

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 $[(6.27 \pm 0.22) \times 10^9/L$ vs $(5.33 \pm 0.20) \times 10^9/L$; $p=0.008$]; 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 dissection 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 and 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}

¹Minimal Invasive Surgery Centre, Department of Surgery, National University Hospital Singapore, Singapore

²Yong 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 Lomanto¹

¹Department of Surgery, B.P. Koirala Institute of Health Sciences, Nepal

²MISC, 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

Jaideep Raj 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 hernioplasty for inguinal hernia patients complicated with ascites in 22 cases

S.W. Yang¹, B. Wu², W.Z. Lei¹, Y.H. Song¹, Yong Wang¹

¹Department of Gastrointestinal Surgery, West China Hospital, Sichuan University, China

²Department of Radiology, West China Hospital, Sichuan University, China

Objective: To analyse 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 hernioplasty 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 Hayakawa¹, Tetsushi Hayakawa², Kawori Watanabe¹, Shiro Fujihata¹, Hiroataka Miyai¹, Akira Yasuda¹, Minoru Yamamoto¹, Hidehiko Kitagami¹, Yasunobu Shimizu¹, Morisugu Tanaka¹

¹Department of General Surgery, Kariya Toyota General Hospital, Japan

²Laparoscopic 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 Honda¹, Nagato Shimada¹, Yu Yoshino¹, Takayuki Suzuki¹, Hironori Kaneko², Yoshihisa Urita¹

¹Department of General Medicine and Emergency Care, Toho University Omori Hospital, Japan

²Department 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.