

LAPAROSCOPIC DISMEMBERED PYELOPLASTY FOR URETEROPELVIC JUNCTION OBSTRUCTION: OUR PRELIMINARY EXPERIENCE

MD. MAHFUZUR RAHMAN CHOWDHURY¹, AKM KHURSHIDUL ALAM², AKM ANWARUL ISLAM², MD. SAJID HASAN², TMS HOSSAIN², MD MIZANUR RAHMAN³

¹Department of Urology, Dhaka Medical College & Hospital, Dhaka, ²Department of Urology, BSMMU, Dhaka, ³Department of Urology, NIKDU, Dhaka

Abstract

Objective: To evaluate prospectively the results obtained in 16 patients undergoing laparoscopic pyeloplasty through trans-peritoneal access.

Materials and Methods: The study was conducted in the department of urology, BSMMU, Dhaka between the periods of March 2013 and June 2014, sixteen patients between 15 and 48 years old, were treated for ureteropelvic junction obstruction (UPJO) via a transperitoneal laparoscopy. All patients had clinical symptoms of urinary obstruction and hydronephrosis were confirmed by imaging methods. Anderson-Hynes dismembered pyeloplasty was performed in all patients. Patients were clinically and imaging evaluated in the postoperative period at 6 and 12 weeks.

Results: Most of the patients were male (68.75%) and female were 31.25%. The mean operative time was 127.37 (± 15.67) minutes ranged from 95 to 240 minutes. Pain score in first postoperative day and third postoperative day following pyeloplasty were 20.87 (± 6.83) and 4.75 (± 3.34) respectively. The mean hospital stay was 4.25 (± 1.34) days. Anomalous vessels were identified in 4 patients, intrinsic stenosis in 12 patients. Postoperative urine leakage and UTI were seen 18.75%, 12.50% subject respectively. Split renal function and GFR were significantly improved ($p < 0.05$) and improvement of renal functional outcome was 87.50%.

Conclusion: Laparoscopic pyeloplasty had the advantages like less postoperative pain and shorter hospital stay.

Key words: laparoscopy; pyeloplasty;

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Introduction

Ureteropelvic junction (UPJ) obstruction is one of the most common ureteric intrinsic pathology, generally manifested by back pain, renal colic and urinary tract infection but it may be asymptomatic. It can lead to progressive hydronephrosis and renal dysfunction. Surgical management of ureteropelvic junction obstruction aims to provide symptomatic relief and

improve renal function or preserve remaining renal function. The gold standard treatment of ureteropelvic junction obstruction is Anderson-Hynes dismembered pyeloplasty, traditionally performed in a conventional open procedure, with success rates over 90%[1]. Laparoscopic pyeloplasty was first reported in 1993, both by Schuessler and co workers and by Kavoussi and Peters, who utilized the dismembered pyeloplasty

Correspondence address: Mohammad Mahfuzur Rahman Chowdhury, Assistant Professor, Department of Urology, Dhaka Medical College & Hospital, Dhaka. E-mail: mahfuz.urology@gmail.com

technique[2] with excellent functional results and significant reductions in morbidity[3]. Laparoscopic pyeloplasty can be performed via a retroperitoneal or a transperitoneal approach. Equivalent success rates have been quoted in the literature for both of these methods[4,5]. Present study was conducted by the transperitoneal approach for all the patients, as this approach offered ease in identifying, dissecting and mobilizing the intra-abdominal structures, while the potential disadvantages included a prolonged ileus, adhesion formation, and injury to the adjacent viscera. The aim of the study is to assess the potential advantages of laparoscopic pyeloplasty and to share our experience. These are less post-operative pain, a shorter period of hospitalization and relief of renal obstruction.

Materials and Methods

Purposive Sampling technique was applied to collect the sample from study population. In this prospective study sixteen consecutive patients were selected by inclusion and exclusion criteria. In the period from March 2013 to June 2016, 16 patients, 11 men and 5 women, aged between 15 and 48 years old were treated for UPJ obstruction through transperitoneal laparoscopy (Table-I). All patients had clinical symptoms of high urinary obstruction and hydronephrosis, confirmed by intravenous urogram and GFR. None of them had undergone any previous treatment.

Table-I
Summary of patient

Number	
Male	11
Female	05
Age (years)	
Mean	22.81 (\pm 8.86)
Range	15-50
Laterality	
Right	06
Left	10

This present study had been conducted on the patients with ureteropelvic junction obstruction admitted in the department of urology, Bangabandhu Sheikh Mujib Medical University, Dhaka. All patients were evaluated by history, physical examination and investigations. Pre-

operative IVU was done in all the patients to see the condition of kidney. Diuretic ^{99m}Tc -DTPA (diethylenetriaminepentacetate) renogram was done in all patients to see the preoperative split renal function (SRF) in percentage and glomerular filtration rate (GFR). Patients with documented UTI were treated with appropriate antibiotic before the procedure.

With all preoperative preparation general anaesthesia was given, the patient was positioned into contralateral 45^o lateral decubitus position and kidney bridge was elevated. The Veress needle was placed in the midclavicular line 2 cm below the costal margin and pneumoperitoneum to a pressure of 15 mm Hg was established. The primary 10 mm trocar was placed in the midclavicular line about 5 cm above and lateral to the umbilicus and diagnostic laparoscopy was performed. Secondary ports were placed four fingerbreadths apart in a triangulated manner. Sometimes additional port was placed according to requirements. For right sided operations one additional 5 mm port was placed in the midline beneath the xiphoid process for liver retraction. The retroperitoneal space was entered by incising the peritoneum overlying the medial aspect of the kidney and allowing the colon to be displaced medially. The renal pelvis was then dissected completely free of all attachments. Laparoscopic scissors were used to dismember the ureter and pelvis and the stenotic ureteropelvic junction segment was excised. The repair was then completed by anastomosing the ureter to the renal pelvis using interrupted and continuous 4/0 polyglactin suture after placement of double J stent at the ureter. Percutaneous drain was placed. If crossing vessel was present, the repair was performed anterior to the vessel. In the follow up study all cases were evaluated after six weeks and three months postoperatively. The double J stent was removed after six weeks. Every case was evaluated by history i.e. symptomatic improvement (pain free or complain of pain), clinical examination, urinalysis, IVU, ultrasonography of KUB and ^{99m}Tc -DTPA renography after three months postoperatively.

Results

The operative and post-operative results are distributed in Table-2. 19 patients were operated initially. But 3 patients were lost during follow up. Most of the patients were male (68.75%). The mean operative time was 127.37 (\pm 15.67) minutes *ranged from 95 to 240 minutes*. There

was a progressive decrease in operative time after the first few cases. Anomalous vessels were **identified in 4 patients, intrinsic stenosis in 12 patients.**

Pain score in first postoperative day and third postoperative day following pyeloplasty were 20.87 (± 6.83) and 4.75 (± 3.34) respectively. Intensity of pain following pyeloplasty was significantly less ($p < 0.05$).

Urine leakage and UTI were seen 18.75% and 12.50% subject respectively. No wound infection occurred following laparoscopic pyeloplasty. The mean hospital stay following laparoscopy was 4.25 (± 1.34) days. Hospital stay was significantly shorter in laparoscopic pyeloplasty group ($p < 0.05$).

In the present study, 87.5% cases were improved i.e. completely pain free after removal of double J stent. In the study group, pre and post-operative split renal function in percentage were 28.85 (± 11.35) and 35.64 (± 9.78) respectively and GFR were 20.03 (± 4.22) ml/min and 27.48 (± 5.05) ml/min respectively. Split renal function and GFR were significantly improved after operation ($p < 0.05$) and improvement of renal functional outcome was 87.50%.

Table-II
Summary of results

Operative time(minutes)	
Mean	127.37 (± 15.67)
Range	95 to 240
Pain score(100 mm scale)	
First postoperative day(Mean)	20.87 (± 6.83)
Third postoperative day(Mean)	4.75 (± 3.34)
Hospital stay (Days)	
Mean	4.25 (± 1.34)
Range	2-14
Complications(in percentage)	
Urine leakage	18.75%
UTI	12.50%
GFR(ml/min)	
Preoperative (Mean)	20.03 (± 4.22)
Postoperative(Mean)	27.48 (± 5.05)
Split renal function(in percentage)	
Preoperative	28.85 (± 11.35)
Postoperative	35.64 (± 9.78)
Success rate(in percentage)	87.50%

Discussion

Open Anderson-Hynes pyeloplasty is the gold standard for surgical treatment of ureteropelvic junction obstruction, a long-term success rate exceeding 90%[6]. This procedure requires a muscle cutting incision that causes some degree of morbidity. Ureteropelvic junction obstruction causes hydronephrosis and progressive renal impairment if left untreated. The optimum surgical correction of UPJO has been a urological challenge for over a century. Open pyeloplasty originally described by Anderson and Hynes remains the gold standard against which new technique may be compared. The morbidity associated with flank incision, however has lead to development of minimally invasive approaches to UPJ repair.

Minimally invasive procedures have emerged with the aim of reducing the morbidity in the open surgery. Retrograde and antegrade endopyelotomy, pneumatic balloon dilatation, Acucise, cold Knife and more recently the use of laser were used for the purpose of treatment of UPJ stenosis. Such procedures have low morbidity, but lower rates of success[7,8]. Moreover, there is evidence that patients with large re-nal pelvis, poor kidney function and anomalous vessel are not good candidates for endoluminal techniques. Added to this, the long-term results are also worse, at around 63% with more frequent relapses[9].

Anderson-Hynes dismembered technique is used in most series of published laparoscopic pyelo-plasties, reflecting an attempt to reproduce the well-established principles of open surgery[3,10], besides being more effective than other minimally invasive procedures[7,8,9]. The dismembered technique should always be considered, even in the presence of anomalous vessel, because in more than half of the cases there is an associated intrinsic stenosis[11].

Laparoscopic pyeloplasty can be performed via a retroperitoneal or a transperitoneal approach. Equivalent success rates have been quoted in the literature for both these methods. The present study used a transperitoneal approach for all the patients, as this approach offered ease in identifying, dissecting and mobilizing ureter and pelvis of the kidney.

The results of laparoscopic pyeloplasty from several institutions which was reported on the adult series, suggested that this procedure was a viable alternative to both open and endoscopic procedures.

In this study, mean operative time was 127.37 (± 15.67) minutes. Operative time was significantly longer in

laparoscopic pyeloplasty like previous studies due to proximal ureteric spatulation and laparoscopic intracorporeal stitching. Bansal observed that total operative time with stent placement in laparoscopic pyeloplasty was 244.2 min (188-300 min)[12]. There was a significant and progressive decrease in operative time during this series associated with greater experience acquired by the surgeon.

Intensity of pain following operation was significantly less. Klingler[13] performed a study where it was seen that postoperative pain score was lower in the laparoscopic group (day 1 3.5+/-1.6 vs. 5.4+/-3.1, day 5 0.9+/-1.2 vs. 3.1+/-1.8, p=0.001). Analgesic doses were also less after laparoscopy[12,14]. There is very small port incision and tissue trauma during laparoscopy. So, patient can be discharged early than open surgery. In current study, the mean hospital stay was 4.25 (±1.34) days which was comparable to other published data. urine leakage was seen in case of laparoscopic pyeloplasty which might be due to inappropriate ligature and knotting during procedure. In the present study, it was found in 18.75% patients which was also comparable to other study.

Open pyeloplasty has been the gold standard for the treatment of UPJ stenosis since its establishment, with long-term success rates higher than 90%[1]. However, its morbidity is high especially related to chronic pain, risk of incisional hernia and later return to 'daily activities'[3]. The success rates of laparoscopic pyeloplasty were comparable to those of open surgery with long-term rates as high as 98%[15-21].

In this series, there was a success rate of 87.50%, consistent with the data presented in the literature for laparoscopic and open pyeloplasty.

Conclusion

Laparoscopic pyeloplasty has functional results comparable to the conventional open technique and better than the other endoluminal procedures. It is a safe and effective alternative for the treatment of UPJ obstruction and it can be considered as first choice by surgeons with experience in laparoscopy.

Conflict of Interest : None

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