

Laparoscopic versus Retroperitoneoscopic Pyeloplasty – A comparative study

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Abstract: Ureteropelvic junction (UPJ) obstruction is a partial or intermittent total blockage of the flow of urine that occurs where the ureter enters the kidney. The etiology of UPJ obstruction includes both congenital and acquired conditions. UPJ obstruction is the most common pathologic cause of antenatally detected hydronephrosis, generally manifested by back pain, renal colic and urinary tract infection.¹ The gold standard treatment of this pathology is Anderson-Hynes dismembered pyeloplasty, traditionally performed in a conventional open procedure, with success rates over 90% (2). Laparoscopic pyeloplasty can be performed by either trans or retroperitoneal approach. Our study enrolled fifty patients between 6 months to 3 years for a period of 10 years from 2009 (February) – 2019(February) who underwent laparoscopic pyeloplasty by trans or retroperitoneal approach . Both operative time and the results of transperitoneal were compared to retroperitoneal access (11). The outcome showed low perioperative complications, with success rate of 95% and short hospital stay in both the groups. Functional results after retroperitoneoscopic pyeloplasty are comparable to those of laparoscopic surgery. However, special knowledge of retroperitoneum is necessary to provide the patient with a safe and effective alternative to open pyeloplasty

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I. Introduction

Ureteropelvic junction (UPJ) obstruction is a partial or intermittent total blockage of the flow of urine that occurs where the ureter enters the kidney. The etiology of UPJ obstruction includes both congenital and acquired conditions. UPJ obstruction is the most common pathologic cause of antenatally detected hydronephrosis, generally manifested by back pain, renal colic and urinary tract infection. It can lead to progressive hydronephrosis and renal dysfunction (1) . The gold standard treatment of this pathology is Anderson-Hynes dismembered pyeloplasty, traditionally performed in a conventional open procedure, with success rates over 90% (2). Minimally invasive techniques, both endoscopic and percutaneous, with incision of UPJ are also performed with low morbidity, but with success rates lower than those of conventional surgery (3,4). Laparoscopic pyeloplasty was reported by Kavoussi as safe and effective for treating PUJO with success rates up to 95% after laparoscopic procedures .The minimally invasive approach can be transperitoneal or retroperitoneal, with a good success rate, lower morbidity and shorter convalescence than after open surgery. Although, the transperitoneal approach provides more working space for dissection and suturing with more defined anatomical references, retroperitoneoscopy promotes direct access to UPJ with less need for dissection and without violating the peritoneal envelope (5). Both operative time and the results of transperitoneal way are comparable to retroperitoneal access (6).

II. Materials And Methods

Our study enrolled 50 patients between the age group of 6 months to 3 years in Dept of Paediatric Surgery, Coimbatore Medical College Hospital from 2009 to 2019. The study compared the operating time, post operative hospital stay and complications between transperitoneal & retroperitoneoscopic approach



FIG-1



FIG -2

FIG 1 & 2 – patient positioning & port placement for lap pyeloplasty

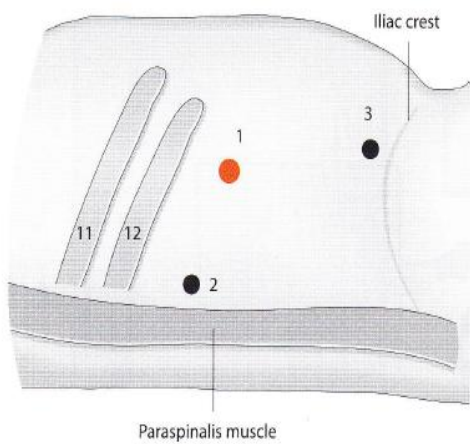


FIG 3 & 4 –PORT POSTION FOR RETROPERITONEOSCOPIC PYELOPLASTY

III. Results

In our study conducted for a period of 10 years between 6 months to 3 years by laparoscopic & retroperitoneoscopic method the operating time was between 90+/-15 min and 120+/- 15 min respectively . The success rates of laparoscopic pyeloplasty in our study were comparable to those of open surgery (7-13)with long-term success rates as high as 100% and 96% .The post operative complications and hospital stay are depicted in the table

	Laparoscopic pyeloplasty (25)	Retroperitoneoscopic pyeloplasty (25)
Patient age	6 months to 3 years	6 months to 3 years
Operating time	90 +/- 15 mins	120 +/- 15 mins
Post operative stay	4 days	6 days
Success rate	100%	96%
Post operative complications	1 (minor urinary leak)	4 (3 – minor urinary leak and 1 – port site infection)

TABLE 1 – comparative results between laparoscopic & retroperitoneoscopic pyeloplasty

In the post operative period one patient aged 2 years developed urinary leak which was managed conservatively .In the retroperitoneoscopic pyeloplasty three patients developed minor urinary leak which was managed conservatively . One patient developed port site infection with atypical mycobacterium treated with anti tuberculous drugs.

IV. Discussion

Open pyeloplasty has been the gold standard for the treatment of UPJ stenosis since its establishment, with long-term success rates higher than 90% (2). However, its morbidity is high especially related to chronic pain, risk of incisional hernia and later return to ‘daily activities’ (14). Minimally invasive procedures have emerged with the aim of reducing the morbidity in the open surgery. When evaluating the results based on the used ways, both the transperitoneal and retroperitoneal approaches offer similar success rates, with similar rates of complications (7-13).

The success rates of laparoscopic pyeloplasty were comparable to those of open surgery with long-term rates as high as 98% (7-13). Laparoscopic pyeloplasty can be performed by either trans or retroperitoneal approach. Laparoscopic pyeloplasty was reported by Kavoussi as safe and effective for treating PUJO with success rates up to 95% after laparoscopic procedures .The minimally invasive approach can be transperitoneal or retroperitoneal, with a good success rate, and lower morbidity and shorter convalescence than after open surgery.The retroperitoneal approach has the advantage of a lower morbidity if there is urinary leakage. However, because this approach has a limited working space that makes dissection and especially suturing more difficult, only a few series have been reported to date. Transperitoneal laparoscopy is the most widely used approach ,creating a large working space with familiar anatomy whereas in retroperitoneal laparoscopy creation of working space is done manually or by ballon dilatation. Overall there is low perioperative complication with 95% success rate and short hospital stay in both methods.

The failure of laparoscopic pyeloplasty can be early or late(16). In the early failure, the manifestation is often with pain, fever or a worsening of hydronephrosis after removing the ureteral stent. Late failure can also occur two or more years after surgery (15). There are only a few reports of laparoscopic management of recurrent UPJO. Criteria of success are radiologic and/or clinical improvement or resolution of obstruction. Renal scintigraphic criteria seems to be the best criteria to take into consideration a successful pyeloplasty. Failure of pyeloplasty can be related to different factors. Even if anatomical features play a role, it is most likely secondary to technical issues. To obtain a successful pyeloplasty some basic surgical principles should be observed: scrupulous preservation of the vascularity of ureter and pelvis, performing of a widely patent and watertight anastomosis, and careful tissue handling (17). It is important also to perform a “tension free” anastomosis, an anatomic reconstruction of ureteropelvic junction. Care should be taken to avoid kinking or

twisting of anastomosis. In order to avoid a twisted anastomosis it is important to perform a good isolation of the pelvis and of the ureter and to pay attention to the first suture point.

V. Conclusions

Laparoscopic pyeloplasty has functional results comparable to the conventional open technique and better than the other endoluminal procedures. It is a safe and effective for the treatment of Ureteropelvic junction (UPJ) obstruction, Functional results after retroperitoneoscopic pyeloplasty are comparable to those of laparoscopic surgery. However, special knowledge of retroperitoneum is necessary to provide the patient with a safe and effective alternative to open pyeloplasty.

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