

ORIGINAL ARTICLE

Transperitoneal Laparoscopic Management for Secondary Ureteropelvic Junction Obstruction in Adult

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ABSTRACT

Keywords: Laparoscopic treatment, Pyeloplasty, Secondary UPJO.

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Background: Secondary ureteropelvic junction obstruction (UPJO) of the kidney can cause pain, recurrent urinary tract infections, hydronephrosis and loss of renal unit function after failed primary repair
Objective: We report our results in transperitoneal laparoscopic management of UPJO after failed open or laparoscopic pyeloplasty.
Patients and methods: In the period from April 2016 to April 2020, a total of forty five patients with secondary UPJ obstruction fulfilling the inclusion criteria, were admitted for undergoing laparoscopic pyeloplasty.
Results: The study consisted of 21 men and 24 women with the mean age of 30.2years (range 21 to 45 years)). Mean operation time was 154.9± minutes (range, 80 to 185 minutes) and mean hospital stay was 3.8 days (range, 2 to 7 days). Mean follow-up was 24.1 months (range, 12 to 42 months). The overall success rate for these salvage laparoscopic pyeloplasties was 93.3%. Only one three patient developed minor complication. **Conclusion:** Laparoscopic pyeloplasty is an effective minimal invasive surgery less morbidity in treatment of secondary pelviureteric junction obstruction.

INTRODUCTION

Secondary Pelviureteric junction obstruction (UPJO) of the kidney can cause pain, recurrent urinary tract infections, hydronephrosis and loss of renal unit function. Laparoscopic pyeloplasty (LP) for primary pelviureteric junction obstruction was first described in 1993 (Schuessler WW *et al.* 1993). Since then the technique has been standardized then became an alternative first-line option with success rates that parallel those of the open approach. Although success rates are high, failures do occur and necessitate additional interventions Until recently current managing options for secondary UPJO (Lim DJ *et al.* 1996). Are endopyelotomy and open surgery , now believe that laparoscopic pyeloplasty is the new gold standard, having superior outcomes compared to endopyelotomy and less

morbidity compared to open pyeloplasty.(Rassweiler JJ *et al* 2007). Redo open pyeloplasty is associated with significant difficulty and complications with variable success rates of 37.5% to 71.4%, which are uniformly lower than primary surgery (Anderson JC *et al.* 1949). Endopyelotomy after failed UPJO repair have shown inferior result to open re-operation in outcome (Jabbour ME *et al*1998).

We evaluate our experience results in transperitoneal laparoscopic pyeloplasty in patients with secondary ureteropelvic junction obstruction after failed primary treatment.

PATIENTS AND METHOD

We prospectively collected the data of all 45 cases between February 2016 and January 2020. whom prior open or laproscopic surgical interventions had failed of PUJ obstruction treatment, The indication of redo

pyeloplasty in these patients were persistent flank pain, recurrent febrile infection, infected hydronephrosis with nephrostomy tube or lack of radiological improvement and persistence of symptoms. The diagnosis was confirmed by renal ultrasonography (US), intravenous urography (IVU) or a CT scan (CT). And renal unit function, degree of obstruction was documented by diuretic renal dynamic scan using diethylenetriaminepentaacetic acid (DTPA). The operative and postoperative details were collected. Patients were followed up at regular interval by clinical assessment, US, and DTPA renogram. Failure is defined as persistence or recurrence of symptoms and obstructive drainage pattern in DTPA renogram. A comparative analysis was performed between patients who underwent laparoscopic redo pyeloplasty in our department and patients whom underwent laparoscopic redo pyeloplasty in the literature for perioperative and postoperative outcome.

Operative technique

Firstly the patient was placed in supine position a retrograde pyelogram was performed in all cases to delineate the ureter and pelvis. The transperitoneal laparoscopic approach was utilized in the lateral decubitus. Pneumoperitoneum was achieved using Veress needle.. Standard four ports technique was followed. The line of Toldt was incised and the colon and its mesentery were displaced medially. Normal ureter was identified using the psoas muscle as a landmark, and dissection was carried out proximally towards renal pelvis, dissection of dense adhesions was meticulously carried out]. Ureter was disconnected distal to fibrotic segment and adequately spatulated on the lateral aspect. Anderson–Hynes pyeloplasty technique was used in all cases with interrupted stitches using 4-0 polygalactin sutures over the double J stent after excision of redundant pelvis if present, 14 Fr tube drain was then fixed and the port was closed. A Foley bladder catheter was placed for 24 h. The stent was removed cystoscopically after 6 weeks.

Statistical analysis

Data collected from thorough history, basic clinical examination, laboratory investigations and outcome measures were coded, entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS) version 20. 0.

According to the type of data, qualitative were represented as number and percentage and quantitative were represented as mean ± SD.

The following tests were used: Chi square test (X²) for difference and association of qualitative variables and Mann Whitney test for differences between quantitative independent groups. P value was set at ≤ 0.05 for significant results.

RESULTS

This study included 24 females and 21 males, with the mean age of 30.2 ± 7.5 years (ranged from 21 to 45 years), Failed previous repair on the left side was in 29 cases while it was 16 cases on the right side. Regarding BMI, it ranged from 21 to 30 with mean of 24.9 ± 3.1 kg/m². The mean time after failure of primary pyeloplasty in both genders was 21.3 ± 8.2 months (rang 10-38 months). The preoperative total renal function by DTPA was 80.7 ± 26.5 (Table 1).

Table (1) Base line demographic data

Variable	Number
Age	30.2± 7.5
Sex Male/female	21/24
Diseased side Rt./Lt.	16/29
Body mass index (kg/m2)	24.9± 3.1
Mean time of failure/months	21.3 ± 8.2
Renal function/DTPA/ml	80.7±26.5

The main complaint of the patients were loin pain in about 75% of cases , followed by lack of radiological improvement after primary repair, other patient presented by recurrent

urinary tract infection (UTI), or infected obstructed kidney (Table 2).

Table (2) Intraoperative data presentation.

Variable	Number
Mean operative time (min)	154.9± 25.4
Type of repair	Anderson–Hynes
Mean blood loss (ml)	77.8± 32.8
Intraoperative complication No (%)	3(6.7%)
Mean hospital stay (days)	3.8± 1.2
Postoperative complication No (%)	6(13.3%)
Success rate No (%)	42(93.3%).

All cases were done laparoscopically without conversion to open surgery with mean operative time of 154.9 ± 25.4 minutes (range, 80 to 185 minutes). The intra operative etiological finding of previous failure were peripelvic fibrosis and scarring in 34 cases, proximal ureteric stricture in 4, missed lower pole crossing vessels at initial surgery in 5 and a kink at the PUJ associated with redundant pelvis in two patients.

Intra operative blood loss estimated by hemoglobin and hematocrit value loss, no needed for intra or postoperative blood transfusion with mean estimated blood loss in ml was 77.8 ± 32.8 (Table 3).

Table (3) postoperative complications according to Clavien-Dindo classification

Clavien Grade	No	complication	Management
Cl/0	39	no	no
Cl/I	2	Prolonged anastomotic leak	Folly's catheter
Cl/II	1	Hematuria	medical treatment
Cl/II	2	Urinary tract infection	antibiotic
Cl/II	1	illius	intestinal prokinetic
total	45		

Intraoperative complications were reported in 3 cases (6.7%) where in two patients there was bleeding due to accidental injury of the gonadal vein during dissection of dense fibrosis. It was controlled without the need of blood transfusion or conversion into open surgery through holding and ligation of the vein with no further complications. Another patient showed colonic serosal injury, which occurred in patient with right sided PUJO after failed open pyeloplasty since 1 year ago. Intraoperatively, the patient showed dense adhesions and during dissection by scissor, injury occurred and early discovered and was successfully sutured intraoperative. In five cases, we needed complete mobilization of the kidney to allow tension free anastomosis of pelvis to the ureter,

Postoperative complications were reported in six patients (13%) were categorized according to the Clavien–Dindo classification system, two patients had a urinary tract infection (Clavien grade II), two patients had Prolonged anastomotic leak managed by insertion of Folly's catheter (Clavien grade I)., one had mild hematuria that was conservatively managed (Clavien grade II) and one had a prolonged ileus that recovered spontaneously (Clavien grade I). None of them required blood transfusion (Table 3). The post operative flow up period was 24 months for all Patients in our study.

DISCUSSION

Ureteropelvic junction obstruction is the most common congenital abnormality of the upper urinary tract. Open pyeloplasty has been the gold standard for UPJO repair since first successful reconstruction of an obstructed UPJO was accomplished in 1892 (Kletscher BA *et al.* 1995), and achieves success rates exceeding 90% (Psooy K *et al.* 2003).

Laparoscopic dismembered pyeloplasty represents a minimally invasive alternative of gold standard open Anderson- Hynes technique that have comparable successful outcome with open pyeloplasty while avoiding its comorbidity. It is also better than endopylotomy as it deals effectively with crossing vessel. ((Bansal P *et al.* 2008).

In cases of failed pyeloplasty open redo provides excellent results, with reported success rates of 77.8–100%. and have suggested to be first choice method for repair(Thomas JC *et al.* 2005) Laparoscopic pyeloplasty has recently been shown to have

excellent success rates for persistent UPJO after a previously failed procedure (Zhang X *et al.* 2006).

Basiri *et al* reported 18 patients whom treated by laparoscopic redopyeloplasty after a failed open surgery. This report is, nevertheless, limited by short-term follow-up 14 months.(Basiri A *et al.* 2007)

In the study of Sundaram *et al* achieved 83% overall objective success for all 36 cases, not differentiating between those open surgery or endopyelotomy failere. (Sundaram CP *et al* 2003) They concluded that salvage laparoscopic redopyeloplasty can be performed safely with same success comparable to primary open surgery (Table 4).the only three patients in that series had failed prior open pyeloplasty. The overall number of patients with persistent UPJO who have undergone salvage laparoscopic pyeloplasty and their follow-up are too limited to draw any firm conclusions.

Table (4) Comparison of outcome of laparoscopic redopyeloplasty reports with the present series

Study	Number Of Patients	Technique	Mean Operation Time, Min	Mean Hospital Stay, D	Follow-Up, Month	Success Rate, %	Failure Rate, %
Our study	45	Transperitoneal	154.9± 25.4 (80 to 185)	3.8	6(1to36)	93.3	6.7
Piaggio <i>et al</i>(19)	6	Transperitoneal	290 (206 to 280)	2.5	7 (1 to 24)	80	20
Basiri <i>et al</i>(15)	18	Transperitoneal	254 (150 to 450)	7.2	14.1 (4 to 25.5)	77.8	22.2
Sundaram <i>et al</i>(7)	36	Transperitoneal	372 (162 to 200)	2.9	10 (3 to 40)	83	17
Shapiro <i>et al</i>(2)	9	Transperitoneal	204 (80 to 264)	2.1	66 (12 to 119)	89	11

In the retrospective study of Piaggio *et al* which contain ten patients undergoing redo pyeloplasty. the feasibility of redo laparoscopic pyeloplasty confirmed by the authors and , concluded that in experienced hands redo laparoscopic pyeloplasty can be performed

safely with a success rate similar to the open surgery.(Piaggio LA, *et al* 2007) It provide faster recovery with decreased analgesic requirement and morbidity.(Ortapamuk H *et al* 2003)
Shapiro reported 89% success rate in his study with a small of 9 patient whom

underwent salvage laparoscopic pyeloplasties. All patients had mean time of 67.7 months from the failed open pyeloplasty. Five of them underwent laparoscopic Anderson-Hynes. But their study was affected by small sample size referral bias, retrospective nature. (Shapiro EY *et al* 2009.)

In our study achieving a success rate in 42(93.3%) case of total 45 patients by definitions of success which included symptom relief and radiological improvement after treatment which is compatible with literature and Postoperative complications was noticed in three patients, one of them required reinsertion of DJ stent for another one month were lost during follow up, in the other two case had high grad of obstruction, renal scan was done revealing a poorly functioning kidney with a split function of < 10% one of whom was symptomatic (infected

hydronephrosis) and underwent nephrostomy tube insertion followed by nephrectomy, while the other was managed through redo open pyeloplasty.

CONCLUSION

Laparoscopic pyeloplasty is an effective minimal invasive surgery for treatment of secondary UPJO, it has short hospital stay, low rate of intra and post operative complications, this procedure should be attempted by a urologist with considerable experience in laparoscopic reconstructive procedures to achieve optimal results.

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