

(S26) PNEUMOVESICOSCOPIC CORRECTION OF PRIMARY VESICoureTERAL REFLUX (VUR) IN CHILDREN. - OUR INITIAL EXPERIENCE-

A. M. Benaired, Pediatric, Surgeon; H Zahaf, Pediatric, Surgeon; Military Central Hospital

Purpose: Vesicoureteral reflux is a common urological abnormality predisposing risk of childhood hypertension and chronic renal failure. It is called primitive when it is due to an abnormality of the vesicoureteral junction. Different treatment approaches have been proposed a long time. Two main trends can be identified, conservative and operative approach. The main objective of our prospective study is to demonstrate the feasibility of vesicoscopic crosstrigonal ureteral reimplantation under CO₂ pneumovesicum in treatment on primary vesicoureteral reflux and analyze results of this approach.

Methods: A total of 60 patients underwent transvesicoscopic ureteral reimplantation (33 boys, 27 girls) by the same surgeon from Mai 2011 to Mai 2015. All patients had primary vesicoureteral reflux, and surgery was performed because of breakthrough urinary tract infection despite antibiotic prophylaxis, persistent high grade of vesicoureteral reflux especially in association with significant renal scarring, mean age at operation was 47.47 month (5 month - 12 years). Of the 60 patients, 34 had bilateral reflux and 26 had unilateral reflux. The reflux grade in the total of 94 ureters was grade IV, V in 59.57%, grade III in 35.11% and grade II in 5.32% in association with contralateral high grade vesicoureteral reflux. Our surgical methods followed those reported by Valla et al.

Results: The transvesicoscopic procedure was successfully completed in all patients without perioperative complication except one case of pneumoperitoneum that required exsufflation by open laparoscopy. The mean overall operative time decreased significantly with an average of 58.43 +/- 11.26 minutes for unilateral reimplantation and 101.18 +/- 26.5 minutes for bilateral reimplantation. The postoperative hospital stay was 3 days for all patients. The mean follow-up period was 03 years. Cystography was performed 3 month after surgery in all patients and showed the disappearance of vesicoureteral reflux in 57/60 patients (95%) or 91/94 of ureters (97%). Persistent vesicoureteral reflux was documented in 3 of 94 ureters and had resolved spontaneously at 12 month after reimplantation.

Conclusion: Our preliminary results indicate that vesicoscopic ureteral reimplantation is safe and effective procedure with minimal morbidity when compared to traditional open method. It can be apply in children under 12 months.

Key words: Primary vesicoureteral reflux, surgical treatment of primary vesicoureteral reflux, vesicoscopic CrossTrigonal Ureteral Reimplantation, diagnostic and therapeutic recommendations of primary vesicoureteral reflux in children.

(S27) COMPARISON OF LEARNING CURVES FOR ROBOTIC PYELOPLASTY BETWEEN SENIOR AND YOUNG SURGEONS

Grazia Spampinato¹; Aurelien Binet²; Laurent Fourcade¹; Mario Mendoza Sagaon³; Thierry Villemagne²; Karim Braik²; Celine Grosos¹; Caroline Szwark²; Hubert Lardy²; Quentin Ballouhey¹; ¹Service de chirurgie viscérale pédiatrique, Hôpital des Enfants, Limoges Cedex, France; ²Service de chirurgie viscérale pédiatrique, Hôpital de Clocheville, Tours Cedex, France; ³Ospedale Regionale Bellinzona e Valli, Bellinzona, Switzerland

Introduction: The widespread use of robotic surgery has given surgeons a high quality and alternative method to perform pyeloplasty. In fact robot-assisted technology has made more achievable the advanced technical skills required to perform this procedure.

The learning curve (LC) represents how an increase in learning comes from greater experience. Robotic Assisted Laparoscopic Pyeloplasty (RALP) represents a well standardized and reproducible procedure whose LC can give reliable results.

The aim of our study is to compare LC for RALP between senior and young surgeons.

Materials and Methods: We reviewed all RALP performed in three pediatric surgery centers between November 2007 and November 2018. Three senior surgeons and four young surgeons performed the robotic procedures. Both senior and young surgeons did not have previous experience with robotic surgery; they had experience with conventional laparoscopic procedures but not with laparoscopic pyeloplasty.

The primary metric that we selected to evaluate competence acquirement was a composite outcome defined by a combination of operative time, complications and surgical success.

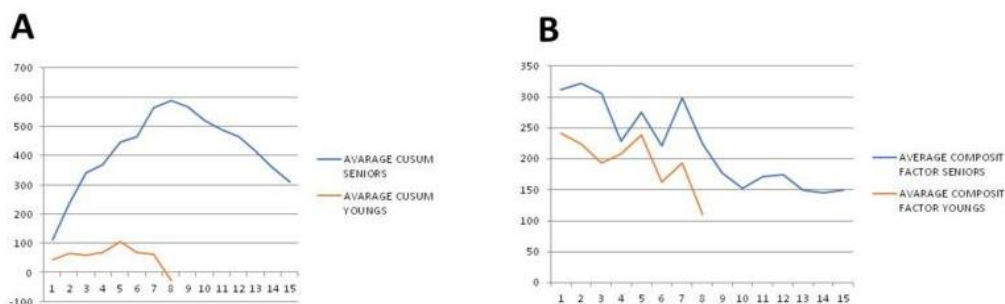
Complications were classified according to the Clavien-Dingo classification expressed by a complication factor (Fc); surgical success was expressed by a success factor (Fs) and we used a cumulative sum (CUSUM) analysis to determine the learning curve. The CUSUM method, through its multi-outcome approach, has a valuable role for learning curve evaluation.

Results: Between November 2007 and November 2018 three senior surgeons and four young surgeons performed 88 RALP. Patients with a median age of 6.1 years (range 7 months – 16 years) were included in our study. The median duration of follow-up was 6.4 years (range 14 months – 12 years). The median operative time was 203.5 minutes (range 106 – 335 minutes).

Thanks to the CUSUM analysis for composite outcome we found out that, despite young surgeons had performed less procedures than senior surgeons, their learning curve showed a faster inflection point (Figure 1) followed by a constant rate of proficiency, displaying a more rapid learning process. Median composite score was 299 (range 210-370) and 193 (range 131-255) after 7 procedures for respectively senior and young surgeons.

Conclusion: Assuming proper exposure to robotics and adequate case volume, we demonstrated that young surgeons can quickly achieve comparable levels of expertise in comparison with senior practitioners in the field of pediatric RALP. It can be assumed that LC in robotic pyeloplasty is not directly influenced by individual surgical experience but also by the experience of the surgical team.

Learning curves for senior and young surgeons



Learning curves for senior and young surgeons respectively, concerning CUSUM score (A) and composite factors (B)

(S28) SHOULD WE BETTER SWITCH BACK FROM RETROPERITONEAL TO TRANSPERITONEAL APPROACH FOR LAPAROSCOPIC PYELOPLASTY?

Mahmoud M Marei, MD, FEBPS, FRCS, FEAPU^{1,2}; Anju Goyal, FRCS, FEAPU¹; Supul Hennayake, FRCS¹; Tamás Cserni, MD, PhD, FEBPS, FEAPU¹; ¹The Royal Manchester Children's Hospital, Department of Paediatric Urology, UK; ²Cairo University, Faculty of Medicine (Kasr Alainy), Department of Pediatric Surgery, Egypt

Introduction: The retroperitoneal approach (RP) for pyeloplasty has been proposed to be associated with a lower complication rate than the transperitoneal pyeloplasty (TP), however, TP offers larger working space, allows an anastomosis in front of the lower pole vessels and the peritoneum can be easily reconstructed at completion. Similarly, there is no difference in cosmesis. We reviewed our experience with RP and TP, in comparison to the classic open retroperitoneal procedure (OP).

Material and Methods: Comprehensive data of 156 pyeloplasties at a single centre were reviewed. TP: 40 consecutive cases, including 3 redo cases (27 cases over 5-years old, 13 below 5-years, including 3 below 1-year and the youngest was 5-months old). RP: 56 consecutive primary cases (all over 5-years of age). OP: 60 primary cases (41 over 5-years, 19 under 5-years, 9 under 1-year and the youngest was 3-months old). The operative time, conversion rate and postoperative complications were all assessed. Unpaired t-test was used to compare the means and SD. Chi-squared test was used to compare proportions (%). P-value of <0.05 was considered significant.

Results: There were no intraperitoneal surgical complications in the form of injury of abdominal organs or intestinal adhesions with TP. The operative time was shorter in TP than RP (230.4 ± 29 min vs. 249.8 ± 46 min, p=0.0036). The conversion rate was lower in TP than RP [1/40 (2.5%) vs. 3/56 (5%) p=0.380]. There was no statistically significant difference in hospital stay (3 days) and complications requiring second intervention like JJ stenting, balloon dilatation and redo pyeloplasty [TP: 4/40 (10%) vs. RP: 4/ 56 (7%) p=0.6003 vs. OP 5/60 (8%) p=0.7308].

Conclusion: TP is safe, effective, and has a relatively shorter operative time than RP. It is suitable for much younger patients and for redo cases as well. In our practice, it may be worth to switch our standard approach from RP to TP.

(S29) MINIMALLY INVASIVE VASCULAR HITCH TO TREAT PEDIATRIC EXTRINSIC URETEROPELVIC JUNCTION OBSTRUCTION BY CROSSING POLAR VESSELS: A SYSTEMATIC REVIEW AND META-ANALYSIS.

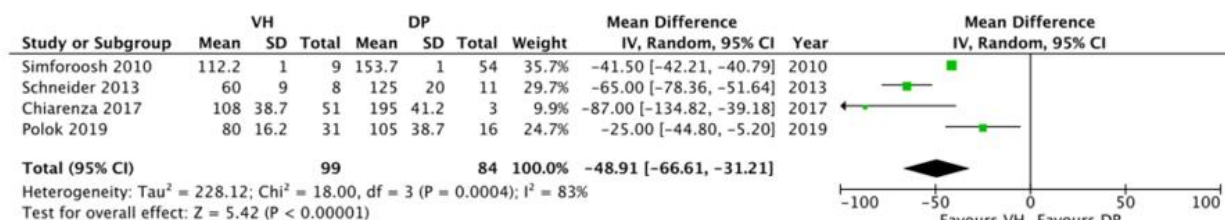
Maria Enrica Miscia, MD¹; Giuseppe Lauriti, MD, PhD¹; Angela Riccio, MD¹; Dacia Di Renzo, MD, PhD²; Valentina Cascini, MD, PhD²; Pierluigi Lelli Chiesa, MD, Prof¹; Gabriele Lisi, MD, PhD¹; ¹"Gabriele d'Annunzio" University of Chieti-Pescara; ²Department of Pediatric Surgery "Santo Spirito" Hospital of Pescara

AIM OF THE STUDY: Vascular hitch (VH) has been gaining an increasing success in treating extrinsic ureteropelvic junction obstruction (UPJO) by crossing polar vessels (CV) in infants and children. Although minimally invasive VH has been reported to be associated with improved outcomes compared to dismembered pyeloplasty, the accumulated evidence to support this concept in children is lacking. The aim of the present study was: (i) to determine whether laparoscopic VH was superior to laparoscopic dismembered pyeloplasty (DP) for the treatment of extrinsic UPJO by CV; (ii) to review the published results with regards to robot-assisted laparoscopic VH.

METHODS: Using a defined search strategy (PubMed, Medline, OVID, Scopus, Cochrane databases), three investigators independently identified all studies reporting the results of laparoscopic VH to treat extrinsic UPJO by CV in pediatrics. Those studies comparing laparoscopic VH versus laparoscopic DP or versus robot-assisted laparoscopic VH were included in the meta-analysis. Case reports and opinion articles were excluded. Both the systematic review and the meta-analysis were conducted according to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The meta-analysis was conducted using RevMan 5.3. The present study was registered on PROSPERO - international prospective register of systematic reviews. Data are expressed as mean±SD.

MAIN RESULTS: Systematic review - Of 1,838 titles or abstracts screened, 37 full-text articles were analyzed. Thirteen studies (295 children) reported an overall success rate of laparoscopic VH in 267 cases (90.5%), with 4 intra-operative complications (1.3%). Meta-Analysis - Four retrospective studies comparing laparoscopic VH versus laparoscopic DP were included (183 patients). Operative time was significantly reduced in VH (95.7±56.5min) compared to DP (142.1±53.7min; p<0.00001, mean difference (MD) -48.9, 95% confidence interval (CI) -66.6 to -31.2, I²=83%; Figure). The incidence of complications was similar between the two groups (VH 3/99pts, 3.0% versus DP 4/84pts, 4.8%, p=ns, risk ratio (RR) 0.6, 95% CI 0.1 to 2.8, I²=0%). The length of hospital stay was significantly shortened in VH (1.9±0.7dd) compared to DP (5.9±4.0dd, p=0.0008, MD -2.6, 95% CI -4.2 to -1.1, I²=91%). The success rate was comparable between the two procedures (VH 97/99pts, 97.9% versus DP 80/84pts, 95.2%, p=ns, RR 0.99, 95% CI 0.90 to 1.1, I²=0%). Only two retrospective studies compared robot-assisted laparoscopic VH to laparoscopic VH (53 patients). No differences were found with regards to complications (robot-assisted VH 0/13pts, 0% versus laparoscopic VH 1/40pts, 2.5%, p=ns, RR 1.50, 95% CI 0.1 to 30.5) and success rate (robot-assisted VH 13/13pts, 100% versus laparoscopic VH 39/40pts, 97.5%, p=ns, RR 0.99, 95% CI 0.9 to 1.1, I²=0%).

CONCLUSIONS: Laparoscopic vascular hitch seems to be a safe and reliable procedure to treat extrinsic ureteropelvic junction obstruction by crossing polar vessels. The procedure has been reported to be quicker than laparoscopic DP, with shortened hospital stay. Further high-quality studies would be needed to corroborate these results, as well to establish further amelioration given by a robot-assisted procedure.



(S30) ASSESSMENT OF THE EFFECT OF SURGICAL CORRECTION OF VARICOCELE IN CHILDREN ON TESTICULAR CONDITION.

S. P Yatsyk; A. O Tarzyan; A. A Rusakov; E. L Semikina; A. A Gusev; A. P Fisenko; E. Y Dyakonova; FSAI "NMRC for Children's Health" MH RF

Relevance: One of the most adverse consequences of having an uncorrected varicocele in a man is infertility. In this regard, early diagnosis and the right treatment tactics are extremely important for maintaining reproductive function.

The purpose and objectives: Determine the criteria for violation of the hematotesticular barrier (GTB) before and after surgical correction in children with varicocele. To assess the state of GTB in children with varicocele in the pre and postoperative periods based on indicators of inhibin B and claudine 11.

Materials and Methods: The study included 76 boys aged 11 to 17 years with grade III varicocele. The control group consisted of 20 boys aged 11 to 17 years without andrological pathology. The research method was ultrasound of the scrotum organs, determination of the level of Inhibin B and the titer of claudine 11 protein in the blood serum before surgical treatment and in the postoperative period.

Results: In the preoperative period, the decrease in the volume of the left ($9.76 \pm 0.58 \text{ cm}^3$) control - $13.5 \pm 1.03 \text{ cm}^3$, $p < 0.001$) and the right testicle ($10.96 \pm 0.614 \text{ cm}^3$, control - $13.3 \pm 0.73 \text{ cm}^3$, $p < 0.001$). 6 months after surgical correction, an increase in testicular volume was established: on the left $10.53 \pm 0.55 \text{ cm}^3$ ($p < 0.001$), on the right $11.88 \pm 0.59 \text{ cm}^3$ ($p < 0.001$). The resistance index (RI) in the intraparenchymal vessels of the left testicle before surgical treatment was lower (0.53 ± 0.009) in the comparison group ($p < 0.001$). 6 months after surgery, a significant 0.6 ± 0.006 ($p < 0.001$) increase in RI. An increase in Inhibin B levels was observed after 6 months (to $181.19 \pm 9.5 \text{ pg / ml}$, after 6 months $205.8 \pm 10.7 \text{ pg / ml}$, $p < 0.001$). A positive relationship between the level of inhibin B and the volume of testicles ($r_s = 0.44$, $p = 0.018$ on the left; $r_s = 0.34$, $p = 0.02$ on the right) in the late postoperative period. No marked changes in the claudine level 11 before and after the operation were observed ($0.632 \pm 0.002 \text{ ng / ml}$) control ($0.608 \pm 0.002 \text{ ng / ml}$), 6 months after surgical correction ($0.719 \pm 0.002 \text{ ng / ml}$).

Conclusion: A comprehensive analysis of the markers of the state of the hematotesticular barrier, in combination with ultrasound of the scrotum organs, showed that surgical correction of varicocele does not negatively affect the testicular condition in the early (after 1 month) and long-term (after 6 months) postoperative period, and also positively affects the further the formation of the reproductive sphere in adolescents.

(S31) LAPAROSCOPIC REMOVAL OF RETROPERITONEAL EXTRAORGANIC TUMORS IN CHILDREN

Polad Kerimov; A Kazantsev; D Rybakova; A Temny; M Rubanskiy; M Rubanskaya; R Pimenov; G Sagoyan; Institute of Paediatric Oncology and Hematology N.N. Blokhin Cancer Research Center

Objective: To determine the effect of minimally invasive access on the results of surgical treatment of children with retroperitoneal extraorgan tumors. To develop indications and contraindications for the use of minimally invasive operations for retroperitoneal extraorgan tumors in children and adolescents.

Results: From 2007 to 2016, 24 patients underwent laparoscopic removal of retroperitoneal extraorganic tumor. Boys 7 (29.2%), girls 17 (70.8%). The average age was 5.66 ± 0.97 years. Neuroblastoma detected in 12 (84.1%) cases. Ganglioneuroblastoma in 2 (8.4%) patients. Benign pathology was represented by ganglioneuroma detected in 5 (20.83%) patients. Mature teratoma in 5 (20.83%) cases. The average tumor size was 5.68 ± 0.41 cm.

Intra / postoperative complications not reported. The average blood loss was 7.5 ± 4.09 ml. The duration of the operation was 73.75 ± 2.74 minutes.

Duration of drainage, stay in the intensive care unit and general rehabilitation of patients was 1 day. The average hospital stay is 3 ± 0 days. Relapse-free and overall 5-year survival rates were 100%. Median follow-up was 58.63 ± 8.06 months

Conclusion: Laparoscopic removal of retroperitoneal extraorganic tumors in children with benign and malignant organ tumors has established itself as an effective and safe method that is accompanied by minimal surgical trauma and excellent cosmetic results, reduces the duration of the postoperative period and does not worsen the oncological prognosis, minimally invasive technologies can be considered preferred surgery for the removal of uncomplicated, not associated with the surrounding organ and tissues of retroperitoneal extraorganic tumor.

(S32) A COMPARISON OF TESTICULAR VOLUME AND CREMASTERIC REFLEX AFTER LAPAROSCOPIC (PIRS METHOD) AND OPEN INGUINAL HERNIA REPAIR.

Przemyslaw Wolak, MD, PhD¹; Aneta Piotrowska, MD¹; Agnieszka Strzelecka, PhD¹; Piotr Wolak²; Grazyna Nowak Starz, Prof¹; ¹Jan Kochanowski University, Collegium Medicum, Kielce (Poland); ²Medical University of Silesia, Zabrze/Katowice (Poland)

Introduction: Laparoscopic and open inguinal hernia repair can lead to decreased testicular volume and testicular atrophy due to operative trauma of vessels. This is a rare postoperative complication described in literature after open inguinal hernia repair in boys.

The aim of the study: The purpose of the study is to determine, how profile (elective or emergency) and type- laparoscopic or open inguinal hernia repair, influence testicular volume. The secondary aim is to assess the presence of the cremasteric reflex after laparoscopic and open inguinal repair, as well as after emergency and elective surgery.

Materials and Methods: We conducted prospective analyses of testicular volume among boys who underwent unilateral inguinal hernia repair between 2016 and 2019 in a single institution. The preoperative ultrasound of testis was performed one day before or on the day of the surgery. It consisted of taking measurements in three dimensions of both testes. The postoperative ultrasound was performed at least three months after the surgery. Additionally, cremaster reflex was checked on those patients. Patients with unilateral inguinal hernia and without any comorbidities were qualified for the study. Exclusion criteria consisted of the following: bilateral inguinal hernia, cryptorchidism or any procedure performed on the testis. The statistical analyses of the data were conducted. To determine the differences between the studied groups, the non-parametric Mann-Whitney U test was used. The level of significance $\alpha = 0.05$ was adopted in the study. Data was collected in a spreadsheet and statistical data analysis was carried out using the TIBC STATISTICA ver. 13.

Results: A total of 44 patients aged 1-106 months old were included. Patients were asked to come for the follow-up study at least 3 months after the surgery. The mean time of the follow-up study was 19 months. The study consisted of 31 patients after laparoscopic inguinal hernia repair and 13 boys after the open method. The mean testicular volume boys operated electively with laparoscopic approach (n=25) was 0.633 ml. The average postoperative testicular volume was 0,697 ml. The mean preoperative testicular volume of patients operated with the elective open method (n=8) was 0.748 ml, while postoperative measurements showed an increase and the average was 0.805 ml. The mean testicular volume after emergency laparoscopic inguinal hernia repair (n=6) preoperatively was 0.533 ml and postoperatively decreased to 0.517 ml. The mean preoperative testicular volume of patients operated with open approach due to incarcerated hernia (n=5) was 0.446 ml and postoperatively increased and was 0.564 ml. There was no statistically significant difference observed in those groups.

It was shown that after laparoscopic inguinal hernia repair, there was less impairment of cremasteric reflex observed, then after open repair. There was no correlation with surgery profile (emergency or elective) recorded.

Conclusions: Inguinal hernia repair method does not impact the testicular volume.

The profile of surgery: elective or emergency does not influence the presence of cremasteric reflex. Although, it was shown that open inguinal hernia repair may lead to the weakening of cremasteric reflex.