perform preoperative USS at our institution, expecting preoperative recognition of contralateral groin hernia.
The current study aimed to verify the usefulness of preoperative USS of asymptomatic contralateral groin hernia at our institution. This is a retrospective study of patients undergoing groin hernia repair with transabdominal preperitoneal approach (TAPP) at our institution in 2015.
43 patients with unilateral hernia symptom received preoperative USS in 2015. Patients with bilateral hernia symptoms were excluded.
USS detected contralateral hernias in 8 patients, and 6 of them had hernia findings during laparoscopy. 35 patients had negative USS, however, 6 of them was found hernia during laparoscopy. 3 of them underwent bilateral TAPP.
The sensitivity and specificity of USS to detect contralateral hernia were 0.500 and 0.935, respectively, although they were both 1.00 regarding of symptomatic side of groin in the same patients.
The specificity of contralateral side is favorable, however, the sensitivity is far lower than symptomatic side and requires improvement.
Since USS procedure and documentation depend on each examiner, introduction of standardized USS protocol may improve USS sensitivity. If USS accuracy improves, routine contralateral groin USS would help us managing asymptomatic contralateral groin hernia.

AS18-3

Mesh repair for negative finding sides in laparoscopic hernia surgery: Is it necessary?

Su-Wei Hu, Chia- Chang Wu
Department of Urology, Taipei Medical University- Shuang Ho Hospital, Taiwan

Introduction: Whether routine exploration of contralateral site during laparoscopic herniorraphy is necessary is still under debate. The need of mesh repair for the negative finding site as prevention is even more controversial. We considered the incidence of contralateral metachronous hernia to see if there is any benefit doing prophylactic mesh repair.
Methods: Retrospective analysis of patients who underwent laparoscopic TEP exploration in our institute was performed.
Results: From 2008 to 2012, a total of 247 patients were performed by a single surgeon. Bilateral exploration was completed in 241 (98%) of these patients, of whom bilateral repair was
performed on 17 (7%) patients with positive findings. No mesh repair was done for 224 (93%) patients with negative findings. With a median follow-up of 5 years, 6 recurrences (2%) were noted. 2 (0.8%) direct type of hernias developed on the previously identified "healthy" side without mesh repair. The operation time (mins), VAS and hospital stay length (hours) between exploration according to physical examination/ contralateral positive findings and mesh repair/ contralateral negative findings without mesh repair groups are (103 vs. 140 vs. 104 ; 2.2 vs. 2.5 vs. 2.2 ; 41.7 vs. 40.3 vs. 41).
Conclusions: Bilateral exploration during laparoscopic surgery will not alter hospital stay length and pain score comparing with exploration only according to physical examination. Mesh repair for negative finding contralateral site is optional because of low recurrence rate and longer operation time with increasing pain score after the operation.

AS18-4

Contralateral management of groin during TEP: Perspective from preoperative radiographic study

Takeshi Nagahama
Department of Surgery, Kudanzaka Hospital, Japan

Introduction: Due to lack of intraperitoneal observation TEP have less diagnostic capability compared to TAPP. To overcome those deficit, we have adopted preoperative herniography as diagnostic tool. Here we will propose our strategy depend on our series of preoperative herniography.
Object and Results: From 2012, 264 cases of inguinal hernia were undergoing preoperative herniography and subsequent laparoscopic hernia repair. (TEP 242, TAPP 22) Radiographically apparent contralateral hernias were treated simultaneously even if subclinical. (Unilateral 170, Bilateral 94) Mean duration of surgery were 72 minutes for bilateral and 45 minutes for unilatera. During follow up, 2 patients developed contralateral lesion (15, 19 months). Both patients failed to complete TEP for contralateral lesion due to tight adhesion in preperitoneal space and conversion to TAPP or open was needed. Duration of surgery were 86 minutes and 106 minutes respectively.
Discussion: Our results demonstrated that herniographic evaluation before surgery provided lots of information on contralateral side and also revealed that after unilateral TEP dissection of preperitoneal space is difficult in which etiology still unknown. There still must be much more discussion whether treat or observe for subclinical contralateral hernia. However, our result indicated that synchronous repair was easier than metachronous repair carried out after development of clinical hernia. Synchronous bilateral repair can be an acceptable option for TEP even if it is subclinical.
Conclusion: Under herniographic evaluation synchronous bilateral repair can be an acceptable strategy for management of contralateral lesion during TEP.

AS18-5

Profile of contralateral groin hernia in the elderly

Kentaro Fukushima[1], Takahide Yokoyama[1,2], Takahiro Yoshizawa[1], Hitoshi Masuo[1], Tsuyoshi Notake[1], Noriyuki Kitagawa[1], Hiroaki Motoyama[1], Akira Shimizu[1], Akira Kobayashi[1], Shiro Miwa[3], Shinichi Miyagawa[1]
[1] 1st Department of Surgery, Shinshu University School of Medicine, Japan
[2] Department of Surgery, Showa Inan General Hospital, Japan
[3] Department of Surgery, Okaya City Hospital, Japan

Background: The characteristics of contralateral groin hernia remain uncertain in the elderly. The aim of this study was to evaluate the association between age and type of contralateral groin hernia detected during laparoscopic transabdominal preperitoneal (TAPP) herniorrhaphy.
Methods: We retrospectively evaluated patients' background, intraoperative findings and postoperative complications in consecutive 665 patients who underwent the TAPP repair between October 2000 and December 2015.
Results: The incidence of contralateral hernia significantly increased by age (15.3% for patients less than 60 years, 27.4% for those with 60-69 years, 35.0% for those with 70-79 years and 42.7% for those 80 years or older, $p < 0.001$). Contralateral occult hernia was seen more common in patients 80 years than in patients under 60 years (21.4% vs. 11.6%, $p < 0.001$). The most prevalent form of multiple groin hernia was direct plus indirect hernia in patients less than 80 years (66.7%), whereas inguinal hernia plus femoral and/or obturator hernia in patients 80 years or older.
Conclusions: Present study showed the striking diversity of the type of contralateral groin hernia in the elderly.

AS19-1

Diagnosis and Treatment for Mesh Infection with Bowel Erosion after Open Inguinal Hernia Repair

Bao-shan Wang, Bao-shan Wang, Jie Chen, Fu-qiang Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Background: Inguinal hernia repairs are the most common elective abdominal wall procedures performed by general surgeons. The use of mesh has become the standard for hernia repair. However, mesh-related complications have become increasingly more frequent. Few reports from the medical literature have presented severe mesh-related complications following open inguinal hernia repair. One of these complications is mesh erosion into bowel. This study was to discuss the diagnosis and treatment for mesh infection with bowel erosion after open inguinal hernia repair.
Methods: From January 2013 to December 2015, 89 cases with mesh infection following open inguinal hernia repair were included, including 7 cases with mesh erosion into bowel. The medical records of these patients were retrospectively reviewed.
Results: Only 1 patient had diagnosed mesh infection with bowel erosion before operation, and 6 patients made a definite diagnosis via laparoscopic exploration. Surgical treatment involved separated bowel from mesh via laparoscopic method, bowel resection or repair (laparoscopic or open methods), primary suture, without replacement of a new mesh. All patients were followed up for a mean period of 21 months (range 14-35 months), no wound infection, intestinal fistula, postoperative pain and recurrence were observed.
Conclusions: The rate of mesh infection due to mesh erosion into bowel is 7.9% (7/89). The diagnosis and treatment of mesh infection with bowel erosion after inguinal hernia repair are complicated. Laparoscopic technology plays a significant role in diagnosis and treatment. Using comprehensive surgical treatment can obtain a satisfactory result.

AS19-2

Surgical treatment combined with debridement and vacuum sealing drainage(VSD) for mesh infection after prosthetic patch repair of inguinal hernia

Li Sun[1], Ying-mo Shen[1], Jie Chen[1], Gui-yue Yang[2]
[1]*Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China*
[2]*Department of Medical Record and Statistics, Beijing Chao-Yang Hospital, Capital Medical University, China*

Objective: To discuss the surgical treatment and experience of infection after prosthetic patch repair of inguinal hernia for 67 cases.
Methods: The clinical date of 67 cases mesh infection after inguinal herniorraphy in our department from January 2012 to June 2014 were retrospectively analyzed. This group of patients whose wound were not healed after placement of prosthetic patch and local place festered, patch exposed or sinus tract formed after 3~12 months of wound consistently dressing change. They were treated with surgical operation in our department, including removing the infected mesh and surrounding tissues, primary suture and a placement of wound drainage or vacuum sealing drainage (VSD), without replacement of a new patch substitute. After that we recorded and analyzed the wound healing daily.
Results: All patients accepted affected mesh removal successfully. 51 patients got primary healed and the other 16 patients healed delayed after local dressing change due to the superficial infection following stitch removal. The result showed 100% postoperative follow-up of patients over a 6-month period, with no recurrence in this 67 cases.
Conclusions: the treatment of infection after inguinal hernia repair is very complicated, we suggest that the primary suture repair after removing infected mesh with completely debrid.

AS19-3

Relationship with the infection and drainage in the open tension-free herniorrhaphy

Xue-hu Wang, Si-yu Chen, Yu Zhao
Department of Vascular Surgery, Department of Vascular Surgery, China

Objective: To detect the negative pressure drainage postoperatively in inguinal hernia free-tension repair on the correlation and effects of postoperative incision infection.
Methods: retrospectively analysis the postoperative infection in inguinal hernia free-tension repair from January, 2011 to March, 2016 of the first affiliated hospital of Chongqing medical university.
Results: there was 1554 patients in this data, the mean age was 60.04±15.84 (13-97 years old), and the mean BMI was 22.65±3.05, among this data include 1352 unilateral inguinal hernia and 201 bilateral, combined 396 hypertension, 119 diabetes mellitus, 44 COPD, and 60 carcinoma. Totally 55 patients occurred infection postoperatively, 30(2.51%) with negative pressure drainage, and 25 (6.93%) without drainage. There was no related between the infection and age, gender, unilateral or bilateral, smoke, BMI, combined base diseases by logistic analysis ($P>0.05$). but the drainage have related to infection ($P<0.05$). And the lower infection occurrence and lower postoperative hospital stay with negative pressure drainage postoperatively than control group ($P<0.05$).
Conclusion: the postoperative negative pressure drainage of inguinal hernia free-tension repair could reduce the infection occurrence.

AS19-4

Management of mesh related infection after inguinal hernia repair: Laparoscopic Technical Challenges

Zhen-ling Ji
Department of General Surgery, Institute for Minimally Invasive Surgery, Zhongda Hospital, Southeast University School of Medicine, China

Introduction: Mesh related infection is rare in inguinal hernia repair. Here we report 10 patients who had mesh infection and managed by laparoscopic assisted method for an infected mesh grafts following inguinal hernia repair.
Methods: All patients were treated by laparoscopic technique. For mesh removal laparoscopic was introduced into the pelvic and to mobilize the adhesion of visceral to the abdominal wall, the grafts were carefully removed and abdominal wall scar tissue was debrided, skin incision was irrigated and a catheter was placed for drainage. For mesh salvaging, the laparoscopic was used to guided the abdomen and then a laparoscopic trocar was inserted to the pre-peritoneal space, suction of the infected fluid was examined for biology study, the antibiotic fluid was used for irrigation, a catheter was placed in the pre-peritoneal space for continuously irrigation and drainage. Local wound care and antibiotics if clinically indicated.
Results: Over a period of 6 years, 10 patients developed infected mesh grafts post-inguinal hernia repair surgery. 7 patients transferred from other hospitals. All patients were successfully treated by our method. Hospital stay is from 2 weeks to 3 months after operation. There were no operative complications.
Conclusion: This series of this study indicates that laparoscopic management of inguinal hernia mesh infection is likely to be successful. The most advantage is to voiding visceral injury during the procedure of mesh removing and salvaging.

AS19-5

Mesh related infection in inguinal and ventral hernia repair: causes and managements

Fu-quan Yang
Shengjiing Hospital of China Medical University, Department of General Surgery, China

Mesh related infection after inguinal and ventral hernia repair is a very serious complication. And the management of mesh related infection is a challenge to surgeons. During the past 5 years (2011.1-2016.1) there are 19 inguinal hernias after tension free repair and 6 ventral hernias after mesh repair were got mesh related infection. All the inguinal hernia infection was male patients, age from 67-85 years old. In the ventral hernia mesh related infection patients; there were 2 female patients and 4 male patients, age from 57-81 years old. The main causes of infection of inguinal hernia include seroma, diabetic mellitus. The main causes of infection in ventral hernia repair are seroma, delayed intestinal injury. The managements of mesh related infection are drainage with fluxions, broad spectrum antibiotics, vacuum suction drainage, and mesh removed. All of the infection patients recovered after 1month to 12 month treatments. 2 inguinal hernia and 1 ventral hernia recurrent after mesh removed and re-operation repair with mesh were after the infection controlled 6 months later.

AS19-6

Management of infected and exposed light-weight polypropylene mesh after complex ventral hernia repair

David Donald Zabel, Michael Conway, Eric Kalish, Joseph Belgrade, Peter Santoro
Division of Plastic Surgery, Christian Care Health Systems, United States of America

Introduction: Mesh reinforcement is necessary to decrease hernia recurrence for large and complicated ventral hernias. Historically, synthetic mesh infection often requires mesh removal. We discuss our management and salvage of light-weight polypropylene synthetic mesh infection after ventral hernia repair with mesh in the pre-peritoneal and retro-rectus space.
Methods: We prospectively reviewed our single surgeon retrospective data-base of 493 consecutive patients that underwent complex ventral hernia repair with synthetic mesh reinforcement in the pre-peritoneal and/or retro-rectus space. Follow up was 6-64 months. 41 patients had peri-mesh infection or mesh exposure with infection. Three of these patients had entero-cutaneous fistula formation. Mesh was salvaged in 40 patients utilizing re-operation, closed suction drainage and/or local wound care with short term antibiotic therapy. Mesh was removed in one patient with life threatening abdominal sepsis 6 days after ventral hernia repair. One patient had hernia recurrence.
Discussion: Synthetic mesh infection with mesh removal can lead to high rates of hernia recurrence. Our mesh salvage rate was 98% without long term sequale or antibiotic use. Patients with mesh exposure were healed with delayed primary closure or skin grafting after appropriate granulation tissue formation. All patients had complete wound closure. We had one hernia recurrence in this group, the only patient that had mesh removal to date.
Conclusion: Light-weight synthetic mesh can be salvaged in the midst of mesh infection in complex ventral hernia repair. Mesh salvage leads to lower hernia recurrence rates.

AS19-7

Negative pressure wound therapy for mesh site infection after an incisional hernia repair: a case report and literature review

Shaobo Hu[1], Ping Sun[1], Qichang Zheng[2]
[1]*Department of Hepatobiliary Surgery, Union Hospital, China*
[2]*Department of Hepatobiliary Surgery, Song Zifang, China*

Purpose: Herein, we report a case of mesh site infection after an incisional hernia repair that was treated with negative pressure wound therapy (NPWT), and review the relevant literature.
Methods: A 76-year-old female patient presented with a history of 6 abdominal operations, including 3 incisional hernia repairs. The last repair was performed on October 19, 2013. Four months later, intermittent incisional exudation developed. The culture of the exudate was positive for Escherichia coli. After systematic treatment with sensitive antibiotics and local debridement for 3 months, the infection was not well controlled. Thus, we utilized NPWT. The systemic and abdominal symptoms released. Unfortunately, the infection was not completely eliminated 3 months later, and an intestinal fistula appeared. We removed the mesh, continued negative pressure drainage via a urinary catheter, and provided nutritional support for one month.
Results: After 8 months treatment in hospital, the infection and fistula healed, and no new hernia was observed in the following 15 months.
Conclusions: According to our experience and review, NPWT can promote the growth of granulation tissue. If NPWT is applied during the early stage of infection, the majority of patients can achieve good results, and the infected mesh may be salvaged.

AS20-1

The Prevention of Reherniation in Anterior Component Separation Technique

Nagato Shimada[1], Yoshiko Honda[1], Takayuki Suzuki[1], Yu Yoshino[1], Hironobu Kaneko[2], Yoshihisa Urita[1]
[1]*Department of General Medicine & Emergency Care, Toho University Omori Medical Center, Japan*
[2]*Division of General and Gastroenterological Surgery, Toho University Omori Medical Center, Japan*

The Anterior component separation technique (ACST) is an effective method for reconstructing large midline abdominal wall incisional hernias. This technique can restore abdominal wall functionality for defects up to 15cm at the waistline. But the reconstruction of defects is slightly more difficult at the epigastrium and suprapubic region. Repair of a midline incisional hernia with ACST was performed on 55 patients at Toho University Omori Medical Center between June of 2003 and May of 2015. ACST without mesh was performed on 46 patients (83.6%) and reherniation after surgery occurred in 3 patients (6.5%). All patients were women, between the ages of 74 and 84 years old. Location of reherniation was in the suprapubic region for all cases.
Reherniation appeared within 7 to 9 months of the operation. Repair of the reherniation region was not performed, because there was only minor bulging and the patients did not complain of any pain or discomfort.On the other hand, ACST with underlay mesh (polypropylene soft mesh) was performed on 9 patients(16.4%). The mesh was placed in the retromuscular/preperitonial space. There were no occurrences of reherniation for ACST with mesh.Repair of large midline incisional hernias using ACST with underlay mesh is more effective in preventing the occurrence of reherniation when performed in the epigastrium and suprapubic regions compared to ACST without mesh.

AS20-2

Laparoscopic Anterior Component Separation a Versatile procedure

Pramod Shinde, Priyanka Shinde
Department of Minimal Access Surgery, Kaushalya Hospital & Research Centre, Nashik, India

Introduction: closure of midline in a defect larger than 8 cms is a challenge in Open as well as Laparoscopic Ventral Hernia Repair; Laparoscopic Component Separation is a procedure to help us overcome this by enabling closure of midline in Open, Laparoscopic repair or Hernia with mesh erosion/infection surgery. We present a series of Eight cases of Ventral Hernia repair where Laparoscopic Anterior Component separation was used.
Material and Methods: All patients with defects larger than 8cms requiring Component separation for midline closure, operated between January 2015 to August 2016, were included for the purpose of this study. Four of these patients underwent Open Ventral Hernia repair with Laparoscopic Anterior Component Separation; three patients underwent total Lap Ventral Hernia repair with Laparoscopic Component Separation. One Patient had ulcer with mesh erosion into bowel, hence no mesh repair was performed.
Results: The average Hospital stay was 6.2 days. One patient developed Superficial Surgical site infection. All the patients had closed suction drains which were removed once drainage was less than 30 ml. No recurrence was observed in the immediate postoperative period. No Seroma formation was observed in any patients.
Conclusion: Laparoscopic Anterior Component Separation is a versatile procedure which can be combined with open as well as Laparoscopic Ventral Hernia Repair.

AS20-3

ENDOSCOPIC COMPONENT SEPARATION: A NOVEL TECHNIQUE FOR MANAGEMENT OF LARGE VENTRAL HERNIA

Parthasarathi R, Darshan S Nayak, Sarvani M, Sandeep C Sabnis, Samrat V Jankar, Senthilnathan P, Rajapandian S, Praveen Raj P, Palanivelu C
[1]*Department of Surgical Gastroenterology, GEM Hospital and Research Centre, India*

Introduction: Management of large ventral hernia is challenging as the closure of defect will be under tension and associated with higher recurrence rates. Component separation technique helps in tension-free closure of large defects. It was first described in 1990, since then various modifications have been described to reduce morbidity, minimise recurrence and address the complications associated with previous techniques. Endoscopic component separation is a newest addition to the list, which aims at providing all the benefits of the open component separation with reduced morbidity. In our technique, component separation is done completely by laparoscopic approach with conventional instruments and is relatively easy to master.
Materials and Methods: It is a prospective observational study. Various intra-operative, post-operative and follow up parameters were analysed.
Results: Between October, 2015 to May, 2016, we operated on 8 patients with large ventral hernia, among which four patients had recurrent ventral hernia. All patients underwent laparoscopic anterior component separation followed by closure of defect and intraperitoneal placement of composite mesh. In one patient, the procedure was combined with laparoscopic sleeve gastrectomy for morbid obesity. Mean size of the defect was 14.4cms (10 20cms). Mean operative time was 185 minutes. Mean post-operative hospital stay was 6.75 days (3 10 days). One patient developed seroma postoperatively which resorbed with conservative management. None of the patients had skin necrosis, persistent pain and recurrence during follow up.
Conclusion: In experienced hands, endoscopic component separation is feasible and safe option for management of large ventral hernia.

AS20-4

Modified component separation technique for the treatment of massive incisional hernias

Giorgi Giorgobiani, Anzor Kvashilava
Department of Surgery, Tbilisi State Medical University Aversi Clinic, Georgia

Purpose of the study was to compare different modifications of Component Separation Technique (CST) in the treatment of massive incisional hernias. Main disadvantage of classic CST is that those relaxing incisions might be potential weak places for recurrence. For this reason we introduced our modification which utilizes 3 mesh strips for reinforcement the bilateral incisional areas and midline. Studied 186 massive hernias from total 711 incisionals. Male/female 119/77. Mean BMI 36.39% hernia defect size was more that 15 cm (largest 50 cm x 25 cm) in all patients. Concomitant diseases 156 (83.8%). The following modifications of CST were used for repair: Ramirez (original) - 37 (I group) Ramirez with triple mesh reinforcement 61 (II group); Ramirez with Rives - 14 (III group); Total 112. Mean operation time, complication rate, mean length of stay in hospital and recurrence rate (period up to 2 yrs) were compare for all groups.Mean operation time was 135 mins for the I group, 145 mins. for the II and 150 for the III ($p>0.1$). There was also no significant difference ($p>0.1$) in complications (mean 38,3%) and length of stay (6.4 days) for all groups; Recurrence rate for the I group was 10.8 %, for the II (6.55%) and III - (7.1 %) - $p<0.001$. Considerable increasing of the abdominal capacity is achieved only by CST. CST with triple mesh reinforcement of anterior abdominal wall gives less recurrences comparing with classic CST.

AS20-5

Component Separation Technique Transverse Abdominis Release Ventral Hernia is a common disorder. Many of them have multiple defects which grow with time to become Large Ventral Hernia, requiring complex procedures for repair. We will discuss TAR (Transverse Abdominal Release), in detail in treating Large Ventral Hernia

Ramesh Punjani
Department of Sugery, Fortis Hospital, Mumbai, India

Component Separation Technique Transverse Abdominis Release
Incisional Hernia occurs in 11 to 23 % of laparotomies. If untreated, often, it grows in size.
These Large Ventral Hernia leads to lot of functional derangements & compromise the quality of life. Traditionally, these hernias were treated with "Bridging" techniques. A mesh is put as an Onlay, Inlay, Sublay or Underlay by open or laparoscopic approach. However, because of disparity between living abdominal wall muscles & non-living mesh, there is decreased abdominal wall compliance & patients continue to have functional disability.
Closure of Mid-line is found out to be of extreme significance to get back lost abdominal wall functions. Component Separation Technique, advocated by Ramirez, achieves midline closure of these wide defects without tension. However, it has lot of wound related morbidity, especially skin necrosis, in about 30 % of cases.
Posterior component separation technique, as described by Carbonell, solved the problem of skin necrosis, but compromised on nerve supply of rectus.
TAR (Transverse Abdominis Release), is a novel technique, described by Yuri Norvitsky, is a promising solution for Large Incisional hernia. It gives back the lost structural & functional integrity back to the abdomen.
We will describe our experience in treatment of Large Incisional Hernia.

AS20-6

Withdrawal

AS21-1

The use of the new "target mesh" in the preperitoneal space, for the treatment of the small ombilical hernias, with an open minimal invasive surgery. VIDEO

Marc Soler
Department of Parietal Surgery, Clinique Saint Jean, France

Our preference to treat an ombilical hernia is to put a mesh in the preperitoneal space. The main difficulty of the technique was to unroll the prosthesis through the small incision. So we created a new semi rigid and self-expandable mesh. It is the target mesh: a twelve cm rounded polypropylene mesh with three not knitted and not woven concentric rings. The movie shows the preperitoneal dissection of an umbilical hernia, with several small holes.The mesh can be cut. The main step of the procedure is the preperitoneal space dissection.
A personal prospective study (n=112) is under way, under the control of the French "club hernie" data base.
Follow up: [15-63] months. 79 men, 33 women
Primary 108, secondary 4
Day surgery, n=106 (88%)
Complications; Seroma, n=2; Ombilical necrosis, n=1; Recurrence, n=1 with a good result after reoperation
Post-operative pain at one month: Visual Analogic scale (VAS)
VAS=0: 96 (86%) VAS [1-3]: 11 (10%) VAS [4-7]: 4 (3.5%) VAS 8: 1 (0.90%)
Post-operative pain between 3 and 6 month (Only the patients with pain at one month are reviewed)
VAS=1-3: 5 VAS=4-7: 1 VAS=8: 1
For all these patients the post-operative pain is less important than the preoperative one
Post-operative pain between 12 and 51 months (All the patients are reviewed at one year)
VAS=4-7: 4 patients
Conclusion: The use of the extra peritoneal mesh is a safe technique. The use of the target mesh make easier to unroll the prosthesis in the Preperitoneal space

AS21-2

Retrospective analysis of umbilical hernia repair with ULTRAPRO Plug

Yan-yan Xie, Wen-zhang Lei
Hernia Center of Department of Gastrointestinal Surgery, West China Hospital of Sichuan University, China

Objective: The aim of this retrospective study was to investigate the efficacy and safety following umbilical hernia repair with ULTRAPRO Plug.
Background: Umbilical hernia (UH) is one of the commonest surgical lesions. There is evidence that mesh repair for primary umbilical hernias results in less recurrences and complications compared with tissue repair. Different hernia repair devices and surgical approaches are used in umbilical hernia. ULTRAPRO Plug (UPP) has been widely adopted for inguinal hernias with excellent results. However, rarely reported on the use of this hernia patches for umbilical hernia repair.
Methods: The medical records of 93 patients who underwent umbilical hernia repair using the ULTRAPRO Plug between October 2011 and September 2015 were reviewed. Demographics, surgical information, and outcome were assessed.
Results: Out of 93 patients, there were 28 male and 65 female patients. The mean age was 51.6 y. Mean duration of a hernia surgery was 21.2 min, and 85 patients were day-surgery. Mean time to complete return to daily activities was 5.6 d. No mortality or major complications occurred during the periperative period. Median follow-up was 27 mon, and the total follow-up rate was 93.5%. Early postoperative complications included one seroma, two fat liquefactions and one superficial surgical site infection. During the follow-up, recurrence in two patients and chronic mesh infection in one patient were found. There were no chronic pain and foreign body sensation.
Conclusions: Repair of umbilical hernias with ULTRAPRO Plug is a simple and effective procedure without major postoperative events.

AS21-3

Redundant skin problems after laparoscopic paraumblical hernia repair: Is there any gold standard technique to prevent these complications?

Naing Lin Zaw[1,2,3]
[1]*Surgical Ward 1, Department of Surgery, Yangon General Hospital, Myanmar*
[2]*Surgical ward (1) Yangon General Hospital, Prof Thein Myint, Myanmar*
[3]*Maggwe General Hospital, Prof Moe Moe Tin, Myanmar*

Introduction: After laparoscopic paraumblical hernia repair, we have encountered problems like seroma and post operative pain.However as a beginner or starter on laparoscopic repair, we found many redundant skin fold' problems during follow up period of our patients.
Method and Results: From september 2014 to september 2015, there were total number of 28 patients who underwent laparoscopic paraumblical hernia repair with composite mesh used both subfascial sutures and tackers. During our study period of one year, there were 12 patients with different types of redundant skin problems.
Conclusion: Although most patients who underwent laparoscopic mesh repair got many advantages from minimally invasive procedure, the redundant skin fold was still a hurdle for their full satisfaction.

AS21-4

Mesh vs Suture For Small Ventral Hernia Repair

Ka Wing Karen Chan, HRishikesh Salgaonkar, David Lomanto
General Surgery, National University Hospital Singapore, Singapore

Small ventral hernias (<2cm) are commonly repaired by open suture Repair or open mesh repair. It has not been shown that one surgical technique is superior over the other and both techniques are still being practiced worldwide. The ParietaxTM Composite Ventral Patch (Covidien, USA) is made especially for open mesh repair for small ventral hernia. It is safe and easy to use. The hydrophilic absorbable collagen film allows intra-peritoneal placement without formation of adhesions to bowel. Our prospective case series looks at comparing our early results of the use of ventral patch and primary suture repair for ventral hernia. Data of Fifteen patients underwent ventral patch repair and 12 patients underwent primary suture repair was collected. Patients demographic, size of hernia defect, mesh size, surgery time, pain scored and complications were documented. There is no significant difference in mean operating time (57.4 vs 52.9 minutes), size of defect, pain score, complications rate and length of stay demonstrated in our early follow up results. Our study has shown that the use of ventral patch mesh in ventral hernia repair does not require longer operating time and no difference in outcome in the early post-operative period (6 months). However, the presence of mesh may provide more strength to the repair and likely less chance of Long term recurrence. Further study with Long term follow up would be required to confirm such hypothesis.

AS21-5

Spigelean Hernia: A Diagnostic Dilemma

KN Srivastava
Department of General and Minimal Access Suregry, BL Kapur Super Specialty Hospital, India

Spigelean hernias, also called as lateral ventral hernias are rare hernias to present themselves in clinical practice. The significance of these hernias lies in the fact that they are commonly intra-parietal hernias and are hence difficult to diagnose clinically. Moreover the neck of these hernias is usually small posing a fair risk of strangulation.
With the advancement in laparoscopic hernia repair, there is evidence that spigelean hernias too can be repaired laparoscopically thereby causing less morbidity and shorter hospital stay.
Here we present a rare case of large spigelean hernia that posed to us as a diagnostic dilemma. The symptoms, clinical findings and ultrasound of the patient were not specific and a CT scan had to be used as the measure to confirm the diagnosis. The patient was then managed successfully with laparoscopic intraperitoneal onlay mesh repair.
The details of the case and a brief discussion is included.

AS21-6

Trans-fascial Hernia following sublay repair of an umbillical hernia

Ramesh Punjani
Minimal access Surgery, Fortis Hospital, India

Trans-fascial Hernia is a very rare entity at the site of trans-fascial sutures taken during previous repair of ventral hernia.
It is recommended that mesh fixation is necessary during repair of ventral hernia.
In open surgery mesh is often placed in retro-rectal plane (sublay). This mesh is fixed by trans-fascial sutures passing through entire abdominal wall.
In Laparoscopic repair of ventral hernia, the mesh is placed in intraperitoneal & fixed with four trans-fascial sutures & tackers.
Trans-fascial sutures are usually placed at the border of the mesh & secured with an "Air knot", which is a loose knot not strangulating the entrapped muscles.
We present a case of trans-fascial hernia following sublay repair for an umbillical hernia.
We will discuss the causes, prevention & treatment with supporting three minutes video.

AS21-7

The clinical effecciency of sublay hernioplasty in adult patients with lumbar hernia

Wen Luo, Yong Wang
Department of Hernia and Abdominal Wall Surgery, The Central Hospital of Wuhan, Tongji Medical College of Huazhong University of Science and Technology, China

Objective: To investigate the clinical effecciency of sublay hernioplasty in adult patients with lumbar hernia.
Methods: The clinical data of 18 patients with lumbar hernia were analyzed retrospectively. All cases were repaired with sublay hernioplasty and had operation.
Results: The data included 11 male patients and 7 female patients with median age of 59 years. Of the patients, 5 cases were the left lumbar hernia and 13 cases were the right. There were 16 patients with primary hernias and 2 patients with recurrent hernias, 8 cases with radical nephrectomy, 3 cases with kidney stone surgery, 1 case with pubic bone osteotomy, 2 cases with laparoscopic renal cysts, 2 cases with laparoscopic adrenal tumor, 1 case with waist closed injury and 1 case with the bulge at waist after herpes zoster. The operation was performed successfully in all patients. There were no injuries of the kidney, bowel and ureter during the operation. 2 patients with analgesics added for 1 week after the operation.The postoperative hospitalization time was 7-15d, with an average time of 10d. There were no infection of obstetric surgical wound, hematoma and fat liquefaction after operation. During the period of 6 to 48 months of follow-up, all cases contact. There was no recurrence, chronic pain and material infection.
Conclusions: The sublay hernioplasty in the treatment of lumbar hernias is safe and feasible. It's typically appropriate for aduit patients with lumbar hernias.

AS21-8

Laparoscopic lumbar hernia repair

Jun-sheng Li, Zhen-ling Ji
Department of General Surgery, ZhongDa Hospital, Southeast University, China

Background and Purpose: Lumbar hernias are rare. Many techniques have been described for the surgical repair of lumbar hernias including primary repair, local tissue flaps, and conventional mesh repair. In this report, we report our series of cases of superior lumbar hernias, which were successfully repaired using two different laparoscopic techniques.
Methods: We successfully performed two kinds of laparoscopic lumber hernia repair, the laparoscopic transabdominal preperitoneal approach and the IPOM technique. Trans-abdominoretroperitoneal laparoscopy is undertaken with three trocars placed into the peritoneal space along the midline or along the external border of the rectus abdominis. The dissection is begun by incising the peritoneum, an appropriate sized prolene mesh is used to reconstruct the defect. The mesh is then positioned in place, and fixed with spiral tacker to the surrounding muscles. And the incision was closed with suture. IPOM was performed similar as in incisional hernia repair.
Results: 8 cases of lumbar hernia was repair with either TAPP technique (2), or IPOM (6) procedure. Compared with open procedure, both types of procedures provided excellent operative visualisation, preventing damage to nearby structures, and were associated with lower pain scores, shortened hospital stay, early return to routine activity, more favorable cosmetics and minimal morbidity.
Conclusion: laparoscopic lumbar hernia repair was associated less postoperative complications and early return to normal activity.

AS21-9

Complications and treatment experiences of lumbar hernia

Yuan-yuan Yang, He-guang Huang
General Surgery Department, Fujian Medical University Union Hospital, China

Objective: To avoid potential operative complication and increase the cure rate after lumbar hernia.
Methods: A retrospective analysis was performed about complications and treatment experiences of thirteen clinical cases who were accepted treatment in our hospital during April 2006 to April 2016.
Results: The mean age of the 11 patients was 58 ± 7 years, with the average BMI 26.4 ± 4.2 kg/m2. The average size of the hernia defect was 5.6 ± 6.4 cm2. Seven patients got the simple open repair and six patients got the tension-free open repair. During the follow-up time of one to ninety-seven months,there are four patients (30.77%) got the post-operative complications.Two patients (15.38%) had infection (both of them used biological mesh) after lumbar hernia repair. The etiology research of these two cases showed that one was after trauma, other one was after a resection of intramuscular cyst.Anyone else were primary. One patients (7.69%) developed hematoma.One patient 7.69%) had seroma. All of these patients were completely cured when they leave our hospital. There are no perioperative deaths and no deaths. The average hospitalization time was 14.6 ± 13.4 days. There was no intra-operative visceral injury in all these cases.
Conclusions: According to our experience in this research, seroma,hematoma and infection are the most common complications after lumbar hernia repair. There is a close relationship with etiology and post-operative infection. Early diagnosis, effective drainage and pressuer dressing are the key to recovery.

AS22-1

The Feasibility of Single Incision Laparoscopic TAPP with Common Laparoscopic Instruments

Peng Wang, Qing-song Guo, Chang-chun Ling
Department of General Surgery, The Affiliated Hospital of Nantong University, China

Background: In recent years, single incision laparoscopic (SIL) hernia repair have been reported in some clinical centers by using the triports and the curved laparoscopic instruments. However, this technology is very expensive for some people. How can we benefit more people to meet their needs for reduce the port-related morbidities and improve cosmetic outcomes? This study aimed to assess the safety, efficacy and cost effectiveness between SIL TAPP approaches with common laparoscopic instruments and conventional laparoscopic (CL) TAPP.
Methods: We analyzed the results of patients who underwent either CL or SIL TAPP with common laparoscopic instruments for inguinal hernia between May 2014 and May 2016 in Affiliated Hospital of Nantong University. Patients' demographic details, type of hernia, operative time, mesh used, post-operative complications and costs were compared.
Results: There were 50 patients in SIL compared to 51 in CL group. SIL vs. CL showed: age45±2.31 vs. 54±2.72, $p<0.05$; post-operative painday one 2.0 vs. 3.0, $p<0.05$; operative timesunilateral 50.0 vs. 39.0 min, $p<0.05$ and bilateral 80.0 vs.60.0 min, $p<0.05$; cosmetic scar scores 12.0 vs. 24.0, $p<0.01$; Costs of ports/trocars for SIL and CL were RMB 400 and RMB 400.
Conclusion: Our results have shown that in experienced hands, SIL TAPP with common laparoscopic instruments is safe and as feasible as CL. In addition, this technology improves the cosmetic outcomes significantly, but it is much cheaper than the use of triports, is likely to be widely used.

AS22-2

Laparoscopic intraperitoneal onlay mesh (IPOM) technique with laparoscopic percutaneous extraperitoneal closure (LPEC) for inguinal hernia in adult

Hidefumi Nishimori[1], Fumitake Hata[1], Hideharu Miura[1], Tomomi Hirama[1], Chikashi Kihara[1], Kuniaki Okada[1], Shingo Kitagawa[2]
[1]*Department of Surgery, Sapporo Dohto Hospital Medical Corporation, Japan*
[2]*Department of Surgery, Shin-Sapporo Hohwakai Hospital, Japan*

Introduction: We herein report simple and fast laparoscopic procedure to repair an inguinal hernia in adult using an IPOM technique in conjunction with LPEC.
Surgical procedure: Under general anesthesia, this procedure is performed by single-incision laparoscopic surgery. First, make sure the hernia orifice, then, LPEC was performed. Then the self-expandable ePTFE mesh (VENTRIO/VENTRIO ST) was placed directly onto peritoneum with AbsorbaTackTM overlapping the place where LPEC was done widely.
[Materials and Methods] From February 2013 to July 2016, we performed this procedure in 129 inguinal hernias (119 patients; 96 males and 27 females). Ten patients had a bilateral hernia. Bladder and large hernia are excluded preoperatively.
Results: There were 99 indirect, 25 direct and three femoral hernias. The average age of patients was 72.5-year-old. Mean operative time was 46.2 minutes (from 18 to 89 minutes). There was no conversion and intraoperative complications. There was a 7.0% of postoperative complications; 3 seromas, 2 chronic pains, 2 adhesive intestinal obstructions and 2 omental migration beneath the mesh. At an average 21 months follow-up, we recognized only 1.5%(2/129) recurrences.
Conclusions: The most important advantage of this IPOM with LPEC procedure for inguinal hernia in adult is that it is performed easily within relatively short time. Also, the recurrence rate is low. It is easier and faster than the other laparoscopic procedures (transabdominal preperitoneal (TAPP) repair and total extraperitoneal (TEP) repair). We have to evaluate the long-term follow-up, this procedure is, however, attractive for inguinal hernias.

AS22-3

A novel less invasive method of transabdominal preperitoneal repair (TAPP) for groin hernia with single incision plus one puncture

Norihiro Masuda[1], Junko Takita[1], Norihiro Haga[1], Yuta Shibasaki[1], Hideo Ogata[1], Masanobu Nakajima[2], Satoru Yamaguchi[2], Hiroyuki Kato[2], Hiroyuki Kuwano[3]
[1]*Department of Surgery, Utsunomiya National Hospital, Japan*
[2]*Department of the First Surgery, Dokkyo Medical University, Japan*
[3]*Department of General Surgical Science, Graduate School of Medicine, Gunma University, Japan*

Introduction: In trans-abdominal pre-peritoneal repair (TAPP) for groin hernia, single-port laparoscopic surgery (SILS) has been reported to reduce abdominal damages. We have tried a new operation method, two ports from single incision plus one puncture (POP-SILS) in TAPP.
Patients and Methods: A total 118 patients of TAPP from May 2014 to May 2016 at our hospital were investigated. Nineteen-one cases had groin hernia of either side, and twenty-seven cases had both sides. In the POP-SILS TAPP, we use two 5mm ports through a multi-channel port in umbilicus and a needle instrument pierced above the pubic bone. By using flexible 5 mm diameter camera, we can keep triangular formation easily. We study the safety and usefulness of this method from the point of operation time, postoperative stay, and complications.
Results: The median operation time of either side hernia cases was 77 min (38-152), and that of bilateral cases was 139 min (91-269). Three cases needed one or two additional 5mm ports, and one case with severe preperitoneal adhesion due to previous operation for prostate cancer converted to open laparotomy because of venous bleeding. Other complications were a spermatic cord injury case and a postoperative seroma case needing percutaneous puncture. There were no incisional hernia nor wound infection.
Conclusion: The operation scar is less visible than conventional TAPP or SILS-TAPP, and there is no difference between our POP-SILS-TAPP and CLA in operation time and complication rate. The POP-SILS-TAPP is demonstrated as a novel minimally invasive approach of laparoscopic groin hernia repair.

AS22-4

Transumbilical single-incision laparoscopic transabdominal preperitoneal hernioplasty with homemade port: 20 cases report

Qi-long Chen, Xiao-yan Cai, Di-yu Huang
Department of General Surgery, Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University, China

Objective: To evaluate the safety and feasibility of transumbilical single-incision laparoscopic transabdominal pre-peritoneal hernioplasty (TUSI-TAPP) with a homemade port for inguinal hernia.
Methods: We treated 20 cases (12 unilateral and 8 bilateral inguinal hernia cases) of TUSI-TAPP with conventional laparoscopic instruments and homemade ports which composed of a wound retractor, surgical gloves and 3 ordinary trocars. Clinical data and follow-up results were collected and analyzed retrospectively.
Results: All 20 patients received TUSI-TAPP uneventfully. The median operating time for 12 unilateral cases was 90.0 (55-175) min, the median blood loss was 5.0 (2-10) ml and the median postoperative hospital stay time was 2.0 (1-3) d. The median operating time for 8 bilateral cases was 105.0 (100-145) min, the median blood loss was 7.5 (5-10) ml and the median postoperative hospital stay time was 3.0 (2-4) d. All the 20 patients had minor postoperative pain which measured on a visual analogue scale and no post-operative complications were noted. Additionally, umbilical incisions proved cosmetically favorable as scars were not readily visible. Patient wounds healed without issue and at 12-month follow-up no hernia recurrences or complications were noted.
Conclusions: Our initial impression concerning TUSI-TAPP with a homemade port is a safe and efficient procedure with a favorable cosmetic aftermath. This method can simplify the TUSI-TAPP with available equipment and easy applied in basic hospitals.

AS22-5

A shift to single-port TEP from 3-ports TAPP

Manabu Amiki, Masato Yamasaki, Yuki Tomizawa, Ryota Sakon, Takahiro Inoue, Syun Sato, Masataka Oneyama, Ryo Ota, Kazuhiro Narita, Manabu Goto
Department of Surgery, Kawasaki Saiwai Hospital, Japan

Introduction: After experiencing about 100 cases of 3-ports transabdominal preperitoneal (TAPP) technique, I began to perform single-port totally extraperitoneal (sTEP) technique. Initially, I had a hard time with unique development of the view and operation of the forceps in sTEP, but after 15 cases, I mastered the style. I report my experience of shifting from TAPP to sTEP.
Patients: Included are 15 cases of TEP that we performed from August 2015 to June 2016. All patients were men.
Method: I made a 2cm incision at the umbilicus, inserted an FF mini-type Lap Protector, installed an EZ Access, and inserted three 5mm EZ trocars. The forceps were operated with cross technique rather than parallel technique, mainly using straight forceps.
Results: Median operation time was 57.5 minutes. Two cases were shifted to TAPP because of peritoneal damage and postoperative adhesions. The average length of postoperative hospital stay was 2.0 days. Seroma developed in 4 patients and postoperative hematoma in one patient, but all complications were resolved with medical treatment. There were no other serious complications or recurrences of hernia. I did not experience a learning curve in terms of operation time, but as I gained experience, I became used to the cross technique and felt less stress over parietalization or mesh placement.
Conclusion: If one has TAPP experience, sTEP can be mastered within a few cases. I think that learning the cross technique is important when overcoming the movement restrictions of sTEP.

AS22-6

Clinical Characteristics of Spermatic Cord Lipomas

Min Chung
Department of Surgery, Gil Medical Center, Republic of Korea

Lipoma of the spermatic cord is incidentally found during inguinal hernia repair. When correcting inguinal hernia, laparoscopic surgeons are concerned about spermatic cord lipoma, which can cause postoperative inguinal bulging. This clinical review describes prevalence, proper management, and importance of spermatic cord lipoma. Inguinal hernia repair cases between December 2009 and July 2015 were reviewed via electronic medical record system. Repairs were undertaken via open technique. Sex, weight, height, BMI, type of hernia and location of hernia were compared to identify clinical characteristics of spermatic cord lipomas.

AS22-7

LAPAROSCOPIC REPAIR IN FATTY INGUINAL HERNIA

Abdullah Aldohayan[1], Fahad Bamehriz[2], Omar Al-Obaid[3]
[1]*Bariatric Surgery, King Saud University Hospital, Saudi Arabia*
[2]*Bariatric Surgery, Fahad Bamehriz, Saudi Arabia*
[3]*Bariatric Surgery, Omar Al-Obaid, Saudi Arabia*

Background and Objective: Inguinal hernia is abnormal protrusion of intra-abdominal tissue through abdominal defect in the groin, with sac containing bowel or omentum. Hereby we reporting an inguinal hernia with sac loaded with extra peritoneal fat creating abdominal defect in the groin.
Method: Standard laparoscopic examination of the inguinal hernia revealed defect either medical or lateral of inferior epigastric vein in 3 patients no defect is noticed however, pre-operative diagnosis is confirmed. Dissection of the peritoneum revealed the SAC and defect. Optilene mesh is 15x15cm polypropylene to cover the defect.
Results: During 3 years of Laparoscopic op 3 patients has that type of hernia, one indirect and 2 direct inguinal hernia.
Conclusion: In the presence of clinical diagnosis and absence of Laparoscopic of defect finding, dissecting the peritoneum is needed to avoid second operation. Fatty inguinal hernia is new laparoscopic finding will encounter surgeon in the future and should be in mind during laparoscopic management of symptomatic hernia.

AS22-8

Sacless groin hernia. Should it be treated as a true hernia? About 7 cases and review of literature

Bouchiba Nizar, Tamer Elbakery, Ahmad Elfaki, Mohamed Soliman Elakkad
Department of Surgery, Al Wakra Hospital Hamad Medical Corporation, Qatar

Introduction: The dogma of considering that a groin hernia is present only when a peritoneal sac is identifiable is now abandoned since many cases of hernias with intact peritonea was reported especially after the generalization of laparoscopic approach. The etymology used to describe these findings varies from sacless hernia, to sliding fatty hernia or lipoma of the cord and round ligament. It is a surprising situation for the surgeon and the management is still controversial, for certain authors the resection of the lipomas with mesh repair must be the rule, others prefer the conservative management for anatomical and medico-legal reasons.
Case reports: The authors report about 7 cases (6 men and 1 women, with an average age of 41) operated with the diagnosis of groin hernia (4 right side, 2 left side and 1 bilateral). 2 patients by open technique and 5 patients by laparoscopic approach (one of them robotic -assisted).Preoperatively 3 patients had only clinical assessment, 4 patients were investigated by ultrasound and 2 patients had groin MRI. During the surgery no peritoneal sac was found .A conservative management was decided in 2 cases, 4 patients had a mesh repair, and one had excision of lipoma without mesh placement. Through the result of this short case series and a review of literature the authors will discuss the optimal management of these kinds of hernias, the best preoperative investigations and the surgical options according to the particularities of each case.

AS23-1

Anterior hernia repair is better than laparoscopic hernia repair

Takehiro Hachisuka
Department of Surgery, Yokkaichi Municipal Hospital, Japan

Introduction: Tension free hernia repair using polypropylene mesh was introduced by Lichtenstein in 1970's. In our institution, mesh plug technique was introduced in 1995 and the results are feasible as previously described. In 2010 anterior preperitoneal technique using PolySoft was introduced to direct hernias. In 2012, laparoscopic hernia repair (TAPP) was introduced to bilateral patients and young adults. From our experiences of more than 4000 cases of groin hernia repair, we insist that anterior hernia repair is much better than laparoscopic repair, except some selected cases.
Methods and Results: Laparoscopic repair (TAPP) is only indicated to the patients of bilateral groin hernia and the young adults of younger than 70 y. o. who need quick recovery to physical labor. To the indirect cases of less than 2cm-hernia defect, mesh plug technique using Light Perfix Plug is performed. To direct and large indirect cases, anterior prepertoneal technique using PolySoft is performed. The results are both acceptable.
Cost: In Japanese medical system, the medical fee of laparoscopic repair is 4 times as much as anterior repair. I do not deny the advantages of laparoscopic hernia repair, I insisit that surgeons should select the appropriate patients to more expensive technique, because from the standpoint of economics, 4-fold cost should bring 4-fold benefits.
Conclusion: Considering all factors in hernia surgery, anterior hernia repair is better than laparoscopic hernia repair. Surgeons try to find the most appropriate cases for laparoscopic repair.

AS23-2

Outcomes after Inguinal Hernia Repair: A Singapore Institution's Experience

Aung Myint Oo[1], Bodi Chinna Rao[2], Tian Qin Cao[2], Kaushal Sangvi[1], Aaryan Koura[1], Jaideepraj Rao[1]
[1]*Department of General Surgery, Tan Tock Seng Hospital, Singapore*
[2]*Yong Loo Lin School of Medicine, National University of Singapore, Singapore*

Background: The main aim of this study is to investigate whether there are significant differences in outcomes between laparoscopic and open inguinal hernia mesh repair in a Singapore institution.
Methods: This is the retrospective study of 435 patients who underwent inguinal hernia mesh repair from Jan 2014 to Dec 2014 in Tan Tock Seng Hospital, the second largest general hospital in Singapore.
Results: Majority of the patients were male (95.4%, n=415) and most of the hernias were unilateral (82.8%, n=360). 94.5% (n=411) of the repairs were done as elective surgeries. Of the unilateral hernias, 66.1% (n=238) were indirect, 23.6% (n=85) were direct and 10.3% (n=37) were pantaloon hernias. 44.8% (n=195) of all repairs were laparoscopic repairs, while 55.2% (n=240) were done using the open approach. Open repair resulted in overall longer operating time (89.0 minutes vs 84.9 minutes, p= 0.215) and greater post op pain (19.6% vs 14.9%, p = 0.207), while laparoscopic repair resulted in higher rates of seroma and haematoma formation (7.9% vs 17.9%, p = 0.002) as well as higher recurrence rates (1.7% vs 2.6%, p = 0.523). The overall recurrence rate was 2.1% (n=9).
Conclusion: The outcomes of laparoscopic and open repair were mostly comparable except for higher rates of seroma and haematoma formation in laparoscopic repair.

AS23-3

Clinical Comparison of Transabdominal Prepenitoneal Approach versus Conventional Open Procedure for Inguinal Hernia

Hiroaki Shiraishi, Takeshi Yano, Shigeaki Aihara, Kazuhide Kumagai
Department of Surgery, Asoka Hospital, Japan

Purpose: We compared to clear the advantage of TAPP with conventional open procedure.
Material and Method: We had 52 conventional cases and 89 TAPP cases. TAPPs were separated at the half and decreased tacks within 5 pieces in the second half.
Result: A corona mortis injury was looked in Conventionals. A testicular artery injury and a bladder injury were looked in the first half. We didn't look such intraoperative damages in the second half. But there was no difference. Wound infection was appeared in 5.8% of Conventionals. But it couldn't see in TAPPs. (p=0.04) Subcutaneous hematoma was appeared in 5.8% of Conventionals. But it couldn't see in TAPPs. (p=0.04) The first half of seroma was shown in 9.1% and the second half showed in 17.8%. But it couldn't see in Conventionals. (p<0.01) Conventionals had chronic pain in 15.4%. The first half had it in 4.5% and second half had in 8.9%. There was no difference in TAPPs. But chronic pain of the first half was obvious lesser than Conventionals. (p=0.08 OR 3.8) Conventionals had discomfort in 13.5%. The first half had it in 9.1% and the second half had in 4.4%. Discomfort of the second half was lesser than the first half. (p=0.38 OR 2.2) Further it was obviously lesser than Conventionals. (p=0.13 OR 3.3)
Conclusion: TAPP could undergo safely and reduce chronic pain and discomfort. Decreasing tack could reduce discomfort.

AS23-4

Tension-Free Inguinal Hernia Repair: a Retrospective Study in Single Center

Yun Ling, Hao Liu
Department of General Surgery, the First Affiliated Hospital, Medicine College of Xi'an Jiaotong University, China

Rencently, a retrospective review is conducted among 669 patients with tension free herniorrhaphy. The laparoscopic group including 145 patients has longer operation time, and the open herniorrhaphy group including 554 has longer hospital stay. Two of recurrence which were operated by laparoscopic surgery and the other fifteen were open surgery, but no statistically significant between two groups. There were eight laparoscopic surgery patients and nineteen open surgery patients complaining of incision discomfort, but did not reach statistical significance. Four postoperative scrotal hydrocele cases were in the laparoscopic group and two cases were in the open group, there are significant difference between two groups. Twenty-one laparoscopic surgery patients and seventy open surgery patients suffering from postoperative chronic pain, but also have not statistical significance. Compare Bard-3DMax mesh with Anatomical Mesh, both the recurrence rate and operation time have no statistically difference, but the incision discomfort was higher in the anatomical mesh. The Bard-3DMax mesh group has longer hospital stay. Plug-mesh, Modified Kugel mesh and Self-Gripping mesh, three groups of the mean operative time have no statistical significance. The hospital stay of self-gripping mesh group was significantly less than other two groups, and the plug-mesh group was the longest, following MK group. In terms of recurrence and postoperative complications, three kinds of mesh had no statistical difference.
Laparoscropic herniorrhaphy is as effective as the open tension free herniorrhaphy in inguinal hernia repair surgery, and it has shorter length of hospital stay. Different meshes have no significant difference in recurrence and postoperative complications.

AS23-5

Laparoscopic transabdominal preperitoneal repair versus mesh plug repair for bilateral primary inguinal hernia: a retrospective observational study

Yuichi Takayama, Yuji Kaneoak, Atsuyuki Maeda, Yasuyuki Fukami, Takamasa Takahashi, Shunsuke Onoe, Masahito Uji
Department of Surgery, Ogaki Municipal Hospital, Japan

Background: A few studies comparing laparoscopic and open techniques reported that an open repair with mesh is the optimal operation for unilateral primary hernia. The aim of this study is to compare the outcome of laparoscopic transabdominal preperitoneal repair (TAPP) versus mesh plug repair (MP) for bilateral primary inguinal hernia.
Methods: This was a retrospective study of 102 patients with bilateral primary inguinal hernia between January 2008 and July 2016. Of these patients, 43 underwent TAPP under general anesthesia, while 59 underwent MP under local anesthesia. Clinical characteristics and surgical outcomes were compared between TAPP and MP.
Results: In the TAPP group, patients were significantly younger (64 ± 13 vs 74 ± 10 years, p<0.001) and there were less patients with comorbidity (40 vs 64%, p=0.013). There was no difference in the operation time (101 vs 92 min, p=0.082) and the incidence rate of postoperative complications (12 vs 12%, p=0.97) between the two groups. Recurrence occurred in 1 patient (1.2%) in the TAPP group and 5 patients (4.2%) in the MP group (p=0.17). Wound infection occurred in 1 patient (0.9%) in the MP group. At one month after surgery, there were less patients with pain in the TAPP group (16 vs 31%, p=0.093) and less patients with medication of analgesics (4.7 vs 15%, p=0.074).
Conclusion: TAPP for bilateral primary inguinal hernia is a safe and feasible procedure without increase in operation time, and rates of complication and recurrence.

AS23-6

A prospective comparison of preperitoneal tension-free open herniorrhaphy with laparoscopic preperitoneal herniorrhaphy for the treatment of femoral hernias

Shuo Yang, Ying-mo Shen, Jie Chen
Department of Hernia and Abdominal Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: Though many techniques exist for hernia repair, controversy still exists as to the best management of femoral hernias. Thus, we compare the open preperitoneal approach with the laparoscopic technique for the surgical treatment of femoral hernias.
Methods: In this prospective study, 70 patients with primary unilateral femoral hernias were assigned randomly to a open preperitoneal group (n = 35; 8 males, 27 females) and a laparoscopic group (n = 35; 10 males, 25 females). EasyProsthesis MESH-D10 and EasyProsthesis MESH 15×15 (TransEasy Medical Technology Co., Ltd., China) were used, and all operations were performed by the same surgical team. Patients demographics, recurrence rate, duration of hospital stay, and complications were recorded. The duration of follow-up ranged from 6 months to 24 months.
Results: There were no differences between the groups with respect to surgical time, recurrences, postoperative duration of stay, or wound infection rate. There were no postoperative pain (visual analogue score>4, lasted 3 months) in the laparoscopic group, whereas there were 3 cases (8.6%) in the open group. In the laparoscopic group, there were 5 cases (14.3%) of seroma that occurred 3 and 7 days after operation and lasted 1 month. In the open group, 1 case (2.9%) of seroma occurred 7 days after operation.
Conclusions: Laparoscopic preperitoneal herniorrhaphy appears to be associated with a decreased postoperative pain and a major incidence of seroma formation compared with the open technique in the repair of femoral hernias.

AS24-1

The influence in chronic post-herniotomy pain and quality of life with fixation versus no fixation of mesh in TAPP hernia repair

Wei-ming Li, Da-li Sun, Shu-min Li, Yun-yun Cen, Peng-yuan Xu
Second Affiliated Hospital of Kunming Medical University, Department of Gastrointestinal Surgery, China

Aim: To demonstrate the influence in chronic post-herniotomy pain and quality of life (QOL) with fixation versus no fixation of mesh in TAPP repair. The incidence of chronic post-herniotomy pain and recurrence rate in the follow-up after 6 months were evaluated.
Methods: 72 adult patients with uncomplicated inguinal hernia were randomized into fixation group or non-fixation group. Data analysis included all patients who underwent inguinal hernia surgery at our surgical department within the period from October 1, 2015 to July 31, 2015, who fulfilled the inclusion criteria. Standard surgical technique was used. Return to activity, chronic groin pain and recurrence rates were assessed. QOL was assessed in all patients pre-operatively and at 6 months post-operative follow-up. SF-36 version2 questionnaire was used for QOL assessment.
Results: Seventy-two completed follow-up of 6 months, 40 in non-fixation group and 32 in fixation group. The incidence of moderate to severe chronic groin pain (which was taken as a VAS score ≧ 3) was less in non-fixation group than in fixation group at 6 months post-operative. There was no difference in QOL scores at pre-operatively. But QOL scores was higher in non-fixation group than in fixation group at 6 months post-operative, there was no recurrence in the two groups.
Conclusion: Fixation of the mesh for TAPP repair unnecessary. TAPP repair with no mesh fixation is safe, reduce the incidence of postoperative chronic pain and improve the quality of life.

AS24-2

Chronic Post-Operative Pain Strongly Correlates With Patch Fixation Method Used in Tension-Free Inguinal Hernias Repair Under Local Anesthesia

Chang-fu Qin[1], Jie Chen[1,2], Ying-mo Shen[1]
[1] *Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China*
[2]*Department of Gynecology & Obstetrics, Beijing Chao-Yang Hospital, Capital Medical University, China*

Objective: To identify factors associated with post-operative chronic pain in tension-free inguinal hernia repair under local anesthesia.
Methods: The data of 2875 cases of tension-free inguinal hernia repair under local anesthesia, performed in our Hospital from January 2013 to May 2015, were retrospectively analyzed.
Results: A month later, among the 2875 cases, a total of 83 (2.89%) patients reported post-operative pain; Three months later, only 2 cases sill have pains, and the occurrence rate is 0.69%. All the patients with pains have not last over 6 months. Age, gender, type of hernia, occurrence of complications and pre-existing underlying diseases showed no correlation with chronic post-operative pain, while the patch suture fixation method showed significant correlation (P<0.001). Four fixation methods were used: 7-stitch patch fixation (729 cases), 5-stitch patch fixation (622 cases), 3-stitch patch fixation (743 cases), and 0-stitch (bio-gel) patch fixation (718 cases). There were 41, 23, 15, and 4 post-operative pain cases in these groups, corresponding to incidences of 5.62%, 3.36%, 2.02% and 0.56%, respectively. Significant differences in post-operative pain incidence was found among the groups (P<0.001 for 7-stitch group vs. 3- and 0-stitch groups; P<0.001 for 5- or 3-stitch group vs. 0-stitch group). The stitch-free method did not increase postoperative complications.
Conclusion: Multiple factorial analyses demonstrated that patch fixation method is an independent risk factor for chronic pains after tension-free inguinal hernia repair under local anesthesia. Therefore, selection of appropriate patch suture fixation could reduce the incidence of chronic pain.

AS24-3

Treatment of patients with chronic pain after inguinal hernia repair with ultrasound guided radiofrequency ablation: a retrospective analysis of 6 cases

Xue-dong Xu, Wei-guo Zhang, Jia Wang, Yu-wen Li, Zhong-hui Deng, Wei-de An
Department of Surgery, The First Affiliated Hospital of Dalian Medical University, China

Objective: To explore the value of clinical application of ultrasound guided radiofrequency ablation in the treatment of chronic pain after inguinal hernia repair.
Methods: To review and analyze the clinical results and follow-up results of 6 patients with chronic pain after inguinal hernia repair, who were treated by ultrasound guided radiofrequency ablation from January 2015 to July 2016.
Results: 6 patients with chronic pain after inguinal hernia repair were treated by ultrasound guided radiofrequency ablation. Pain in 5 cases of them were significantly relived. Complications of hematoma appeared in 1 case, and then operation was performed to remove the hematoma and to place drainage. The pain was significantly relieved at last.
Conclusion: Patients with chronic pain after inguinal hernia surgery can be treated with ultrasound guided radiofrequency ablation, which can reach a curative effect. Complications such as hematoma need to be noticed.

AS24-4

A Meta-Analysis of Postoperation Chronic Pain in Inguinal Hernia Repair Used Material Reduced Mesh Based on Chinese Data

Li-ming Tang
Department of Surgery, Shaoxing People's Hospital, China

Objective: To investigate the influence of the material reduced mesh on the postoperation chronic pain in inguinal hernia repair based on Chinese date.
Methods: We retrieved the data from Chinese Knowledge Resource Integrate Database and China Science and Technology Journal Database (between January 1989 and May 2016), such as database and cross check the documents, sieved into Chinese literature at the beginning of 217, which compared material reduced mesh group and highweight mesh group used in inguinal hernia repair. The Meta-analysis was performed using RevMan 5.0 software.
Results: A total of 2006 patients from 14 articles, were included into the study. The incidence of postoperative chronic pain was 14.0% (172/1226) in the highweight mesh group, was significantly higher than the material reduced mesh group (5.9%, 78/1313), Close and the OR value of 0.31 (95% CI: 0.23 ~ 0.43), difference have statistical learning means (P < 0.00001).
Conclusion: Use of lightweight mesh in selection inguinal hernia repair was associated with reducing the incidence of postoperative chronic pain.

AS24-5

The causes and prevention of chronic pain after inguinal hernia repair

Jun-sheng Li, Zhen-ling Ji
Department of General Surgery, Zhongda hospital, Southeast University, China

Background: Patients' chronic pain (CP) has become the most important outcomes after hernia surgery.
Methods: We searched data regarding the cause and prevention of CP from Pubmed.
Results: Neuropathic pain is the most important factor. It was reported the classical described nerve course in textbook was present in only about 50% patients. And one of the three important nerves absent is also not uncommon. Several methods have been proposed for the reduction of chronic pain. And the update guideline showed no difference in the development of postoperative chronic pain between ilioinguinal nerve cutting and sparing; Nerve neurolysis may cause pain in Lichtenstein repair. Less chronic pain was associated glue fixation method in open procedure, furthermore, the penetrating fixation methods, such as suture, tack or staple may increase the incidence of chronic pain. However, self-gripping mesh failed to confirm the advantage of this mesh in terms of chronic pain. The use of lightweight mesh was reported to be associated with less postoperative pain, and without increase the incidence of recurrence, although some reports failed to prove this result.
Conclusion: Surgeons should acknowledge and identify the anatomical variation of the vital nerves, use the surgeon's most experienced technique and choose the proper mesh to accomplish the procedure.

AS24-6

Lightweight or Middleweight? A retrospective study on the choice of mesh in the open hernia repair

Ji-wei Yu
Department of General Surgery, Shanghai Ninth People' Hospital, Shanghai Jiao-tong, China

Objective: To compare the therapeutic benefits of the light-weight and middle-weight mesh used in the open hernia repair.
Methods: A total of 145 cases of inguinal hernia repair with non-stress in our department from 2011 to 2014 were retrospectively investigated. Two kinds of operations using the lightweight or the middleweight mesh were performed. At 3 mo., 6 mo. and 1 yr after operation, the patients were assessed for chronic pain, foreign body sensation, groin discomfort, uncomfortably pulling sensation by questionnaire and clinical examinations.
Results: The recurrence rates in the LWM group and the MWM group were respectively 1.67% and 1.09%. At 3 and 6 mo. after operation, no significant difference could be respectively identified in the incidence of chronic pain, groin discomfort, uncomfortably pulling sensation and foreign body sensations. At 1 yr after operation, between the LWM and MWM group, there was no significant difference in the VAS score, the incidence of chronic pain (8.51% vs 12.50%), foreign body sensation (4.26% vs 12.50%) and uncomfortably pulling sensation (6.38% vs 5.35%). The incidence of discomfort in inguinal region in the light-weight mesh group was significantly lower than the middle-weight mesh group (P = 0.021).
Conclusion: This study showed that the application of LWM was safe and effective in the open hernia repair, and it could significantly reduce the incidence of discomfort in the inguinal region at 1 year's follow-up. The pore size of the mesh might play a greater role than the weight did.

AS25-1

Are non-crosslinked biologic mesh effective for laparoscopic inguinal hernia repair: Results of a multicenter, non-randomized controlled study

Jian Zhang[1,2], Gan Yao[3], Zhi-chao Tian[1], Wei-xing Yu[5], Hai-yang Zhou[1], Wen-yue Cheng[2,4], Rong-jia He[6], Qiang Wang[1,2,4], Zhi-qian Hu[1]
[1]Department of Surgery, Shanghai Chang Zheng Hospital, Second Military Medical University, China, [2]Department of Regenerative Medicine, Shanghai Zhabei District Central Hospital, China
[3]Department of General Surgery, Foshan First People's Hospital, China, [4]Department of General Surgery, Shanghai Zhabei District Central Hospital, China
[5]Department of Urology, Shangyu People's Hospital, China, [6]Department of General Surgery, Zhongshan People's Hospital, China

Introduction: The effectiveness of non-crosslinked biologics for laparoscopic inguinal hernia repair (IHR) is under controversies and most surgeons usually treat them in accordance with the principles to non-absorbable prosthesis. We aimed to determine the long-term hernia recurrence and other clinical data, as well as the preferred implantation position following use of small intestinal submucosa (SIS) compared to lightweight polypropylene for laparoscopic IHR.
Methods: Multicenter, non-randomized controlled study was performed from 05/2012 to 04/2015. 724 hernias, including patient and hernia data, peri- and post-operative clinical data were prospectively evaluated in 6 groups: TEP with SIS (150-indirect, 128-direct), TEP with polypropylene (149-indirect, 150-direct), IPOM with SIS (112-indirect, 35-direct).
Results: Median follow-up exceeded 30 months with all greater than 18 months. There was no significant difference between the patients and the hernia parameters in each group except higher ratio of primary-recurrent in IPOM ($P<0.05$). Compared to polypropylene, using SIS for TEP indirect IHR showed equivalent data in operation time, seroma formation, surgical site infection, incidence of recurrence and postoperative pain, however higher rate of postoperative feve r ($P<0.01$). More recurrence occurred in TEP direct IHR with SIS compared to polypropylene (3/128 vs 0/150), and in IPOM with SIS(2/112 for indirect, 5/35 for direct) than TEP regardless of hernia type. All the recurrence was recorded within 14-months postoperatively, without tissue regeneration in hernia defect area because of poor blood supply.
Conclusion: The application of non-crosslinked biologics in laparoscopic IHR is safe, but cautiously applied for huge direct hernia. To obtain a good blood supply, recommend extraperitoneal implantation of non-crosslinked biologics.

AS25-2

Compare the outcomes of porcine small intestinal submucosa after being implanted in different layers of rat's abdominal wall

Rui Tang
Department of General Surgery, East Hospital Affiliated to Tongji University, China

Obejictive: This animal study was underwent to investigate the outcomes of porcine small intestinal submucosa (PSIS) after being implanted in different layers of rat's abdominal wall.
Methods: The 1cm×2cm SIS meshes were implanted in different layer of abdominal wall in rats (Onlay, Sublay and Underlay).The rats were harvested at week 1, 2, 4, and 9 after implantation. General state and histological response of the animals were observed.
Results: All animals survived without infection and hematoma formation. Three cases of seroma were found only in Sublay group. No obvious reject reaction was observed in all three groups, while the macrophages invasion in Underlay group was stronger than that in the other two groups at 1, 2 and 4week after operation ($p<0.05$). The revascularization of abdominal wall was better in Sublay group compared the other two groups at 1week after operation ($p<0.05$), there was no significant statistical difference at 2, 4, and 9 week after operation ($p>0.05$). Collagenous tissue at the Underlay group was shown slightly disorganized when comparing with the other two groups at 4 week. Well organized collagen was observed at onlay group compared to the other two groups and the collagen amount was abundant at sublay group vs the other two at 9 week time point.
Conclusion: As a biological material, PSIS is biodegradable, biocompatible and is good fortissue regeneration. The outcomes of SIS after being implanted in different layer were different due to the variety of microenvironments.

AS25-3

Application of decellularized muscular matrix scaffolds in abdominal wall defects

Zhi Yang, Zhi-cheng Song, Jian-jun Yang, Xin Nie, Yan Gu
Department of General Surgery, Hernia and Abdominal Wall Disease Center, Shanghai Ninth Hospital, Shanghai JiaoTong University School of Medicine, China

Acellular biomaterials prepared from the extracellular matrix of mammalian tissues are increasingly being used in abdominal wall reconstruction but still have certain shortcomings. The present study describes a decellularization protocol to generate porcine-derived decellularized muscular matrix (DMM), a scaffold in which cellular components are effectively removed, retains an intact 3-D architecture as well as biochemical components and mechanical properties. When implanted in a defective rat abdominal wall, the DMM induced tissue remodeling and supported the reconstruction of functional skeletal muscle tissue as compared to porcine-derived acellular dermal matrix. These results show that DMM can serve as a clinically useful material for abdominal wall defect and hernia repair.

AS25-4

Carrying active VEGF to improve early vascularization of porcine small intestinal submucosa in abdominal wall defect repair

Rui Tang
Department of General Surgery, East Hospital Affiliated to Tongji University, China

Biological meshes such as porcine small intestinal submucosa (SIS) have exhibited excellent potential for the repair of abdominal wall defect. However, insufficient early neovascularization post-operation is thought to be the main reason of surgical failure. The controlled release of exogenous angiogenic growth factors (GFs) from biocompatible carriers is a feasible way to overcome this limitation. Electrospun fibrous membranes are superior carriers for protein delivery but GFs are highly impressible to be deactivated. In the present study, dextran nanoparticles (DNPs) loaded with vascular endothelial growth factor165 (VEGF) were pre-formulated by aqueous-aqueous freezing induced phase separation method and then electrospun into poly (lactic-co-glycolic acid) (PLGA) polymer fibers to protect the bioactivity of VEGF in a sustained way. The prepared VEGF/DNPs-PLGA membrane was sandwiched by dual-layer SIS to construct a SIS-DNPs/VEGF-PLGA-SIS (SVDPS) composite scaffold. The bioactivity maintenance of VEGF was tested by promoting HUVECs proliferation and early therapeutic neovascularization. Meanwhile, the collagen deposition and mechanical strength of repaired abdominal wall were evaluated. In the in vitro study, the VEGF/DNPs-PLGA showed higher VEGF encapsulation efficiency (50%), better release property (20 days) and bioactivity (demonstrated by enhanced HUVECs proliferation) than the emulsion electrospun VEGF-PLGA and PLGA fibrous membranes. The in vivo study showed that the SVDPS composite scaffold promoted significantly higher early therapeutic neovascularization within 2 weeks postimplantation than SIS-VEGF-PLGA-SIS (SVPS) and SIS-PLGA-SIS (SPS). Meanwhile, the SVDPS group obtained more collagen deposition and increased mechanical strength than SVPS and SPS group.

AS25-5

The feasibility study of acellular matrix graft that used in treating incarcerated inguinal hernia with laparoscopic technique

Shuo Yang
Department of Hernia and Abdominal Wall Surgery, The feasibility study of acellular matrix graft that used in treating incarcerated inguinal hernia with laparoscopic technique, China

Background: Incarcerated inguinal hernia is an emergency situation in clinical which need surgical intervention. Laparoscopic technique is one of the operating methods to choose, however, it is still controversial about the mesh used in the operation. We tried to choose acellular matrix graft and explore its applied feasibility.
Methods: there were 13 indirect inguinal hernia patients that accepted repair of transabdominal preperitoneal prosthetic (TAPP) included in the study from Jan. 2014 to Jun. 2015. All patients had no necrosis of incarcerated contents and no need to excision. We chose the acellular matrix graft mesh (8×12cm) to repair defect and medical adhesive to fix the mesh, intraperitoneal drainage tube was placed after the operation. The same surgeon team finished the operation, the recurrence rate, length of stay (LOS), time of operation and return to work and complications were recorded and the follow up time were 6-18 months.
Results: All operation was completed successfully and there was no recurrence, the operation time was 41.9 ± 4.3 min (range 35-50 min), LOS was 3.7 ± 1.0 d (range 3-6 d), time of return to work was 7.1±1.7 d (range 5-10 d), no patient got postoperative pain. One patient had a fever and leukocyte increase and got cured after three-day cephalosporin antibiotics. Postoperative seroma were found in two patients, we punctured the hydrops to treat.
Conclusions: The acellular matrix graft with laparoscopic technique is a safety and feasible way in the treatment of incarcerated inguinal hernia.

AS25-6

The application of biological mesh in Transabdominal laparoscopic inguinal hernia repair for young male

Hui-qi Yang
Department of General Surgery, Beijing United Family Hospital, China

Background: The issue of male infertility and mesh related complications raises more concern in hernia repair for young male. The adhesion caused by synthetic mesh to spermatic cord is the fear. Compare to synthetic mesh, biological mesh is considered to have better biocompatibility and better bacterial clearance. In this study, a series of patients who underwent laparoscopic transabdominal pre-peritoneal (TAPP) hernioplasty with biological mesh were evaluated respectively.
Aim: To present our initial experience on the application of biological mesh in TAPP for young male, especially focus on the feasibility of technique and mesh related complications.
Method: From 2013 to 2016, 12 cases of TAPP with biological mesh (Surgisis, Cook) were performed. The mesh was fixed with interrupted PDS II Sutures at the following landmarks: Cooper's ligament, posterior rectus sheath, and the transversalis fascia.
Result: On average, the operation time was 80 (+/-10) min. The follow up time was 15.5months. All patients were managed as day case. There was no mesh related complications, such as rejection or infection. There was no recurrence.
Conclusion: Our initial experience showed that TAPP with biological mesh fixed with suture is feasible, effective and safe with good results. Even though the cost of the biological mesh is the consideration, it remains a good option for young patients due to the worry of side effect result from synthetic mesh. Of course, the longer follow up is needed to evaluate the long term result of biological mesh.

AS25-7

Laparoscopic Transabdominal Preperitoneal Repair of Inguinal Hernias Using Acellular Tissue Matrix Grafts

Bao-shan Wang, Ying-mo Shen, Fu-qiang Chen, Jie Chen
Department of hernia and abdominal surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: To explore the value and the clinical effect of laparoscopic transabdominal preperitoneal (TAPP) hernia repair with acellular tissue matrix grafts.
Methods: Clinical data of 36 cases of inguinal hernia who underwent laparoscopic TAPP hernia repair with ACTM grafts from January 2014 to January 2016 in Beijing Chao-Yang Hospital, Capital Medical University, were retrospectively analyzed. Postoperative complications and recurrences were recorded.
Results: Operations were completed successfully in all 36 cases and none was converted to open surgery. The mean operation time was (44.5±7.8) min (range 33-62 min) and the mean hospital stay was (3.5±1.5) d (range 2-7 d). The postoperative VAS pain score were (2.6±0.9) (range 2-4); there were 3 patient suffered fever and 5 patients suffered scrotal seroma. There were no complications such as wound infection and intestinal obstruction after operation. All cases were followed-up for 6-30 months (mean of 19.3±4.3 months) without obvious chronic pain, foreign body sensation and recurrence.
Conclusions: Laparoscopic TAPP repair of inguinal hernias using acellular tissue matrix grafts is safe and feasible, and has the advantages of minimal invasion, few complications and good postoperative comfortable feeling, without increasing the risk of recurrence. This technique is especially suitable to young patients with inguinal hernia who have the requirement of fertility.

AS25-8

Laparoscopic Repair of Inguinal Hernia using Phasix Mesh

Abdullah Aldohayan, F Bamehriz, S Althuwaini
Bariatric Surgery, King Saud University Hospital, Saudi Arabia

Background and Aim: Traditionally inguinal hernias are repaired using synthetic permanent mesh and synthetic complications may downgrade the mesh of the repair. Most of the post-operative recurrence occurred in the first year post-operatively. The introduction of phasix mesh (poy-4-hydroxybutyrate) which absorbable mesh in 14 months gives the chance to form layers of tissue to support the defect. Hereby, we report our initial experience of phasix in laparoscopic repairing of inguinal hernia.
Methods: Phasix mesh 15x15 is used to repair inguinal hernia laparoscopically in Medical City of King Saud University, Riyadh, Saudi Arabia.
Results: The techniques were done for 3 male patients in May 2016. The mesh is good to manipulate with good memory.
Conclusions: The mesh has the principal of tissue you need to use. Longer follow-up is needed to apply the phasix mesh repair in wider scale.

AS26-1

Laparoscopic hernioplasty of large ventral hernia with transfascial sutures: Short term utility and outcome

Rakesh K Gupta[1,2], Suresh Shah[1], Davide Lomanto[1]
[1]*Department of Surgery, B.P. Koirala Institute of Health Sciences, Nepal*
[2]*MISC, Dept. of Surgery, National University Hospital Singapore, Singapore*

Introduction: The laparoscopic approach to repairing ventral and incisional hernias has gained increasing popularity worldwide. The approximation of the hernia defect during laparoscopic ventral hernia repair, prior to mesh fixation, provides a more physiologic and anatomic repair. We reviewed the experience of laparoscopic repair of large ventral hernia (diameter 5cm) at a university hospital in the Nepal with particular reference to patients with massive defects (diameter 15cm) transfascial closure.
Methods: A total of 72 patients underwent laparoscopic ventral (incisional or umbilical/paraumbilical) hernia repair between July 2014 and June 2016.
Results: The prevalence of conversion to open surgery was 4.2%. The prevalence of postoperative complications was 15.3%. Median postoperative follow-up was 18.2 months. A total of 9.7% cases suffered late complications and 2.8% developed recurrence. Forty-two patients underwent repair of defects 10cm in diameter with no recurrence. Three patients underwent repair of 'massive' incisional hernia (diameter 15cm) with a prevalence of recurrence of 1.4%. Ten patients with a body mass index (BMI) 30kg/m2 (range, 3235kg/m2) underwent laparoscopic repair without any recurrence.
Conclusions: Laparoscopic ventral hernia repair with transfascial suturing can be carried out safely with a low prevalence of recurrence. It may have advantages in obese patients in whom open repair would represent a significant undertaking. Laparoscopic ventral hernia repair may be used in cases of large and massive hernias, in which the risk of recurrence increases but is comparable with open repair and associated with low morbidity.
Keywords: Ventral hernia; Laparoscopic repair; Transfascial suture

AS26-2

The decision about the mesh size in intraperitoneal onlay mesh Repair (IPOM-Plus)

Anri Maeda, Yuichiro Miyaki, Synya Tahara, Aina Kunitomo, Shunsuke Tamura, Hirotaka Yamamoto, Takashi Hamano, Shinichiro Ushida, Yasuyuki Kobayashi, Hiromichi Machida, Kazufumi Suzuki
Department of Surgery, Seirei Hamamatsu General Hospital, Japan

Objectives: This study aimed to evaluate whether before or after of hernia defect closure is thought to be best for the decision about the mesh size in intraperitoneal onlay mesh Repair (IPOM-Plus).
Material and Methods: The subjects were 11 patients receiving IPOM-Plus between June 2014 and Feburary 2016, who were made a follow-up CT after surgery. Hernia defect was closed with non-absorbable suture (Size1 Ethibond) at 1-1.5cm intervals, using Lapa-Her-Closure. The mesh size was choiced so as to plus 5cm outward from the hernia defect before closure. We measured the maximum distance of rectus abdominis muscles at follow-up CT after surgery for the index of dilation.
Results: 11 patients were included, 3 were males and 8 were females. Their ages ranged from 31.6 to 84.1 years (mean 68.9). Their BMI ranged from 19 to 31.8 years (mean 25.8). The average follow-up period after surgery was 299 days. The average distance of rectus abdominis muscles was 5.8cm, which was just about the average width of hernia defect before closure 6.0cm. In addition, seroma was observed in 2 patients.
Conclusions: This study demonstrated that although the hernia defects were closed tightly, many of those were dilated after surgery. For this reason, the mesh size should be choiced with consideration for the size of hernia defect before closure not after. In addition, seroma was observed in 2 patients, although this complication was reported at lower risk in IPOM-Plus.

AS26-3

Defect stabilization techniques in mesh repair of Ventral hernias

Kayomars B Kapadia
Department of Surgery, Hernia Society of India, India

This presentation focuses on hernia ring management in laparoscopic and open ventral hernia repairs.
To achieve a low recurrence rate, three principles should be followed-
A) Sublay mesh repair B) Adequate mesh size C) Stabilizing the hernia defect. The first two principles are usually taken care of but not the third.
Defect ring stabilisation can be done in the following ways.
1. Defect upto 3cm -Primary tension free suture closure of the defect with continuous 2-0 Nylon sutures.
2. Defects between 3-7cm (circular or oval)- Hernia ring sutured to the underlying mesh with interrupted sutures placed circumferentially around the defect margin using a hybrid technique.
3. Defects more than 7cm especially large oval defects with transverse diameter more than 7cm and length of any size- In addition to fixing the circumference of the defect to the mesh, the ring should be loosely darned so as to form a scaffolding or support for the underlying mesh. This prevents the mesh from bulging out through the defect.
4 For multiple Swiss cheese defects, a combination of the above techniques is to be followed- small defects closed primarily; larger defect edges fixed to the mesh circumferentially.
Thus the choice depends on the defect size and the judged tissue tension. If a large ring is not fixed, the mesh will 'tent-out' with time. This leads to a gradual enlargement of the ring, leading to recurrence.
Adopting these principles in the past 15 years, our recurrence rate have improved from 12 to 5%.

AS26-4

EXPERIENCE WITH CLOSURE AND NON CLOSURE OF DEFECT IN INCISIONAL /VENTRAL HERNIA REPAIR

Bhupinder Singh Pathania
Postgraduate Department of Surgery, Ascoms Medical College and Hospital Jammu India, India

Purpose: Problems in laparoscopic ventral and incisional repair still persist. In addition to recurrence and postoperative pain there are certain issues still need to be tackled such as seroma and post-operative body image satisfaction. Therefore the study was taken up to compare the safety and efficacy in Laparoscopic Ventral and Incisional hernia repair with and without closure of the hernial defect.
Methods: We could select exclusively patients in each group after matching, parameters of age group, range of defect size and body mass index (BMI) and divided into two groups with 30 patients in each group. In one group of patients group A, we closed the hernial defect using partial thickness tension free technique before placing the mesh and in the other group B, we directly placed the mesh over the defect.
Results: The mean defect size in-group A was 31.2 sq. cm and 32.4 in group B. In-group A, 14 patients were satisfied with their quality of life and only one patient was not satisfied and this was the case that had developed seroma. In-group B only 3 patients were satisfied with their quality of life but 12 patients were not satisfied. 8 of these had postoperative seroma and 4 patients complained of persistent bulge.
Conclusions: We concluded that laparoscopic repair of incisional and ventral hernias with closure of defect followed by mesh reinforcement is an acceptable technique and superior to non closure of defect.

AS26-5

Trans-Abdominal Pre-Peritoneal (TAPP) approach for ventral hernia repair: An innovative, simple, cost-effective laparoscopic technique

Priyank Chelawat
Minimal Access Surgery, Max Super Specialty Hospital, India

Laparoscopic Ventral Hernia repair (LVHR) with intra-peritoneal onlay mesh (IPOM) is a well-established procedure for the treatment of ventral hernias. However, it is not without its draw-backs. The intra-peritoneal location of mesh placement has resulted in the use of expensive mesh technology involving a plethora of materials as well as anti-adhesion barriers and coatings. Yet the problem of adhesions to the mesh persists and its sequelae such as intestinal obstruction, mesh erosion, fistulization and mesh migration are still being reported. The cost of barrier meshes and fixation devices available is prohibitive especially in developing countries, and is often the factor responsible for the denial of the benefits of laparoscopic surgery to the economically weaker sections of society.
In this study, we compare an innovative technique for the laparoscopic repair of ventral hernia i.e. Trans-Abdominal Pre-Peritoneal (TAPP) approach, that combines the ideal site of mesh placement i.e. pre-peritoneal plane with a mesh material that has stood the test of time i.e. polypropylene with conventional IPOM. The use of polypropylene brings down the costs significantly while avoiding the risk of intra-abdominal adhesions as the mesh is completely covered by peritoneum.

AS26-6

Long-term prognosis of laparoscopic ventral hernia repair and short-term results of hernia defect closure cases

Kanyu Nakano[1], Hitoshi Idani[1], Toshihiro Ogawa[1], Kazutaka Takahashi[1], Yasuhiro Komatsu[1], Soichiro Miyake[1], Naoki Mimura[1], Toshihiko Fujita[1], Daisuke Sato[1], Kento Mishima[1], Mitsumasa Yoshida[1], Masao Harano[1], Shigehiro Shiozaki[1], Norihisa Takakura[2]

[1]*Department of Surgery, Hiroshima Citizens Hiroshima City Hospital, Japan*
[2]*Department of Surgery, Fukuyama City Hospital, Japan*

We underwent laparoscopic ventral hernia repair for 128 patients from April 2002 to July 2016. 35 men and 93 women, average age 70.2 years old. We conduct transfascial suture with non-absorbable thread and tacking fixation under 3 ports. Conversion to an open repair was required in 7 cases. The mean operation time was 129 minutes. The complications were 5 seromas that needed treatment, four bleeding, two intestinal injury, two ileus, two liver damage, one mesh infection, one severe asthma attack and upper gastrointestinal bleeding and one port-site recurrence. During a median follow up period of 57 months, recurrence was noted on 5 patients (3.9%).
We performed the hernia defect closure for 24 patients for the prevention of a seroma, mesh infection, a recurrence and bulging, for hernia orifice transverse diameter 8cm or less from October 2013. There was one case that fixation of the mesh was not possible enough because working space became small after a hernia defect closure. We experienced another case that oral intake did not advance to by the pain of the defect closure site postoperatively. Other than them, the complications with the hernia defect closure were absent. The observation period is short, up to 33 months, but there is not the recurrence case to date. It is necessary to observe about the long-term prognosis carefully.

AS26-7

Laparoscopic primary ventral and incisional hernia repair - comparison of operative variables and outcomes

Saleema Begum[1], Muhammad Rizwan Khan[1], Asma Gulab[2]

[1]*General Surgery, Aga Khan University Hospital, Pakistan*
[2]*Aga Khan University, Pakistan*

Introduction: The superiority of laparoscopic repair of ventral and incisional hernia over open repair has been validated by many studies but there is paucity of literature comparing the outcomes of primary ventral versus incisional hernia repair by laparoscopic approach. The aim of our study was to review our experience of laparoscopic repair of primary ventral and incisional hernia and compare the operative variables and short-term outcomes.
Materials and Methods: We reviewed the clinical data of 121 patients who underwent laparoscopic ventral and incisional hernia repair from January 2014 to December 2015. Demographics, operative variables and short-term outcomes were compared by using independent sample t test and Chi-square test.
Results: Out of 121 patients, 46 (38%) underwent incisional hernia repair and 75 (62%) had primary ventral and recurrent hernia repair. Both groups were similar in terms of mean age, gender distribution and body mass index. Operating time ($p< 0.017$), extent of adhesionolysis ($p< 0.001$), and length of hospital stay ($p< 0.011$) were significantly higher in patients with incisional hernia. Intraoperative complications were more frequent in patients with primary ventral hernias ($p < 0.264$) while postoperative complications were more frequent in patients with incisional hernias ($p < 0.061$), but the difference was not significant. No recurrence was observed in postoperative period.
Conclusion: Laparoscopic incisional hernia repair was associated with longer operating time, extensive adhesionolysis, and hospital stay as compared to primary ventral hernias. However, there was no significant difference in complications and short-term outcomes in both groups.

AS28-1

Laparoscopic Transabdominal Preperitoneal Herniorrhaphy (TAPP) “How It Becomes the Better One”

Muhammad Iqbal Rivai

department of surgery, DR. M.Djamil Hospital, Indonesia

Two revolutions in the inguinal hernia surgery have occurred during the past two decades. The first was the introduction of tension-free open mesh repair (OMR) by Lichtenstein et al in 1989. The second revolution was the application of laparoscopic surgery during the early 1990s. A laparoscopic approach is particularly suited for the repair of bilateral or recurrent hernia. There are two standardized techniques for laparoscopic inguinal hernia repair (LIHR): (1) Trans-Abdominal PrePeritoneal (TAPP) and (2) Totally Extra-Peritoneal (TEP) repair. There are advantages and disadvantages of both TAPP and TEP procedures. The transabdominal preperitoneal (TAPP) approach provides an ideal opportunity to evaluate the contralateral side. Laparoscopic confirmation of normal inguinal anatomy without abdominal wall defects may avoid unnecessary anterior inguinal explorations. In addition, identification and repair of an occult contralateral defect can mitigate the need for subsequent herniorrhaphies should the patient become symptomatic There is no statistically significant difference regarding postoperative complications, particularly recurrence rates and chronic groin pain. It is generally believed that TAPP is easier to teach and learn, although there is no level 1 evidence in the literature to support this belief. We need to generate more data comparing TAPP and TEP by conducting randomized, controlled trials.

AS28-2

Application of Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal (TEP) Laparoscopic Techniques for Inguinal Hernia Repair: A Systematic Review and Meta Analysis

Ji-wei Yu
Department of General Surgery, Shanghai 9th People' Hospital, Shanghai Jiao-tong University School of Medicine, China

Aim: To evaluate the clinical outcome of Transabdominal Preperitoneal (TAPP) and totally extraperitoneal (TEP) laparoscopic techniques for primary inguinal hernia repair.
Methods: The inclusion and exclusion criteria were made as per the Cochrane Collaboration, then the mean database was searched to find the relevant random control trials (RCTs) about the two laparoscopic inguinal hernia repair methods, TAPP and TEP. Finally, the quality of the including literatures was assessed and a meta analysis was carried out.
Results: Eventually, 7 RCTs including 915 patients are involved in the meta analysis, of which 481were in TAPP group and 434 in TEP. After the quantitative comparison between TAPP and TEP group, no significant difference between the two group in operation time, postoperative hospital stay, time return to family life, time return to work, pain at 1 hours postoperatively (P=0.19), incidence of postoperative complications (wound infection (P=0.11); groin paresthesia (P=0.54); urinary retention (P=0.33); recurrence (P=0.69)) and cost(P=0.51) has observed. But the pain scores of TEP at 24 hours and 1 week postoperatively (P=0.04; P=0.008) is significantly lower than TAPP, while the seroma formation (P= 0.0009) in TEP is significantly more in TAPP.
Conclusions: The pain in TEP is comparatively lesser than TAPP at 24 hours and 1 week postoperatively, while the seroma formation in TEP is more with no statistic difference between the in operation time, postoperative hospital stay, time return to family life and work, pain at 1 hours postoperatively, wound infection, groin paresthesia, urinary retention, recurrence and cost.

AS28-3

MESH FIXATION COMPARED TO NONFIXATION IN LAPAROSCOPIC TOTAL EXTRAPERITONEAL INGUINAL HERNIA REPAIR: A RANDOMISED CLINICAL TRIAL

Rakesh K Gupta, Chandra S Agrawal, Ganesh Simkhada, Rikesh J Karki
Department of Surgery, B.P.Koirala Institute of Health Sciences, Nepal

Background: In TEP the preperitoneal space is dissected clearly and mesh is placed in between fascia transversalis and peritoneum so that mesh will cover all potential groin hernia defects without entering the abdominal cavity. This study aimed to examine the recurrence rate and postoperative pain in TEP performed without fixation of the mesh and to compare the rates with those for repairs using fixation of mesh.
Methods: A prospective randomized clinical trial was conducted in our tertiary center in BPKIHS, Dharan. In this study 110 patients of inguinal hernia undergoing TEP were divided in n=55 in fixation group and n=55 in non fixation group. Recurrence rates, chronic pain, operative time, postoperative hospital stay, days to return to normal activity, seroma formation were compared between two groups. The results were analyzed sing SPSS 20.
Results: Out of 110 patients, the mesh was fixed in 55 patients and not fixed in 55 patients. The follow up period was 6 months. The two groups did not differ significantly in terms of recurrence rate, chronic pain, operative time, postoperative hospital stay, days to return to normal activity, seroma formation.
Conclusion: This study found no difference in between fixation and non fixation of mesh in hernia repair. Non fixation of mesh is safe and feasible with no recurrence rate.
Keywords: TEP, hernia, inguinal hernia, mesh

AS28-4

The Impact of Titanium Tack and N-Butyl Cyanoacrylate Glue (NBCG) Mesh Fixation versus NBCG Fixation in Totally Extra-peritoneal Hernioplasty with 3-dimensional Configured Polyester Mesh a Comparative Study

Joe KM Fan[1,2], KJ Chen[2], JW Liu[2], XF Yang[2], Dominic CC Foo[1,2], WL Law[1,2]
[1]*Department of Surgery, Queen Mary Hospital, The University of Hong Kong, Hong Kong*
[2]*Department of Surgery, The University of Hong Kong - Shenzhen Hospital, The University of Hong Kong, China*

Background: Our aim is to compare 3-dimensional mesh fixation using titanium tacks combine with n-butyl cyanoacrylate glue (NBCG) (TACK group) versus NBCG only (NBCG group) in totally extraperitoneal inguinal hernioplasty (TEP).
Method: This is a retrospectively study of patients diagnosed with unilateral inguinal hernia and underwent TEP with 3-dimensional configured polyester mesh fixation using titanium tacks combine NBCG or NBCG only at the University of Hong Kong Shenzhen Hospital with data prospectively collected. Operative details and outcomes were compared including: operating time, size of defect, total hospital cost, post-operative pain scores and recurrence.
Results: From 08.2013 to 03.2016 a total of 219 patients were included. There was no significant difference between TACK group and NBCG group in mean age (52.5 years versus 48.2 years), mean size of defects (2.4cm versus 2.6cm), and operating time (121 mins versus 111 mins). There were significant differences between TACK group and NBCG group in total hospital cost (3035 USD versus 2022 USD), post-operative pain score on day 2 to day 4 (VAS: 1.4 versus 1.0, 1.0 versus 0.4, 0.5 versus 0.2). There was one recurrence in TACK group (p=0.276).
Conclusions: Patients with inguinal hernia underwent TEP with 3-dimensional configured polyester mesh with NBCG fixation only having comparative surgical outcome to TACK group. Tacks fixation may cause more post-operative pain and increase hospital cost. Use of N-butyl cyanoacrylate glue in TEP is safe and effective in our clinical series.

AS28-5

Laparoscopic total extraperitoneal inguinal hernia repair with non fixation of the mesh v/s fixation of mesh: A retrospective study

Atul Wadhwa, Deepak Arora
Department of Minimal Access Surgery, Kailash Hospital and Research Centre, India

Background: This study aimed to review our case series regarding the effectiveness, postoperative pain, recurrence rate and cost of totally extraperitoneal (TEP) procedure for inguinal hernia repair, using an anatomical 3D mesh, without fixation and to compare with those for repairs using fixation of mesh.
Methods: A retrospective analysis was conducted over a 2-year period for 210 patients (406 hernias) who had undergone TEP using anatomical 3D mesh. The recurrence rate, pain scores at 1 week and 1 month, hospital stay, seroma formation, urinary retention rates and cost incurred were noted.
Results: Of the 210 patients (406 hernias), the mesh was fixed for 106 patients (212 hernias) named as group A and not fixed for 104 patients (194 hernias) named as group B. The patients were followed-up for a period of 12months. The two groups did not differ significantly in terms of mean operating time. There was no difference in proportions of patients reporting pain at the end of 1 month, the incidence of seroma formation, incidence of urinary retention and the hospital stay in both the groups. The cost of surgery in the group A was greater than the cost of surgery in the group B. One patient (0.9%) in the group B had recurrence.
Conclusions: Laparoscopic TEP inguinal hernia repair with an anatomical 3D mesh without additional fixation can be performed safely with minimal long-term postoperative pain and the procedure results are comparable with repairs done using fixation devices.

AS29-1

Learning curve & Training in laparoscopic TEP repair

Jaideepraj Rao
Department of General Surgery, Tan Tock Seng Hospital, Singapore

Laparoscopic surgery is now increasingly being done for inguinal hernias due to its advantages of decreased pain and early return to daily activities. Inguinal hernias can be repaired either trans-abdominal pre-peritoneal (TAPP) or totally extra peritoneal (TEP). Both repairs are acceptable; however, TEP has some advantages with decrease in incidence of bowel injury and post operative adhesions. TEP repair, however, has a steeper learning curve. This learning curve can be shortened by standardizing the procedure. Appropriate training is extremely important to decrease the learning curve and this can be achieved through mentoring by expert, fellowship in minimal access surgery and attending workshops.

AS29-2

Learning curve in consecutive 100 cases of laparoscopic groin hernia repair performed by a single surgeon

Kuge Hiroyuki, Yoshikawa Shusaku, Masada Tsutomu, Uchida Hideki, Yokotani Tomoyo, Yamaoka Kentaro, Inagaki Mizumi, Yokoo Takashi, Inatsugi Naoki
Department of Coloproctology, Kenseikai Nara Coloproctology Center, Japan

Background: Few data are available to assess the learning curve in laparoscopic groin hernia surgery.
Objective: The purpose of this present study was to evaluate the learning curve for laparoscopic surgery for groin hernia by a single surgeon.
Method: We analysed a total of 100 consecutive cases of laparoscopic groin hernia repair (TAPP) performed by a single surgeon at the same institute from April 2012 to July 2016. Operative time was divided into three parts, preparation of preperitoneal space, unfolding mesh and suturing of peritoneum. A cumulative sum method (CUSUM) and a moving average method for total operative time and duration of three parts were used to derive the learning curve.
Results: Average total operative time was 89.9±21.9 minutes (mean±S.D.). Preparation of preperitoneal space, unfolding mesh and suturing of peritoneum times were 42.0±16.2, 8.2±3.7 and 19.8±8.1 minutes. The learning curve of total operative time was completed after 70 cases by CUSUM analysis. CUSUM analysis of unfolding mesh and suturing of peritoneum times demonstrated the learning curve completion at 22 and 32 cases. Leraning level in preparation of preperitoneal space was strongly correlated to total operative time. No intra-postoperative comlications and no recurrence cases were encountered.
Conclusion: At least 70 cases were needed for obtaining the learning peak for laparoscopic groin hernia repair.

AS29-3

A single institutional study on operative outcomes of the open inguinal hernia repair: residents v.s. non-residents

Takamasa Takahashi, Yuji Kaneoka, Atsuyuki Maeda, Yuichi Takayama, Yasuyuki Fukami, Shunsuke Onoe, Masahito Uji
Department of Surgery, Ogaki Municipal Hospital, Japan

Purpose: Previous studies have demonstrated that open hernia repairs performed by residents were associated with higher recurrence rates than those repaired by non-residents. We retrospectively evaluated operative outcomes of the open inguinal hernia repair performed by residents at a single high volume institute.
Methods: We compared the operative outcomes of the open hernia repair operated by residents of the second year after graduation (Group I) with those by non-residents (Group II). A total of 612 repairs performed from 2011 to 2015 (Group I in 197, Group II in 415) were evaluated.
Results: Age, sex, diseased side and type of inguinal hernia were not significant difference between the two groups. Group I had significantly longer operative time compared with Group II (60 min (23 -157) v.s. 55 min (19-172), P=0.001). The blood loss was similar between the two groups (5ml (0 -100) v.s. 5ml (0-300), P=0.84) Complication rates were not different between the two groups (4.1% v.s. 5.8%, P=0.44). Recurrence rates were significantly higher in Group I than in Group II (5.1% v.s. 0.7%, P<0.001). In univariate analysis, hernia repair by residents was a unique risk factor for recurrence (Odds ratio=7.344; 95% CI= 2.00-26.99; P=0.001)
Conclusions: Open hernia repairs performed by residents were associated with higher recurrence rate than those repaired by non-residents. It is important to perform the open hernia repair by residents under enough and careful instruction.

AS29-4

Impact of standardization for operative procedure of the transabdominal preperitoneal (TAPP) approach for groin hernia. - It improves the surgical technique of young generation of surgeons.-

Akira Muraki[1], Naoto Chihara[1], Hideyuki Suzuki[1], Yuji Koyama[1], Takao Shimizu[1], Rina Ooyama[1], Ryousuke Nakata[1], Keisuke Mishima[1], Seiji Kuroda[1], Seiji Yamagishi[1], Tetsutaka Toyoda[1], Hidetsugu Hanawa[1], Katsuhiro Miura[1], Masanori Watanabe[1], Eiji Uchida[2]
[1]*Institute of Gastroenterology, Nippon Medical school Musashi-kosugi Hospital, Japan*
[2]*Department of Gastroenterological Surgery, Nippon Medical School, Japan*

In recent years, laparoscopic groin hernia repair has been attracted attention and widespread in Japan. The transabdominal preperitoneal (TAPP) approach has been the first choice for adult groin hernias in our institution since 2009. To standardize its procedure, we introduced an effective surgical technique named "Spiral method" for TAPP approach since 2013 for over 400 patients. With dissecting clockwise for right sided groin hernia (counterclockwise for left sided one) after cutting of the peritoneum, we can make more speedy and safety operation by dissecting the tissue one by one gradually without excessive tension to prevent unnecessary injury or blood loss. Average operation time has become much shorter. (Group A: before the surgical technique established; 120.7min, Group B: after introducing Spiral method; 87.6min, P value< 0.001) Moreover the learning curve of young generation of surgeons have improved significantly after introducing this technique. The concept of this method is easy to understand even for the beginners and our results suggest that "Spiral method" for TAPP approach have a good possibility to become the standard technique by doing the stylized operative procedure.

AS29-5

Development of the training system for laparoscopic inguinal hernia Repair

Saseem Poudel[1,2], Yo Kurashima[3], Yo Kawarada[3], Yoshihiro Murakami[4], Kimitaka Tanaka[1], Hiroshi Kawase[1,5], Toshiaki Sichinohe[1], Satoshi Hirano[1]
[1]*Department of Gastroenterological Surgery II, Hokkaido University Graduate School of Medicine, Japan*
[2]*Department of Surgery, Steel Memorial Muroran Hospital, Japan*
[3]*Department of Surgery, KKR Tonan Hospital, Japan*
[4]*Department of Surgery, Asahikawa City General Hospital, Japan*
[5]*Department of Surgery, Sapporo Kiyota Hospital, Japan*

Background: There has been a rapid rise in the number of laparoscopic inguinal hernia repair surgery. However, the procedure has a long learning curve and there is no standard training system. We have previously developed and validated a TAPP checklist for the evaluation and feedback of TAPP procedure. The purpose of this presentation is to introduce the TAPP training system that we have developed based on the TAPP checklist.
TAPP training system: We developed a TAPP educational video explaining each items of the TAPP checklist and basic knowledge of the procedure. A training manual was developed for the instructors which would help them to educate, evaluate and give feedback to the trainees using the TAPP checklist. We integrated a training tool with the evaluation and feedback where the trainees used them to learn the procedure. Currently we have implemented this training system in 5 practicing programs of the affiliated hospitals of our institute and there are 7 residents who are currently being trained under this program.
Conclusion and Future directions: We have developed a training system for TAPP procedure based on the TAPP checklist and have implemented in the practicing programs of affiliated hospitals of our institute. We will study and report about the educational value of this tool in the future.

AS29-6

Hands-on training system for laparoscopic ventral hernia repair using newly developed training box and porcine model

Hitoshi Idani[1], Yoshiyuki Omomo[2], Kenichi Wada[2], Suma Nakagaki[2], Sumio Matsumoto[3]
[1]*Department of Surgery, Hiroshima City Hiroshima Citizens Hospital, Japan*
[2]*Professional Affairs and Clinical Education, Covidien Japan Inc., Japan*
[3]*Department of Surgery, National Hospital Organization Tokyo Medical Center, Japan*

Laparoscopic ventral hernia repair (LVHR) has recently been introduced. However, its training system has not yet been established. We have started a new Hands-on training course using newly developed training box and porcine model for LVHR in 2005. Training box is covered with a double layer seat. The outer layer is made of silicon sponge and the inner layer is made of polyethylene foam with a defect of 2cm in diameter. This model was used for training for IPOM. In a porcine model, a 5cm of laparotomy was made near the umbilicus and only the skin was closed. This animal model was used for IPOM with or without defect closure. We prepared two Hands- on courses, one day course using the training box and two day course using the training box and the animal model performed concomitantly with a laparoscopic inguinal hernia repair, which was named "Master Class".
In the Master Class, all trainees had lectures for TAPP, TEP and LVHR and had Hands-on box training for TAPP and LVHR in the first day. In the second day, Hands- on training for TAPP, TEP and LVHR was performed. From 2005 to 2015, more than 200 trainees attended our training course. 75% of participants evaluated this course as excellent or good. And all participants considered introducing LVHR. This new training system is effective for safe introducing LVHR.

AS30-1

Lichtenstein repair of indirect inguinal hernias with acellular tissue matrix grafts in adolescents and young adult patients (13 to 45 years old)

Ying-mo Shen, Shuo Yang, Jie Chen
Department of hernia and abdominal surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: To evaluate the outcomes of Lichtenstein hernioplasty using acellular tissue matrix (ACTM) grafts in adolescents and young adult patients (13 to 45 years old).
Methods: In this study, 317 patients, 13 to 45 years old, with primary unilateral indirect inguinal hernias, received Lichtenstein hernioplasty using ACTM mesh (ThormalGEN® thoracic surgical graft produced by Grandhope Biotech Co., Ltd., bovine pericardium tissue graft, Guangzhou, China).The outcome measures were the length of the operation, postoperative visual analogue scale (VAS) pain score, length of hospitalization, postoperative complications and recurrence rate.
Results: The operative time was (31.2±5.8) min and the length of hospitalization was (1.4±0.7) d. The minimum follow-up was 24 months, there were 2 postoperative wound infections (0.6%) and fully recovered by change of dressing for 1 month; there were no chronic postoperative pain (visual analogue score＞4, lasted 3 months) or local foreign body sensation occurred; 13 patients (4.1%) developed scrotal hydroceles and recovered by the scrotal puncturation. There were no recurrences and other complications.
Conclusions: Lichtenstein hernioplasty using ACTM grafts is a safe and available treatment in adolescents and young adult patients (13 to 45 years old).

AS30-2

Utility of laparoscopic percutaneous extraperitoneal closure for young adult patients with indirect hernia

Shunsuke Tamura, Shinichiro Ushida, Hirotaka Yamamoto, Yuichiro Miyaki, Eiji Miyazaki, Kazuhumi Suzuki
Department of Surgery, Seirei Hamamatsu General Hospital, Japan

Laparoscopic percutaneous extraperitoneal closure (LPEC) is a common technique for indirect hernia repair in infants, whereas tension free technique is conventionally performed for indirect hernia in adult. The most common cause of indirect hernia in infants is patent processus vaginalis. Since the mechanism of indirect hernia in young adult (between ages 16 to 30) is similar to that of infants, we hypothesize that LPEC can be applied for indirect hernia in young adults. Between 2009 and 2016 we performed LPEC for 13 young adult patients, 7 men and 6 women. 4 patients had left indirect hernia, 6 patients had right inguinal hernia, and 3 patients had bilateral hernia. The results were satisfactory, with average operation time of 34.7 and 44 minutes for unilateral and bilateral cases, respectively, with no postoperative recurrence. In addition, with LPEC, the risk of spermatic cord stenosis, a rare complication of conventional tension free technique, can be avoided, intraabdominal observation with laparoscopy allows diagnosis of occult hernia, and smaller incision with less postoperative pain can lead to improved patient satisfication.
In conclusion, LPEC is justified for indirect hernia in young adults.

AS30-3

Long-term outcomes of groin hernia repair in octogenarians and nonagenarians: the French "club hernie" database results

MARC SOLER [1], Jean Francois Gillion[2], All the Members of the Club Hernie[3]
[1]*Department of Parietal Surgery, Clinique Saint Jean, France*
[2]*Department of Visceral Surgery, Hopital Prive D'antony, France*
[3]*Parietal Surgery, Club Hernie, France*

The French Surgeons of the Hernia-Club have gathered their patients' data from their patients since 2011. The input are anonymous, exhaustive, registered in real time, before the outcomes are known, and every participant consents to random controls of their data.
From September 1st 2011 to April 15th, 2016, 14,254 groin hernias in 12,089 patients (18-101 years old) have been operated on including:
-10,287 patients [18 79 years old] in the 'young' group.
-1,504 patients [80-89 years old] in the octogenarians' group
-289 patients [90-101 years old] in the nonagenarians' (and more) group.
Results: The Female rate is increasing with the age. There were more unilateral, lateral, femoral hernias with the age. There were less laparoscopic procedure with the age. Post-operative pain at 8, 30, [90-180] days and 2 years decrease with the age. The rate in an ambulatory setting is decreasing with the age.
About the emergency surgery: The emergency surgery, women and femoral hernias rate increase with the age. The laparoscopic procedure and ambulatory setting rate decrease with the age.
Conclusions: In the elderly patients there are more female, more femoral hernias and more emergency surgery. n elderly patients, surgeons preferred not to do laparoscopic procedure even in scheduled surgery or in emergency surgery.
The authors recommend to operate sooner the female, and specifically the femoral hernias.
A complete statistical evaluation will be given.

AS30-4

Feasibility and Safety of Endoscopic Total Extraperitoneal Preperitoneal Inguinal Hernia Repair in Very Old Age: A Porpensity Score-Matched Comparison

Yao-Chou Tsai
Surgery, Taipei Tzu Chi Hospital, Taiwan

Backgrouds: Several studies of hernia registries have revealed that older age patients are associated with higher peri-operative complication rates compared with younger patients. However, the incidence of hernia is increasing with aging process. To evaluate the feasibility and safety of endoscopic hernia repair in very old age patients (>75 years), we conducted a prospective case-matched control study to compare peri-operative outcomes between patients older and younger than 75 years.
Methods: Between Sep. 2008 and Jul. 2015, 572 consecutive patients undergoing endoscopic hernia repair were included in this prospective study. This case-matched control study was matched based on sex, ASA score, and BMI between patients younger and older than 75 years. The propensity-score matching of two groups on 1 1:1 basis. Peri-operative data were prospectively recorded for all patients including demographic data, operation time, length of hospital stay, narcotic dose, and complications.
Results: Finally, fifty four patients who was younger than 75 years were extracted to match the 54 patients 75 years. These two groups had similar baseline characteristics except age. These two groups had similar peri-operative outcomes in hernia recurrence, metachronous contralateral hernia occurrence, complication rate and chronic pain. Besides, patients not less than 75 years had lower requirement for pain rescue analgesics than those who was younger than 75 years ($p = 0.047$).
Conclusions: In experienced hands, endoscopic inguinal hernia repair is feasible and safe for patients not less than 75 years with comparable peri-operative outcomes in patients younger than 75 years.

AS30-5

Individualized treatment of the elderly tension-free hernia repair

Chang-fu Qin, Jie Chen, Ying-mo Shen
Department of hernia and abdominal wall surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: To analyze tension-free hernia repair surgery carried in the elderly in terms of operation method, anesthesia method and therapeutic effect.
Methods: A toal of 1652 cases of elderly patients with tension-free hernia repair performed in our hospital from September 2012 to September 2014 were retrospectively analyzed. We compared different operation schemes for operation time, postoperative pain, postoperative narcotic response, time to leave bed, time to active food intake, length of hospital stay, wound complications, recovery time, recurrence rate, and time to resuming routine daily life, etc.
Results: All the elderly patients with inguinal hernia were cured, and the therapeutic effect was satisfactory. There has been no recurrence, and no wound infection. Compared with general anesthesia surgery, local anesthesia surgery has advantage in shortening the time to resuming daily life, time to leave bed, time to active food intake, and length of hospital stay. (P values < 0.05). Conclusion: Individualized care plan is satisfactory in the surgical treatment of elderly inguinal hernia. Tension-free hernia repair in the elderly is safe, fast, and effective.
Key Words: Elderly inguinal hernia; Individualized treatment; Tension-free hernia repair; Local anesthesia;
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CONFLICTS OF INTEREST
The authors declare no conflicts of interest.

AS30-6

Laparoscopic percutaneous extraperitoneal closure for over 80 year-old patients

Minoru Nishihara, Nobuo Kuniyoshi, Akehiro Oshita, Hironori Nomura, Hiroyuki Aka, Takumi Miyahira, Naoji Hanashiro, Hideki Ryo, Norihiko Okushima, Hiroo Takehara
Department of Surgery, Heartlife Hospital, Japan

Background and Purpose: The anterior repairs were the standard procedure to treat adult inguinal hernias in our hospital. Since 2013, we introduced laparoscopic hernia repairs (TAPP, LPEC), and developed the indication of LPEC for over 80 year-old patients with inguinal hernias.
Materials and Methods: This study evaluated the hernia size, surgical methods and time, and post-operative hospital stay. For over 80 year-old patients, 24 cases treated for 2010 to 2012, and 25 cases treated after 2013.
Results: In 24 cases for 2010 to 2012 treated with anterior repairs, mean surgical time and post-operative hospital stay were 92.9 minutes and 10.8 days. 5 of 24 cases were died by other causes in 2 to 5 years after surgery. In 25 cases, 16 cases were unilateral hernia consisted of LPEC 3, TAPP 10, and anterior repairs 3. Mean surgical time was LPEC 80 minutes, TAPP 114.7 minutes, and anterior repairs 80.3 minutes. Mean post-operative hospital stay was LPEC 3 days, TAPP 2.6 days, and anterior repairs 5.7 days.
Conclusion: LPEC is the better procedure. LPEC can be performed less invasively and to keep QOL in the advanced age population. No complications were seen in LPEC.

AS31-1

HERQL, the Hernia-specific Quality of Life Assessment Instrument): an update

Chi-Cheng Huang[1,2], Feng-Chuan Tai[1], Heng-Hui Lien[1], Ching-Shui Huang[1]
[1]*Department of Surgery, Cathay General Hospital, Taiwan*
[2]*School of Medicine, Fu-Jen Catholic University, Taiwan*

Background: With the development of prosthetic mesh and tension free techniques, the recurrence rate following hernia repair has been reduced, and hernia outcomes research should focus on post-operative quality of life and potential complications.
Methods: A novel hernia quality of life assessment instrument, HERQL, was developed. The HERQL questionnaire comprises a 4-item summative pain score measuring pain and discomfort resulting from various strenuous activities. Symptomatic burden and functional domains, as well as post-operative satisfaction and potential complications are evaluated as well.
Results: A total of 200 HERQL surveys were completed by 114 patients with groin or abdominal wall hernias. Internal reliability of the summative pain score was satisfactory, with a Cronbach's alpha of 0.83. Criterion validity was examined by concomitant assessment of the pain/discomfort and health impact subscales of the EQ-5D questionnaire, with substantial to moderate correlations. Pre-operative patients reported more severe hernia protrusion, more pain during heavy exercise, and greater activity restriction and health impairment than follow-up patients, indicating clinical validity. The conceptual structure of HERQL was evaluated to determine the causal relationship between formative symptomatic subscales and reflective functional status indicators. Repeated measurement of summative pain scores revealed an estimated time effect of -0.24, which was the rate of change in the summative pain score across the pre-operative, immediate post-operative, and follow-up periods suggesting the clinical responsiveness of HERQL.
Conclusion: This study will facilitate hernia outcomes research and enhance the quality of care for this common disease by providing a validated HERQL instrument with enhanced sensitivity.

AS31-2

Comparison of the perioperative QOL in inguinal hernia surgery -Between laparoscopic approach and anterior approach-

Masahiro Ishizaki, Hiroshi Kawai, Hirokuni Ikeda, Ryoma Sugimoto, Norichika Iga, Ryosuke Yoshida, Naohisa Waki, Hideyuki Nishi, Kazuki Yamashita
Department of Surgery, Okayama Rosai Hospital, Japan

Purpose: we made questionnaires about QOL after surgery and compared the early QOL between TAPP and anterior approach. Methods; 159 patients had elective inguinal hernia repairs in our hospital from December 2013 to June 2016. 97 patients had TAPP operations (20 both sides) and 62 anterior approach operations (4 both sides). Medical secretaries gave VAS (Visual analog scale) score questionnaires to those patients at 1-3 days after surgery, and at 2-3 weeks after surgery. Questions are about disturbance with early QOL.
Results: mean unilateral operative time was 118.3 and 65.8 minutes in TAPP and anterior approach respectively. P values of T-test of disturbance with walking, sensing of bloating, pain (both navel and inguinal), sensing of foreign body, and swelling of wound in 3 days were 0.06, 0.03, 0.01, 0.87 and 0.21 respectively in favor of anterior approach group. But the differences in those symptoms in 3 weeks disappeared between those two groups. But limiting for 91 latest cases only, there was no significant disadvantage for those QOL factors in 1-3 days between them.
Discussion: perioperative QOL of anterior approach was not inferior to laparoscopic surgery and even better in early series. We assumed that long operative time of early TAPP group mostly accounts for the poor QOL in early series.
Conclusions: the surgery with anterior approach should be reevaluated to be chosen in day surgery. We need to experience more cases to find out the best operation.

AS31-3

IMPROVING PATIENT OUTCOMES WITH INGUINAL HERNIOPLASTY LOCAL ANAESTHESIA VERSUS LOCAL ANAESTHESIA AND CONSCIOUS SEDATION. Preliminary Results of A Randomized Controlled Trial

Pierre-Anthony E. Leake[1], Patrick J. Toppin[1], Marvin Reid[2], Joseph M Plummer[1], Patrick O Roberts[1], Hyacinth Harding-Goldson[1], Michael E McFarlane[1]

[1]*Department of Surgery, Radiology, Anaesthesia and Intensive Care, University of the West Indies, Mona Campus, Jamaica*
[2]*Tropical Medical Research Institute, University of the West Indies, Mona Campus, Jamaica*

Background: Conscious sedation is increasingly being used in ambulatory surgery, with the aim of improving patient outcomes, including patient satisfaction. Reports demonstrate that the use of conscious sedation in inguinal hernioplasty performed under local anaesthesia is safe and effective in improving patient satisfaction. No previous randomized trial has assessed the benefit of conscious sedation in this regard.
Methods: This represents preliminary analysis of a randomized controlled trial comparing local anaesthesia alone (LA) and local anaesthesia with conscious sedation (LACS) in patients undergoing inguinal hernioplasty. Outcomes measures of interest included demographics, operative time, complications, time to discharge, pain scores and overall patient satisfaction with the procedure. T-test and Chi-Square tests were used for analysis. P value of < 0.05 was considered significant.
Results: A total of 144 patients were included and subjected to analysis. Seventy-four patients were assigned to the LA group and 70 patients to the LACS group. Significantly more patients in the LA group experienced pain during the procedure compared to the LACS group (p=0.022). Procedural pain severity was also greater in the LA group (p=0.0098). There was no difference between groups with respect to time to discharge (p=0.5). Overall patient satisfaction at discharge and at two weeks postoperatively was better in the LACS group (P=0.009; 0.001).
Conclusion: The use of conscious sedation for local inguinal hernioplasty is safe, results in less pain experience and severity and is associated with better patient satisfaction. The use of conscious sedation does not delay patient discharge.

AS32-1

What are the differences between female and male groin hernias ?

Ching-Shui Huang[1,2]

[1]*Surgery, Cathay General Hospital, Taiwan*
[2]*Surgery, Taipei Medical University, Taiwan*

Groin hernias are more common in males. In addition,the presentation, Gilbert types, surgical repair, convalescence and recurrences may be different. Among 3344 adult groin hernia patients repaired from 2001 to 2014 (prospective database), 397(12%) were female. The age distribution, involved groin, anesthesia, Gilbert types, endometriosis, repair procedure, length of stay, postoperative pain and recurrence of the 397 females were compared with those of the whole group. Result: Average age: female / whole group were 46.4+-16.1/55.7+-18.4. Involved groin: right (47%/46.1%), left (30%/28.6%), bilateral ((7.8%10.7%), femoral (8.6%/3.8%), recurrent (6%/12.6%). Anesthesia: local (15.6%/21%), epidural (74.6%/70%), general (9.8%/9%). Gilbert types: 2 (60.5%/ 44.7%), 3 (22%/25.8%), 4, 5, 6 (7%/25.6%), 7 (11%/3.5%). Endometriosis: 1.5%/0.2%. Repair procedure: anterior repair (80%/32%), posterior (2.5%/23%), bilayer(17.5%/45%). Length of stay: 0 day (7.3%/7.8%), one (69.2%/68.5%), 2 (16.2/20%), 3 (5.3%/2.2%), >4 (2%/1.4%). Postoperative pain (VAS 0~5) at day 1, 6 and 90: no difference statistically. Long-term recurrence: 0.5% / 0.3%. Conclusion: Female groin hernias are different from males. the average age is younger, the involved groin has more femoral hernia(8.6%/ 3.8%) and less recurrent hernia (6%/12.6%),female has more femoral defect (11%/ 3.5%), less direct defect (7%/25.6%), 1.5% of the female patients have endometriosis in the sac, higher percentage of female received anterior repair (80%/32%), there is no differences on the length of stay, postoperative pain and recurrences.

AS32-2

Clinical Characteristics of Laparoscopic Repair for Groin Hernias in Female Patients: A Report of 225 Cases

Jian-wen Li, Fei Yue, Min-hua Zheng

Gastrointestinal Surgery and Shanghai Minimally Invasive Surgery Center, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, China

Objective: To investigate the clinical characteristics of laparoscopic repair for groin hernias in female patients.
Methods: The clinical data of 246 groin hernias in 225 female patients were analyzed retrospectively. Between January 2001 and December 2013, these female patients undertook laparoscopic hernia repair procedures, including 170 TAPPs for 183 hernias and 55 TEPs for the remaining 63 ones. According to the maintenance of round ligaments, the data were classified into preservation group (104 hernias in 95 patients) and transection group (142 hernias in 131 patients).
Results: We have 36 patients with 41 femoral hernias (16%). 12 cases are incarcerated. All incarcerated femoral hernias got repaired with TAPP. We performed 90 TAPPs (86.5%) and 14 TEPs (13.5%) in the preservation group, and 93 TAPPs (65.5%) and TEPs 49 (34.5%) in the transection group (P=0.002). The average ages in preserved and transected groups are 41.2±1.7 and 62.3±1.2 year-old (P<0.000) respectively. The time of operation in preserved group is 31.3±1.3 minutes, compared to 25.0±1.0 minutes in transected group (P<0.000). The post-operative hospitalization is 1.5±0.2 days. All patient returned to normal activity within 2 weeks. No recurrence were noted in the follow-ups.
Conclusion: It is feasible to apply laparoscopic procedures for groin hernias in female patients. The surgeon should thoroughly evaluate multiple factors, including age, time of operation, recurrence and so on, before transecting the round ligament. Both peritoneum dissection and re-suture technique and inner ring keyhole technique are available for the preservation.

AS32-3

Inguinal endometriosis: a retrospective study

Kyosuke Miyazaki
Miyazaki Surgery & Hernia Clinic, Japan

Introduction: There are very few reports on endometriosis localized to the canal of Nuck. The purpose of this study is to retrospectively examine the findings of the canal of Nuck and inguinal endometriosis in adult female inguinal hernias.
Methods: Between April 2003 and July 2016, adult groin hernia repair was performed on 5,282 patients (>18 years-old, 4,348 males/934 females). In all females (age:49±18, 18-93), 189 patients (20.2%, age: 40±9, 21-72) had indirect hernias with the canal of Nuck. In indirect hernia with the canal of Nuck, the author performed the resection of the hernia sac, the canal of Nuck and the round ligament as much as possible in addition to the hernia repair. The diagnosis of endometriosis was provided by pathological examination. The patient characteristics, pathological diagnosis and treatment outcomes were recorded in indirect hernias with the canal of Nuck.
Results: Inguinal endometriosis was diagnosed in 68 patients (7.3%, age: 40±8, 25-62) pathologically. Three patients complained of painful masses in groin coincident with menstrual cycles within one year after operation. These patients underwent a second operation, where residual endometriosis in a groin region was proven pathologically. Intotal, we recorded 71 inguinal endometriosis (7.6%) in all female patients undergoing hernia repair in our institute.
Conclusions: The canal of Nuck and inguinal endometriosis in female indirect hernia is not rare. The complete resection of the hernia sac including the canal of Nuck and the round ligament is very important to prevent groin pain due to inguinal endometriosis.

AS32-4

Diagnosis and Treatment: Differentiation of Inguinal Hernia from Other Diseases in Female Patients

Sung-Ryul Lee
Department of Surgery, Damsoyu Hospital, Republic of Korea

Introduction: Inguinal herniorrhaphy is one of the most common surgical procedures, and females have a lower risk than males. Ultrasonography is a reliable tool to diagnose an inguinal hernia and surgical treatment is required. Most common herniated organ in female is the omentum. However, hydrocele of the canal of Nuck and solid mass are clinically similar to inguinal hernia so differentiation of inguinal hernia from these is important.
Methods: 893 adult patients (over 20 years old) with hernia symptoms visited our hospital from September 1st, 2012 to June 31st, 2016. Of 893, 120females patients were retrospectively analyzed.
Results: Of 120 patients, there were 75 inguinal hernia patients, 37 hydrocele patients, 7 lipoma patients, 1 angioleiomyoma patients. In case of hydrocele patients, 8 of them had communicating hydroceles and 29 of them had encysted hydroceles. However, ultrasonography could not exactly diagnose between communicating and encysted hydrocele. Lipoma and angioleiomyoma were difficult to differentiate from inguinal hernias which were protruded omentum due to similarity of physical examination and clinical symptoms and hyperechoic round shape of ultrasonographic scan, but surgery confirmed the diagnosis.
Conclusion: In female patients, there are high rate of hydrocele, and diagnosis using ultrasonography cannot differentiate other diseases such as lipoma and solid tumor from inguinal hernia, and usually correct diagnosis is intraoperatively confirmed. Inguinal hernias in female patients need to be diagnosed carefully and all these other disease can be treated with TAPP and intracorporeal excision due to the clinical similarity to inguinal hernia.

AS32-5

Laparoscopy for repair of Groin hernia in Asian female cohort: Is the approach better?

Hrishikesh P Salgaonkar[1,2], Jerry G T Thye[1,2], Sujith Wijerathne[1,2], Lynette M A Loo[1,2], Cheah W Keat[1,2,3], Davide Lomanto[1,2]
[1]*Minimal Invasive Surgery Centre, Department of Surgery, National University Hospital Singapore, Singapore*
[2]*Yong Loo Lin School of Medicine, National University Singapore, Singapore*
[3]*Department of Surgery, Jurong Community Hospital, Singapore*

Introduction: In female patients, laparoscopy seems an attractive approach for all inguinal hernias due to the greater prevalence of femoral hernia and these synchronous hernias are often missed.
Methods: Between Jan 2006 and May 2015, 54 consecutive female patients underwent laparoscopic surgery for groin hernia. Patient demographics, hernia characteristics, operating time, conversion rate, intraoperative, postoperative complications and recurrence were measured. 45 patients had inguinal hernia, 6 femoral hernia, 2 inguinal with obturator and 1 both inguinal and femoral hernia. 45 patients underwent a totally extra-peritoneal (TEP) repair and 9 patients underwent a trans-abdominal pre-peritoneal (TAPP) repair. 1 patient in each group underwent SILS.
Results: 51 patients had primary and 3 recurrent hernia. One of these 3 patients presented with an immediate femoral recurrence after a previous open repair of an inguinal hernia suggestive of missed femoral hernia. One patient with synchronous femoral hernia and 2 with obturator hernia were not detected preoperatively. An inguinal with a synchronous occult hernia was only diagnosed during the laparoscopy. The overall mean operative duration was 63 minutes (range 34-112 minutes). One patient required conversion to open due to adhesions from previous surgery. Three patients developed seroma and one hematoma postoperatively. No recurrences were recorded.
Conclusion: Laparoscopic repair offers accurate diagnosis and simultaneous treatment of both inguinal and femoral hernia with minimum morbidity and good clinical outcomes. Laparoscopic repair has become the procedure of choice for the treatment of the majority of groin hernia of women at our institution.

AS32-6

Report of 41 cases of round ligament varicosities that easily misdiagnosed as inguinal hernia

Guo-dong Gao[1], Ping Wang[1], Yong-gang Huang[1], Chen-xia Ma[2], Xiao-jing Xu[2]
[1]*Department of Hernia and Abdominal wall surgery, Hangzhou First People's Hospital, China*
[2]*Department of Ultrasonography, Hangzhou First People's Hospital, China*

Purpose: To investigate the differential diagnosis with inguinal hernia and clinical management of round ligament varicosities (RLV).
Methods: Retrospectively analyzed clinical materials of 41 cases of RLV diagnosed by coloured Doppler ultrasound in our hospital during January 2011 to December 2015. Newly diagnosed Department, rate of misdiagnosis, clinical and sonographic features, management after diagnosis and prognosis were recorded.
Results: All of the 41 cases were pregnant female with average age of about 34.5 years old. 28 cases were firstly misdiagnosed as inguinal hernia (68.3%). 30 cases complained of mass in the inguinal area (73.2%), 25 cases swelling pain as well as mass (61.0%), and 4 cases swelling pain without mass (9.7%). 7 cases were diagnosed during routing pregnant examination of ultrasound without any complaints (17.1%). All cases were justified a wait-and-see policy. 37 cases were followed until 3-6 months after delivery (follow-up rate was 90.2%). Mass or swelling pain disappeared spontaneously postpartum in all cases.
Conclusions: Most of the RLVs are seen in pregnant female and easily misdiagnosed as inguinal hernia. Colored Doppler ultrasound of the inguinal area is the best examination to make a collect diagnosis. It recommended to manage conservatively after diagnosis.

AS33-1

Should we repair Diastasis Recti?

Min Chung
Department of Surgery, Gil Medical Center, Republic of Korea

Diastasis recti describes a condition in which the two rectus abdominis muscles are separated by an abnormally wide distance. Usual causes of diastasis recti are multifetal pregnancy and obesity. Diastasis recti was classified by Nahas; Type A; Patients have a classic rectus diastasis caused by pregnancy and a well-defined waistline.Type B: who present rectus diastasis secondary to pregnancy and do not have adequate tension of the lateral and infraumbilical areas of the myoaponeurotic layer. Type C; Patients present a congenital lateral insertion of the rectus abdominis muscles at the costal margins Type D; Patients with rectus diastasis and poor waistline definition are included in this group. Between Feb 2005 July 2007, 12 cases of diastasis recti repair was done. All patients were female. Median age was 35 years old (30-43). Median of Body Mass Index was 23.6 (17.9-36.1). Average operation time was 129 minutes (80-210). All patients stated they found abdominal bulging after delivery. Seven patients had one delivery history and 6 patients had two delivery histories. One patient had three delivery histories. Two patients had twin delivery history. Open repairs were 2 cases of sublay mesh techniques (retrorectal), 2 cases of open repair with abdominoplasty and 1 case of open repair with abdominal subcutaneous flap. Laparoscopic repairs were 4 cases of IPOM (intraperitoneal onlay mesh) technique and 4 cases of IPOM and linea alba closure with transfascial fixation device. Complaints of patient are the most important factors for decision making of diastasis recti repair.

AS33-2

Midline reconstruction strategies in diastasis recti

Ramana B[1], Saumitra Chatterjee[2]
[1]*Department of Surgery, Belle Vue Clinic, India*
[2]*AWR, Kolkata, Belle Vue Clinic, India*

Abdominal wall weakness from diastasis recti is extremely common in general populations, especially amongst women after childbirth. Traditionally, the surgical approach has been to avoid surgery, or in some cases to refer them for abdominoplasty. While laparoscopic techniques have been described for midline reconstruction, they involve intraperitoneal implantation of large pieces of synthetic mesh, with its potential complications.The authors describe the various techniques of midline reconstruction in this condition, and this is directly applicable in ventral hernia repairs as well. These techniques include: double layer suture plication, plication with bariatric surgery in the obese, e-TEP Rives-Stoppa repair, and subcutaneous endoscopic midline plication with onlay mesh repair.

AS33-3

Laparoscopic plication of diastasis recti with prosthetic reinforcement by Venetian blinds technique: 15 years experience

Parthasarathi R, Samrat V Jankar, Darshan S Nayak, Sandeep C Sabnis, Senthilnathan P, Rajapandian S, Praveen Raj P, Palanivelu C

Department of Surgical Gastroenterology, GEM Hospital and Research Centre, India

Introduction: Rectus abdominis diastasis is a term used to define the split between the two rectus abdominis muscles and can be measured as the inter-recti distance. Surgery for diastasis is still controversial. We are presenting our experience of last 15 years of laparoscopic plication for diastasis recti by using 'Venetian blinds' technique.

Materials and Methods: A total of 33 patients underwent laparoscopic plication by 'Venetian blinds' technique of diastasis recti with prosthetic reinforcement. Patients with previous abdominal surgery were excluded. The common indications were cosmesis and discomfort while performing normal activities.

Results: The mean body mass index (BMI) was 29 kg/m2. The mean preoperative inter-recti distance as determined by CT scan was 11 cm. All obese patients had more inter-recti distance. The mean operating time was 113 min. Minor complications were present in 7 patients. 2 patients had chronic pain. After 6-month follow up all patients inter-recti distance on CT scan is almost zero. There is no recurrence at 2 years of median follow up.

Discussion: Even though there is still controversy regarding the surgical management of diastasis of the recti, from our past 15years experience of laparoscopic repair of diastasis of recti, we believe that laparoscopic plication can be the indicated on background of symptoms and cosmesis, with all of the benefits of minimal access surgery. Adding prosthesis will provide strength to abdominal musculature and also prevent future abdominal wall hernia.

Keywords: Diastasis recti, Laparoscopic plication, inter-recti distance.

AS33-4

Managing Diastasis Recti Laparoscopically is an ideal solution

Manash Ranjan Sahoo

Department of Surgery, Associate Professor, India

Introduction: Rectus abdominis diastasis (or diastasis recti) Is mainly an acquired condition with clinically evident separation of the rectus abdominal muscle pillars. It occurs principally in newborns and pregnant women. There is no associated morbidity or mortality with this condition except for cosmeticdisfigurement.

Case Series: We present twenty patients, all female, presented with a bulging of the abdomen in the midline.All were multiparous in the range of 35 45 years. There was no history of previous operation.

Methods & Materials: There was no history of chronic cough and ascites in any patient. On examination in standing position midline bulge was seen. Under general anesthesia through a three port approach laparoscopically, camera port (11 mm) in epigastrium right to the falciform ligament, two working port (6 mm) in right and left hypochondrium on anterior axillary line, linea alba was plicated in the midline after taking intracorporeal horizontal continuous sutures using ethilon double loop sutures 2-3 cm on either side of midline through the separated rectus sheath all along the defect from suprapubic area till 5-6 cm above umbilicus tightened by red ucing the intraperitoneal pressure to 8mmhg. Then a tissue separating mesh, was used to reinforce the plication by placing over the plicated length.

Conclusion: Laparoscopic plication of diastatis recti and placement of prosthetic mesh is very promising, safe & ideal operation for diastasis recti and could be the future for treatment of the same.

AS34-1

External hernia of the supravesical fossa: portrait of a misidentified protrusion

Giuseppe Amato[1], Giorgio Romano[2], Enrico Erdas[3], Fabio Medas[3], Luca Gordini[3], Piergiorgio Calò[3]

[1]*Postgraduate School of General Surgery University of Cagliari - Italy, Italy*

[2]*Department of General Surgery and Urgency, University of Palermo, Italy*

[3]*University of Cagliari, Department of Surgical Sciences, Italy*

Background: Protrusions of the supravesical fossa are considered rare, maybe erroneously. Probably, being misidentified with direct hernias, they are not listed in existing classifications. Underlining its characteristics helps early diagnosis, thus reducing risks of complications.

Methods: 100 consecutive open anterior inguinal hernia repairs consecutively carried out were analyzed. The Nyhus classification was used to categorize the protrusions detected in the cohort of patients. True hernias of the supravesicalis fossa were considered a subgroup of direct hernias. Combined protrusions (direct + fossa supravesicalis hernia) were also taken into account.

Results: 5 true hernias of the supravesicalis fossa and 7 bi-component combined hernias (direct hernia together with hernia of the supravesical fossa) were detected. All protrusions of the supravesicalis fossa presented diverticular outline with tightened basis. In two patients, the stricture was so tight as to provoke incarceration. In two other patients with bicomponent combined protrusion, the herniated element of the supravesical fossa revealed incarceration of the visceral content.

Conclusions: External hernias of the supravesical fossa seem to be more frequent than imagined. Indeed the incidence of these hernia types, both in the uncombined and combined version, is above 10%. The diverticular shape of these protrusions together with the stricture at its base, seems to explain the high trend to incarceration affecting this hernia type. Consequently, if a mid-sized protrusion with pain and/or irreducibility is present, the occurrence of a hernia of the supravesicalis fossa should be taken into account. In these cases, the indication for urgent surgical treatment is recommended.

AS34-2

Laparoscopic Transabdominal Preperitoneal Repair for Supravesical Hernia in Adult: A single center experience

Sung Ryul Lee, Byung Seo Choi
Surgery, Damsoyu Hospital, Republic of Korea

Introduction: Supravesical hernia (SVH) is a rare subtype of internal inguinal hernia. The purpose of this study is to report the characteristics of SVH and the outcomes of transabdominal preperitoneal (TAPP) repair
Methods: TAPP repair had been performed on 27 patients from July 2015 to July 2016. All patients underwent a defect wall repair using intracorporeal suture. A mesh (6x6 cm2) was applied to the repair site without covering the whole area of direct or indirect hernia. Demographic information and operative outcomes such as operation times were analyzed.
Results: All patients were male and had external SVH. The mean age was 55±11.5 years (range 3478). Protrusion was most common symptom but groin pain (11.1%) and urinary symptom (7.4%) were also observed. SVH were more common on the right (55.6%) but bilateral SVH also occurred in 1case. SVH was associated with the following comorbidities: 10 contralateral direct hernias, 1 contralateral indirect hernia and 6 lipomas. The mean operation time was 31.0 ± 9.53 minutes (range 15-60). The mean postoperative hospital stay was 15.3 ± 20.1 hour (range 2 -96). There was 1 case (wound hematoma) of postoperative complication.
Conclusion: SVH shares common symptoms with direct inguinal hernia but we were able to identify the exact location of defect by the TAPP procedure. And TAPP repair with intracorporeal suturing can safely treat SVH. The use of smaller mesh has its benefits of reducing pain and complications but long-term study is required to monitor recurrences.

AS34-3

Obturator Hernia in the elderly: A hidden tragedy! Report of 2 cases

Fu-wen Luo, S Ning, Y Rui, Z Chen, Gavish Awotar
Department of General Surgery, The Second Affiliated Hospital of Dalian Medical University, China

Introduction: Obturator hernia is a rare hernia, with a reported incidence of 0.2% to 0.9% from autopsies. Small bowel, especially the ileum, protrudes into the obturator canal and can remain incarcerated there. The cardinal symptom is obturator neuralgia which can lead to a misdiagnosis, especially because it happens mostly in the elderly women. This inevitably causes a delay in treatment which leads to dire consequences.
Methods: Two cases of obturator hernia in the elderly are being described with small bowel resection and end-to-end anastomosis following intestinal decompression. Both hernia defects were repaired with ULTRAPRO Hernia System (UHS) mesh.
Conclusion: Obturator hernia is an extremely rare hernia which has the probability of misdiagnosis as high as 90%. Early correct diagnosis of the disease is the essence of effective treatment. CT scan greatly assists its diagnosis and guides the surgeon to choose the proper management.

AS34-4

Bowel obstruction secondary to incarcerated obturator hernia

Da-wei Chen, Zhe-wei Fei, Xiao-jun Wang, Song-ming Zhu
Department of General Surgery, Shanghai Xinhua Hospital Chongming Branch, Shanghai Jiaotong University School of Medicine, China

Background: Obturator hernia is rare type of abdominal hernia and its diagnosis usually is made intraoperatively for bowel obstruction or CT scans of abdomen.
Objective: The aim of this study was to review patient's records with respect to clinical manifestation, CT scan findings, and operative outcomes.
Patients and methods: From April 2009 to January 2015, six female patients with incarcerated obturator hernia underwent urgent operation for acute intestinal obstruction. The medical records were reviewed with respect to clinical manifestation, findings of CT scan and the outcomes of operation.
Results: The median age of patients was 83 years (range: 79-87 years) and the body mass index was 21.61±0.52kg/m^2. CT scans of abdomen demonstrated that intestinal obstruction secondary to obturator hernia, consistency with operative findings. Partial bowel resection was performed in 2 of 6 patients because of necrosis of incarcerated obturator hernia. Hernia was repaired with interrupted sutures. Lung infection occurred in one patient, and wound infection in another patient. One recurrence was observed and two patients died from the unrelated diseases during the period of follow up.
Conclusions: The diagnosis of obturator hernia can be made by CT scan preoperatively, and the obturator should be suspected while an unexplained bowel obstruction in elderly, thin ladies occurs.

AS35-1

Review of 1000 Lichtenstein Inguinal Hernia repair and comparison of suture materials for mesh fixing

Suresh Raman, Jeevan M Krishnan, Venugopalan R
General Surgery, Kerala Government Health Services, India

Introduction: Lichtenstein hernia repair, technique for decades. Assessment significant in formulating strategies in reducing complications like inflammation, infection, recurrence and type of suture to use.
Objectives: 1) To compare post operative pain, inflammation, acceptance using 00 and 000 polypropylene sutures. 2) To assess prevalence of post operative inflammation, sinus formation, mesh rejection, recurrence.
Methodology: 1000 inguinal hernia repairs done as Lichtenstein described (937 male, 63 female) over a period of five year using 00 and 000 poly propylene (500 cases each) to fix mesh. Variables of post operative pain, post operative inflammation, chronic sinus formation, mesh rejection assessed for both group. Evaluation chart is attached to case record to record variables each day for 5 post operative days, two weeks, 4 weeks, 6 months and one year. Data obtained from 1000 cases operated compiled after five years.
Results: First post operative day no complaint of pain among 56% cases used with 000 suture and 38% with 00 suture. Sevier signs of inflammation 11% with 00 and 8% with 000. No foreign body sensation, for 82% with 000 and 60% with 00. Sinus formation .4% and .2%. Mesh rejection .2% for both. Recurrence .4%
Conclusion: Post operative pain inflammation and discomfort were less with 000 pp than 00 sutures for fixing. Infection rate same for both, sinus formation more with 00 sutures. 3 Recurence - faulty technique.

AS35-2

Personal experience of Lichtenstein tesion-free inguinal hernia repair

Fujio Katsumoto
Department of Surgery, Katsumoto Day Surgery Clinic, Japan

4126 cases of adult Lichtenstein tension-free inguinal hernia repairs were performed for 11 years since 2005 at Katsumoto Day Surgery Clinic under local anesthesia with sedation. 97.1% of those patients left the clinic on the same day, moreover, the reinstatement day following surgery was 2.8 days on the average. Patients can safely undergo inguinal hernia repair without cessation of anticoagulant and antiplatelet therapy, and ASA grade 3 hernia patientsu may be appropriate for ambulatory inguinal hernia repair. The Lichtenstein tension-free inguinal hernia repair under local anesthesia with sadation can apply to all the groin hernia patients, especially for ambulatory surgery at out-standing clinic.

AS35-3

NBCA (n-butyl-2-cyanoacrylate) medical adhesive for mesh fixation in inguinal herniorrhaphy (Lichtenstein, TAPP or TEP)

Ying-mo Shen, Jie Chen, Shuo Yang
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: Although the mesh fixation with non-absorbable synthetic suture has been adopted, it is disadvantaged by the large number of stitches and an increased incidence of complications such as postoperative pain, chronic pain, and hematoma or hydrops formation. With the aim of reducing these complications, some researchers have adapted medical adhesives in tension-free herniorrhaphy and have achieved satisfactory results. We conducted this study using a novel lightweight polypropylene mesh that has been proven to be associated with fewer complications for inguinal herniorrhaphy to imply the effectiveness of n-butyl-2-cyanoacrylate (NBCA) glue for mesh fixation in Lichtenstein repair and laparoscopic herniorrhaphy for inguinal hernias.
Methods: A total of 2,136 patients with primary unilateral inguinal hernia were included. NBCA adhesive was used in 893 cases of Lichtenstein repair and 1,243 cases of laparoscopic repair (TAPP or TEP) for the mesh fixation. Operation time, postoperative length of stay, visual analogue scale (VAS) score, incidence of chronic pain and hematoma, and recurrence were evaluated.
Results: The operative time was 36.2±10.3 min and the postoperative length of stay was 1.2±0.6 d. The minimum follow-up was 24 months, there were no recurrence or wound infection. The postoperative VAS score was 1.6±0.7, there was no chronic pain occurred. Thirteen (1.5%) hematomas occurred in the open group and 17 (1.4%) cases occurred in the laparoscopic group.
Conclusions: Application of chemical medical adhesive in tension-free herniorrhaphy for inguinal hernia appears to be a safe and effective approach.

AS35-4

Sutureless repair of inguinal hernias by mesh plug with comparison to a single stitch

Yuki Sunagawa, Takehiro Hachisuka, Masahiro Matsuno, Naoya Takeda, Masato Shizuku, Yasuhito Suenaga, Kazuki Sakata, Masashi Hattori, Hitoshi Teramoto, Toshio Shikano, Keisuke Hattori, Yutaka Mizuno, Hirotaka Maruyama, Toshihiro Mori
Department of Surgery, Yokkaichi Municipal Hospital, Japan

Background: The plug method is one of the most widespread methods for repairing inguinal hernias. In 1992 and 1997, Gilbert et al. reported on sutureless repair of inguinal hernias using the plug method; however, this method has not spread due to a high rate of hernia recurrence. Currently, the understanding of the anatomical structures in groin has progressed, and the tissue compatibility of hernia meshes has dramatically improved. Therefore, we attempted sutureless repair of inguinal hernias.
Methods: The enrolled subjects, who were relatively sedentary and aged 70 years or older, had indirect inguinal hernias with hernia orifices 3 cm in size. For the repair, we used a Light PerFix Plug, which has high tissue compatibility. High dissection of the hernia sac was completed by detachment at the entire periphery of the transversalis fascia and superficial preperitoneal fascia, and subsequently, the plug was inserted without any sutures. Patients younger than 70 years underwent suture fixation using only a single stitch.
Results: In the 52 cases, from 20122014, no recurrence was observed. Additionally, no significant complications resulting in delayed hospital discharge were observed. A post-operative questionnaire yielded favorable results. In addition, similarly good outcomes were obtained in the 168 cases in which repair by single-stitch fixation was performed.
Conclusion: Sutureless repair is a useful method that avoids tissue damage and tissue tension caused by stitches. In our study, we obtained favorable short- and long-term results for sutureless repair by using precise surgical technique with recognition of the involved anatomical layers.

AS35-5

Use of self-gripping mesh in Lichtenstein hernioplasty compared to the sutured mesh: A systematic review and meta-analysis

Cui-hong Jin, Ming-gang Wang, Jie Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Background: Lichtenstein repair is the most commonly used technique for open inguinal hernia. However, mesh fixation with sutures to avoid dislocation has been considered as a cause for chronic pain and discomfort. The self-gripping mesh has been explored for some time as a strategy to solve this problem. Previous studies have come to different conclusions about the superiority of one method over another. Therefore, we conducted a meta-analysis to determine the totality of evidence regarding the postoperative pain and other outcomes in using self-gripping mesh when compared to sutured mesh in inguinal hernioplasty.
Methods: Studies published up to June 2016 were searched using PubMed, EMBASE, MEDLINE, Cochrane Library. Inclusion criteria were studies comparing self-gripping mesh and sutured mesh in patients undergoing Lichtenstein inguinal hernia repairs. Mean differences (MDs) were derived from continuous outcomes and pooled odes ratios (ORs) for categoric outcomes.
Results: Eleven studies were selected, with a total of 2,154 patients. Self-gripping mesh for open inguinal hernioplasty reduced chronic groin pain (OR=0.68, 95%CI: 0.50 to 0.92) and duration of operation (MD=-9.18, 95%CI: -11.05 to -7.31,). There was no statistical difference in the hematoma or seroma (OR=0.98, 95%CI: 0.71 to 1.37), wound infection (OR=0.61, 95%CI: 0.37 to 1.02) and recurrence (OR=0.60, 95%CI: 0.25 to 1.44).
Conclusion: When compared with conventional sutured mesh in Lichtenstein technique, the self-gripping mesh had advantages in reducing chronic pain and operative time, without increasing other postoperative complications.

AFP1-1

Non-mesh (Desarda) versus mesh (Lichtenstein) methods for inguinal hernia repairMeta-analysis and system review

Feng Ren[1], Zhi-xue Fang[2], Jian-ping Zhou[1], Zhong-cheng Huang[2]
[1]*Department of Geriatrics Surgery, the Second Xiangya Hospital, Central South University, China*
[2]*Department of General Surgery, the Hunan Provincial People's Hospital, China*

Background: The ideal method to treat inguinal hernia is still unknown. The purpose of this study was to compare non-mesh (Desarda) with mesh (Lichtenstein) methods in primary inguinal hernia repair.
Methods: A systematic literature review and meta-analysis was undertaken to identify studies comparing the outcomes of Desarda and Lichtenstein in primary inguinal hernia repair. Published studies were identified by the databases PubMed, EMBASE and the Cochrane Library.
Results: A total of 452 patients in three randomized controlled trials (RCTs) were reviewed (226 patients in Desarda group; 226 patients in Lichtenstein group). The two groups did not significantly differ in early post-operative pain, hematomas, seroma, hydrocele, chronic groin pain, foreign body reaction or recurrence. Desarda method might cost shorter operating time than Lichtenstein. There was significantly earlier return to normal gait in favor of Desarda repair, and apparently, Desarda method cost much lower than Lichtenstein method.
Conclusions: From the data of this study, the outcomes of primary inguinal hernia repair with Desarda and Lichtenstein methods are comparable. Desarda method has advantage in operating time, cost and recovery, but still needs to be assessed in large, multi-center, well-designed RCTs.

AFP1-2

INGUINAL HERNIA REPAIR WITH A NEW DYANAMIC FIXATION FREE 3D IMPLANT- A SINGLE ARM STUDY

Devi Shanker Malik, Neeraj Bhateja, Buddhi Singh Dhakad
Department of General and Laparoscopic Surgery, Eternal Hospital, India

Objective: Prosthetic reinforcement is the gold standard in inguinal hernia repair. Almost 20-30% patients complain of postoperative pain due to irritation and inflammation caused by the mesh and methods of fixation and about 4-10% of these feel severe chronic postoperative pain. So a single arm study was conducted for the assessment of postoperative pain after inguinal hernia repair with a new dynamic, self-fixating Proflor mesh
Methods: From Oct 2012 to April 2016, 140 consecutive patients of Inguinal hernia were repaired with Proflor mesh (Insightra) where no suture fixation was done. All patients were assessed on visual analog scale (VAS) at 7 days, 3 months, 6 months and 1 year and examined for perioperative/postoperative complications.
Results: According to VAS, pain was reported in a range from 1 to 3 during the first week. No perioperative complications occurred. 11 postoperative complications were reported. 3 seromas,1 ecchymosis, 6 hypoaesthesia, 1 postoperative pain from 7th postoperative day onwards which was initially intolerable but reduced in intensity after 2 months and was minimal at the end of 6 months. No recurrence was found.
Conclusions: Postoperative complication rates were comparable to the world literature. The use of this new mesh could be an alternative method to reduce chronic postoperative pain after inguinal hernia repair. It may become gold standard in future. Although further studies with long term results are still needed to establish it as a gold standard.

AFP1-3

Transverse skin incision versus oblique skin incision in open inguinal hernia repair -- a Prospective Comparative Study

Zhi-xue Fang[1], Feng Ren[2], Jian-ping Zhou[2], Bin Zou[2], Chao Tu[2], Sha-long Wang[2]
[1]*Department of General Surgery, the Hunan Provincial People's Hospital, China*
[2]*Department of Geriatrics Surgery, the Second Xiangya Hospital, Central South University, China*

Object: To compare the clinical outcomes of transverse skin incision (TSI) versus oblique skin incision (OSI) in open inguinal hernia repair (OIHR).
Background: Early postoperative pain is common to all inguinal hernia operations. A short-term study was performed to find whether the TSI could reduce the early postoperative pain.
Method: Between September 2014 and February 2015, sixty elective unilateral primary inguinal hernia patients were treated with TSI (n= 30) or OSI (n= 30). The primary endpoints were early postoperative pain, time of operation. Secondary endpoints were incidence of wound infection, seroma, hematoma and recurrence.
Results: Patients in the OSI group had significantly worse pain scores from the day after operation to postoperative day 7 ($P < 0.05$). The incidences of complications were similar between the two groups.
Conclusions: From the data of this study, TSI was associated with reduced early postoperative pain without increasing the operation time. TSI was associated with fewer scars and did not increase the difficulty of operation. However, large random controlled trials are necessary to confirm these preliminary results.

AFP1-4

The surgical treatment for late-onset deep infection after tension-free hernioplasty of inguinal hernia

Mao-ming Xiong, Bo Chen, Jia-wei Zhang, Kong-wang Hu
Department of Gastrointestinal Surgery, The First Affiliated Hospital of Anhui Medical University, China

Background: At present, the complications of inguinal hernia repair using various types of synthetic patch, especially the erosion and infection are becoming increasingly prominent.
Objective: To summarize the experience in surgical treatment for late-onset deep infection after tension-free hernioplasty of inguinal hernia.
Methods: The clinical data of 4 patients with late-onset deep infection after tension-free hernioplasty of inguinal hernia treated in Affiliated Hospital of Anhui Medical University from July 2014 to September 2015 were analyzed retrospectively. Four cases of male with age range from 29 to 79 years old. Their BMI<25kg/m^2 and had no diabetes. The infection occurred in 2 weeks-13 years after hernia repair with polypropylene plug(mesh). 1 case of wound secretion were cultured as Staphylococcus aureus, 1 case as Enterobacter cloacae, 1 case as Klebsiella pneumoniae. 2 cases with patch erosion to the ileocecus and 1 case with patch erosion to the bladder.
Results: All patients patch (plug and mesh) were removed completely with suture wound directly. 2 cases underwent resection of the ileocecus and 1 case underwent partial resection of the bladder. All cases recovered with primary wound healing. With a follow-up of 10 to 24 months, no hernia recurrence occurred.
Conclusion: The mechanism of late-onset deep infection after tension-free hernioplasty of inguinal hernia is still unclear, but it is related to the material and design of the patch. Complete removal of patch and the wound of direct suture had shown a good effect.

AFP1-5

Management of Mesh Erosion into Small Bowel and Urinary Bladder Following Laparoscopic Inguinal Hernia Repair

Ying-ru Li, Zhi-peng Jiang, Wen-chang Gan, Shuang Chen
Department of Gastroenterology, Hernia and Abdominal Wall Surgery, The Sixth affiliated Hospital of Sun Yat-Sen University, China

Mesh erosion into visceral organs is a rare complication following laparoscopic mesh repair for inguinal hernia. A 78-year-old man underwent laparoscopic intraperitoneal onlay mesh repair of right hernia at another hospital 16 years ago. He presented with recurrent sepsis, groin swelling and fistula, and lower urinary tract symptoms 2 years. Diagnosis of mesh migration and erosion into small bowel and urinary bladder was made by percutaneous fistulography and cystography. At laparoscopy, a small bowel loop was adhered to the area of inflammation in the right lower abdomen. After adhesiolysis, mesh was seen to be eroding into small bowel and urinary bladder. Most of infected mesh was pulled out from urinary bladder wall using gentle traction except part of mesh into small bowel. Urinary bladder was repair under laparoscopy and test for leak was found to be negative. At part of open surgery, the involved small bowel segment was resected, and bowel continuity restored. The patient recovered uneventfully and was no recurrence at 1 year follow-up.

AFP1-6

Study on Preventing of Surgical Site Infection of Inguinal Hernia Repair with An Interventional Boundle

Chun Yang, Qian Xiang
Department of Gastrointestinal Surgery, Sichuan Provincial People's Hospital, China

Objective: To explore the effect of the interventional boundle (chlorhexidine bath before operation, electric shaving, shaving on surgical day, skin disinfectant in chlorhexidine compound composition) for inguinal hernia repair in surgical site infection prevention.
Method: Using control trials in this study, in accordance with United States NHSN 2013 definition of surgical site infection surveillance and monitoring and comparing of the incidence of surgical site infection in baseline phases and intervention stages. Baseline phase is from July 2013 to July 2014 and intervention stage is from July 2015 to now.
Results: The incidence of surgical site infection for inguinal hernia in the stage of baseline was 6.43% (18/280), that in the intervention stage was 2.5% (1/40). Although we saw the decline in infection rates, but due to the small sample size, there is no significant differences in (X^2=0.39, P=0.53).
Conclusions: Through the four intervention measures preoperative chlorhexidine baths, electric shaving, shaving on surgery day, using skin disinfectant with chlorhexidine compound ingredient, we can reduce the incidence of surgical site infection for inguinal hernia, but compared to the baseline prevalence, we saw no significant difference and further study is need to confirm its effect.

AFP2-1

Our experiences of 20 laparoscopic incisional hernia repairs with three type mesh

Yuichiro Miyaki, Shinichiro Ushida, Anri Maeda, Shunsuke Tamura, Shunya Tahara, Aina Kunitomo, Hirotaka Yamamoto, Takashi Hamano, Yasuyuki Kobayashi, Hiromichi Machida, Kazufumi Suzuki
Department of Surgery, Seirei Hamamatsu General Hospital, Japan

We started the laparoscopic incisional hernia repair (LIHR) from 2014 in our institution. LIHRs were performed on twenty patients (6 males and 14 females) from June 2014 to July 2016. These patient's average age is 70years, average BMI is 25.2kg/m^2, and average size of hernia defect is 12.5cm×7.5cm. Eighteen patients wear performed the IPOM-Plus and two patients were performed the IPOM.
The first camera trocar (12mm) is inserted by visually guided Optical View Method. Wide visual field is given us by the EndCAMeleon™ (KARL STORZ®) scope. It makes us easy and secure mesh tacking, especially near the camera ports. The suture for hernia defect is performed by nonabsorabable braided surgical suture with intervals of about 1.5cm. The Parietex™ Optimized Composite (PCOx) mesh (Medtronic®) was placed in first five patients, the PHYSIOMESH™ (ETHICON®) was placed in next four patients, the Symbotex™ Composite Mesh (Medtronic®) was placed in last eleven patients. Mesh covered hernia defect with each 5cm overlaps before closure hernia size. Mesh fixation is performed by absorbable tacking with double-crown technique and nonabsorabable suture fixation.
Four recurrences were observed in just continuous operations. One patient has been performed re-operation, one patient is planning re-operation and two patents are watchful waiting now. All patients with recurrent hernia were operated with same mesh. We suspect the consequence of recurrence and dual side laminated mesh. Two seromas and two surgical site infections were observed.

AFP2-2

LAPAROSCOPIC PLACEMENT OF MESH OF PATENT US9204 955 B2 IN ABDOMINAL HERNIA

Abdullah Aldahian, Fahad Bamehriz, Omar Al-Obaid
Center of Excellence in Metabolic and Bariatric Surgery, King Saud University Hospital, Saudi Arabia

Background: Surgical mesh has been used for most of the abdominal hernia. Laparoscopic manipulator of the mesh is difficult in handling and manipulation. We used a mesh integrated with gripping and fixating threads which has a patent US3204 955 B2.
Patient & Method: The integrated thread mesh are used in inguinal and ventral hernias. The integrated mesh is easily handling by grasping the mesh and furthermore the threads are used to be fixed to the abdominal wall.
Conclusion: The integrated thread mesh is easily to manipulated and threads are used to be fixed to the abdominal wall.

AFP2-3

Durable open repair of flank hernia with onlay mesh and bone anchor fixation

Takeyuki Misawa[1], Kimihiro Nojima[2], Yojiro Makino[2], Shuichi Fujioka[1], Kota Ishida[1], Yu Kumagai[1], Hiroaki Kitamura[1], Seishi Hojyo[1], Se Ryung Yamamoto[1], Tadashi Akiba[1], Katsuhiko Yanaga[3]
[1]*Department of Surgery, The Jikei University Kashiwa Hospital, Japan*
[2]*Department of Plastic Surgery, The Jikei University Kashiwa Hospital, Japan*
[3]*Department of Surgery, The Jikei University School of Medicine, Japan*

Background and Aim: Flank hernias (FH) can be divided into congenital, lumber, and acquired often after previous surgery or trauma. The anatomic proximity of FH to bony prominences presents a challenge in the durable repair of these hernias. We demonstrate our technical aspects of open repair for FH.
Patients: Two patients: an incisional hernia after urological surgery, and a lumber hernia, respectively, were operated Surgical techniques. The patient is positioned in the full lateral decubitus position. Skin incision is dictated along with the previous incision. The external oblique muscle is widely exposed to secure an adequate (a 5- to 10-cm) overlap of mesh. Then the hernia is inverted, and the defect is reduced as much as possible with sutures. The light weight mesh is placed over the external oblique muscle (onlay), and is fixed inferiorly to the iliac crest with anchor fixations, superiorly to the eighth to twelfth ribs using Deschamps Ligature Carrier, laterally to the latissimus dorsi muscle, and internally to the anterior sheath of the rectus muscle with 2-0 proline. A closed drain is placed before wound closure.
Results: Operative time: 180 and 161 min., respectively. Blood loss: minimal in both cases. Patients were discharged uneventfully postoperative day 10 and 12, respectively. Subcutaneous seroma developed and disappeared without surgical intervention in one patient. No recurrence was seen at the follow-up period of 7 and 9 months, respectively.
Conclusions: Onlay mesh repair with secure fixation to the iliac crest using bone anchor and ribs is feasible for FH.

AFP2-4

Analysis of the occurrence of female pelvic floor hernia patients and the levels of menopause and estrogen

Chang-fu Qin[1], Chen Chen[2], Jie Chen[1], Yingmo Shen[1]
[1]*Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China*
[2]*Department of Gynecology & Obstetrics, Beijing Chao-Yang Hospital, Capital Medical University, China*

Objective: To study the relationship between the occurrence of female pelvic floor hernia patients and the levels of menopause and estrogen.
Methods: The female patients with pelvic floor hernia admitted in out hospital were divided into two groups, according to whether they have the menopause or not. The levels of estrogen were detected respectively in the two groups, and the difference was compared and analyzed.
Results: The estrogen levels of patients before and after menopause were significantly lower than normal control groups; ($P < 0.05$). The difference is statistically significant.
Conclusion: Significant decrease of estrogen level is a high risk factor for women with pelvic floor hernia, and also is one of the important reason of higher incidence of pelvic floor hernia for women after menopause.

AFP2-5

Mesh removal for chronic mesh site infection after incisional hernia repair: three cases report and literature review

Ping Sun, Shaobo Hu, Zifang Song, Chen Zhang, Ming Li, Xiang Cheng, Qichang Zheng
Hepatobiliary and Hernia Department, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China

Purpose: Herein, we report three cases of mesh removal for mesh site infection after incisional hernia repair and review the relevant literature.
Methods: The medical records including surgical videos of three patients undergone excision of the mesh for chronic mesh site infection were reviewed. The three patients aged 76, 77 and 58 years old respectively, with a history of six, five and four times open abdominal surgery respectively, including two to three times of hernia repair. Mesh site infection occurred four, two and eleven months later after the last hernia repair respectively, with the formation of sinus or deep abscess for two patients.
Result: The culture of all the three patients was positive. Systematic treatment with sensitive antibiotics, repeatedly debridement and drainage, even negative pressure wound therapy (NPWT) was given for all the patients. But the infection could not be completely cured. Finally, after discussion under the multiple disciplinary team (MDT) and the discussion with patients, excision of the mesh was applied for all the patients under local anesthesia, epidural anesthesia or general anesthesia, with small incision. All the patients was cured smoothly except case 1. Small intestinal fistula was occurred after the removal of the mesh. It took another twenty days to cure the fistula. No new hernia was observed after a follow-up from six months to 24 months.
Conclusion: Excision of the mesh with small incision could be applied safely for patients with chronic mesh site infection.

AFP3-1

Unique Device for Laparoscopic Inguinal Hernia Repair Using ProGrip™ Laparoscopic Self-fixating Mesh

Fujio Ito, Seiya Ogata, Takahiro Saito, Satoshi Otani, Takao Tsuchiya, Junichi Miura
Department of Surgery, Iwase General Hospital, Japan

ProGrip™ laparoscopic self-fixating mesh is composed of numerous microgrips that promote strong self-adherence to the abdominal wall. Due to this property of the mesh, this product does not require a fixation device that may induce pain, and it is useful in decreasing the recurrence of sliding hernia through its strong gripping ability. On the other hand, the drawback of this product is that it is difficult to handle, since it also clings easily to itself and to areas unintended for fixation. A unique device to resolve this issue is presented. Mesh insertion and deployment were performed using two different methods: the folding method and the rolling method. The attachment of ligation threads as a handle at several locations on the edge of the mesh was useful for the deployment of the mesh in both methods. With the rolling method, a thin polyethylene sheet was placed on the microgrip surface and rolled together, and then subsequently inserted into the body. The mesh was then unrolled for deployment such that the polyethylene sheet was sandwiched between the abdominal wall and the mesh. This allowed the operator to make minute adjustments for properly positioning the mesh. Subsequently, by gradually withdrawing the sheet upward and by fixing the mesh to the abdominal wall from the lower portion, the mesh could be fixed at the desired position. A thread for unrolling that is useful for the deployment of the rolled mesh was also developed. The rolling method was especially useful when the workspace was narrow.

AFP3-2

Clinical research of Lichtenstein tension-free hernioplasty repair in adult patients with inguinal incarcerated hernia

Luo Wen, Yong Wang
Department of Surgery, Tongji Medical College Huazhong University of Science & Technology, China

Objective: To investigate the preoperative management and clinical effecciency of Lichtenstein repair in adult patients with inguinal incarcerated hernia.
Methods: The clinical data of 86 patients with inguinal incarcerated hernia were analyzed retrospectively. All cases were repaired with Lichtenstein under local anesthesia and had emergency operation.
Results: The data included 59 male patients and 27 female patients with median age of 63 years. There were 8 patients with liver cirrhosis, and the Child-Pugh grades of liver function were grade B (6 cases) and grade C (2 cases). The operation was performed successfully in all patients. Segmental bowel resection with end-to-end anastomosis was performed in 38 emergency medical operations. The operative time was 20-120min (mean of 54min), and the postoperative hospitalization time was 8d (5-17d). There were 7 cases of skin ecchymosis of scrotum, no intestinal perforation, hepatic encephalopathy and upper gastrointestinal hemorrhage after operation. In this initial series of 24 cases without drainage tube in wound cavity, 10 cases of fat liquefaction, 10 cases of hydrops of hernia sac, 6 cases of seroma and 3 cases of wound infection after operation. During the period of 12 to 48 months of follow-up, all cases contact. There was no case died at 2 year post-operation and no recurrence in operative side, and 5 cases of recurrence in nonoperative side.
Conclusions: Tension free repair in the treatment of incarcerated inguinal hernia is safe and feasible. Lichtenstein hernioplasty is simple and has less risks. It's typically appropriate for patients with inguinal incarcerated hernia.

AFP3-3

Comparative study of analgesic effect of local anesthesia with simple lidocaine and ropivacaine-plus in inguinal hernia tension-free repair in adults

Fan Wang, Fu-qiang Chen, Ying-mo Shen, Jie Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: To investigate the analgesic effect of lidocaine plus ropivacaine in inguinal hernia tension-free repair under local anesthesia.
Methods: A total of 815 patients with unilateral inguinal hernia who were admitted to Beijing Chao-yang hospital from July 2013 to Jane 2014 were enrolled in this retrospective study. The patients were divided into 2 groups: local anesthesia (ilioinguinal-iliohypogastric-genitofemoral blocks plus local infiltration) using a combination of 1% lidocaine (10ml) and 0.75% ropivacaine (10ml) in observation group (n=412), and 1% lidocaine (20ml) were administered in control group (n=403). Postoperatively heart rate (HR), mean arterial pressure (MAP), pain intensity (VAS), analgesic demand, adverse events and hospital duration were assessed.
Results: There was no significant difference between the 2 groups in postoperative hemodynamic monitoring ($p>0.05$). VAS score in observation group were lower than those in control group at 1h, 3h, 6h and 9h. The former had significantly less pain killer ($p<0.05$).
Conclusion: Ropivacaine reduces postoperative pain levels after tension-free inguinal hernia repair. It can provide a good analgesic effect, without elevated perioperative risk.

AFP3-4

Incarcerated umbilical hernia with intestinal obstruction: a case report

Bing Qu, L Yao, J Xie, Z Zhang
Department of General Surgery, China Resources & WISCO General Hospital, China

The incarcerated umbilical hernia with intestinal obstruction is rare and associated with some life-threatening complications. We present a case of 85-year-old male patient who was admitted to the emergency department beacause of incarcerated umbilical hernia with intestinal obstruction. After admitted, this patient was diagnosed with incarcerated umbilical hernia with intestinal obstruction, leading abdominal compartment syndrome (ACS), septic shock, acidosis and multiple organ dysfunction. The patient was treated by gastrointestinal decompression, emergency surgery for an incarcerated umbilical hernia, anti-infection treatment and anti-shock therapy. The disturbance of water, electrolyte and acid base had been corrected on the second postoperative day. The dysfunction of coagulation recovered on the third postoperative day. After the abdominal compartment syndrome disappeared on the 4th day and heart-kidney function recovered on the 5th day, the postoperative mobilisation started. And then, the patient began to take food after anus exhausting. Finally, the patient discharged on 10th postoperative day when he recovered. This report indicates that the positive outcome of elderly patients with incarcerated umbilical hernia with intestinal obstruction would be benefit from positive surgery and reasonable perioperative management.

AFP3-5

laparoscopy, it is the best surgical approach for the treatment of groin hernias for the young soldier? A prospective study about 90 ptients

Zatir Soufiane[1], Makhlouf Boudekhil[2], Meliani Benyakhlef[2], Leboukh Miloud[2], Adnane Doiaun[2], Ouzine Ramdane[2], Brixi Samir[2], Selmani Azzedine[2], Koudjeti Rachid[2]
[1]*General Surgery, HMRUO, Algeria*
[2]*Departement of Surgery, HMRUO, Algeria*

The army needs a young and active population, to the accentuation of the inguinal hernia pathology in the military we-have adopt the treatment of inguinal hernias laparoscopic view the postoperative advantages of this surgical approach,we realized a prospective study of 90 young military operates all for inguinal hernias through laparoscopic.
Materiel and Method: We operated 90 patients for inguinal hernias on the age a period of 02 years, the age of our patients varies entre 20 and 45 years, all of our patients are professional soldiers, 48% straight hernia, inguinal hernia 35% left, 13% inguinal bilateral hernias, 4% recidivantes hernias.
our results Was spectacular Especially on the plane early resumption of activities in post-surgery patients all Resumed Their activities after-15 days of convalescence, our exit from hospital patients out one day postoperative. the post operative complications Was Had a 3 patients scrotal edema, has had a postoperative patient Serom no recurrence During the two years post opeatoires, 3 patients hAD chronic post operative pain for a period of 15 days and 32 days-limiting.
Conclusion: Lapport of laparoscopy in the treatment of groin hernias can be an alternative to traitementdes inguinal hernias in young Militiare view the many

AFP4-1

Hybrid technique in the treatment of late-stage mesh-related inguinal hernia infection

Jun-sheng Li
Department of General Surgery, Zhongda Hospital, Southeast University, China

Background and purpose: Wound and mesh infections after hernia repair are very severe complications. While the deep-seated infection involving an inserted mesh may result in groin sepsis, which usually necessitates complete removal of the mesh to produce resolution. We aim to describe the role of hybrid (laparoscopic & open) technique in the treatment of late-stage mesh-related infection after tension-free inguinal hernia repair.
Methods: Patients with chronic mesh-related infection were treated surgically in our department. Patient were either by open procedure, or hybrid technique. The patients were re-operated through the same groin incision. We used methelene blue to guide the complete removal of mesh.
Results: All late-staged infected meshes were successfully removed without severe complications. No hernia recurrence and/or chronic groin pain occurred.
Conclusion: Methelene bule is useful for the complete removal of mesh, hybrid technique is a preferred method in some cases in the inspection of abdominal adhesion caused by mesh, and avoid visceral injuries during operation.

AFP4-2

Comparison of Triple Repair using Ventralight and Soft mesh with Omyra and Optilene in Laparoscopic Repair of Incisional Hernia

Abdullah Aldohayan, Fahad Bamehriz, S. Althuwaini
Bariatric Surgery, King Saud University Hospital, Saudi Arabia

Background and Aim: Laparoscopic repair is usually done by one mesh. In need to reduce the recurrence of the hernia, we introduce new technique using closure of the defect with monomox suture and 2 meshes to cover the defect.
Methods: The technique is done for 2 groups of patients. The first group has undergone Laparoscopic Repair of Incisional Hernia using Omyra, Optilene meshes and Monomox suture closing of the defect. Moreover, the second group has been repaired using ventralight, soft meshes and monomox suture repairing of the defect.
Results: The study is performed from January 2015 to January 2016 in the Medical City of King Saud University. The first group includes 14 patients (4 males and 10 females) and the second group has 10 patients (2 males and 8 females). The technique is done as day surgery and in follow-up no seroma and no recurrence in follow-ups.
Conclusions: Triple laparoscopic repair of incisional hernia for both group has the same outcome for the follow-up period. No seroma, wound infections and recurrence. Long follow-up is needed to demonstrate the best kind of meshes to be used.

AFP4-3

Polylactide-caprolactone composite mesh used for ventral hernia repair: a prospective, randomized, single-blind controlled trial

Ying-mo Shen, Jie Chen, Li Sun, Fu-qiang Chen, Chang-fu Qin
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: Composite surgical mesh is widely used in laparoscopic repair of ventral hernia but may carry the risk of postoperative adhesion and more serious complications. The present study was undertaken to demonstrate the effectiveness and safety of a new composite polypropylene mesh coated with poly L-lactide-co- ε -caprolactone (EasyProsthes™).
Methods: This randomized, controlled trial was designed to compare EasyProsthes composite mesh (EPM) with Parietex™ Composite (PCO) in patients undergoing laparoscopic ventral hernia repair (with or without the hybrid technique). Hernia recurrence, chronic pain, seroma formation, intestinal fistula and obstruction, wound or abdominal infection, and ultrasound evidence of viscera adhesion were evaluated.
Results: Forty patients were randomly assigned to each of the EPM and PCO groups. All patients completed 24 months of follow-up. One patient in EPM group (2.5%) and two patients in PCO group (5%) developed mesh-viscera adhesions after surgery (p=1.000). No patients developed intestinal fistulas or obstructions. Seventeen patients in EPM group (42.5%) and 21 in PCO group (52.2%) developed post-surgical seromas in the operative area (p=0.370). One patient from each group developed postoperative wound infection. There were no cases of abdominal infection and no reports of chronic pain or hernia recurrence.
Conclusions: The incidence of postoperative complications in EPM group was similar to that seen with PCO. EPM is safe and effective when used in ventral hernia repair.

AFP4-4

Domestic absorbable tacks versus imported similar product for mesh fixation: A prospective randomized controlled clinical trial in China

Yi-ting Liu, Ying-mo Shen, Jie Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: To evaluate the safety and effectiveness of a domestic absorbable tack for mesh fixation, with compared with a widely used imported similar product.
Methods: From July 2014 to July 2015, a total of 119 patients with ventral hernia were enrolled in this prospective, single-blind (for subjects), randomized controlled clinical trial. They were divided into 2 groups randomly, 60 cases were received operation by same surgeons with domestic absorbable fixation (experimental group) and 59 cases with imported similar product (control group). Excellent rate of postoperative immediate fixation, fluency and accuracy of instruments were analyzed statistically. Meanwhile, recurrence, adverse events and complications after operation were observed.
Results: There were no statistically significant differences between the groups in terms of excellent rate of postoperative immediate fixation (P=1.000), fluency (P=0.163) and accuracy (P=0.547). During a follow-up period of 6 months, no recurrence in both groups and no significant differences were noted between the two groups for adverse events, seroma/hematoma, postoperative pain, discomfort sensation and etc.
Conclusion: It suggests that the domestic absorbable tacks in operation for mesh fixation is not inferior to imported similar product, so it is effective and safe to be worth promoting on clinical application.

AFP4-5

Standard procedure of laparoscopic incisional herniorrhaphy in our institution

Shuusuke Miyake, Jun Nakamura, Hirokazu Noshiro
Department of Surgery, Saga University Faculty of Medicine, Japan

Introduction: Laparoscopic surgery for incisional hernia has been widely spread. However, surgical indication and operative procedure for herniorrhaphy have not been well established yet and several recurrence and morbidity have been reported, Thus, it is important to establish the evidenced-operative procedure and strategy of surveillance for postoperative course.
Aim: We investigate the risk factor of laparoscopic surgery for ventral hernia retrospectively. In addition, we demonstrate our standard procedure of herniorrhaphy.
Method: Retrospective data from a cohort of 42 consecutive patients who underwent surgery for ventral hernia from April 2012 to April 2016 in our institution were reviewed.
Results: Forty laparoscopic surgeries of incisional hernia were performed. Patients' average age was 68 years old (41-86). Average BMI was 26.3 and average the size of hernia orifice was 79mm. Mesh repair was generally performed (sIPOM or IPOM plus). Tacking method (tacking and four transfascial suture or less) to fix the mesh was performed for 19 cases and penetrated method (tacking and five transfascial suture or more) was done for 21 cases. Recurrence was occurred in four cases. Fixation method of the mesh was an independent recurrence risk factor. (p = 0.048)
Discussion: Our study shows the recurrence risk factor of laparoscopic ventral herniorrhaphy was less fixation of a mesh. Our procedure "IPOM plus method" is generally performed with closure of the hernia orifice by reverse U stitch method and mesh repair. Further study is needed to establish the evidenced-operative procedure and strategy of surveillance for postoperative course for the future.

AFP4-6

PROLENE MESH ERODING COLON FOLLOWING LAPAROSCOPIC INCISIONAL HERNIA REPAIR

Manash Ranjan Sahoo
Department of Surgery

Introduction: A 50 year old gentleman underwent laparoscopic repair of incisional hernia with prolene mesh, one and half month after he had discharge from umbilicus and it did not heal with all dressings, then he roamed around from one hospital to another hospital, finally he presented to our hospital 6 months following surgery. We did CECT abdomen and sinogram which revealed contrast entering to bowel.
Method: Under general anesthesia we followed the sinus tract and found that the culprit prolene mesh was eroding to the transverse colon, so the mesh along with the part of the transverse colon was resected and an end to end anastomosis was done and finally the abdomen was closed.
Result: The patient had an uneventful recovery and everything was healed.
Conclusion: Prolene mesh should not be used in laparoscopic incisional hernia repair.

AFP4-7

Laparoscopic repair of a traumatic abdominal wall hernia in a morbidly obese patient

Kiyotaka Imamura, Minoru Takada, Shintaro Takeuchi, Kouichi Teramura, Yukiko Tabata, Masaru Abe, Satoshi Hayama, Eiji Tamoto, Yoshihiro Kinoshita, Hiroaki Kato, Yoshiyasu Ambo, Fumitaka Nakamura, Yoshiaki Narita, Nobuichi Kashimura, Osamu Matsunami
Department of Surgery, Teine Keijinkai Hospital, Japan

This is a case of a 31-year-old morbidly obese man with history of obstructive sleep apnea and hypertension who presented to the emergency department with a traumatic abdominal wall hernia following a motor vehicle collision. A CT scan revealed a right upper flank hernia and multiple injuries including a cervical spine fracture. As his vital signs were stable without evidence of bowel incarceration, we did not operate in the acute setting. He remained in the hospital for one-month and then he was transferred to a rehabilitation facility. Unfortunately, eight months later he developed signs of incarceration requiring only a nasogastric tube. After this episode, an intermittent periumbilical pain after meals persisted and therefore we felt surgical repair was necessary. Fortunately, the patient was able to lower his BMI from 57.5 to 45 kg/m2. We performed a laparoscopic repair to close the 12×7 cm hernia orifice using a 25×20 cm synthetic mesh placed intraperitoneally. Ten days after the operation, the patient was discharged and remained without any symptoms and recurrence in the 2-month follow-up.
If concomitant injuries accompany a traumatic abdominal wall hernia, delayed elective repair may be appropriate in selected stable patients. Twenty years have passed since the first laparoscopic approach was used to repair this uncommon hernia, and this case illustrates that it might be useful to treat morbidly obese patients.

AFP5-1

laparoscopic transabdominal preperitoneal hernioplasty in a medical college setting

Mushtaq Ahmed Chalkoo, Hilal Maqhdoomi, Mujahid Mir
Department of Surgery, Government Medial College Srinagar Kashmir India

Objectives: To determine the feasibility and patient's outcome of laparoscopic transabdominal preperitoneal mesh hernioplasty for inguinal hernias.
Patients and Methods: This study was carried out from March 2011 to April 2014. A total of 130 patients underwent laparoscopic transabdominal preperitoneal mesh hernioplasty (TAPP) for uncomplicated inguinal hernia. Of this, 10 patients presenting with bilateral inguinal hernias were operated in the single sitting. A 15 cm × 12 cm polypropylene mesh was used in all cases. Operative morbidity, postoperative pain, seroma formation, evidence of superficial infection, chronic groin pain and hernia recurrence were noted. The majority of the patients were discharged within 24 hours and follow-up was done at 1 week, 1 month, and 6 months.
Results: 130 patients presenting with uncomplicated inguinal hernias were operated over a period of three years in the department of surgery, Govt. Medical College Srinagar. The mean age of the patients was 39.18 years (range: 18 - 70 years). The median duration of operation was 48.5 minutes (range: 18 - 120 minutes). None of the procedure was converted to open inguinal hernia repair. Postoperative pain was observed in 9.23% of the cases and was easily controlled by oral analgesics. Six patients (4.62%) developed seroma, out of which one required aspiration while others settled conservatively. Two patients (1.54%) developed wound infection and one patient (0.77%) had recurrence. None of the patients developed scrotal hematoma or neuralgia. Return to normal activity after TAPP repair was found to be

AFP5-2

COMPARATION OF LICHTENSTEIN AND TAPP TECHNIQUE FOR INGUINAL HERNIAREPAIR

Ignatius Suryatmoko
Departement of Surgery, Awal Bros Hospital Batam, Indonesia

Background: The objective of this study was to compare Lichtenstein hernia repair and laparoscopic TAPP hernia repair.
Material & Methods: Patients who underwent hernia repair in Awal Bros Hospital, Batam, Indonesia, between January 2012 and December 2014, over 18 year old with primary unilateral, uncomplicated inguinal hernias were included in this study. We analyzed duration of surgery, length of stay in hospital, acute post operative pain, seroma/hematom, surgical site infection, time to return to normal activity, recurrence and chronic post surgical discomfort in hernia site.
Results: 54 patient with inguinal hernia were included to this study, 25 TAPP's patients and 29 Lichtenstein's patients. The mean age was similar in both groups. The mean operative time in Lichtenstein group was faster than in TAPP group. The length of hospital stay and was similar in both groups. Acute post operative pain was similar. TAPP patients was faster to return to normal activity (8 vs 15,21 days; p<0,05). No evidence of surgical site infection or recurrence in both groups. Hematom/seroma was occurred in 10,1% of Lichtenstein group and 4% in TAPP group (p>0,05). Lichtenstein group was felt more discomfort in hernia site (20,65 vs 8%: (p<0,05).
Conclusion: There is no difference in surgical site infection, length of hospital stay, post operative hematom/seroma and recurrence in the both group. TAPP group was faster to return to normal activity less discomfort in hernia site, but had longer operative time.
Keywords: herniarepair, Lichtentein's, TAPP

AFP5-3

Clinical analysis of 18 cases of inguinal incarcerated hernia treated by transabdominal preperitioneal laparoscopic inguinal herniorrhaphy

Wei-guo Zhang
Department of Surgery, The First Affiliated Hospital of Dalian Medical University, China

Objective: To investigate the feasibility, indications, advantages, mesh selection and postoperative effects of transabdominal preperitioneal laparoscopic inguinal herniorrhaphy (TAPP) on the treatment of inguinal incarcerated hernia.
Methods: The clinical data of 18 cases of patients with inguinal incarcerated hernia treated by TAPP from January 2015 to March 2016 were studied. The operative time, hospital stay, complications, recurrence and other factors were analyzed.
Results: The operations of all the patients were successful without conducting small intestine resection and conversing to laparotomy, and all the patients were cured while left the hospital. The shortest operation time was 80 min and the longest was 190 min with a mean operation time of 130 min. The postoperative hospital stay was 6-12 days The incarcerated hernia contents were small intestines in 11 cases, omentum in 6 cases, small intestine combined with omentum in 1 case. Postoperative seroma in inguinal region was appeared in 1 case and scrotal seroma in 3 case, and no chronic pain, scrotal hematoma, bowel obstruction, wound infection, patch infection and other complications were found.
Conclusion: TAPP is feasible and safe in curing the inguinal incarcerated hernia.Compared with open surgery, TAPP can easily find the automatically returned hernia contents after anesthesia, and avoid the necrotic bowel within the abdominal cavity with the missing retrograde incarcerated hernia.The mesh of TAPP is conducted in the preperitoneal space and it can avoid the heavy edema bleeding sites, and reduce the chance of infection patch.

AFP5-4

Intestinal Obstruction after Reduction "En-masse of inguinal hernia"

Ming-Husn Yang
Division of General Surgery, Department of Surgery, Cheng Hsin General Hospital, Taiwan

"Reduction en-masse of inguinal hernia", means reduction/migration of a hernial sac along with the incarcerated bowel into the preperitoneal space and is most often arising from the manual reduction of the hernia. Occasionally, it can also be spontaneous. There is usually a history of difficult reductions, and which would induced continued incarceration, and so containing incarcerated bowel loop in the preperitoneal space resulted in signs of bowel obstruction persist. Emergent surgical intervention must be performed to prevent potential complications, such as ischemic bowel disease.
We present a case of 62 y/o male, who was sent to emergency room because of incarcerated left inguinal hernia. Manual reduction of incarcerated hernia was performed successfully under intravenous general anesthesia in the operating room. Further hernioplasty is held because of congestive heart failure (LVEF= 34%) and bleeding tendency due to aspirin. He was admitted to ordinary ward and waiting for surgery. However, signs of intestinal obstruction persisted with increased nasogastric tube amount. Emergent diagnostic laparoscopy was arranged, which disclosed small bowel trapped in a sac with gangrenous change. The hernial sac located in the preperitoneal space with fibrosis of the opening. We converted to exploratory laparotomy via a low midline incision. Segmental resection of small bowel and repair of the peritoneal defect by sutures were carried out. Sepsis developed after surgery, and the patient expired for multiple organ failure. This case should help raise clinical awareness of the possibility of intestinal obstruction after reduction "en-masse of inguinal hernia"

AFP5-5

Clinical analysis and laparoscopic treatment of recurrence after open inguinal hernia repair

Xiao-yan Cai, Qi-long Chen
Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University, China

Objective: To investigate the recurrence of open inguinal hernia repair and the laparoscopic treatment for the recurrence.
Methods: Clinical data of 58 cases of recurrent inguinal hernia were reviewed retrospectively from Oct. 2010 to Apr. 2015. The median interval from the initial surgery to recurrence was 5 years (range from 1 week to 50 years). 53 cases after single hernia repair include 26 after tension repair, 9 after Lichtenstein repair, 9 after mesh-plug hemioplasty, 2 after Kugel procedure and 7 after Gilbert repair (UHS). 1 case received three surgeries which include 2 tension repairs and 1 mesh-plug hemioplasty. 4 cases received two procedures which include tension repairs and tension-free repairs.
Results: In principle, Recurrent hernias after open procedure were treated with laparoscopic repairs. 26 recurrent hernias after single tension repair include 12 direct hernias, 11 indirect hernias, 2 femoral hernias and 1 pantaloom hernia. 9 recurrent hernias after Lichtenstein repair include 1 direct hernia, 6 indirect hernia and 2 femoral hernia. 9 recurrent hernias after mesh-plug hemioplasty include 5 direct hernias and 4 indirect hernias. 1 direct and 1 indirect hernia were confirmed for the recurrence after Kugel procedure. All the recurrence after Gilbert repairs were indirect hernias. The initial mesh patches were not removed except 2 cases of plug which impeded repairs.
Conclusions: There were different characteristics of recurrence in each type of hernia repair. Laparoscopic treatment for recurrence of open inguinal hernia repair is safe and effective.

AFP5-6

Muralidharan

AFP5-7

Laparoscopic transabdominal preperitoneal approach (TAPP) for the repair of particularly complex recurrent inguinal hernias

Binggen Li, Xiangyang Nie, Yonghui Peng, Duhui Gong, Zhihua Xie, Yuxuan Mo
General Surgery, Hexian Memorial Affiliated Hospital of Southern Medical University, China

Background: The treatment of recurrent inguinal hernia is a common problem that vexes all the general surgeons. It is always accompanied with higher recurrences and more postoperative complications. Which is the best treatment still remain controversial. Transabdominal preperitoneal approach (TAPP) seems to be a preferred alternative. We report our experience with the TAPP surgery for the repair of some particularly complex recurrent inguinal hernias.
Methods: Between November 2012 and February 2016. Nine cases of complex recurrent inguinal hernia who have underwent previous TAPP, TEP repair or IPOM repair were enrolled in this study. All of them were treated by laparoscopic transabdominal preperitoneal repair again. The clinical data were retrospectively analyzed.
Results: All surgeries were successful without any serious complications. The mean operative time was 90(range 50145) min while mean blood lost was (3O±13) ml. The mean of postoperative hospital stay was 76 (range 36144) h. Complications including urinary retentions, scrotal seromas were noticed in 3 cases (33.3 %) and were properly managed, with no major impact on outcome of the operations. Complications associated with mesh was not detected. No serious acute or chronic pain occurred postoperatively. No recurrent case was found in these patients who had been followed-up for 3-42 months.
Conclusions: The TAPP procedure for repair of complicated inguinal hernia is a safe procedure with satisfactory outcome. Tailored treatment should be employed during the operation and the technique should be reserved for surgeons with extensive experience in the TAPP.

AFP6-1

Mesh associated infection after Laparoscopic parastomal hernia repair- a case report

Li-jia Liu, Si-meng Chen
Department of Surgery, The First Affiliated Hospital of Nanjing Medical University, China

A female aged 71 years old was admitted to hernia center in our hospital on Oct.29, 2014 with the main complaint of a recurrent parastomal mass for 2 years after Redical resection of rectal carcinoma (Miles). No history of diabetes mellitus.
The patient underwent Laparoscopic parastomal hernia repair (IPOM, Keyhole, PROCEED 15×10cm, Bard Permafix fixation system) on Nov.4, 2014. with preventive systemic antibiotic administration. No injury to bowels occurred during the operation. Drainage was intra-abdominally and subcutaneously placed respectively. Both drainages were removed 3 days post operation.
However, since then, the patient suffered from high fever with peak temperature of 39℃ for 7 days. CT scan indicated infection associated with the implanted mesh with liquid collection just under ther abdominal wall in the surgical site(between the mesh and abdominal wall). Puncture drainage of 120 ml cloudy purulent liquid in the surgical infected site for bacterial culture was performed, followed by Tinidazole lavage on Nov.14,2014. Ultrasound guided puncture was done for another 20 ml bloody liquid on Nov.18,2014. Bacterial culture indicated E.Coli infection. The patient was successfully treated with puncture drainage and the mesh was salvaged. No delayed infection was detected in the follow-up of 18 months.
Timely percutaneous drainage of suspected mesh-related infection/abscess is effective. Synthetic mesh such as Proceed can be preserved in case of SSI since the adoption of macroporous mesh is conductive to tissue ingrowth and drainage, which avoid the collection separating the mesh from the surrounding tissue.

AFP6-2

Laparoscopic Treatment for Bochdalek Hernia with Acute Abdomen: A Report of Two Cases and Literature Review

Fei Yue, Jian-wen Li, Min-hua Zheng
Gastrointestinal Surgery, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, China

Objective: Bochdalek hernia is the most common type of diaphragmatic hernia, which has an incidence rate of 0.17% in the adult population. However, the asymptomatic patients seldom seek clinical help, but often got admitted with acute symptoms. We hereby report our experience dealing with Bochdalek hernia in emergency.
Methods: The clinical data and surgical procedures of the two cases were reviewed retrospectively. The 35-year old female patient was admitted due to acute abdominal pain in the left upper quadrant. She also has a concomitant symptom of incomplete intestinal obstruction, thus got treated with a total laparoscopic procedure. The other 57-year old male patient with acute left chest pain demonstrated symptoms of complete intestinal obstruction. The reduction of hernia contents was not achieved during the laparoscopic exploration. Hence, the thoracic surgeons performed a thoracotomy for the repair.
Results: The female patients underwent a 3-trocar laparoscopic hernia repair with mesh, who recovered rapidly postoperatively and got discharged 3 days after surgery. The male patient underwent thoracotomy had a 10-cm intercostal incision in the left chest. His incarcerated transverse colon was reduced, but the strangulated omentum was removed. The hernia repair was managed by simple suture, and the chest tube was removed by 7 days and got discharged by 10 days postoperatively.
Conclusion: According to our experience and literature review, we conclude that, with careful evaluation of patients' situation and procedure indication, laparoscopic treatment could also play a key role in the management of Bochdalek hernia with acute abdomen.

AFP6-3

Laparosocpic diaphragmatic hernia repair: delayed diagnosed traumatic diaphragmatic hernia

Gil Ho Kang, Jong Min Kim, Jong JE Sung, Hyek Moon Kim, Hoe Min Yang, Ok Pyeng Song
Department of Surgery, Min Hospital, Republic of Korea

Laparoscopic repair for diaphragmatic hernia is uncommon entities of challenging to repair. And most cases of Laparoscopic diaphragmatic hernia repair were often reported for congenital diaphragmatic hernia in child or adult. But in cases of traumatic diaphragmatic hernia, laparoscopic repair cases were very rare, and the report of it is not being in Korea So We want to report experience of laparoscopic repair for delayed diagnosed traumatic diaphragmatic hernia.
A 35year old male was visited for operation. He has past history that had a passenger traffic accisent 15 years ago. That time he had injured left side of body mainly, but not diagnosed diaphragmatic hernia by abdominal computed tomography. After that time he has no other symptoms except dyspnea in exercise, stepping. He was diagnosed when he had medical check up at 7 years ago.
We done laparoscopic repair. Patient was positioned semi-laterally. We used 4 ports included camera port. We gently reducted herniated organs, omentum, partial jejunum and colon, total spleen. We found collapsed lung through the defect. The defect was measured 8x5cm size. After insertion of chest tube, We repaired hernia defect with primary closure, and then applied synthetic mesh. There were no complications and the patients was discharged on postoperative seventh day.

AFP6-4

Management of Recurrent Hernia After TEP (Totally Extraperitoneal) Repair Using The TAPP (Transabdominal Preperitoneal) Technique - Initial Experience and Literature Review

Anil D Rao, Reyaz M Singaporewalla, Arunesh Majumder
Surgery, Khoo Teck Puat Hospital, Singapore

Background: The techniques of Totally Extraperitoneal (TEP) and Transabdominal Preperitoneal (TAPP) repair for inguinal hernias are now well established and both show good results. Managing recurrences after TEP repair is however challenging and the optimum repair technique is controversial. Literature reports some series of post-TEP recurrences being repaired using repeat TEP procedure. We report five cases of post-TEP recurrences that were repaired using TAPP technique.
Methods: Five patients with bilateral inguinal hernia underwent primary TEP repair. The first patient had a left pantaloon and a right direct hernia. The second patient had a right direct and left indirect inguinal hernia. The other three patients had large bilateral direct herniae. Each patient had two separate lightweight prolene meshes (10 x 15 cm) anchored in place using absorbable tackers. All patients developed clinical recurrences at about 6 months which were confirmed with ultrasound imaging.
Results: At subsequent TAPP repair, the recurrences could be easily visualized and confirmed to be unilateral (Indirect-3, Direct-2). The peritoneum could be easily dissected off, preserving the cord structures with placement of mesh in the preperitoneal space after adequate mobilization. Light weight prolene mesh (10x15 cm) was anchored in place using absorbable tackers in each case with adequate cover of the peritoneal flap. Both patients had uneventful recovery and no further recurrence was noted at 8 and 12 months follow-up.
Conclusion: In patients with post -TEP recurrences, the TAPP repair technique is much easier, allowing accurate diagnosis, adequate working space and ease of dissection.

AFP6-5

Safety and efficacy of laparoscopic transabdominal preperitoneal herniorrhaphy using a partially absorbable polypropylene mesh for recurrent femoral hernias

Shuo Yang, Ying-mo Shen, Jie Chen
Department of Hernia and Abdominal Wall Surgery, Beijing Chao-Yang Hospital, Capital Medical University, China

Objective: Femoral hernias are relatively scarce in clinic, but the patients frequently present as emergency or recurrent cases, especially, in a specialized hernia center. Open surgery is still the most common procedure, but its standard technique and approach have not yet reached. We present our preliminary experience of laparoscopic transabdominal preperitoneal (TAPP) repair with a partially absorbable polypropylene flat mesh in recurrent femoral hernias.
Methods: In this retrospective study, 18 patients who had a previous open herniorrhaphy repair (simple suture or mesh repair) underwent laparoscopic TAPP repair using a partially absorbable polypropylene mesh (EasyProsthesis MESH 15×15, TransEasy Medical Technology Co., Ltd., China) in our institution from 2013 to 2015. Data was collected regarding patients' demographics, prior surgery, recurrence rate, duration of hospital stay, and complications.
Results: In this series, the mean age was 54.4 years. The patients (15 females, 3 males) had an average of 1.3 prior repairs. 3 patients had simple suture repair, 4 had both suture and mesh repair, and 2 had undergone twice mesh repairs. The mean operating time was 95.0 min (range 80-130 min). After at least 12 months follow-up, there were no recurrences or infections. Three cases (16.7%) of seroma occurred after operation. No postoperative chronic pain was observed.
Conclusions: The treatment of femoral hernia which has previous open hernia surgery is a challenge in the clinical practice. Laparoscopic TAPP using partially absorbable polypropylene mesh appears to be a safe and effective procedure in the repair of recurrent femoral hernias.

AFP6-6

Unusual Syncope Caused by Huge Hiatus Hernia: An Operative Case Report

Yoshifumi Tagami, Katuhiro Masamune, Sadahiro Yoshida
Department of Surgery, Anan Kyoei Hospital, Japan

Syncope is induced by various conditions. Large hiatus hernia was a rare cause of syncope.
69-year- old woman was admitted to our hospital because of lower abdominal pain and vomiting. Loss of consciousness and apnea occurred on retching at outpatient clinic. She had suffering from frequent syncopal attack for 1 year. CT scan revealed a type Ⅲ giant hiatal hernia within the intrathoracic stomach located just behind the heart with resultant compression of the heart. Electrocardiogram monitoring showed a paroxysmal atrioventricular block on syncopal attack. Her previous episodes of syncope occurred after gastrointestinal complain like vomiting and abdominal pain. As the patient's hiatal hernia was severe, we planed to repair of hiatus hernia. After the operation, her syncope attacks disappeared for 1 year.
Giant hiatal hernia was the rare cause of syncope and surgical treatment improved patient's quality of life. Giant hiatus hernia was one of differential diagnosis on unusual syncope.

AFP6-7

Primary closure of direct inguinal hernia defect in laparoscopic repair with barbed suture -a simple method to prevent early recurrence and seroma

Jun-sheng Li, Zhen-ling Ji, Wei-yu Zhang
Department of General Surgery, ZhongDa Hospital, Southeast University, China

Purpose: Seroma and early recurrence are the frequent postoperative complications after laparoscopic direct inguinal hernia repair (Both in TAPP and TEP). There are several methods to address these problems, however, these techniques are not without problems. The purpose of this study was to introduce and evaluate a new technique to address these problems.
Methods: This is a prospective study of consecutive patients. All patients diagnosed with direct inguinal hernias eligible for laparoscopic repair were included. A single surgeon performed all operations. In the present study, we closed the direct hernia defect with barbed sutures around the transversalis fascia, and inverted the apex of the attenuated transversalis fascia and trans-sutured it together at the same time to eradicate the defect cavity. Prosthetic mesh was not additionally fixed in all patients. The primary postoperative outcome parameter was seroma formation, secondary outcome parameters included groin pain, surgical complications, and hernia recurrence.
Results: 12 male patients with 18 sides of direct hernias were included in this study, all procedures were carried out laparoscopiclly and successfully. Only one patient developed significant seroma, which resolved one month later. The early postoperative pain was minimal, and without chronic pain and recurrence during the follow-up period (2 to 5 months).
Conclusions: The present direct inguinal hernia defect closing technique with barbed-suture is simple, easily reproducible and effective for the prevention of seroma formation and early recurrence.

AFP6-8

Laparoscopic repair of parastomal hernia associated with recurrent midline ventral hernia: surgical technique

Hoyuela Carlos, Montserrat Juvany, Fernando Carvajal, Miquel Trias, Antoni Martrat, Jordi Ardid, Joan Obiols
Department of General and Digestive Surgery, Hospital Platon Barcelona, Spain

Background: Parastomal hernia is often associated to other incisional hernias, frequently unexpected. Laparoscopic approach allows assessing abdominal wall hernias properly, achieving better results than other techniques.
Objective: To describe the key aspects of laparoscopic repair of a parastomal hernia (Sugarbaker Technique) associated with recurrent midline incisional hernia using a single mesh.
Methods: A 78-year-old obese woman (BMI>34) underwent an APR due a rectal cancer (2007); in 2010, she was operated on due to an incisional hernia (primary midline closure plus onlay mesh repair). 2013: painful parastomal hernia associated with a recurrent midline incisional hernia, with several acute pain episodes. Laparoscopic repair is performed using three trocars (12-10-5mm). A careful adhesiolysis is first performed. It's mandatory to identify and measure all wall defects properly. Then, wall defects are covered with an intraperitoneally placed 25x20cm mesh, with an overlap of at least 4 cm. around defects, according Sugarbaker Technique. It's of utmost importance to prevent narrowing and angulation of the bowel when entering the abdominal cavity. The prosthesis is fixed to the abdominal wall (double-crown technique). Wounds>10mm are closed in layers after removal of the trocars.
Results: Operating time: 120 minutes. The patient was discharged 72 hours after operation (VAS=2). Postoperative course was uneventful. No postoperative complications were observed. No recurrence has been observed after 10 months follow-up.
Conclusions: Laparoscopy must be considered as a primary option treating parastomal hernia, due to its frequent association with other (and sometimes unexpected) incisional hernias and its results.

APS-01

Study of adult inguinal hernia postoperative pain caused by surgical procedures

Yasuhito Hisatsune[1], Satoshi koizumi[2], Ryuichi Oshima[1], Kazumi Tenjin[3], Natsuko Sasaki[1], Asako Fukuoka[1], Takahiro Sasaki[3], Osamu Saji[1], Masamitsu Ishii[4], Takeshi Asakura[4], Yukihito Kokuba[2], Nobuyosi Miyajima[3], Takehito Otsubo[1]

[1]*Department of Gastroenterological Surgery, St. Marianna University School of Medicine Yokohama City Seibu Hospital, Japan*
[2]*Department of Gastroenterological Surgery, St. Marianna University School of Medicine, Japan*
[3]*Department of Gastroenterological Surgery, St. Marianna University School of Medicine Toyoko Hospital, Japan*
[4]*Department of Gastroenterological Surgery, Kawasaki Municipal Tama Hospital, Japan*

Background: The purpose of this study was to evaluate the postoperative pain of transabdominal pre-peritoneal repair (TAPP) versus that of the anterior approach (AA).
Methods: From April 2015 to April 2016, 55 adult patients with inguinal hernia were analyzed. To calculate the intrinsic degree of pain preoperatively, the values of minimum sensed current and the corresponding pain current were measured using a perceived pain analyzer (Pain Vision). Postoperatively, the wound pain level was calculated, and the wound pain ratio was determined from the intrinsic pain level and the wound pain level. We compared the wound pain ratio between the TAPP and AA surgical procedures. Significance was determined by a t-test.
Results: Of the 55 patients, 26 underwent TAPP and 29 underwent AA. The wound pain ratio on postoperative day 1 was 235.72±44.7 vs 199.59±42.93 (p=0.56) and on day 2 was 159.26±27.73 vs 144.02±26.26 (p=0.69), respectively. No significant difference was seen in the wound pain ratio between the two groups.
Conclusion: The results of the present analysis indicate that there is no significant difference in postoperative pain between the TAPP and AA procedures.

APS-02

Ultra-Pro Hernia System For Repair of Primary Complex Inguinal Hernia: Should it be the technique of choice?

Tamer Abdelhafez Elbakry, Nizar Bouchiba, Mohamed Soliman Elakkad, Ahmed Elfaki

Department of General Surgery, Alwakra hospital, Hamad Medical Corporation, Qatar

Purpose: Emergence of light weight 3D mesh devices showed outstanding results in inguinal hernia repair. Ultrapro Hernia System (UHS) is a partially absorbable bilayer mesh with only patch connected to inlay patch by a mesh cylinder connector. It leaves 65% less foreign material comparing to heavy weight meshes. It enables to reinforce pre-peritoneal space with minimal fixation, less post-operative pain, & rapid return to usual activities.
Methods: 75 male patients with complex primary inguinal hernia were submitted to open inguinal hernia repair using UHS (Ethicon, USA) between November 2013 and November 2015.
Results: Mean age was 46.1 years. 33 patients had inguino-scrotal hernias, 14 with Nyhus type IIIA, 22 with Nyhus type IIIB, 6 patients with strangulated hernias. Mean Operative time was 48 minutes. No operative complications were recorded. Post-operatively, the mean VAS scale on 1 day, 1 week, & 1 month was 3.64, 1.32, & 0.24 respectively. The mean duration of oral analgesics use was 2.4 days. None of the patients reported any chronic pain at 12 months post-operatively. Two superficial wound infections were recorded & treated by oral antibiotics (no surgical drainage needed). No recurrence occurred during mean follow up of 21 months.
Conclusion: Inguinal hernia repair using UHS is an effective technique combining advantages of anterior and pre-peritoneal approaches. It improves patient quality of life with less chronic pain and minimal recurrence rates. Longer follow up periods on more patients is needed for further assessment of long term results of UHS.

APS-03

How to do laparoscopic recurrent inguinal hernia repair in peritoneum insufficient case: a simple technique

Jun-sheng Li, Zhen-ling Ji

ZhongDa Hospital, Southeast University, China

Background and Purpose: Recurrent inguinal hernia is technical challenging, especially for that after previous mesh repair, the mesh may implicate the peritoneum, which leads to peritoneum tearing or shortage for laparoscopic repair. Here we described how we deal with this problem.
Methods: Two cases recurrent direct hernias after previous mesh-plug repairs were treated with the transabdominal preperitoneal repair (TAPP) repair, during operation, we left the previous mesh in untouched, and dissected the peritoneum around the previous mesh, and enlarged the preperitoneal space, after peritoneum dissection, we found the peritoneum was not enough to cover the mesh, we completed dissected and reduced the large hernia sac, then a longitudinal incision was made to tailor the sac, which was used to compensate for the shortage of peritoneum.
Results: in these two cases of recurrent direct hernias, we avoided the dissection and removal of the previous mesh, and successfully performed the TAPP, avoid the usage of expensive anti-adhesive mesh, by the tailoring of the hernia sac, the shortage of the peritoneum conflicted by previous mesh could be compensated. And patients recovered uneventfully.
Conclusion: We believe it is a simple technique in suitable cases.

APS-04

The Transabdominal Preperitoneal (TAPP) Repair in the inguinal hernia Patient with Hemophilia A

Li-sheng Wu, Jian-wei Yu
Department of Hernia and Metabolism of Loss Surgery, AnHui Provincial Hospital, China

Laparoscopic hernia repair is recommended for inguinal hernias in patient because of most benefit such as less pain, excellent cosmesis, bilateral inguinal hernia, and so on. At the same time, Despite meticulous concentrated factor VIII and factor IX supply, Surgery in patients with inherited bleeding disorders is considered high risk and remains a challenge for surgeons. Laparoscopic hernia repair in patients with hemophilia is traditionally considered relative contraindication and report about that is very rare. We report a case with right inguinal hernia associated with hemophilia A. A 56-year-old married male suffered from hemophilia A for 30 years presented with a right inguinal hernia. This was repaired laparoscopically with a prothetic mesh (3D Max) using a transabdominal preperitoneal approach (TAPP). The patients had a good surgical procedure and blood loss was similar to that with normal coagulation, despite the patient with hemophilia stayed in hospital a little bit longer and hospitalization cost increased a lot because of the need to give him factor 8 infusions. We obtained a successful outcome during a 11-month follow-up period.

APS-05

Beware of the hyponatremia post inguinal hernia surgery

Yi-wei Qiu
General Surgery Department, Tianjin Medical University General Hospital, China

Background: Hyponatremia is a common but often mistreated clinical situation. We hypothesize that the mechanism behind is most likely to be the sodium and water redistribution from the serum to the cells or the interstitial spaces due to the insufficient cortical steroid, not the sodium deficiency. As we have no reason to believe the patients have lost that much sodium which caused hyponatremia.
Methods: From January 2014 to March 2016, we studied 87 inguinal hernia patients who underwent Lichtenstein repair and experienced unexplainable hyponatremia with at least one of the symptoms including headache, nausea, vomiting, obstinate diarrhea and hypotension immediately post-surgery. All of the patients' serum sodium levels were perfectly normal prior to the surgery. Those aforementioned symptoms alleviated simultaneously and immediately with the serum sodium level restored after the hydrocortisone or prednisone was administered without any oral/intravenous sodium supplementation. We discuss the possible mechanism for hyponatremia in patients who are mostly likely to be adrenal insufficient rather than absolute sodium deficiency. The evidence supporting our hypothesis is that, (1) the serum sodium level does not always respond well to sodium supplementation; (2) the patients responded well to the hydrocortisone or prednisone therapy without any sodium supplementation; (3) patient with an elevated serum/urine cortisol level does not warrant him being adrenal sufficient.
Conclusions: Hyponatremia without significant loss of sodium can be used as an indicator to monitor the patients' adrenal function regardless of the serum/urine cortisol level. This hypothesis warrants further research of the adrenal function of the patients post-surgery.

APS-06

The effect of prophylactic oral antibiotics in the prevention of incision infection after tension-free hernioplasty

Shi-xiong Hu, Li-yang Tan, Mei-feng Zhang
Department of Surgery, Guangdong General Hospital, Guangdong Academy of Medical Scinces, China

Objective: To evaluate the effect of prophylactic oral antibiotics in the prevention of incision infection in patients received tension-free hernioplasty.
Methods: A total of 192 patients diagnosed with hernia between Sept. 2015 and Dec. 2015 at our institution were selected for this retrospective study. Patients with risk factors of incision infection, such as diabetes and obesity, were excluded. All patients received surgical treatment by the same surgeon, and were randomly given oral antibiotic for 48 hours after surgery. Patients were follow-up for one week in order to observe the incision status.
Results: One hundred and twenty patients, including 112 cases of male and 8 cases of female, adopted UPP mesh; of them, 60 cases received oral antibiotic treatment, and the other 60 cases did not take oral antibiotic, each group had 2 cases of surgical incision infection (3.33% vs. 3.33%). Another 72 patients were repaired with EadyProsthesis path, there were 1 case of incision infection in the 48 cases of patients those take oral antibiotic (2.08%); in the other 24 patients those did not received oral antibiotic, there were no cases of incision infection.
Conclusion: Prophylactic oral antibiotics could not decrease the rate of incision infection in hernia patients received tension-free hernioplasty.

APS-07

The effect of iliohypogastric nerve resection on postoperative pain after tension-free herniaplasty

Shi-xiong Hu, Li-yang Tan, Mei-feng Zhang
Department of Surgery, Guangdong General Hospital, Guangdong Academy of Medical Scinces, China

Objective: To explore the feasibility and clinical effect of iliohypogastric nerve resection on reducing postoperative pain in hernia patients received tension-free herniaplasty.
Methods: The clinical data of 640 patients with inguinal hernia underwent tension-free herniaplasty from July 2013 to July 2014 were retrospectively reviewed. Patients were divided into two groups according to whether they received iliohypogastric nerve resection. The postoperative pain were evaluated with VAS scoring system, and the score of two groups were compared and analyzed.
Results: Of the 640 patients, 348 cases (54.4%) received iliohypogastric nerve resection, and 292 cases (45.6%) did not. The mean operation time was 50±12.5min (30 - 65 min), the average length of hospital was 3±1.5 d (1-4d), and the follow-up time was 2 weeks. In the group of patients with iliohypogastric nerve resection, there were 130 patients got 0-points (37.5%), 43 patients got 1-points (12.4%), 44 patients got 2 points (12.6%), 87 patients got 3-points (25.0%), 44 patients got 4-points (12.6%), respectively, and no cases got 5-points or more. In the group of patients without iliohypogastric nerve resection, there were 51 cases got 0-points (17.5%), 84 cases got 1-points (28.6%), 6 cases got 2-points (1.9%), 68 cases got 3-points (23.4%), 53 cases got 4-points (18.2%), 28 cases got 5-points (9.7%), 2 cases got 6-points (0.7%), respectively.
Conclusion: Iliohypogastric nerve resection can reduce postoperative pain in inguinal hernia patients received tension-free herniaplasty.

APS-08

CLINICAL OBSERVATION OF ILIOHYPOGASTRIC NERVE AND INGUINAL DISSECTION IN TENSION-FREE INGUINAL HERNIOPLASTY

Li-jia Liu, Si-meng Chen
Department of General Surgery, the First Affiliated Hospital with Nanjing Medical Univeristy, China

Objective: The iliohypogastric nerve under the aponeurosis of external oblique was explored to provide the guide for the choice of the surgical procedures and mesh size in open tension-free inguinal hernioplasty.
Method: The consecutive observation of the iliohypogastric nerves under the aponeurosis of external oblique was made for 935 cases of open inguinal hernioplasty from 2007.12 to 2011.8, among which 297 cases of hernioplasty with 3.5cm-wide meshes and 638 cases of hernioplasty with 5.5cm-wide meshes. The iliohypogastric nerves were observed in the space extending from the internal ring to the pubic tubercle in length and from the reflex of the inguinal ligament to the position 3.5cm, 5.5cm vertically above the inguinal ligament in width respectively.
Result: The iliohypogastirc nerves were observed in 386 cases (41.3%) of the total 935 inguinal hernioplasties, during which 78 cases (26.3%) in 297 hernioplasties with 3.5cm wide meshes and 308 cases (48.3%) of 638 hernioplasties with 5.5cm wide meshes, with the former significantly lower than the latter (statistically significant, P0.001).
Conclusion: For open inguinal hernioplasty, the wider the separation of the space under the aponeurosis of external oblique, the higher the possibility of the exposure of and injuries to the iliohypogastric nerve as well as the requirement for the proper management of the nerve and mesh. Although inguinal hernioplasty with large mesh could reduce the post-operation recurrence rate, the possibility of injury to the nerves in operation will increase.

APS-09

Application of Ultrapro Hernia System in Preperitoneal Hernioplasty for Inguinal Hernia

Peng Cai, Li-ming Xu, Qing-feng Xu, Peng-hui Guo, Min-zhe Huang
Department of Surgery, Zhangzhou People's Hospital, China

Objective: To investigate the application and efficacy of partially absorbable ultrapro hernia system (UHS) in preperitoneal tension-free hernioplasty.
Methods: The clinical data of 89 patients undergoing preperitoneal tension-free hernioplasty by applying UHS for inguinal hernia from 2014 were summarized.
Results: All 89 patients were cured; the duration of surgery ranged from 40 to 90 min with a mean duration of 70 min. As for postoperative complications, retention of urine was detected in 2 patients, incision infection in 1 patient, seroma in 2 patients, slight incision pain was found, and no obvious foreign body sensation, scrotal hydrocele or hematoma of the scrotum was observed. Patients left hospital 3-5 days after surgery. No recurrence occurred in the 3-month to 2-year follow-up.
Conclusion: By applying partially absorbable UHS in preperitoneal tension-free hernioplasty for inguinal hernia, the patch could completely cover the myopectineal orifice, the anterior and posterior walls of abdominal transverse fascia were improved, foreign body retention was low, and the incidence of chronic pain was low; therefore, preperitoneal tension-free hernioplasty applying UHS is an ideal method to treat inguinal hernia.

APS-10

Lichtenstein tension-free hernioplasty repair in adult patients with De Garengeot hernia

Luo Wen, Yong Wang
The central hospital of Wu Han, Tongji medical college Huazhong university of science & technology, China

To investigate the preoperative management and the clinical effecciency of Lichtenstein tension-free hernioplasty in an adult patient with De Garengeot hernia.

APS-11

Two cases of early recurrence after transabdominal preperitoneal (TAPP) inguinal hernia repair

Yoshihisa Yaguchi, Tsuyoshi Inaba, Yuichi Igarashi, Naruyoshi Soeda, Yoshimasa Kumata, Masahiro Horikawa, Takashi Kiyokawa, Hisae Iinuma, Ryoji Fukushima
Department of Surgery, Teikyo University School of Medicine, Japan

We performed transabdominal preperitoneal (TAPP) inguinal hernia repair on 58 patients. Of these patients, 2 experienced recurrence within three months of the surgery. The purpose of this study was to analyze the cause of this early recurrence after TAPP.
Case 1 was a 76-year-old male who underwent TAPP (Bard 3DMax Light) for bilateral inguinal hernia (I-2, both sides). The recurrence was diagnosed 1 month after surgery. A second surgery was performed using the anterior approach method. The mesh had dislocated to the lateral side with kinking in the internal cranial side. We repaired it using the Direct Kugel method.
Case 2 was a 79-year-old male who underwent TAPP (Bard 3DMax Light) for bilateral inguinal hernia (left: IV (I-2+II-2); right: II-3). It was difficult to exfoliate the peritoneum due to omental adhesion after appendectomy. The recurrence was diagnosed three months after surgery. A second surgery was performed using the anterior approach method under laparoscopic observation. The mesh, which was fixed with Cooper's ligaments, had dislocated to the lateral side and was slipping off. We repaired it using an ULTRAPRO Plug.
It has been reported that recurrence after TAPP is more common on the internal side and it has been suggested that sufficient exfoliation and a large enough mesh are important to prevent such recurrence.
We believe that the recurrences in the present cases were due to insufficient internal exfoliation and fixation, though the recurrence in Case 2 resulted from the complicated exfoliation of the preperitoneal space due to omental adhesion.

APS-12

A case of chronic postherniotomy pain treated by genitofemoral neurotomy with a laparoscopic transabdominal approach

Ichiro Ohsawa, Tatsuya Sakamoto, Yu Fujimura, Koki Maeda, Kenji Kato, Makoto Iwata, Masami Tabata, Takayuki Sanda
Department of Surgery, Matsusaka Central General Hospital, Japan

A 66-year-old man, who underwent anterior mesh plug hernia repair at our clinic for the right direct inguinal hernia 6 years previously and anterior mesh plug hernia repair for the recurrent right inguinal hernia 6 months previously, re-visited our clinic due to occasional right inguinal pain. This symptom became refractory and severe year by year, and was especially exacerbated by the lifting heavy goods or standing for long periods. According to a physical examination, the patient's pain was supposed to have originated from the genitofemoral nerve given the direction of neuralgia which radiated downward to the genitalia and inner aspect of the thigh. After 5 years, analgesics failed to relieve the pain, and we planned an operation comprising inguinal hernia repair and genitofemoral neurotomy with a laparoscopic transabdominal preperitoneal approach under the diagnosis of genitofemoral neuralgia with recurrence of inguinal hernia. Recurrence of hernia was not found during the operation, and the patient underwent neurotomy of the genitofemoral nerve and preperitoneal reinforcement of the lateral area using mesh without removal of the mesh-plug that had been placed on the medial side in a previous operation. One month after the operation, right inguinal pain disappeared except for slight tenderness around the operative scar. With the anterior approach, iliohypogastric and ilioinguinal nerves are easily accessible, but the genitofemoral nerve is difficult to detect and manipulate, especially postherniotomy. A laparoscopic transabdominal approach has the advantage over an anterior approach in providing access to the genitofemoral nerve.

APS-13

Post operative pain following Totally Extraperitoneal Laparoscopic Inguinal Hernia Repair - Self Gripping Mesh Vs Staple Fixation: A Prospective Double Blinded Randomized Controlled Trial An interim Result

Peng Choong Lau, Kuan Yean Low
Department of Surgery, University Malaya Medical Centre, Malaysia

Background: Laparoscopic totally extraperitoneal (TEP) repair of inguinal hernia has been a standard of care for inguinal hernias. A recently introduced self gripping mesh (SGM) which does not require staple fixation(SF) has been shown to reduce post operative and chronic pain in open inguinal hernia repair. This ongoing study aims to compare the post operative pain outcomes in TEP repair.
Methods: A randomized controlled patient and evaluator-blinded study was conducted in patients with uncomplicated unilateral inguinal hernia in our centre from December 2015 to August 2016. Patients were randomized to either receive a SGM (ProGrip) or a light polypropylene mesh fixed with stapler (ProTack). Main outcomes measured were pain score on Visual Analogue Scale (VAS) at 1 hour, 1 day and 2 weeks post operation.
Result: A total of 27 patients were recruited and analysed so far. 12 were randomized to SGM and 15 to SF. The mean length of the procedure was 78.8 min in the SGM group and 79.3 min in the SF group. The mean preoperative pain values scored by VAS at post operation 1 hour, 1 day and 2 weeks (SGM vs SF) were 5.0 vs 3.7(p=0.43), 2.9 vs 3.3(p=0.55) and 2.0 vs 1.8(p=0.63) respectively. There are no post operative complications or recurrences reported so far.
Conclusion: At interim analysis there was no difference in pain score of the patient post operatively using either SGM or SF in TEP repair.

APS-14

Omental torsion caused by incarcerated inguinal hernia: report of a case

Yuya Shimoyama[1], Katsuhito Suwa[1], Takuro Ushigome[1], Masamichi Otsu[1], Satoshi Narihiro[1], Tomoyoshi Okamoto[1], Katsuhiko Yanaga[2]
[1]*Department of Surgery, Daisan Hospital, The Jikei University School of Medicine, Japan*
[2]*Department of Surgery, The Jikei University School of Medicine, Japan*

Background: Torsion of the greater omentum (OT) is a rare condition in the literature.
Presentation of a case: A 44-year-old male presented at our institution complaining of right quadrant pain, and acute appendicitis was suspected on physical examinations. CT demonstrated a fat density mass in the left groin continuing intraabdominally to form a whorl-like stratified structure. A diagnosis of OT due to left incarcerated inguinal hernia was obtained, and an emergency surgery was performed. On entering the peritoneal cavity through a midline incision, the omentum was found to be twisted and necrotic. The omentum continued into the left inguinal hernia sac and was incarcerated. Hernia content was reduced, and the omentum was resected. His postoperative course was uneventful.
Discussion: OT is classified into two groups, primary and secondary. Inguinal hernia is the most common cause of secondary OT. Although OT is rarely reported, the diagnosis can be established preoperatively because of its characteristic CT findings.
Conclusion: OT should be considered in differential diagnosis of acute abdomen.

APS-15

A randomized clinical study on postoperative pain comparing the supraglottic airway device in TAPP

Yoshio Nagahisa, Kazuyuki Kawamoto, Michio Okabe, Tatsuya Okamoto, Kazuki Hashida, Ryu Matsumoto
Department of Surgery, Kurashiki Centaral Hospital, Japan

Background: Transabdominal preperitoneal (TAPP) repair is the most widely used laparoscopic technique for the treatment of inguinal hernia in Japan. Many studies have shown that in comparison with open hernia repair, laparoscopic repair results in less pain and a shorter convalescence. However, postoperative pain remains a concern. One possible cause of postoperative pain in the early postoperative phase is strain or cough on removal of the endotracheal tube. Use of a supraglottic airway (SGA) device helps to avoid such complaints. We evaluated postoperative pain after TAPP repair using the SGA for general anesthesia.
Methods: We evaluated the postoperative pain in 144 patients with inguinal hernia repaired by TAPP in our hospital between May 2013 and May 2016. All patients who underwent needlescopic TAPP surgery were randomly allocated to one of two groups of 72 patients: group A (SGA), in which the patient's airway was secured with an appropriately sized I-gel, and group B (endotracheal tube), in which the airway was secured under laryngoscopy.
Results: There was no significant difference between the groups regarding patient background, postoperative hospital stay and operation time. In the analysis of postoperative pain, the mean Numerical Rating Scale score of peak pain in group A was significantly less than that of group B (2.10±2.05 vs 2.90±2.65; p=0.043), and the level of postoperative pain in group A tended to decrease earlier than that in group B.
Conclusions: The results of this study are the first to show that an SGA device can reduce postoperative pain.

APS-16

An Omental Fibroma Resembling a Testicular Tumour but Presented as an Irreducible Inguinal Hernia: a Case Report

Phong Jhiew Khoo, Stephen Jacob Jacob
Department of General Surgery, Labuan Hospital, Malaysia

We present a case of omental fibroma, which posed a surgical diagnostic dilemma. Primary tumours of the omentum are uncommon, and omental fibromas account for 2% of these. The rarity of omental fibroma and paucity of available information hamper an accurate diagnosis. In this particular case, the diagnostic process was misleading. The history was classical of an irreducible inguinal hernia, but the physical examination and imaging studies were suggestive of a testicular tumour. However, intraoperatively, an omental tumour and a normal testicle were found in the scrotum. Histopathological examination proved the tumour to be a fibroma. The presentation of an omental fibroma in an inguinal hernia sac had never been reported in literature. Due to the rarity of such cases, a thorough history, detailed examination, and objective investigation are the pillars to attain the correct diagnosis.

APS-17

Laparoscopic treatment of diaphragmatic defect and chronic intra-thoracic gastric volvulus

Chong-Chi Chiu[1,2]
[1]*Department of General Surgery, Chi Mei Medical Center, Tainan and Liouying, Taiwan*
[2]*Department of Electrical Engineering, Southern Taiwan University of Science and Technology, Tainan*

Gastric volvulus is an uncommon disease condition that affects mostly the elderly. It occurs mainly as a result of congenital laxity of ligament attachments of the stomach. It is also accompanied by a diaphragmatic hernia. This sometimes causes the stomach herniation into the thorax, giving rise to respiratory compromise, herniated part ischemic or gangrenous change. This disease could present as acute or chronic condition. We have managed 16 patients with diaphragmatic hernia and chronic intra-thoracic gastric volvulus under laparoscopy over the past thirteen years; all patients are of secondary type. Twelve (12) patients belong to organoaxial type and four (4) were mesenteroaxial type. Elective surgery was performed for all these patients. All patients recovered well from surgery without evident complications. Most of their hospital stays were five days. After operation, patent gastrointestinal tract was noted in all patients. Besides, all patients showed improvement of pulmonary condition after surgical correction of anatomic anomaly. Even though worldwide experience in laparoscopic surgery for diaphragmatic hernia and chronic intra-thoracic gastric volvulus is limited, our results are encouraging. Based on our experience, laparoscopic technique seems to be safe and feasible in treatment of this disease.

APS-18

Preoperative Inguinal Evaluation by Imaging Studies performed for Radical Retropubic Prostatectomies

Jin-Woo Park, Dong-Ju Kim
Department of Surgery, Chungbuk National University Hospital, Republic of Korea

Purpose: Patients who underwent radical retropubic prostatectomies (RRPs) have an increased risk of developing inguinal hernias (IHs). However the exact role of RRP in hernia development is still controversial. Subclinical IH which was not diagnosed before RRPs may contribute to develop post-RRP IH. The aim of this study is to evaluate inguinal status to identify subclinical IH before RRP using preoperative imaging studies such as CT or MRI.
Methods: From Jan. 2012 to Sep. 2015, 125 patients underwent RRPs at department of urology, Chungbuk National university hospital. Preoperative abdomino-pelvic CT and/or MRI studies were available in all patients.
Results: Twelve patients (9.6%) underwent inguinal hernia repairs during the mean follow-up period of 30.8±13.2 months after RRPs. Subclinical IH can be diagnosed in 6 patients (4.8%) and suggested in additional 5 patients (4.0%). Patients who underwent hernia repairs were older than those who did not ($p<0.05$). Among 6 patients with subclinical IHs, only one patient was diagnosed before RRP and treated by TEP-like mesh repair at the same time. Additional 2 patients required hernia repairs after 5.5 and 21.8 months after RRPs respectively.
Conclusion: Post-RRP IHs do not develop infrequently. Careful evaluation of inguinal status to identify subclinical IH before RRP using preoperative imaging studies might decrease the incidence of post-RRP IHs.

APS-19

The hybrid repair for recurrent inguinal hernias using laparoscopic technique

Keiko Kobayashi[1], Osamu Takata[1], Hidenori Kamiyama[1], Toshiki Rikiyama[2]
[1]*Department of Surgery, Chichibu Municipal Hospital, Japan*
[2]*Department of Surgery, Saitama Medical Center, Jichi Medical University, Japan*

Background: Recurrent groin hernia is a common problem around the world every all through the ages. The "operated-again" patients undergo hernioplasty with a mixture of expectation and anxiety. Therefore, second-operation must be performed reliably and accurately. However, the level of second-operation could be high comparing with initial operation, and the frequency of re-recurrence and complications are problem. The difficulty for re-operation is according to inaccurately record, inadequate follow-up, various methodology and unknown of anatomical and layer structure.
Purpose: To investigate recurrent inguinal hernia and report the easy-technique of the hybrid repair using laparoscopy.
Result: The last two years, 86 hernia repair were performed and 10 cases(11.6%) of recurrent hernia repairs. The average time to recurrence 14.3 years (median; 7.5years/ 8 months-50 years), Average age was 79.6 years-old (57-96), all case were males. Average operation time was 117min (Anterior / TAPP / Hybrid-plug=120/134/97 min, p=0.667). In method, under pneumoperitoneum, skin is incised just above the hernia bulging, recurrent hernia orifice is recognized shortly. Surgical mesh & plug are put on the sac.
Discussion: Under pneumoperitoneum, land mark of inguinal repair "Inferior epigastric vessel", "Medial umbilical fold" and "Copper ligament" recognized easily. Furthermore, the post-operative influence "adhesion to intestine", "degree of adhesion to prostheses" were revealed briefly. We can diagnose pattern of recurrent hernia and evaluate "hernia orifice" exactly.
Conclusion: We reported easy-technique of the hybrid repair using laparoscopy for recurrent hernias.

APS-20

Cases report of 678patients with inguinal hernia treated by Litchenstein hernia repair

Pi Er Di Wa Si Mai Mai Ti Yu Su Fu[1], Ke Li Mu A Bu Du Re Yi Mu[2]
[1]*Department of Minimally Invasive. Hernia & Abdominal Wall Surgery, People's Hospital of Xinjiang Uyghur Autonomous Region, China*
[2]*Department of Minimally Invasive. Hernia & Abdominal Wall Surgery, The Xinjiang Uygur Autonomous Region People's Hospital, China*

Objective: To summarize the clinical efficacy and value of the Litchenstein hernia repair in the treatment of patients with inguinal hernia.
Methods: A total of 678 patients with inguinalhernia were enrolled in The xinjiang autonomous region people´s hospital from march 2005 to march 2015. The Lichenstein method was applied; The operation time, postoperative pain, complications and recurrence rate were analyzed retrospectively.
Result: All the cases had operated successfully.The operation time was 35 to 105 minutes, with a mean of (54±5) minutes. The hospital stay was 4 to 9 days, with a mean of (5±1) days, Wound infection was observed after operation in 14cases of chronic pain, 1 7 cases of acute urinary retention and 1 case of patch infection. All patients were followed up for 6 to 72 months, Recurrences were observed in 4 of 678.
Conclusion: The Lichenstein hernia repair owns strengths of short-time, light pain,low recurrence rate, and less complicatios;which is effective in treatment of patients with inguinal hernia.

APS-21

Suture Site Hernia and Needle-Loop: A new and convenient way to potentially reduce the incidence of an underreported type of incisional hernia

Michael N. Lechner[1], Stefan Mitterwallner[1], Kurosch Borhanian[1], Rudolf Schrittweiser[2], Klaus Emmanuel[1], Franz Mayer[1]
[1]*Department of General Surgery, Landeskrankenhaus Salzburg, Austria*
[2]*Department of General Surgery, Landeskrankenhaus Bruck/Mur, Austria*

'Suture site hernias' resemble rare incisional hernias that can occur at weakspots of the abdominal wall caused by transfascial sutures used to secure the implant's position with filaments during laparoscopic IPOM-repair. After their first description in 2006 only 3 more actual cases were reported in literature. Since the technique is still widely used, the entity appears hugely underreported. One of our own cases clearly showed a defect between the suture channels and the center of the mesh that cannot be explained by local ischemia or tension related to postoperative reduction in implant size by scarring effects alone. Instead it is our understanding that intraabdominal pressure in combination with the original fascia defect caused by the large caliber device used to pass the fixation suture through the fascia contributes to the manifestation of this type of hernia. Similar defects have been described as a source of recurrence by other authors with regard to primary fascial closure of midline incisions and have led to the use of smaller needles and thinner filaments in that field. We hence developed the new, cheap and readily available technique to pass fixation sutures through the smallest possible defects in the abdominal wall where necessary, thereby reaching a near five-fold reduction in initial defect size.

APS-22

Inguinal Hernia With Tuberculous Peritonitis: A Case Report and Literature Review

Kai Min[1], Hui Xia[2], Cheng Zhou[2], Qing-bin Meng[1], Biao Wu[1], Jun Ren[1], Feng-yu Cao[1], Wojciech Konrad Karcz[3]
[1]*Department of Gastrointestinal Surgery, Wuhan No.1 Hospital, China*
[2]*Department of Hepatobiliary Surgery, Wuhan No.1 Hospital, China*
[3]*Department of Surgery, Division Metabolic and Obesity Surgery, Schleswig-Holstein University Clinic, Germany*

A rare case of inguinal hernia with tuberculous peritonitis is described, as well as a review of the pertinent literature. A 56-year-old male patient admitted to our emergency department because of reducible mass presenting in his left inguinal region. After preoperative preparation, we did a laparoscopic totally extraperitoneal hernia repair (TEP) for this patient. During TEP, we unexpectedly found tuberculous peritonitis, which was confirmed by postoperative pathology. With this case report and review, we hope the relevant knowledge about such rare situation, the inguinal hernia coexist with tuberculous peritonitis, could be augmented, and helps might be offered on early diagnosis and treatment of abdominal tuberculosis.

APS-23

Successful repair of a bladder herniation after old traumatic pubic symphysis diastasis using polypropylene mesh with tissue growthing graft and hernia mesh

Li-sheng Wu, An-bao Teng, Jian-wei Yu
Department of Hernia and Metabolism of Loss Surgery, AnHui Provincial Hospital, China

Bladder herniation associated with pubic symphysis diastasis is a very rare condition. We report a case with bladder herniation after traumatic pubic symphysis disruption. A 47-year-old man was admitted to our hospital complaining of under abdominal pain and reversible mass for 11 months in July of 2011. Eighteen months earlier the patient was treated with open Urethral reunion operation and jejunostomy procedure and definitive internal fixation of the pubis. Then, 2-month late, Open incisional hernia patch repair and jejunostomy closed surgery had been carried out. We used a polypropylene mesh with tissue growthing placed of previous surgery for closure of the diastasis and a prolene and a polytetrafluoroethylene mesh graft and for supporting the abdominal wall.some authors have closed chronic pubic diastasis with bladder herniation using a tibial corticospongiose or bone graft. Our surgical procedure is different from others because of the use of polypropylene mesh with tissue growthing. We obtained a successful outcome during a 5-year follow-up period.

APS-24

Perineal hemangioma misdiagnosed as perineal hernia: Two cases report

SW Yang[1], B Wu[2], Wen-zhang Lei[1], Ying-han Song[1], Yan-yan Xie[1], Yong Wang[1]
[1]*Department of Gastrointestinal Surgery, West China Hospital, Sichuan University, China*
[2]*Department of radiology, West China Hospital, Sichuan University, China*

Background: Perineal hemangiomas are nonmalignant vascular tumours that occur on the perineum. Perineal hemangiomas which arise in the subcutis or reticular dermis appeared as raised soft masses, and some of its clinical presentation is similar to perineal hernia. These protrusions were often mistaken for perineal hernia. The purpose of this article was to describe the imaging findings and illustrate the differential diagnosis.
Cases: Two patients presented as adult female with perineal hemangiomas which its clinical feature is mostly alike perineal hernia. The first patient had a perineal hemangioma involving the rectal and vaginal walls. The second patient had only a hemangioma located to the left of the vulva. Diagnoses were secured by color Doppler ultrasonography (CDUS) and magnetic resonance imaging (MRI). Both patients were successfully treated by interventional sclerotherapy.
Conclusions: Imaging examinations are essential to make a differential diagnosis between perineal hernia and some of perineal hemangiomas. Knowing the features of perineal hemangiomas on CDUS and MRI supports confident diagnosis.

APS-25

Internal double omental hernia: report of a case and literature review

Xiang-yi Li
Department of general surgery, Xi'an electric power Central Hospital, China

Objective: To investigate diagnosis and treatment of internal double omental hernia.
Methods: Retrospectivly analysed one case of internal double omental hernia, and reviewed the literatures.
Results: This case was diagnosed by clinical manifestations and radiological images, then emergency laparotomy was performed. The patient recovered well without complications.
Conclusion: Internal double omental hernia should be combined clinical manifestations with radiological images to make the diagnosis, and once the diagnosis has been determined, emergency laparotomy should be performed.

APS-26

The disposal and therapeutic evaluation of femoral hernia found in TAPP or TEP operation accidentally

Qin-wen Tai, Heng Zhang, Jin-hui Zhang
Department of hepatobiliary surgery, Shenzhen hospital of Southern Medical University, China

Objective: To discuss the disposal of femoral hernia found in TAPP or TEP operation accidentally and evaluate the operation therapeutic.
Methods: 13 patients were diagnosed as inguinal hernia before operation but then confirmed as femoral hernia in the operation, then still mending the coloboma by TAPP or TEP after clearly diagnose.
Results: The operation time is in 63~80 min, mean time is 72min. The length of stay is in 3~7d, 5d in average. No complication, such as incision infection, bleeding, fat liquefaction or abnormal sensation, was appeared. The follow-up periods is in 6~18 months, and no relapse case.
Conclusion: When adopt the same surgical method to deal with femoral hernia found in TAPP or TEP operation accidentally, there was not prolong the operation time, and the hospital stay is short, patients' postoperative recovery is quickly, the complication and recurrence rate is lower. So it has reliable therapeutic effect in clinic and it is deserve to generalize.

APS-27

Solo Single Incision Laparoscopic Totally Extraperitoneal Inguinal Hernia Repair: Initial experience

Sang-Hoon Ahn, Do Joong Park, Hyung-Ho Kim
Department of Surgery, Seoul National University Bundang Hospital, Republic of Korea

Background: This study aims to introduce and assess the safety and feasibility of solo laparoscopic totally extraperitoneal (Solo TEP) inguinal hernia repair using a laparoscopic scope holder.
Methods: Between October 2013 and November2014, 15 Solo TEP were performed at Seoul National University Bundang Hospital, with the use of a commercial glove single-port device and a laparoscopic scope holder (Laparostat, CIVCO, Iowa), which can prevent the clashes between the operator and scopist, and also maintain stable field view. We used a 2cm tangential umbilical incision and a 5mm flexible scope with conventional laparoscopic instruments. All procedures were manipulated by the operator. We routinely performed SS-TEP in day surgery.
Results: Of 15 hernias treated, 8 were right inguinal hernias, 7 were left inguinal hernias. There was no conversion to conventional TEP. Mean operation time was 34 minutes (range, 25 to 55 minutes). There were no intraoperative events. Postoperative complications occurred in one cases (wound infection) and were conservatively treated. There was no hospitalized patients after surgery.
Conclusion: In this experience, we demonstrated that SS-TEP is feasible and Laparostat could be a good alternative to a human scopist. However, further experience and well-designed studies are required to confirm the safety and feasibility of this technique.

APS-28

Bilateral inguinal hernia after axillary-femoral artery bypass effectively treated with Transabdominal preperitoneal (TAPP)

Seiya Susumu[1,2], Kantoku Nagakawa[1], Shunsuke Kawakami[1], Kazuya Okada[1], Hiroki Kishikawa[1]
[1]*Department of Surgery, Kouseikai Hospital, Japan*
[2]*Department of Surgery, Juzenkai Hospital, Japan*

We report herein our experience with bilateral inguinal hernia surgery for a patient who underwent a Y-shaped vascular graft for an abdominal aortic aneurysm, followed by the addition of right axillary-bilateral femoral artery bypass surgery. Preoperative physical examination and imaging revealed a subcutaneous vascular graft passing from the right axilla through the right flank region, and branching at the lower abdomen to reach the femoral areas on both sides. As repair surgery by inguinal incision was considered difficult, we performed laparoscopic surgery. Bilateral direct hernia was observed on intraperitoneal observation. Essentially no intraperitoneal organ adhesion to the abdominal wall was present, and the previous surgery was also confirmed not to have reached the inguinal preperitoneal space. Transabdominal preperitoneal repair (TAPP) was therefore performed, yielding favorable results.

APS-29

Synchronous bilateral groin hernias are not always of the same type: An analysis of 1005 cases during 10 years

Tomotaka Akatsu, Akina Haiden, Takahiro Yokose, Haruhiro Nagase, Ryo Nakanishi, Yasushi Kaneko, Yosuke Kobayashi, Mai Tsutsui, Taku Fujii, Kiminori Takano, Kikuo Yo, Seiichiro Yamamoto, Toshio Kanai, Motohito Nakagawa
Department of Surgery, Hiratsuka City Hospital, Japan

Purpose: It is perceived that synchronous bilateral groin hernias are usually of the same type. However, few studies have reported. The aim of the present study is to clarify this point.
Methods: One thousand five patients underwent groin hernia repair between January 2006 and June 2016. Hernia types (I to V) were determined based on the Japan Hernia Society hernia classification. Regarding bilateral groin hernias, we categorized the combination pattern: "the same", "partially the same", and "different".
Results: Of 1005 cases, 70 males and 2 females simultaneously received bilateral repair. The same pattern was observed in 51 cases (bilaterally type I: n = 19; bilaterally type II: n = 28; bilaterally type IV (I + II): n = 3; bilaterally type IV (II + III): n = 1). Partially the same pattern was noted in 12 cases (combination of I and IV (I + II): n = 4; combination of II and IV (I + II): n = 6; combination of II and IV (II + III): n = 2). Different pattern was identified in 9 cases.
Discussion: The frequency of bilateral groin hernias was 7% (72/1005). The percentage of the same, partially the same, and different patterns was 71% (51/72), 17% (12/72), and 12% (9/72). In conclusion, caution should be taken since bilateral inguinal hernias are not always of the same type.

APS-30

Chronic pain after laparoscopic ventral hernia repair

Ho Kyun Lee, Sang Young Chung, Soo Jin Na Choi
Department of Surgery, Chonnam National University Medical School, Republic of Korea

Purpose: In this report, the pain scale and characteristics of post operative pain after laparoscopic ventral hernia repair are examined through a clinical review of patients that have undergone laparoscopic ventral hernia repair.
Methods: A retrospective case series of eighty three patients that underwent laparoscopic hernia repair for an ventral hernia. The patients underwent follow-up with a physical examination and telephone interview.
Results: A total of eighty three laparoscopic ventral hernia repair procedures in all patients were successfully performed without conversion to open surgery. The mean postoperative hospital stay was six days Postoperatively, fifteen cases of post operative ileus, eleven cases of wound seroma, one case of hematoma, thirty five cases of chronic discomfort were noted, but there was no significant major morbidity or mortality. Average pain from postoperative day measured on a visual analogue scale (VAS) was fifty. Chronic pain occurred in ten patients, which was mild pain in seven patients and moderate in three patient. There were no recurrences in all of the patients during the follow-up period from one to twenty months. sixty four patient were satisfied with their results.
Conclusion: Laparoscopic ventral hernia repair is a safe and effective procedure to repair ventral hernias with minimal morbidity and recurrence, but chronic discomfort and pain was occured frequently.

APS-31

Is it essential to confirm routine pathologic examination in adult inguinal hernia?

Hyung-Jin Kim, Nam-Hee Kim, Hyeon-Min Cho, Bong-Hyeon Kye, Gun Kim, Ni-Na Yoo
Department of Surgery, St. Vincent's Hospital, The Catholic University of Korea, Republic of Korea

Background: Some study suggested that routine histologic examination on hernia sac is necessary because there are several incidental findings can be found. However, hernia sac resection has become an additional step in tension-free repair such as plug mesh method or laparoscopic herniorrhaphy which are dominant methods in inguinal hernia repair. Therefore it is necessary to confirm the efficacy of routine pathologic examination.
Methods: We reviewed retrospectively 406 people who got surgery on inguinal hernia by a single surgeon for 3 and a half year from July 2010 to December 2013.
Results: 406 people were reviewed and 25 people had bilateral inguinal hernia, and 164 specimens(38%) were pathologically examined. Abnormal pathologic finding was found in 4 patients (0.9%), however all of them were suspicious other diagnosis rather than consistent of hernia sac intraoperatively. Finally, the rest were consistent of hernia sac. Additionally, gross findings of lipomas were later pathologically examined and confirmed as lipomas in all cases.
Conclusion: Routine pathologic examination of inguinal hernia sac is not essential to diagnosis. Performing pathologic examination is necessary only when the grossly abnormal findings were found.

APS-32

A case of liposarcoma of the spermatic cord masquerading as an inguinal hernia

Kennichi Tazawa[1], Syunshuke Kawai[1], Soshi Osawa[1], Fuminori Yamagishi[1], Takuya Nagata[2]
[1]*Department of Surgery, Itoigawa General Hospital, Japan*
[2]*2nd Department of Surgery, Toyama University Hospital, Japan*

We report a case of liposarcoma of the spermatic cord. A 42-year-old male patient presented with a painless left inguinal mass. CT (computed tomography) showed a fatty mass in the left inguinosacrotal region and was interpreted as a left inguinal hernia containing omentum protruding into scrotum. Under general anesthesia, a laparoscopy was performed and the lesion was diagnosed of type II-3 (JHS classification) hernia with giant sacless lipoma of the spermatic cord. The hernia was repaired by TAPP methods. But, the adipose lesion was connected to the testis. Additionally, partial resection of the lesion was done by anterior approach. Histopathological examination and immunohistochemistry revealed a well-differentiated liposarcoma. In 6 months after the first operation, the residual tumor was removed with the left spermatic cord and left testis. Spermatic cord liposarcoma is a rare condition and liposarcomas are most commonly found in the retroperitoneal space and the extremities, and less often in the head and the neck area. The spermatic cord is a rare area of the origin as about 3-7% of all liposarcoma. Imaging studies only may fail to distinguish a liposarcoma from normal adipose tissue.

APS-33

Incisional Ventral Hernia post mesh repair complicated with enterocutaneous fistula successfully treated with Biosynthetic Mesh Materials: A case report

Lih Yong, Feng Chuan Tai, Ching Shui Huang
Department of General Surgery, Cathay General Hospital, Taiwan

Within the last few years, the use of meshes has become standard procedure in hernia repair surgery throughout the world. Mesh-related infection is a huge challenge because it causes great morbidity and increases the overall cost of treatment due to the often needs of repeated submission and intravenous antibiotics injections. In more severe cases, re-operation, drainage or debridement might be warranted.
We present an 86 years old male patient who underwent prosthetic mesh (composite two layers mesh with polypropylene and ePTFE) repair for abdominal incisional hernia which later complicated with infection. Multiple debridement procedures were performed with wound infection and formation of entero-cutaneous fistula. This complicated situation was finally being treated successfully with re-operation to remove the infected mesh and replaced with biosynthetic mesh (Biodesign)
After two years follow up, no wound infection developed and no hernia recurrence occurred.

APS-34

The noble technique of laparoscopic herniorrhaphy for indirect inguinal hernia: Laparoscopic Intracorporeal posterior wall repair

Sung-Ryul Lee
Department of Surgery, DAMSOYU Hospital, Republic of Korea

Objective: To evaluate the efficacy of intracorporeal posterior wall suture repair technique of laparoscopic indirect inguinal hernia repair.
Background: High ligation without posterior wall repair is the gold standard procedure in the treatment of pediatric inguinal hernia while posterior wall repair is necessary in adults. TAPP and TEP are the common laparoscopic inguinal hernia repairs in adult patients. Disadvantages of using the synthetic mesh and dissecting wide peritoneal area include high cost and a risk of chronic pain.
Method: Laparoscopic herniorrhaphies had been performed on 640 adult patients (over 20 years old) diagnosed with indirect inguinal hernia from July 1st, 2012 to December 31st, 2015. Of 640 patients, 88 patients underwent conventional TAPP with mesh (group #1) and 552 patients underwent intracorporeal posterior wall suture repair instead of using synthetic mesh (group #2).
Results: The mean operation time and hospital stay were both significantly shorter in group #2 than group #1 ($p<0.001$). There were 3 recurrent patients in group #2 while there was only one recurrent patient in group #1 due to the displacement of mesh, but these results show no statistical significance.
Conclusion: Intracorporeal posterior wall suture repair technique without using mesh might be the optimal choice of the laparoscopic indirect hernia treatments for adult patients as it has potential benefits of saving health care resources and reducing complication risks associated with the use of mesh.

APS-35

Our experience of treatment for incisional hernia of abdominal wall in the region; Laparoscopic vs Open method

Yoshihiro Noso[1], Shigeru Sakano[2], Nobuo Takeichi[1], Ken Inoue[3], Masahiro Hoshi[1], Bakytbek Apsalikov[4], Aidal Raimkhanov[4], Laura Pak[4], Nailya Chaizhunusova[4], Tolebay Rakhypbekov[4]
[1]*Departement of General Medecien, Shimane Universisty faculty of Medicin, Japan*
[2]*Department of Surgery, Ohda Municipal Hospital, Japan*
[3]*Department of Public Health, Gunma University Graduate School of Medicine, Japan*
[4]*Department of Oncology, Semey State Medical University, Kazakhstan*

In recent years an aging society in Japan, has come a growing medical needs in the region.
The elderly has a number of surgical diseases, also, often the need for emergency surgery.
After surgery in the elderly is seen abdominal wall hernia, it is necessary to hernia surgery. To hernia surgery in addition to the conventional open surgery, in recent years there is a surgery laparoscopically.
Experienced this time laparotomy 4 cases and laparoscopic surgery five patients, were compared two methods.
Laparotomy cases compared to laparoscopic surgery, but surgery time was shorter period of time, it was longer hospital stay.
For the elderly, more of laparotomy is a minimally invasive rather, seemed to wish to long-term hospitalization.

APS-36

PROSPECTIVE COMPARISON OF SINGLE PORT VS. MULTIPLE PORT LAPAROSCOPIC TEP HERNIOPLASTY FOR RECURRENT INGUINAL HERNIA

Yih-Huei Uen
The Superintendent's Office, Chi Mei Hospital, Taiwan

Objectives: Single port laparoscopic hernioplasty (LH) have rarely been used in recurrent inguinal hernia. We report our experience of single port LH for recurrent inguinal hernia and compare its early results with multiple port LH.
Methods: From Jan. 2010 to March 2014, we totally performed 32 single port LH through TEP approach using homemade (Uen) port for recurrent inguinal hernia, classified as direct (n=26) and indirect (n=6) type. Uen port is constructed with a segment of corrugated elastic tube and three 10 mm trocar connected to the thumb and 3 digits of a double layered surgical glove. The enveloped elastic tube was inserted through an umbilical incision into preperitoneal space after adequate ballonning. The operation procedures were performed with standard laparoscopic instruments with mannually curved shaft in the manner the same as multiple port, and a 10X15 cm mesh was deployed over MPO with Protec fixation. Surgical outcomes were compared with 32 three port LH for recurrent inguinal hernia.
Results: There was no significant difference ($p > 0.05$) between multiple vs. single port LH in patients' characteristics, failure rate, morbidity rate, postoperative pain score and analgesics requirement and short term recurrence rate. Single port LH with inapparent surgical scar in the umbilicus, however, its operation time is significantly longer than three port LH ($p < 0.05$).
Conclusion: Single port LH can be successfully and safely completed for recurrent inguinal hernia with Uen port and traditional instruments. Its cosmetic result is impressive, however, its operation time is significantly longer.

APS-37

Infected hernia meshes: A spectrum of management options

Rajeev Premnath
General & Laparoscopic Surgery, Ramakrishna Hospitals, India

Case I: A 27 year lady presented with a discharging-sinus at the umbilicus following open onlay polypropylene mesh hernioplasty 6 months post-operation,not responding to antibiotics. Ultrasound revealed mesh infection. She underwent two-stage mesh removal with wound being allowed to heal by secondary intention. No hernia recurrence at end of one year.
Case II: A 36 year lady presented one month post laparoscopic umbilical hernioplasty with Parietex mesh with swelling, redness and pain at umbilical region. Ultrasound showed 55 ml of fluid around the mesh. She was administered IV antibiotics for 1 week and oral antibiotics for 3 weeks with complete resolution of her symptoms. No hernia recurrence/infection on 3 months follow-up.
Case III: A 72 year lady presented with a swelling with no pain/redness at the umbilicus following retromuscular polypropylene mesh hernioplasty 12 years ago. Ultrasound abdomen revealed 80 ml of fluid around the mesh. She underwent surgery with complete mesh removal and wound left to heal by secondary intention. No hernia recurrence on one year follow-up.
Case IV: A 28 year gentleman presented with low grade fever, loss of weight and appetite, pain and swelling at left inguinal region since 4 months following TAPP polypropylene mesh hernioplasty. He had been treated with antibiotics/anti-tubercular drugs with no relief. Ultrasound revealed 80ml of pus with mesh crumpled in the abscess cavity. He underwent pus drainage with removal of the mesh+tacks. No Koch on histopathology noted. The wound healed in 1 month by secondary intention. No recurrence at 6 months follow-up.

APS-38

Treatment of Recurrence After Previous Total Extraperitoneal (TEP) Hernia repair

Feng-Chuan Tai, Ching-Shui Huang
Department of General Surgery, Cathay General Hospital, Taiwan

Introduction: The reported recurrence rates after laparoscopic inguinal hernia repair are under 5 %. The laparoscopic repair offers clear advantages in recurrent inguinal hernias after open herniorrhaphy. We present our experience of treatment of recurrent hernias after laparoscopic inguinal hernia repair.
Patients and Methods: The medical records of eight patients who underwent hernia repair (Open or Laparosccopic) for a recurrence between January 2011 and July 2015 were retrospectively reviewed.
Results: The average time from the initial repair to the diagnosis of recurrence was 12 months (range 3-24). Five of the 8 recurrences were treated with a laparoscopic approach. The other three recurrences were repaired in anterior tension-free repair. No intraoperative or postoperative complications were recorded. There were no recurrences at an average follow-up of 14 months (range, 11-18).
Conclusions: Repeated laparoscopic hernia repair (TAPP) or change to open tension-free repair are the definite repair for recurrent inguinal hernias after previous TEP hernia repair. Further studies comparing laparoscopic repair versus open repair of recurrences after laparoscopic inguinal hernia repair will be helpful in defining the best approach when encountering these recurrences.

APS-39

Laparoscopic Totally Extraperitoneal Inguinal Herniorrhaphy in the Octogenarian-early outcomes and safety

Junbeom Park, Heein Jo, Jiyoung Sul
Department of Surgery, Chung-Nam National University Hospital, Republic of Korea

Objective: Inguinal hernia is common disease in extremely elderly patient. And Laparoscopic totally extraperitoneal hernia repair (TEP) also used to be taken in general population to reduce hernia recurrence and facilitate patient recovery and return to work. However, TEP in the octogenarian remains controversial, because of the safety. Therefore, we examine the outcomes and safety of TEP in the octogenarian, through a clinical review of patients who had undergone by TEP.
Methods: A retrospective study of 50 consecutive patients undergoing TEP for inguinal hernia repair were performed by single surgeon at a tertiary care center between March 2010 and June 2016. Three patients were excluded because there was no way to follow up by interview or telephone. All cases had done under general endotracheal ansthesia. All repair was performed with the same surgical methods what other surgeons or institutions do.
Results: A total of 65 TEP were successfully performed. There was no intraoperative problem and no conversion to open surgery. Mean age was 83 years (range, 80-93 years) and operation time (30-130 min) had a wide range. Mean postoperative hospital stay was 1.1 days (range, 0-3 days). Postoperative complications included thirteen urinary retention, no chronic pain, 1 delayed port site healing, two cord hydrocele, two cord edema, and no mesh infection. There was no recurrence in all patients from 2 months to 3 years of follow-up period.
Conclusions: With octogenarians, laparoscopic TEP for all inguinal hernia may be safe, effective repair, and the choice of primary procedure.

APS-40

Consideration of inguinal hernia repair while receiving ongoing antithrombotic therapy

Yoshihito Nakayama[1,2], Shinnosuke Yonaiyama[1,2], Takuya Miura[2], Nobukazu Watanabe[1], Kenichi Hakamada[2]
[1]*Department of Surgery, Aomori kosei hospital, Japan*
[2]*Department of Gastroenterological Surgery, Hirosaki University Graduate School of Medicine, Japan*

Recently, the number of patients taking antithrombotic drugs has increased, and due to bleeding and hematoma, such antithrombotic therapy is interrupted during the perioperative period and heparin bridging is performed prior to surgery. However, heparin bridging reportedly does not reduce the risk of thrombosis, such that continuing antithrombotic therapy has been regarded as an option for managing surgical patients. Herein, we compared a group undergoing inguinal hernia repair, while receiving ongoing antithrombotic therapy, with a group of patients who discontinued antithrombotic therapy and untreated patients. These treatment strategies were examined for their safety. Between July 2014 and March 2016, 145 patients underwent inguinal hernia repair, 75 of whom had been operated on under local anesthesia employing open techniques. The patients were divided into two groups, those who discontinued antithrombotic therapy or were untreated, and patients who remained on antithrombotic therapy. The group receiving ongoing antithrombotic therapy consisted of 29 cases. There were 46 cases in the group consisting of those not treated or in whom treatment was discontinued at the time of surgery. The factors analyzed were operative time, intraoperative bleeding, postoperative complications, and length of hospital stay. There were no significant differences in such factors between the two groups. Inguinal hernia repair employing open techniques and local anesthesia was considered to be safe, regardless of the presence or absence of the antithrombotic therapy. Inguinal hernia repair while continuing antithrombotic therapy was suggested to be beneficial for patients at high risk of thrombosis.

APS-41

Efficacy and outcome of total extraperitoneal herniorrhaphy (TEP) in patients with recurrent inguinal hernia

Chia-Chang Wu[1], Chi-Yun Lan[1], Su-Wei Hu[1], Chen-Hsun Ho[1,2]
[1]*Department of Urology, Shuang Ho Hospital, Taipei Medical University, Taiwan*
[2]*Department of Urology, School of Medicine, College of Medicine, Taipei Medical University, Taiwan*

Purpose: This study aimed to evaluate the efficacy and outcome of total extraperitoneal herniorrhaphy in patients with recurrent inguinal hernia.
Methods: Between January 2009 and September 2014, 472 patients underwent TEP henriorrhaphy for inguinal hernias. In this cohort, 38 patients with previous traditional open herniorrhaphy were defined as study group. For the comparison group, 114 patients without previous hernia operation history were selected to match the study group in terms of age, sex and laterality of inguinal hernia. Perioperative data including patients' demographics, operative time, pain scale, conversions, length of hospital stay, recurrence, and complications were recorded and analyzed.
Results: In this study, the mean follow-up period were 48 months (24~90 months). The operative time in study group and comparison group were 48.5 minutes and 42.5 minutes, respectively (p=0.8). The pain scale was higher in study group than that in comparison group, but not significant (2.8 vs. 2.3, p=0.7). Both groups were proceeded laparoscopically without conversion. The patients in both groups could discharge on the first postoperative day. During follow-up, only two patients in the comparison group had recurrent hernia (1.75%), and which were treated with transabdominal preperitoneal herniorrhaphy (TAPP) later on. Both groups had similar complication rates (5% vs. 3%, p=0.7).
Conclusions: TEP herniorrhaphy for patients with recurrent inguinal hernia is safe and effective. In this study, no significant differences were observed between the two groups in terms of operative time, pain scale, analgesic use, hospital stay length and complications.

APS-42

Usefulness of operation with the Kugel Mesh hernia patch under tumescent local anesthesia with intravenous anesthesia for patients who take anticoagulants

Hitoshi Fujii[1,2,4], Takeshi Iwaya[1,2], Yuuki Tomisawa[2], Yuuji Akiyama[1], Koki Otuka[1], Hiroyuki Nitta[1], Keisuke Koeda[1], Touru Yoshida[4], Takashi Sakamoto[3], Akira Sasaki[1]
[1]*Department of Surgery, Iwate Medical University, Japan*
[2]*General Surgery, Uchimaru Hospital, Japan*
[3]*General Surgery, Iwate Prefectural Ninohe Hospital, Japan*
[4]*General Surgery, Iwate Prefectural Kuji Hospital, Japan*

Background: In operation of patients who take anticoagulants, patients need convert to heparinization. In result, hospital stay was extended and restart of anticoagulants was troublesome. In addition, it is difficult to discontinuation of anticoagulants due to primary illness. We report the usefulness of local anesthesia for patients who take anticoagulants undergo on operation for groin hernia.
Methods: We retrospectively analyzed 108 patients who underwent on operation with the Kugel Mesh hernia patch from January 2012 to March 2015 in Iwate Medical University under tumescent local anesthesia with intravenous anesthesia.
Results: Among 108 Patients included, 13 were heparinized (H), 15 were discontinued of anticoagulants (D) and 80 were continued of anticoagulants(C). Median operation time; H: D: C=65: 67: 61 (min), median amount of bleeding; H: D: C=14.5: 5.0: 5.0(ml), median duration of hospital stay; H: D: C=7: 4: 4(day).
Conclusions: Operation with the Kugel Mesh hernia patch under tumescent local anesthesia with intravenous anesthesia for patients who take anticoagulants is useful and safety under continuation of anticoagulants.

APS-43

A case of Amyand's hernia

Atsushi Okita, Takayuki Muraoka, Masakazu Murakami
Department of Surgery, Yakage Town National Health Insurance Hospital, Japan

A 76-year-old man who had been diagnosed with talus, calcaneal and malleolar fracture by being involved in road traffic accident and treated by cast immobilization in the another hospital. He was transferred to our hospital for the purpose of rehabilitation. Seven days after the admission, he presented an abdominal pain and a physical examination showed a 10-cm swelling in the right inguinal region. An abdominal computed tomography showed the right inguinal hernia contains the intestine of the ileocecal region. He was diagnosed with an incarcerated inguinal hernia and manual reduction was performed. In the next day, he underwent surgery. The intraoperative findings showed that the vermiform appendix and the cecum was located in the right indirect hernia sac. The appendectomy and, then hernioplasty using lightweight mesh by the Lichtenstein method was performed. The postoperative course was uneventful. Inguinal hernia containing the vermiform appendix so called Amyand's hernia was relatively rare. We report our case of Amyand's hernia, along with the relevant literature.

APS-44

Analysis of inguinal hernia repair in elderly people

Yoshihiro Kurisu, Shinji Akagi, Hidenori Shibamura, Yasuo Hayashidani, Yoshio Yuasa
Department of Surgery, Day Surgery Center, Mazda Hospital, Japan

Background: As the life expectancy of people has become longer than before, we have been increasingly encountering elderly patients during daily clinical practice. Thanks to advances in operative procedure and anesthesia for inguinal hernia, surgical treatment of inguinal hernia can be done relatively safely at present. We have retrospectively evaluated our experiences in performing inguinal hernia repair in elderly people.
Method: In all, 907 patients, who underwent inguinal hernia repair under tumescent local anesthesia with sedation between January 2010 and June 2016, were divided into two groups: Group A (774 patients, aged 20 - 79 years), Group B (133 patients, aged 80 - 97 years). The following items were compared between these two groups; operation method, sedative dose level, the type of inguinal hernia according to the classification of Japanese Hernia Society, operation time, time in the operating room, postoperative stay period, ratio of day surgery, postoperative complications.
Results: In group B, the ratios of femoral-type and combined-type were higher; the operation time and time in the operating room were shorter; and the sedation dose was lower; all applicants for day surgery were discharged from hospital in same day.
Conclusion: Surgeons can employ Kugel's approach, as a first choice, to avoid overlooking other combined-type hernias. Repair under tumescent local anesthesia with sedation is beneficial to the patient, especially the elderly, who expects day surgery. Accordingly, we consider that advanced age may not preclude the repairing of inguinal hernia if the operation is performed after sufficient preoperative evaluation.

APS-45

Tendency of inguinal hernia treatment in Shiga prefecture over the past 6 years

Tsuyoshi Mori, Junichi aburagi, Yoshitaka Terada, Kaori Tomida, Hisataka Kato, Sachiko Sakai, Tohru Miyake, Sachiko Kaida, Hiroya Iida, Hiroya Akabori, Tsuyoshi Yamaguchi, Hirimichi Sonoda, Tomoharu Shimizu, Masaji Tani
Department of Surgery, Shiga University of Medical Science, Japan

Shiga Hernia Society was established in 2006. 25 institutions have participated in this society. This is the about 90% of all hospital in Shiga prefecture. We have started data registration from participating institutions since 2009. Here we report the tendency of hernia treatment in Shiga from the database analysis of Shiga Hernia Society.
A medical treatment fee for laparoscopic hernia repair was revised and was raised in April 2012. As a result, laparoscopic hernia surgery has been getting increased in Japan. On the other hand, it has been reported that the recurrence cases of TAPP and TEP have also increased from questionnaire survey of Japan Society for endoscopic surgery.
We collected about 4700 cases between April 2009 and June 2015. We divided primary inguinal hernias' data into two periods before and after April 2012.
After April 2012, the operation of anterior approach (AA) decreased and laparoscopic approach (LA) increased more than 3 times. The operating time of AA group did not change before and after April 2012. But the LA group's time is significantly longer after April 2012 compared with before; also AA group is significantly longer than LA group after April 2012.We think the data reflects actual hernia treatment by general surgeons in Shiga.Laparoscopic hernia surgery has been getting increased in Shiga.

APS-46

A COMPARATIVE STUDY BETWEEN MONOFILAMENT ABSORBABLE VERSUS NON ABSORBABLE SUTURE IN MESH FIXATION IN LICHTENSTEIN'S HERNIA REPAIR

Raj Kamal Jenaw
SMS Hospital and Medical College, India

Purpose: Lichtenstein mesh hernioplasty for inguinal hernia is time proven and gold standard method. But, chronic pain is still a major irritating complaint that patients bring post-operatively to clinicians. Thus, an effort to reduce chronic pain was done in the form of using monofilament absorbable sutures in mesh fixation. The objective of this study was to compare the effect of monofilament absorbable (monofilament glycomer (biosyn)) and monofilament non absorbable suture in mesh fixation in Lichtenstein hernioplasty.
Methods: This prospective hospital based randomized comparative study included adults aged 18-60 years with inguinal hernia who underwent Lichtenstein's mesh hernioplasty in a tertiary academic hospital from 1March 2015 till 30 June 2016. Two groups were distinguished: Study group in which mesh fixation was done with monofilament absorbable suture and Control group in which mesh was fixed with monofilament nonabsorbable suture. Post operative chronic pain was assessed using 10 point Visual Analogue scale at post op day7, 3 months and 6 months.
Results: A total of 80 subjects were included in this study, 40 in each group. No age, sex or hernia side differences were observed between the study groups. Chronic pain mean VAS score at 6 months was higher in group with nonabsorbable suture compared with monofilament absorbable group (0.05 vs 0.30: p value:0.010) and foreign body sensation was also higher in non absorbable group(20% vs 5%: p value: 0.043).
Conclusion: Monofilament absorbable suture is associated with less chronic pain and foreign body sensation compared to monofilament nonabsorbable sutures.