PIV2: MINIMALLY INVASIVE SURGERY EVOLUTION IN A SINGLE PEDIATRIC UROLOGIC CENTER. TIMES, TECHNIQUES AND TRENDS

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Background Minimally invasive surgery (MIS) techniques are reported to be increasingly used, but little data supports this. Our objective was to assess and evaluate the evolution of the surgical MIS approaches in pediatric urology in our Centre. We focus on techniques and trends in MIS utilization across the various urological procedures comparing operative time, postoperative complication rates and outcome between MIS and Open procedures.

Materials and methods We analyzed the 2002–2017 surgical urological procedures (kidney diseases) in our department. We identified children undergoing open and MIS procedures and any in-hospital intra-operative and post-operative complications that occurred during hospitalization. 312 (181M, 131F) patients were studied for congenital anomalies and urologic diseases of upper urinary tract: intrinsic and extrinsic UPJO (hydronephrosis), dysplastic kidney, vesico-ureteral reflux nephropathy, cystic disease of the kidney, dysgenetic kidney. We don't include urinary tract stones disease patients. 182 pts were treated for both extrinsic and intrinsic-UPJO. 41(28M,13F) were studied for a suspected extrinsic obstruction: 36 of them were treated with laparoscopic transposition of CV (modified Hellström Vascular Hitch, LVH). 141(46F,95M) presented an intrinsic obstruction and underwent dismembered pyeloplasty(AHDP): 70 Open (OP), 14 laparoscopic (LP), 57 retroperitoneoscopic (RP). 61 pts (32F,28M) underwent nephroureterectomy: 20 Open, 41 retroperitoneoscopic; 69 pts (29M,40F) underwent heminephrectomy: 30 Open, 39 retroperitoneoscopic.

Results We analyzed the data of 312 patients treated for urological upper tract diseases evaluating the transition from Open to MIS procedures. The major group of patients presented with UPJO (182). 141 presented an intrinsic obstruction: 70 of them were treated with open AHDP, with 2 in the last year for a very difficult anatomical condition. 71 underwent MIS procedure: 14LP and 57RP. Retroperitoneoscopic approach was reserved to children under 2 years of age; 4 patients presented a giant hydronephrosis (>5 cm in antero-posterior scan). No significant differences were noted between groups for intraoperative complications. RP and LP had equivalent risks of postoperative complications developing and a lower length of stays vs OP. In mininvasive group (RP+LP) hydronephrosis improved and/or obstructive pattern on diuretic renography disappeared during a median follow-up period of 24 months. JJ stent was positioned in all patients and removed after 30–40 days. We use a perirenal drain usually removed in 2 postoperative days. We recorded only one recurrence for a re-obstruction, in two patients (2–17 years) a urinary-tract-infection (UTI) after 3-week resulting stent removal and 1 patient underwent reoperation after 2 days for pyeloplasty leakage. Since the beginning we improved the operating time reaching a median of 3½.

Of 41 pts with extrinsic obstruction 36 underwent LVH. Median operating time was 95min; mean hospital stay: 4days. At 12–84 months follow-up 40 patients remained symptoms-free, one needed after two years a laparoscopic-AHDP.

The indications for surgery for the two group, nephroureterectomy and heminephrectomy were: dysplastic kidney, vesico-ureteral reflux nephropathy, cystic disease of the kidney, dysgenetic kidney. In the nephrectomy group the median operative time was of 140' (90–240) with a median age of 4,5 years for RP procedures; in Open group the median age was of 6 year with a median surgical time of 90'.

In heminephrectomy group the median operative time was the same between Open and RP procedures, 120'. The age range was 3months-5years in RP group and 3 months-17 years in Open one. In both RP-groups we have no conversions and intraoperative complications and a lower length of stays vs OP. We recorded an urinoma in RP-heminephrectomy group treated conservatively and 2 symptomatic ureteral stumps which needed a laparoscopic treatment.

The overall rate of complications was lower in patients undergoing MIS compared with open surgery.

Conclusions There is increasing use of MIS for pediatric urology procedures, although utilization rates vary among procedures. MIS was associated with a lower postoperative complication rate than for open procedures. Higher-volume MIS centers have a lower complication rate than lower-volume centers. Our study shows as the transition from open surgery to minimally invasive surgery requires in performing certain surgical procedures years of experience, experienced team (surgeons, anesthesiologist, nurses) and an adequate learning curve that allow to dominate MIS as conventional surgery.

In this context, certain procedures in contrast to the literature may be the most appropriate and effective techniques in the treatment of certain pathologies. Our results demonstrate indeed that RP is preferable and suitable in patients younger than 2 years in experts' hands in performing hemi/nephrectomy or AHDP contrasting with literature which describes it as a technically demanding procedure with a significantly higher complications and re-operation rate compared to LP, also in experts' hands.

Key words kidney diseases, nephrectomy, UPJO, retroperitoneoscopy, laparoscopy, MIS

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