

## RIGID URETEROSCOPY IN TREATMENT OF URETERAL STONES

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**SUMMARY :** *In Urology Department of Gazi University Medical School 342 patients underwent 350 ureteroscopies over a five year period.*

*Of the 342 patients 277 (79,14 %) were stone free after one session of ureteroscopy. 31 (8.86 %) required two sessions of ureteroscopy while the remaining 39 (11.14 %) were treated by ureterolithotomy and 3 (0.85) by ESWL. We experienced only two ureteral perforations.*

*There is continuing debate about the optimum management of the ureteral calculi but we believe that in experienced hands ureteroscopy is a successful method of choice.*

**Key Words :** *Ureteral Stone, Rigid Ureteroscopy.*

### INTRODUCTION

The treatment of ureteral stones is still an important concept in general urologic practice. ESWL, ureteroscopy and percutaneous interventions have replaced ureterolithotomy recently. Ureteroscopes are instruments designed in suitable length and width for passing through the entire ureter under direct vision for diagnosis and treatment of ureteral diseases. In this era first reports were from Prez-Castro Elendt et al (7).

Our study points out the place of ureteroscopy in the treatment of ureteral stones.

### MATERIALS AND METHODS

342 patients had undergone 350 ureteroscopic interventions between 4.1.1988 and 31.9.1993 with the diagnosis of ureteral stone / stones in Gazi University, School of Medicine, Department of Uro-

logy. The number of male patients was 218 (62.28 %) and female patients 132 (37.72 %). Mean age was 42.3 (19-71). Stone location was 185 (52.86 %) right, 157 (44.85 %) left and 8 (2.29 %) bilateral. Ureteral site was lower in 330 (94.29 %), 11 (3.14 %) middle and lower ureter and 9 (2.57 %) middle ureter.

Stone street (stein strasse) after ESWL was present in 10 of 11 patients who had multiple stones (middle and lower ureter) at multiple sites.

12.5 F 6 rigid ureteroscope designed by Storz was used in all patients. At first in all patients general anesthesia with proper disinfection and covering was provided, cystoscopy done to visualize ureter orifices. After that in 216 patients directly and in 34 patients following orifice dilatation, ureteroscope was introduced into the ureter. In cases with difficulty in entrance through the orifice an

ureteral catheter was used as a guide. In view of the ureteral stone Dormia basket and stone grasping forceps were used for stones smaller than 5 mm, whereas ultrasonic lithotripsy was done for stones larger than 5 mm. Double - J catheter was inserted in the patients with residual renal stones, whereas ureteral catheter was inserted and left for 24-48 hours in others. Double - J stents were taken out at various times according to patients' follow up. Patients were followed by urinalysis, urine culture and urinary X-ray postoperatively.

## RESULTS

In the treatment of ureteral calculi 308 (88 %) cases were found to be successful among the 350 ureteroscopic interventions. Single intervention was done in 277 patients whereas 31 patients required 2 sessions. Ultrasonic lithotripsy was used in 301 cases whereas stone grasping forceps and Dormia basket were used in 28 and 21 patients respectively. Perioperatively 280 ureteral and 35 Double-J catheters were inserted as stent while no stents were used in 35 patients. Ureteral catheters were maintained for 24-48 hours postoperatively. Double-J stents were taken out at various periods.

In multiple stone patients 1 patient had undergone ureteroscopy for lower ureteral stone followed by ureterolithotomy to upper ureteral calculus. 5 patients were stone free after one, 3 patients after two sessions of ureteroscopy while ureterolithotomy was done in 2 patients in whom ureteroscopy was unsuccessful.

When we consider the location success was achieved in 292 (88.48 %) lower, 7 (77.77 %) middle and 9 (81.81 %) lower and middle ureteral stones. Table 1 shows success according to the localization of ureteral stones.

Of 42 patients in whom ureteroscopy was unsuccessful, 39 were subjected to ureterolithotomy, whereas ESWL was done in 3 patients. All patients were stone free during follow up.

As a perioperative complication, ureteral perforation was detected in 2 (0.51 %) distal ureteral stones

Localization	Successful	Unsuccessful
Middle ureter	7 (77.77 %)	2 (22.23 %)
Middle+distal ureter	9 (81.81 %)	2 (18.19 %)
Distal ureter	292 (88.48 %)	38 (11.52 %)
Total	308 (88 %)	42 (12 %)

Table 1 : Success rates according to ureteral stone localization.

and primary end-to-end ureteral anastomosis was done. At the postoperative period fever greater than 37.5 C was observed in 23 (6.57 %) cases. No other complications were present, with an overall complication rate of 8.11 %. Table 2 shows complication rates according to stone localization.

## DISCUSSION

In 1912 Young performed the first ureteroscopy. Lyon et al used ureteroscopy to extract foreign bodies and calculi from the ureter; to diagnose and treat the filling defects, obstruction, tumors and the upper urinary tract bleeding (5). Although the first results were unsatisfactory, in time with advances in technology and experience better results were achieved. Perry et al reported 92 % success in the treatment of ureterolithiasis. Success rates range from 76 % to 84 % among the various clinics with a generally accepted number of 75 % (8). In our report we emphasize the importance of localization of ureteral calculi, stating that success rates decrease upon going from lower to upper ureter, with increasing complications (1, 2, 6, 7). We got 88.48 % success in lower ureteral calculi whereas 72.72 % for middle, although no statistically significant correlation was informed from previous reports. Complication rates were determined to increase with stone size (2). Literature reveals 11 % failure of entrance through the orifice for various reasons. Successful entrance can approach to 90 % of lower, 80 % of middle and 66 % of upper ureteral lesions. Failure to reach the desired segment is due to immobility of ureter in retroperitoneal space therefore it is suggested that upper ureteral stones should be pushed to renal pelvis with ureteral catheter for ESWL or percutaneous nephrolithotripsy (7).

Complication	Middle	Middle Distal	Distal	Total
Major ureteral perforation	-	-	2 (0.57 %)	2 (0.57 %)
Fever	3 (33.33 %)	2 (18.18 %)	18 (5.45 %)	23 (6.57 %)
Total	3 (33.33 %)	2 (18.18 %)	20 (6.02 %)	25 (7.14 %)

Table 2 : Complication rates according to ureteral stone localization.

Despite having many advantages ureteroscopy has potential complications in a spectrum of mild colicky pain to necessity of major reconstructive surgery. Literature reveals 8-62 % complication rates (3, 4, 7, 8). In our series total complication rate was found to be 7.14 % with predominance of urinary tract infections easily treatable with antibiotics. 2 of the patients were subjected to open surgery for ureteral perforation.

Lower ureteral calculi have become a major indication for ureteroscopic interventions besides many other urological diseases. It must be concluded that in inexperienced hands it may lead to serious complications.

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