AS24-5

The causes and prevention of chronic pain after inguinal hernia repair

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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)

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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.