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www.hernia2015-milan.com

Scientific Secretariat:
daysurgery.cclm@grupposandonato.it
giampiero.campanelli@hernia2015-milan.com

Organizing Secretariat:
AIM Group International - Milan Office
hernia2015@aimgroup.eu

CO4:14
ALLOPLASTY OF ABDOMINAL WALL AT INCISIONAL HERNIAS DEVELOPED AFTER ADRECTAL INCISION

R Lysenko[1]
[1]*higher state educational institution of Ukraine the Ukrainian medical stomatologic academy-Chair of surgery, Poltava, UKRAINE*

Introduction: The features of incisional hernias that developed after Lennander's adrectal incision include the allocation in the area of Spigelian line, which is a weak point of the anterior abdominal wall, as well as the specific anatomy of this area. A large number of wound complications and recurrences is the main disadvantage of the onlay and inlay methods.

The aim of the research is to develop plastics of abdominal wall at incisional hernias that emerged after adrectal incision by achieving more adequate implant placement, taking into account the anatomical features of this abdominal area in order to improve the treatment outcomes and reduce the number of postoperative complications.

Methods: From 2003 to 2013, 376 patients with incisional hernias of the abdominal wall underwent surgeries. 3 of them (0.8%) had hernias that emerged after Lennander's adrectal incision.

Results: These patients were operated by the technique that was carried out as follows: the sheath of rectus muscle of abdomen is expanded on its outer edge. The rectus muscle of abdomen is detached from the rear aponeurosis leaf medially to the white line. The aponeurotic parts of the internal oblique and transverse abdominal muscles are anatomically disconnected in the area of Spigelian line laterally. The aponeurotic part of the transverse abdominal muscle and the posterior leaf of sheath of the rectus muscle along with peritoneum are stitched. The polypropylene mesh is implanted, fixed with transfascial sutures and placed under the rectus muscle medially and between the internal oblique and transverse muscles of abdomen laterally. The aponeurosis of external oblique muscle of the abdomen and front leaf of sheath of rectus muscle are sewn. No complications in early and late postoperative period were observed.

Conclusions: The proposed method of abdominal wall plastics at hernias that developed after adrectal incision provides the adequate anatomic retromuscular location of implant and reliable closure of the abdominal defect.

CO4:15
COMBINATION OF THE THREE TECHNIQUES IN ONE PROCEDURE FOR MANAGEMENT OF COMPLEX SUBCOSTAL ABDOMINAL WALL DEFECTS

M Zuvela[1,2], D Galun[1,2]
[1]*University Clinic for Digestive Surgery, Clinical center of Serbia, Belgrade, SERBIA*
[2]*Medical School, University of Belgrade, Belgrade, SERBIA*

Introduction: Levine Karp „method of wide myofascial release", Ennis „open book" component separation technique and Maas component separation technique for enterostomies can be combined in one procedure to manage complex subcostal abdominal wall defects. The aim is to present the concept of fusion of the three component separation techniques in one procedure as the original solution for complex subcostal abdominal wall defects

Methods: Between June 2009 – June 2014 five patients with complex right subcostal abdominal wall defects (recurrent incisional eventration and mesh infection in two patient, incision hernia and abdominal wall abscess in one, cholangiocellular carcinoma metastases in the abdominal wall in one, and incision hernia following Wipple procedure for pancreatic cancer in one patient) were managed using the same procedure combining the three component separation techniques. The operative technique was the following: a) Levine and Karp „method of wide myofascial release" at the right side; b) Ennis „open book" variation of component separation technique at the left side, c) Maas modified components separation technique for enterostomies at the left side; e) suturing of the myofascial flaps to cover the defect; f) herniorraphy augmentation with resorbable Vycril mesh in onlay position. The infected mesh was removed in two patients; abdominal wall resection removing the abscess was performed in one patient; full thickness abdominal wall resection with the abdominal wall tumor was performed in one patient; and liver resection due to pancreas cancer metastases was performed in one patient.

Results: There was no hernia recurrence during the mean follow-up of 26 (2-48) months. The wound infection occurred in two patients.

Conclusion: The operative technique combining the three modifications of the components separation technique in one procedure provide good results in the management of complex subcostal abdominal wall defects.

CO25:09
A COST-UTILITY ASSESSMENT OF MESH SELECTION IN CLEAN-CONTAMINATED VENTRAL HERNIA REPAIR (VHR)

J Fischer[1], M Basta[1], J Wink[1], S Kovach[1]
[1]*University of Pennsylvania Health System, Philadelphia, USA*

Introduction: Mesh-reinforcement can reduce hernia recurrence, but mesh selection is poorly understood, particularly in contaminated defects. The use of ADM has provided a tool to perform single-stage VHR in such wounds, but can be associated with higher complications, cost, and poor longevity. The aim of this study is to determine the cost-utility of synthetic mesh and acellular dermal matrix (ADM) for clean-contaminated (CC) ventral hernia repairs (VHR).

Methods: A systematic review was performed identifying articles containing comparative outcomes for synthetic mesh and ADM repairs. A web-based visual analog scale survey was administered to 300 English-speaking US citizens representative of the general population to determine quality-adjusted life-years (QALYs) for several health states related to hernia repair. Overall expected cost and QALYs for VHR were assessed using the roll-back method and Monte-Carlo Simulation.

Results: Synthetic mesh reinforcement had an expected cost of $15,776 and QALY gained of 21.03, and biologic mesh reinforcement had an expected cost of $23,844 and QALY gained of 20.94 on average. When referencing a common baseline (Do Nothing), both biologic mesh (ICER = 3,378) and synthetic mesh (ICER = 2,208) were judged cost-effective, although synthetic mesh was more strongly favored. Monte-Carlo sensitivity analysis was performed varying all parameters simultaneously and 54% of simulations resulted in synthetic mesh being less costly and more efficacious (Dominant Strategy Quadrant IV), 40% resulted in synthetic mesh being less costly and less efficacious with ICER < 50,000 (cost effective strategy), and 6% resulted in synthetic mesh being less costly and less efficacious but with ICER > 50,000 (weaker strategy), supporting the finding that synthetic mesh has greater overall cost utility. Willingness to pay (WTP) threshold was varied from 0 to $100,000/QALY and it was found that synthetic mesh reinforcement was most commonly the optimal strategy across all WTP thresholds.

Conclusions: This cost-utility analysis suggests that synthetic mesh repair of CC hernia defects is both less expensive and more clinically effective than ADM.

CO25:10
INTRAOPERATIVE INDOCYANINE-GREEN FLUORESCENCE ANGIOGRAPHY REDUCES WOUND HEALING COMPLICATIONS AND OVERALL COST IN TRANSVERSE ABDOMINIS RELEASE AWR

P Szotek[1], R Megha[1], K Stanton[1], M Ziegler[1], A Fecher[1], E Streib[1]
[1]*Indiana University School of Medicine, Indianapolis, USA*

Introduction: Surgical site occurrences (SSOs) following abdominal wall reconstruction (AWR) remain high despite the significant evolution of surgical techniques intended to minimize such perfusion related complications. Early SSOs are related to skin and subcutaneous tissue necrosis. Such SSOs result in a significant economic burden to the medical system as a result of delayed wound healing. Clinical judgment, the current gold standard, often proves unreliable as evidenced by the high SSO rates reported in the literature (0-40%). Based on recent reports of decreased wound complications in breast reconstruction using intraoperative, real-time, indocyanine green dye (ICG) fluorescence angiography (FA), we hypothesized that ICG FA may predict and prevent vascular related SSOs and, in doing so, reduce the overall cost of AWR.

Methods: A retrospective review was conducted of all patients who underwent AWR using transversus abdominis release (TAR) component separation with mesh placement from 2011-2014 (n = 36). Assessment of tissue flap perfusion and the extent of skin and soft tissue flap resection was determined using the gold standard of clinical judgment in Cohort I (n = 19) and intraoperative ICG FA using the SPY Elite system (LifeCell Corp.) in Cohort II (17 pts). A subset of Cohort I (n = 5) had recordings of tissue perfusion using ICG FA that was not used to guide resection.

Results: 36 patients met inclusion criteria, 19 patients in the non-ICG Cohort I and 17 patients in the ICG FA Cohort II. SSOs were identified in 5/36 (13.9%) patients overall, 5/19 (26.3%) in non-ICG Cohort I and 0/15 (0%) in the ICG FA Cohort II. Additionally, 5 patients in the non-ICG Cohort I underwent imaging that was not used in place of clinical judgment and SSOs were observed in 2/5 (40%). ICG FA demonstrated 100% sensitivity at predicting these SSOs at the time of the initial operation on review of the images. ICG FA directed additional resection beyond clinical judgment in 6/17 (35%) of patients in which it was performed. SSOs in Cohort I resulted in 28 readmission days and additional healthcare costs of $120,036. The cost to perform ICG FA on all 36 patients would have been $54,000 for a net potential savings of $66,036. The number needed to treat was calculated at 4 patients.

Conclusion: Intraoperative ICG FA can reliably predict ischemia related SSOs at the time of surgery and acting upon this information can decrease wound healing related complications and ultimately cost through prevention of SSOs at the time of initial AWR surgery.

CO25:11
SIMULATION COMPUTER MODELLING OF BIOMECHANICS OF THE ANTERIOR ABDOMINAL WALL

R Lysenko[1], N Kryshchuk[2]
[1]*Higher State Educational Institution of Ukraine the Ukrainian Medical Stomatologic Academy-Chair of Surgery, Poltava, UKRAINE*
[2]*National Technical University of Ukraine Kyiv Polytechnic Institute, Kyiv, UKRAINE*

Introduction: To date, the creation of individual finite-element models of muscular-aponeurotic structures of the abdominal wall (AW) is a promising area of biomechanical research. In recent years, information database on experimental studies of AW biological tissues has been created, but the number of scientific publications on the application of methods of simulation modelling of the AW stress-strain state (SSS) is still limited.

The aim of the research is to design the simulation model of AW, investigate the biomechanics of AW, as well as the patterns of SSS changes in functional load to establish the bearing capacity of AW before and after surgery by using the techniques of alloplasty for eliminating the defects of abdominal wall.

Methods: Bearing capacity of human AW was assessed by mathematical modelling for three typical biomechanical states: in norm, with a defect in abdominal wall and after alloplasty via the Onlay method. The analytical model of AW was represented in the form of spherical heterogeneous multilayer thin-walled cylindrical shell. In order to construct the two-dimensional and three-dimensional geometric simulation models of AW biological objects, the information technologies of computer-aided design were applied, consisting in the use of CAD-geometric modelling systems. In numerical experiments for determining the characteristics of the border SSS of AW, systems of engineering analysis ANSYS v.12.1, module Static Structural and MathCAD v14 were used.