ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 17, Issue 7, 2024

Online - 2455-3891
Print - 0974-2441

Research Article

EVALUATION OF OUTCOME OF 48 CASES OF LAPAROSCOPIC PYELOPLASTY AT TERTIARY CARE TEACHING HOSPITAL OF SOUTHERN RAJASTHAN

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Received: 10 May 2024, Revised and Accepted: 22 June 2024

ABSTRACT

Objectives: The objective of this study was to evaluate the outcome of 48 cases of laparoscopic pyeloplasty at a tertiary care hospital of Southern Rajasthan where medical facilities are still evolving.

Methods: Data of 48 patients from the medical record department, who underwent laparoscopic pyeloplasty surgery in past 4 years (January 2019–January 2023) for primary ureteropelvic junction (UPJ) obstruction due to intrinsic UPJ abnormality or aberrant vessels, were analyzed retrospectively. Intraoperative findings, success rate, and complications were recorded.

Results: Pelvic reduction was required in 30 (62.5%) patients. The mean operative time was 182.4 min and the mean blood loss was 55 mL. The mean hospital stay was of 4.2 days. Success rate of laparoscopic pyeloplasty was 97%. Over all 10.41% of patients had complications.

Conclusion: Laparoscopic pyeloplasty deals concomitant secondary stones with less morbidity and complications. It has better cosmetic outcome as compared to open techniques and similar long-term success rates. Hence, it can be concluded that laparoscopic pyeloplasty is an excellent current gold standard for primary UPJ obstruction.

Keywords: Laparoscopic pyeloplasty, Ureteropelvic junction obstruction, Hydronephrosis.

 DOI: http://dx.doi.org/10.22159/ajpcr.2024v17i7.51884. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Ureteropelvic junction obstruction (UPJO) is a common urological problem in day-to-day urosurgical practice. It may be either primary intrinsic ureteropelvic junction (UPJ) abnormality, compression caused by aberrant lower pole renal vessels, or secondary due to previous interventions. It is commonly presented with pain in the flank region or incidentally during evaluation of some other disease and less commonly by its complications such as infected hydronephrosis, pyonephrosis, stones, and renal failure [1-4].

Since many decades gold standard treatment of UPJO is open pyeloplasty with success rate more than 90% [5]. Minimal invasive treatments such as antegrade or retrograde endoscopic incision are not routinely used because of lower success rate [6-8].

Several causes of obstruction may be present in the primarily obstructed UPJ, including kinking or compression related to crossing vessels or intrinsic narrowing at UPJ. One potential reason for the inferior success rate of incision minimal invasive methods in comparison with open pyeloplasty is that the former technique address the intrinsically narrowed UPJ but may not address extrinsic problems such as kinking of ureter associated with fibrotic bands or compression from crossing vessels. Laparoscopic pyeloplasty addresses all potential causes of obstruction. Any fibrotic band kinking, the ureter is divided and the ureter is spatulated through the level of the UPJ before completion of the anastomosis. Hence, the present study was conducted for evaluating the outcome of 48 cases of laparoscopic pyeloplasty at a tertiary care hospital of southern Rajasthan where medical facilities are still evolving.

METHODS

The present retrospective study was conducted in the department of urology of a tertiary care teaching hospital only after approval from Institutional Ethics Committee. Data of patients from the medical record department, who underwent laparoscopic pyeloplasty surgery in past 4 years (January 2019–January 2023) for primary UPJO due to intrinsic UPJ abnormality or aberrant vessels, were analyzed. All files from which relevant data missing were excluded from the analysis. Patients having secondary UPJO, UPJO with multiple large stone >1 cm, or with percutaneous nephrostomy tube were excluded from the study.

All patients underwent basic surgical workup with ultrasonography of ureters and urinary bladder (KUB) region, intravenous pyelogram (IVP) or computed tomography IVP (CT-IVP), and diethylene-triamine-pentaacetate (DTPA) renal scan to confirm diagnosis after initial clinical evaluation. In all patients, double-J (DJ) stent removed after 1.5 months, and IVP/DTPA renal scan done at 3–4 months.

Operative technique

Patients were taken under general anesthesia for transperitoneal laparoscopic pyeloplasty after thorough pre-operative evaluation and anesthetic check-up. Initial cystoscopy and retrograde pyelography were done, where ureter beyond pelvi-ureteric junction (PUJ) was not delineated in IVP or CT-IVP. In these patients, retrograde DJ stent (4/16 Fr in children and 5/26 Fr in adult) was placed. In all other patients, laparoscopic antegrade DJ stent was placed.

Patient was placed in lateral decubitus position and after creating pneumoperitoneum, standard three ports (10 mm, 5 mm, and 5 mm) were placed at umbilicus/lateral rectus border, midclavicular line below the costal margin, and spinoumbilical line under vision. Transmesocolic approach was used for PUJ dissection, where it was pouting very clearly. In all others patient's colon reflected medially and PUJ dissected. All patients dismembered Anderson Hyne's pyeloplasty with dependent spatulated ureteropelvic anastomosis using 4–0 vicryl interrupted suturing done. Drain is kept in all patients. Foleys catheter was kept for 72 h and the drain was removed within 3–4 days once the

drain output was below <20 mL. Descriptive statistics were used to analyze the data.

RESULTS AND DISCUSSION

Data of a total of 48 patients who underwent transperitoneal laparoscopic pyeloplasty for primary UPJ obstruction from January 2019 to January 2023 were analyzed retrospectively. Out of 48 patients, 28 (58.33%) were male and 20 (41.67%) were females. The mean age of the patients was 20.2 years. Age ranged from 3 years to 54 years. Mean weight was 62 kg which ranged from 9 kg to 78 kg. About 29 (60.42%) patients were operated for the left side and 42 (87.5%) patients were complained of flank pain (Table 1).

Pelvic reduction was required in 30 (62.5%) patients. The mean operative time was 182.4 min and the mean blood loss was 55 mL. The mean hospital stay was of 4.2 days. The success rate of laparoscopic pyeloplasty was 97% (Table 2).

Five patients reported complications in which prolonged ileus was in 2 (4.17%) patients, followed by hematuria, prolonged drain, and misplaced DJ stent in 1 (2.08%) patient each (Table 3).

In the present study, all patients underwent Anderson Hyne's dismembered laparoscopic pyeloplasty as it is versatile and suits for all kinds of UPJO. Türk *et al*. [8] study also considered laparoscopic dismembered Anderson Hyne's pyeloplasty as the treatment of choice for UPJ surgery. In the present study, PUJ narrowing with kink was found in 12.5% of patients only which was cut and excised and ureteropelvic anastomosis was done.

Table 1: Demographic details of the patients

Parameters	n (%) or mean
Gender	
Male	28 (58.33)
Female	20 (41.67)
Mean age (years)	20.2
Mean weight (kg)	62
Side	
Right	19 (39.58)
Left	29 (60.42)
Indication	
Incidentally detected	6 (12.5)
Flank pain	42 (87.50)

Table 2: Results of operative procedure

Parameters	n (%) or mean
Intraoperative findings	
Required pelvic reduction	30 (62.5)
Not required pelvic reduction	6 (12.5)
Crossing vessel crossing vessel	12 (25)
Renal stone removal	05 (10.4)
Mean operative time (min)	182.4
Mean blood loss (mL)	55
Mean hospital stay (days)	4.2
Mean follow-up (years)	2.6
Success rate	97

Table 3: Complications after transperitoneal pyeloplasty

Complications	n (%)
Prolonged ileus	2 (4.17)
Hematuria	1 (2.08)
Prolonged drain	1 (2.08)
Misplaced DJ Stent	1 (2.08)

In 62.5% of patients, pelvis was very large and boggy which required excision and a large pelvic suture line was present which increased operative time. In the present study, operative time ranged from 90 to 140 min. Similar increased operative timing (170–220 min) was also reported by other study [2]. Klingler *et al*. [9] study recommends complete dismembering of UPJ when significant renal pelvis enlargement is seen as finger pyeloplasty had poor results compared to it.

Aberrant lower pole crossing vessel was present in 12 (25%) patients which required transposition of UPJ anterior to vessels. In these cases, operative time ranged from 100 to 170 min [3]. Eden *et al*. [10] study found lower pole vessels adjacent to PUJ in 42% of patients. Soulié *et al.* [11] study also found 42.6% aberrant vessels and Mandhani *et al*. [2] study found 16.12% incidence of crossing vessels.

In 10.4% of patients, concomitant renal stones 3–10 in number and 5–10 mm in size were removed using semi-rigid ureteroscope through laparoscopic port and collected in plastic endobag to avoid spillage. In one pediatric patient, 8-year-old girl out of three stones single 5 mm stone could not be removed during surgery. However, on the next day, X-ray KUB was found in the lower ureter along DJ stent and eventually passed spontaneously. These patients surgery also caused an increase in operative time (150–220 min) [3-5]. Mandhani et al. [2] reported eight patients with concomitant pyelolithotomy and pyeloplasty. They required extracorporeal shock wave lithotripsy (ESWL) in two patients and one was converted to open because of non-retrieval of all stones. Ramakumar et al. [12] study also required ESWL and ureteroscopy in two patients for residual stones for a mean stone size 1.4 cm. Eden et al. [10] study removed all stones in 3 patients. Overall mean operative time was 182.4 min ranging from (90 min to 220 min) in Eden et al. study [10]. Soulié et al. [12] study reported a mean operative time of 185 min by retroperitoneal approach in a series of 55 patients. Ramakumar et al. [12] study had an average operative time of 4.6 h range (2.3–6.2 h). Mandhani et al. [2] study reported 180.9 min in adult and 175 min in pediatric pyeloplasty. They concluded that operative time was proportional to the length of pelvis and the number of sutures to be applied.

Mean estimated blood loss (EBL) was 55.6 mL ranging from 20 mL to 130 mL, blood loss rate higher in patients who required excision of a large pelvis where the cut margin continue to ooze during suturing. Soulié *et al*. study [11] had mean blood loss of 59.6 mL (50–250 mL) whereas Mandhani group had EBL of 63.6 mL (30–200 mL); in this group one blood transfusion was required.

Mean follow-up period was 2.6 years (6 month–4 years) and all patients underwent postoperatively IVP or DTPA renal scan after 3–4 months of surgery. We have taken telephonic review and feedback about any symptoms at the end of study. Mean hospital stay was 4.2 days ranging from 3 to 8 days. Hussain *et al*. [13] study reported in McMaster experience that excellent results are maintained on longer follow-up in laparoscopic pyeloplasty patients.

In this study, overall success rate was 97%, as 46 patients (95.83%) were absolutely symptom free with good draining on post-operative scans. Similar results were also reported by other study [7]. Klingler *et al.* [9] study had 96% success rate for the laproscopic dismembered pyeloplasty group, 73.3% for non-dismembered (LNDP) group, and 93.4% for open (ODP) group. Frauscher *et al*. [14] study found success rate (decrease in hydronephrosis) of 100% in low-grade and 86% in high-grade hydronephrosis patients of UPJ obstruction patient with crossing vessels. Inagaki *et al*. [1] study also reported 99.7% long-term success rate after laparoscopic pyeloplasty.

One patient with poor functioning kidney of 26% complains of occasional mild flank discomfort with equivocal drainage on DTPA renal scan after 2.5 years of surgery in the present study. We did retrograde pyelogram, it has shown dilated renal pelvis, good caliber PUJ, and adequate drainage. His renal functions were maintained, so we managed conservatively.

Another patient required post-operative balloon dilatation of PUJ after initial DJ removal, 6 Fr DJ stent was kept for 3 months and now the patient is asymptomatic and maintaining differential renal function after 2 years of surgery. Similar results were reported by other study [8].

Over all 10.41% of patients had complications, two patients had paralytic ileus who required concomitant stone removed with prolonged operative time due to adhesion and use of irrigant for stone removal while using ureteroscope through the port and they required 7–8 days of hospitalization. 2.08% of patients had prolonged drain output for 5 days, and 2.08% of patient had sustained hematuria for 3 days. In one pediatric patient, DJ stent did not crossed VUJ as found on the next day X-ray KUB and required pulling of DJ into the urinary bladder cystoscopically.

CONCLUSION

Laparoscopic pyeloplasty addresses correction of basic pathology of UPJO which also deals concomitant secondary stones with less morbidity and complications. It has better cosmetic outcome as compared to open techniques and similar long-term success rates. Hence, it can be concluded that laparoscopic pyeloplasty is an excellent current gold standard for primary UPJ obstruction.

AUTHOR'S CONTRIBUTION

All the authors contributed to the preparation of the final manuscript.

CONFLICTS OF INTEREST

None.

FINANCIAL SUPPORT

Nil.

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