



## LAPAROSCOPIC RETROPERITONEAL URETEROLITHOTOMY IN LARGE IMPACTED UPPER URETERIC STONES: A CROSS SECTIONAL STUDY FROM CENTRAL INDIA

Abhijit Dhale

Assistant Professor Dept. of Urology Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences Sawangi (Meghe), Wardha

### ABSTRACT

**Background:** About 33-54 percent of all urinary tract stones are ureteric calculi. It's not uncommon to locate an upper ureteric stone that has been impacted. Surgical procedures include URSL, ESWL, PCNL, and ureterolithotomy (laparoscopic/open).

**Aims & objectives:** The goal of this research was to look at the treatment effects of Laparoscopic Retroperitoneal Ureterolithotomy in patients with big impacted upper ureteric calculi (>15mm).

**Patients and Methods:** This two-year study took place in a tertiary healthcare centre in Central India. The study included 60 medically fit individuals who had a big upper ureteral stone (>15 mm) and underwent laparoscopic retroperitoneal ureterolithotomy. The features of the patients, as well as the success rate, stone-free rate, surgery time, hospital stay, and complications, were all documented and studied.

**Results:** The patients in our study were on average 31.8 years old. The male-to-female ratio was 42/18. More patients (36/60) had stones on their right side. The operation's success rate was 93.8 percent (56/60). The stone-free rate was 100% (60/60) after 4 weeks of follow-up. The average operation time and hospital stay after surgery were respectively 100.52 minutes and 4.33 days. After laparoscopic retroperitoneal ureterolithotomy, the postoperative complication rate was 13% (8/60).

**Conclusion:** For big, impacted upper ureteric stones, laparoscopic retroperitoneal ureterolithotomy is a safe and successful therapeutic option.

**Keywords:** Ureteric Calculus; Laparoscopic retroperitoneal Ureterolithotomy; PCNL- Percutaneous Nephrolithotomy; URSL- Ureteroscopic Lithotripsy; ESWL- Extracorporeal Shockwave Lithotripsy.

### INTRODUCTION:

In developed countries, roughly 5-15 percent of the population suffers with urinary calculi. Adult men are more likely than women to develop urinary calculi. Urinary calculi are uncommon before the age of 20, with the highest frequency occurring in the fourth to sixth decades of life<sup>1</sup>. Ureteric calculi are formed in the kidneys and travel down the ureter, where they become trapped at various locations. Urinary calculi make up 33-54 percent of all urinary stones. A stone with a diameter of more than 8 mm cannot be passed naturally<sup>2</sup>. The inability to pass a guide wire beyond the stone and/or the stone lingering at the same radiographic spot in the ureter for more than 2 months are both considered stone impaction. Failure to see the ureter distal to a stone with proximal hold up of contrast for 3 hours or more following excretory urography is another definition of an impacted stone<sup>3</sup>. Various procedures, such as an X-ray abdomen, are used to confirm the diagnosis of ureteric calculus (KUB). CT scan, intravenous

urography (IVU), and ultrasonography (CT Scan). Over 90% of these can be identified by scanning with contemporary equipment. There are a variety of therapeutic options for big impacted upper ureteric calculi<sup>4</sup>. ESWL, URSL, PCNL, and Ureterolithotomy (open/laparoscopic) are some of the surgical possibilities. Large, impacted ureteral stones may be treated using open or laparoscopic ureterolithotomy as a main treatment option, or as an adjuvant surgery in the case of failed ESWL and attempted URS or PCNL<sup>5</sup>. Patients with impacted ureteric stones have been successfully treated by laparoscopic retroperitoneal ureterolithotomy, with just around 2% requiring open surgery.

### Aims & objectives:

The goal of this research was to look at the treatment effects of Laparoscopic Retroperitoneal Ureterolithotomy in patients with big impacted upper ureteric calculi (>15mm).

## Material and Methods

Our study, which included 60 patients with upper ureteral stone illness and was conducted in the Department of Urology at a tertiary healthcare centre in central India, was a retrospective analysis based on patient case records. A single team of urologists performed laparoscopic retroperitoneal ureterolithotomy on the patients.

**Inclusion Criteria:** Adult patient (Age group >20 yrs), Single stone, Upper uretric stone (from uretropic junction to superior aspect of sacroiliac joint), Stone > 15mm in size, Impacted stones.

**Exclusion Criteria:** Patients who are allergic to general anaesthesia, Females that are pregnant, Previous ureter surgery, Infection that is active, Anomalies of the urinary tract on the same side, coexisting kidney stone.

**Operative Technique:** The patient was placed in a lateral decubitus posture on the operating table after anaesthetic was administered. A skin incision was made halfway between the subcostal margin and the iliac crest along the mid-axillary line, and the aponeurosis was incised. A balloon dilator was placed into the gap to provide a retroperitoneal working area, and the peritoneum was pushed forward utilising index figure. The dissection balloon was removed after blunt dissection of the retroperitoneal region. Under vision, two more ports were put, one on each side at a 45 degree angle to the first. CO<sub>2</sub> was used to make the pneumoretroperitoneum. The psoas muscle was identified with care. The pulsations of the renal arteries were discovered when Gerota's fascia was incised parallel to the psoas muscle. On the psoas muscle, the ureter was identified. The ureter was dissected in order to locate the stone, which was detected by a protrusion. An endo-knife was then used to incise the ureter longitudinally over the stone. The stone was identified and taken out. In all cases, a double-J stent was inserted via the incision and secured with a guide wire. Absorbable sutures were used to close the ureterotomy. For two to three days, a drain was placed in the retroperitoneal area, and Foley's catheter was kept in place for 3 -4 days. The ureteral stent was removed three to four weeks after operation.

**Visual Analogue Scale:** After the surgery, a visual analogue scale (VAS), which is the standard tool for evaluating pain, was used to monitor pain. Patients with a VAS pain score greater than 3 were given a

dose of rescue analgesia (i/m Diclofenac) that was titrated according to the patients' needs.

**Follow-up:** All patients were followed for four weeks after surgery with repeat X-ray-KUB and USG-KUB, as well as IVP in some cases, to assess any residual stones and the patency of the distal ureter.

**Statistical Analysis:** The collected data was assembled and entered into a spreadsheet (Microsoft Excel) before being exported to the SPSS Version 20.0 data editor. Categorical variables were reported as frequencies and percentages, whereas continuous variables were summarised as Mean SD. Bar and pie graphs were used to illustrate the data graphically. For categorical data, the Chi-square or Fisher's exact test was used, depending on the situation. Statistical significance was defined as a P-value of less than 0.05.

**Authors' Contributions:** All of the authors were involved in the redaction and rewriting of the manuscript, and they all gave their permission to the final version.

The study received ethical approval from the Institutional Ethics Committee.

## Results

The patients in this study ranged in age from 20 to 55 years old, with the majority (50 percent) falling between the ages of 30 and 39. The patients were 31.8 years old on average. Patients were divided into two groups based on their gender; the majority of our patients were guys (70 percent). The male/female ratio was discovered to be 42/18. The majority of the patients in our study had a stone on their right side (60 percent). The size of the stones in our patient sample ranged from 15 to 23 mm, with the majority (50%) of the patients having stones between 15 and 17 mm. The average size of the stones was 17.33 millimetres. In our research, the operating duration ranged from 70 to 130 minutes. 100.52 minutes was calculated as the average operative time. Laparoscopic retroperitoneal ureterolithotomy was reported to be 93.4 percent successful (56/60), with four patients (4/60) requiring open ureterolithotomy. Our patients' hospital stays ranged from three to eight days. The average length of stay in the hospital was 4.33 days. Stone-free rates were determined to be 100% (60/60) in the postoperative and follow-up periods. (Table-1)

**Table 1: patient charecteristics**

Total patients	60
Mean age (years)	31.8
Number of males	42
Number of females	18
Laterality	
Right side	36
Left side	24
Mean operative time (minutes)	100.52
Average hospital stay (days)	4.33
Complications	
Intraoperative	6
Postoperative	6

**Table 2: complications**

COMPLICATION	NO. OF PATIENTS
Abdominal Distention (Peritoneal Breach)	6
Urine Leak	2
Prolonged Ileus	2
Fever	2

The rate of intraoperative and postoperative complications was reported. Six patients experienced abdominal distension after surgery (due to gas leak into the peritoneal cavity). Two patients had urine leaks after surgery (from ureterotomy site). Two patients experienced prolonged postoperative ileus, and two others acquired a high-grade fever in the postoperative period, which was diagnosed as a urinary tract infection based on evidence. All of the patients were treated and fully recovered. (Table-2)

### Discussion

In 1564, Ambroise Paré described the first ureteral calculi, and Thomas Emmet performed the first ureterolithotomy in 1879. Hugh Hampton Young was the first to perform ureteroscopy in 1912. Open ureterolithotomy was used to treat ureteric stones before the 1980s<sup>6</sup>. In the last two decades, technological advancements have transformed the way ureteral calculi are treated. Open ureterolithotomy has given way to ureterorenoscopy with endoscopic lithotripsy and extracorporeal shockwave lithotripsy in the treatment of ureteric calculi<sup>7</sup>. The best treatment for ureteral calculi has yet to be found. The 2007 guidelines for the management of upper ureteric stones were released by the American Urological Association (AUA) and the European Association of Urology (EAU)<sup>8</sup>. Many topics remain debatable, and the optimal treatment option should be left to the discretion of the practising surgeon. For the removal of affected ureteral stones, laparoscopic

ureterolithotomy is an alternative<sup>9</sup>. This procedure, unlike SWL and URS, is unaffected by parameters such as stone burden and position, patient obesity and weight, and access problems. As a result, a near-total stone-free rate might be expected in just one session<sup>10</sup>. The participants in this study were 60 medically fit patients with impacted upper ureteric calculus who were chosen on an OPD basis. A single team of urologists performed Retroperitoneal Laparoscopic Ureterolithotomy on the patients. The results were statistically analysed based on stone size, mean operating time, hospital stay (in days), success rate, stone free rate, and complications<sup>11</sup>. The average age of the patients in our study was 31.8 years. Patients were assigned to groups based on their gender. The male/female ratio was discovered to be 42/18. Patients were divided into two groups based on illness laterality (right vs. left). The right/left ratio was discovered to be 36/24. Various earlier researches have found similar outcomes in terms of age, sex distribution, and disease laterality<sup>12</sup>. In our research, the average stone size was 17.33 mm. 100.52 minutes was calculated as the average operative time. Several prior investigations found similar outcomes in terms of average stone size and operational time. The average length of stay in the hospital was 4.33 days. Several prior investigations had shown similar outcomes. The success rate of laparoscopic retroperitoneal ureterolithotomy was 93.4 percent (56/60), with four patients (4/60) requiring open ureterolithotomy due to a technical snag or

difficulties in laparoscopically localising the ureter. Various previous investigations had made similar observations. Stone-free rates were determined to be 100% (60/60) in the postoperative and follow-up periods. Previous research has made similar findings. The post-operative complication rate was determined to be 13.6 percent. Various earlier investigations have made similar observations<sup>13,14</sup>.

### Conclusion

Laparoscopic Retroperitoneal Ureterolithotomy is a safe, practical, and successful procedure for treating impacted upper ureteric stones (greater than 15 mm) with excellent stone-free rates and overall patient satisfaction. Particularly in locations where a flexible ureteroscope and an ESWL are not available. As a result, we believe that in patients with large upper ureteric calculi, PCNL/Lap ureterolithotomy should be favoured over ESWL/ureteroscopy for total stone clearance in a single surgery.

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