

Outcome of Laparoscopic Transperitoneal Ureterolithotomy for Proximal Ureteric Stones - Our Two Years Experiences

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Abstract

To evaluate the results of laparoscopic transperitoneal ureterolithotomy for management of large proximal ureteric stones. This study was performed on 24 patients having proximal ureteric stone greater than 1.5cm at the Department of Urology, Shahid Sheik Abu Naser Specialized Hospital, Khulna, Bangladesh from January 2016 to December 2017. Patients having stone size less than 1.5cm, previous abdominal surgery and sepsis were excluded from this study. Patients characteristics, stone characteristics, perioperative and follow-up data were studied. Twenty-four patients (mean age=52.9±12 years) with large upper ureteric stones (mean stone diameter=35±12) were included. Twenty-two patients had single stone and 2 patients had two stones. Mean operative time was 107±49.5 min with mean blood loss of 60.5±19.2 cc. Mean total pain score was 38.4±5.5 (100 point scale) and mean time resuming oral intake was 7.2±1 h. Mean duration of hospital stay was 2.6±1.4 days and mean time of stenting was 7.2±2 weeks. Throughout a mean duration of follow-up of 10.8±6.6 months 100% stone clearance rate was achieved with no recurrence. Laparoscopic transperitoneal ureterolithotomy is a safe and effective approach for selected patients with large

proximal ureteric stones with reduced postoperative pain short hospital stays and cost effective and should be considered as a choice of treatment option for such stones.

Keywords: Laparoscopy, Stone, Ureterolithotomy.

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Introduction

The treatment of urinary lithiasis has been revolutionized during the last three decades. Minimally invasive therapies in the form of endoscopic surgery in conjunction with the advent of shock wave lithotripsy have diminished the role of open stone surgery¹.

Laparoscopic surgery provides a higher degree of patient satisfaction than open surgery from a cosmetic perspective. It is also effective in reducing postoperative pain, operative wound complications, blood loss, and the length of hospital stay. Accordingly, it has been remarkably developed in the field of urology over the past 20 years. Laparoscopy as a minimally invasive treatment is continuously gaining place in the treatment of urinary stones, mainly replacing open surgery².

Skolarikos et al.³ have tried to identify the level of evidence and grade of recommendation supporting the laparoscopic approach of stone extraction. The highest level of evidence was found for laparoscopic ureterolithotomy. It is technically feasible and having lower postoperative morbidity compared to open ureterolithotomy. It is mostly recommended for large impacted stones or when endoscopic ureterolithotripsy or shock wave lithotripsy have failed.

The present prospective study aimed to evaluate the results of laparoscopic transperitoneal ureterolithotomy for management of large proximal ureteric stones.

Materials and Methods

This study was carried out at the Department of Urology, Shahid Sheik Abu Naser Specialized Hospital, Khulna, Bangladesh from January 2016 to December 2017 on patients having large (≥ 1.5 cm) proximal ureteral stones. Patients with stones < 1.5 cm in size, previous transperitoneal surgical procedure or follow-up duration < 3 months were excluded from the study.

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The studied characteristics included patient's age, sex, stone (size and number) and past history of stone surgeries. Collected operative data included type of anesthesia applied, operative time, mean amount of intra operative blood loss and the frequency of conversion to open surgery. Postoperative data included postoperative pain severity judged using 100-point pain visual analogue scale (VAS) with 0 = no pain and 100 = the worst intolerable pain, time till resumption of oral intake and duration of hospital stay. Follow-up data included duration of follow-up, stone recurrence, ureteral stricture formation and other complications.

After induction of anesthesia, patients were in flank position with no flexion of the operating table. The procedure was performed through 3 ports, a 10 mm camera trocar inserted 2 finger breadth lateral and superior to the umbilicus and 2 additional 5 mm working ports inserted a handbreadth superior and inferior to the camera port. A fourth 5 mm trocar is occasionally used for liver retraction in right-sided cases. After reflection of the colon, the ureter was identified and stone was located and extracted through a vertical ureterotomy. A 6F DJ stent was then inserted and the ureterotomy is closed with 4/0 Vicryl sutures. Using a 5 mm scope, the stone is extracted in a sac through the 10 mm port and then a small drain is inserted via the other 5 mm port.

Results

Twenty-four patients fulfilled the inclusion criteria (16 males and 8 females) with mean age of 52.9 ± 12 (range 26-64) years. The mean stone largest diameter was 35 ± 12 (range 18-62) mm. Fifteen patients had left-sided and 9 had right-sided ureteral stones. Twenty-two patients had solitary stone and 2 patients had two stones. Stone clearance was achieved in 100% of patients.

Operative data are shown in Table-I. All procedures were completed uneventfully without any intraoperative complications or the need for open conversion.

Table-I: The characteristics before, during and after treatment of laparoscopic transperitoneal ureterolithomy

Data	Findings
No of patients	24
Sex (M:F)	16:8
Age (year)	52.9 ± 12 (26-64)
Stone size (mm)	35 ± 12 (18-62)
Anesthesia (General)	24(100%)
Open conversion rate	0
Operative time (min)	107 ± 49.5 (70-250)
Intra operative blood loss (ml)	60.5 ± 19.2 (35-90)
Pain VAS Score	38.4 ± 5.5 (30-45)
Hospital stay (day)	2.6 ± 1.4 (2-5)

Mean total pain VAS score at the time of first request of postoperative analgesia was 38.4 ± 5.5 ; range: 30-45 and was significantly ($P < 0.05$) lower Table I.

Only two patients had paralytic ileus, while the other 22 patients resumed oral intake after a mean duration of 7.2 ± 1 (range: 6-8 h). Mean duration of hospital stay was 2.6 ± 1.4 ; range: 2-5 days and duration of stenting was 7.3 ± 2 ; range: 4-10 weeks. Throughout a mean duration of follow-up of 10.8 ± 6.6 ; range: 3-24 months and all patients remained stone free.

Discussion

All enrolled patients had laparoscopic ureterolithotomy through the transperitoneal approach, a finding that confirms the established experience of the working team with this approach rather than retroperitoneal approach, which is more familiar to the urologists throughout their experience in open surgery. The transperitoneal approach offers more working space and better identification of anatomical landmarks Henkel et al.⁴ However, previous abdominal surgery with the possibility of intraperitoneal adhesions could be a limiting factor; such a limitation was avoided in the current study, where patients with past history of abdominal or pelvic surgeries were excluded.

The favorable surgical outcome depends on combined proper patient selection and surgical experience. In line with this, the mean operative time was about 107 min within a range of 70-250 min. Our operative time was superior to that reported by Huri et al.⁵ who reported a mean operative time of 124 min; this extended operative time could be attributed to the larger number of cases operated using the retroperitoneal approach. In support of this assumption, Simforoosh et al.⁶ compared extraperitoneal versus intraperitoneal approach for laparoscopic proximal ureterolithotomy and reported that operative time was different significantly in favor of the intraperitoneal approach.

Moreover, the procedure was associated with minimal intraoperative bleeding with a mean blood loss of 60 ml and this goes in hand with El-Feel et al.⁷ and Kongchareonsombat et al.⁸ who reported that estimated blood loss during intraperitoneal laparoscopic ureterolithotomy was 62 and 51 cc, respectively.

All patients had low pain VAS scores and this could be attributed to minimal dissection and minimization of wound-related pain. The lower pain scores and the decreased consumption of postoperative narcotics allowed early ambulation and resumption of oral intake and spared the narcotic-related side effects, especially nausea and vomiting. These data go in hand with the conclusion provided by Almeida et al.⁹ who documented that comparison of laparoscopic and open ureterolithotomy proved that laparoscopy offered significant advantages over traditional open ureterolithotomy, resulting in improved analgesia and shorter hospital stays, but with similar complication rates.

All patients were discharged stone-free without stone recurrence throughout follow-up period. These data indicate the efficacy and safety of laparoscopic transperitoneal approach. In support of that, Basiri et al.¹⁰ compared three surgical options for the management of urinary stones in the upper ureter, namely, retrograde ureteroscopic lithotripsy using a semirigid ureteroscope, transperitoneal laparoscopic ureterolithotomy and percutaneous nephrolithotripsy and reported stone-free rates at discharge and 3 weeks later of 56%, 88%, and 64% and 76%, 90%, and 86%, for the three procedures, respectively. El-Moula et al.¹¹ indicated that laparoscopic ureterolithotomy was successful in 94.6% of cases and Matias et al.¹² reported the global rate of stone free was 91%. Khaladkar et al.¹³ reported stone clearance rate of 39.1% with ESWL, 79.2% with ureteroscopic pneumatic lithotripsy and 100% with the laparoscopic method, with a statistically significant difference in favor of laparoscopic methods.

Our reported mean duration of hospital stay of 2.6 ± 1.4 days was superior to that previously reported by El-Feel et al.⁷ and Abolyosr¹⁴ who reported a mean hospital stay of 4.1 and 3.8 days, respectively, despite the absence of intraoperative or postoperative complication, but was in line with Matias et al.¹² who reported a mean hospital stay duration of 3.3 days.

Conclusion

Laparoscopic transperitoneal ureterolithotomy is safe and effective approach for selected patients with large proximal ureteric stones with reduced postoperative pain, short hospital stay and maximum stone clearance rate and should be considered as a choice of treatment option for such stones.

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