

Ureteroscopy: Its diagnostic value

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Ureteroscopy is one of the recent additions to the world of endoscopy in urology. A prospective study has been conducted to determine its diagnostic value in various ureteric lesions. From May, 1994 to April, 2000 we have performed 60 ureteroscopies in 53 patients. Their mean age was 44.7 years and male to female ratio was 1.5 : 1. The indications were ureteric obstruction without any obvious pathology (35), suspicion of ureteric stone with negative radiology but strong clinical diagnosis (21) and to find out the cause of upper tract haematuria (4). Our results show that ureteroscopy was helpful in proper diagnosis in 100 % of cases. Additionally it helped us for successful endoscopic treatment in 41.7 % of cases under the same anaesthesia. In 23.3 % of cases open surgery was required for proper treatment. Thirty five percent of patients required observation alone or medical treatment. The complication rate was 6.7 %. In our experience ureteroscopy is a useful diagnostic help in doubtful cases and helps in proper decision making for offering proper treatment in 100 % of cases.

Key words: Ureteroscopy, diagnosis, endoscopic surgery

Endoscopic visualization and successful treatment of upper urinary tract lesions relatively remained unexplored by urologists because of nonavailability of proper instruments and lack of expertise. Transurethral ureteroscopy has initially been performed with juvenile cystoscopes¹ and first generation ureteroscopes². Numerous minor problems with first generation instrument resulted in technical failure and unnecessary ureteric damage³ but the development of new generation of ureteroscopes, incorporating improvement in design has largely circumvented these problems⁴. The evolution of ultrathin ureteroscopes in early ninety's has been a breakthrough in upper tract endoscopy and resulted in increased ureteroscopies from 9% in 1990 to 32% in 1991⁵.

The role of ureteroscopy for the endoscopic treatment of ureteric calculi is well known^{3,4,6,7,10,15,18,19}. But its value in treating other lesions and its diagnostic advantage, where routine radiography fails has not been much reported. Ureteropyeloscopy has been described for the evaluation of upper tract filling defects⁸ and for diagnosing haematuria of unknown origin⁹. We describe our experience of ureteroscopy for diagnostic purposes.

Patients and methods

From May, 1993 to April, 2000 we have performed 60 ureteroscopies in 53 patients from all age groups and both sexes. In all patients precise diagnosis could not be achieved on routine ultrasonography and intravenous urography.

All ureteroscopies were performed under general anaesthesia. Patients were put in lithotomy position. Genital and perineal area was cleaned with antiseptic

solution and draped. Prior cystoscopies were performed wherever indicated for evaluating bladder. All the ureteroscopies were performed without any dilatation with 6.9 Fr. Wolf long ureterorenoscope. After locating and visualizing the ureteric orifice with ureteroscope a guide wire was passed into it. Then the ureteroscope was gently advanced over the guide wire under vision examining the whole length of ureter up to the renal pelvis, if the clinical condition allowed.

The indications for diagnostic ureteroscopy were ureteric obstruction where radiological investigation failed to diagnose the cause of obstruction (35), suspicion of ureteric stones with negative radiology but strong positive clinical diagnosis (21), and to find out the cause of upper tract haematuria (4). The second group comprised of patients with strong suspicion of ureteric calculi. In these patients routine ultrasonography and IVP findings were normal. Ureteric stone was suspected on the basis of repeated attacks of typical ureteric colic and microscopic haematuria on routine laboratory examination. In third group major problem was that of repeated attacks of painless haematuria without any other signs and symptoms. The results were analyzed for final diagnosis, endoscopic and ancillary procedures performed and the complications encountered for individual groups.

Results

From May 1993 to April 2000, we have performed 60 ureteroscopic procedures in 53 patients, comprising of 32 males and 21 females. Their age ranged from 16 to 83 years and mean age was 44.7 years. Majority of patients belonged to 41-50 year's age group (Fig. 1). Male to female ratio was 1.5:1.

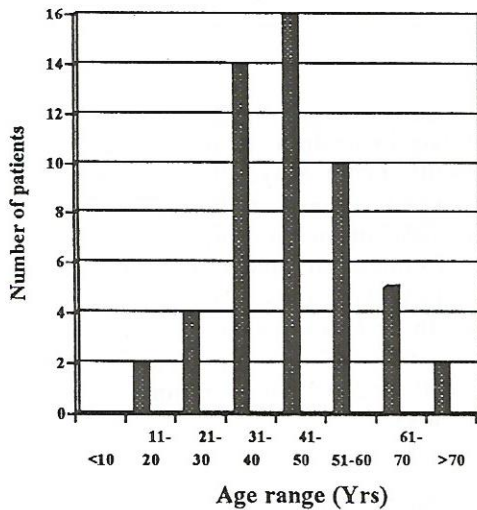


Fig. 1 Age distribution

Table-1 shows the detail of diagnosis arrived at with the help of ureteroscopic findings, endoscopic and ancillary procedures performed and complications encountered in all groups. Group-I comprised of patients with unexplained ureteric obstruction. Ureteric strictures (18) were most common. Out of a total of 18 ureteric strictures, 10 could be dilated endoscopically and alternate treatment was offered in rest of cases. Renal tuberculosis was diagnosed in 2 patients. They had multiple strictures (4-5) in their ureters. We were able to dilate ureteric strictures but those at pelviureteric junction could not be negotiated. There was necrotic and cheesy material in both cases on exploration and required nephrectomy. In one patient,

lower ureters being invaded by cervical carcinoma could not be dilated and bilateral percutaneous nephrostomy was offered to her. Remaining cases were diagnosed as hydronephrosis without any causative obstructive agent (4), PUJ obstruction (4) and sludge & debris in ureter (2). In 4 patients ureters were normal and no abnormality was detected. These lesions could be treated with the endoscopic and ancillary procedures. In group-II, where ureteroscopy was performed on strong clinical suspicion of a stone, we were able to find ureteric stones in 9 cases, oedematous / inflamed localized ureteric mucosa in 3 and normal ureter in 7 cases. All ureteric stones were successfully treated with pneumatic lithotripsy. In one patient who presented with anuria, there were bilateral strictures of lower ureters, which could not be dilated endoscopically. Bilateral ureteric reimplantation was performed in this patient. In group-III requiring diagnosis for upper tract haematuria, transitional cell carcinoma diagnosed on biopsy was the source of bleeding in two, while there were tiny 0.5-1 mm spiky stones embedded in pelvis & upper calyceal mucosa in one patient. In one of the patient the ureteric carcinoma was in association with urinary bladder carcinoma. Two patients with TCC underwent nephroureterectomies, while patient with tiny stones was managed conservatively.

The analysis of results showed that ureteroscopy was helpful in reaching proper diagnosis in 100% of cases. Additionally it helped us for successful endoscopic treatment and rehabilitation in 41.7 % cases. In 14 cases (23.3%) open surgery was required for proper treatment. Thirty five percent of patients required just observation alone or medical treatment (table-2). It was required in 10 cases in group-I, 9 in group-II and 2 in group-III. The complication rate in study group was 6.7 %.

Table 1. Ureteroscopic findings and treatment modalities

Group	Presentation	No.Pts.	No Scopies	Diagnosis	Endo Procedure	Ancillary Pr	Complications
I	Ureteric obstruction	30	35	Benign stricture-14 Tuberculous st.-2 Malignant st.-2 Hydronephrosis-4 PUJ obs/kink-4 Sludge+Debris-2 Mucus plug-1 Megaureter-1 Fungus-1 Normal ureter-4	Dilatation+DJS-13 Lithoclast+DJS-2 (Biopsy-1)	Reimplantation-2 Nephrectomy-2 PCN-3 Pyeloplasty-3	Perforation-3 Sepsis-1
II	Suspicion of ureteric stone	20	21	Ureteric stones-9 Oedema/inflam ureter-3 Ureteric st.-2 Normal ureter-7	Lithoclasty-9 DJS-1	Reimplantation-2	
III	Upper tract haematuria	3	4	TCC ureter-2 Tiny stones-2	(Biopsy-2)	Nephrectomy-2	
	Total	53	60		25	14	4

Table 2. Treatment results

Group	Diagnosis (%)	Endo.Rehabilitation (%)	Open Surgery (%)	Observation+Med.Tt (%)	Complications (%)
I	100	42.80	28.60	28.60	11.40
II	100	47.60	9.50	42.80	0
III	100	0	50	50	0
Cumulative	100	41.70	23.30	35	6.70

Discussion

The evolution of new generation of ureteroscopes has not only increased the number of ureteroscopies performed⁵ but also widened its application to various upper urinary tract lesions^{8,10,11,12}. With more experience and expertise it has gained the confidence of urologists in terms of safety and efficiency¹³. It has been very popular for the management of ureteral calculi^{3,4,6,7,10,15,18,19} but comparatively the reports for its diagnostic use and its application in other upper tract lesions are few. Since 1994, we have not only used it for the treatment of various lesions in the upper urinary tract, but also has found it helpful in diagnosis where routine investigative procedures remained inconclusive.

Prior cystoscopies were performed wherever indicated and one of our cases of upper tract transitional carcinoma was associated with bladder carcinoma. By the time we started ureteroscopy for diagnostic purposes, we had reasonable experience and all ureteroscopies were performed directly without dilating the intramural part of ureter using 6.9 Fr endoscope. It has been reported that balloon dilatation although allegedly safer than rigid dilation, can result in extravasation and stricture formation¹⁴. People have used 9.5 to 12.5 ureteroscope without routine balloon dilatation successfully with negligible vesico-ureteric reflux and complications¹⁵. Dilatation was required only in 1 of 20 children aging between 13 months to 14 years requiring ureteroscopies¹⁶. So, it is preferable to perform ureteroscopy without dilatation.

For diagnostic group our results show that ureteroscopy has been helpful in reaching a final diagnosis in all cases, where routine radiology i.e. ultrasonography and intravenous urography had failed. It was possible to treat and rehabilitate patients in 41.7% of cases through endoscopy under the same anaesthesia. Open surgery was performed in 23.3% of patients and rest of cases (35%) required only observation and or medical treatment. One of the patients with unexplained ureteric obstruction had fungal mass in upper ureter proved on histology, which was a rare entity. Our experience says that ureteroscopy is not only helpful in diagnosing doubtful cases but also leads to proper decision making in terms of offering treatment modalities in 100% of cases. It has been observed that ureteropyeloscopy appears to be more accurate than a standard diagnostic methods in the evaluation of upper tract filling defects. Strem et.al⁸ reached at provisional

diagnosis in 83% (10/12) with ureteropyeloscopy as compared in 58% with standard diagnostic regimen. In both failures in former group, lesions were inaccessible as instrument could not be negotiated in one and in second the lesion was in lower infundibulum. This difficulty in approach can be overcome with the use of flexible ureteroscope, which can provide diagnosis in all patients¹¹. Apart from diagnosing upper urinary tract filling defects, ureteroscopy has been used for the evaluation of chronic unilateral haematuria⁹ and for dependable tissue diagnosis and histopathological grading of upper tract urothelial carcinoma¹². One can also avoid unnecessary nephrectomy for benign ureteral and pelvic lesion like fibroepithelial polyp, if one can do diagnostic ureteroscopy and then can manage these endoscopically¹⁷. It is our observation that upper tract transitional carcinoma is far less common in our country as reported in the west.

Our indications for diagnostic ureteroscopy were ureteric obstruction not diagnosed on ultrasonography and intravenous urography, strong clinical suspicion of a stone and upper urinary tract haematuria. It has been reported that even with the latest radiological modalities, it may not be possible to diagnose all patients with ureteric or pelvic lesions. Direct visual examination is required to reach at a proper diagnosis. Bagley & Rivas¹¹ were able to diagnose 100% of 62 cases with flexible ureterscope, which were inconclusive on ultrasonography, intravenous urography (IVP) and computerized tomography (CT). In second group we were reluctant to perform ureteroscopy initially. But the reward of finding a stone in our earlier cases and patients' relief after intra-corporeal lithotripsy encouraged us. Even with normal radiological findings in this group, we were able to find a calculus in 9 of 21 cases. Other 3 patients might have passed the stones, as there was localized erythema and oedema in ureter. It reflects that more than 50 % of patients had ureteric calculi as suspected clinically and confirmed on ureteroscopy.

The complications were observed in 6.7 % of cases. All of these were encountered in patients with ureteric strictures. All of these complications were managed conservatively and no additional procedure was required to treat them. Our complication rate is very minimal as compared to that reported by Blute et.al.in 1988¹⁰ (20%) and by Stoller et.al¹⁵. in 1992 (19%). But Blute et.al. also included fever and multiple procedure in complications. If we exclude these, their rate of complication comes out to be 8.7%. More over, the size of ureteroscope used by these

authors varied between 10 & 13.5 Fr. Stroller et.al has observed that out of all 24 perforations, 19 were associated with the use of 12.5 Fr. ureteroscope. The rate of complication minimizes with the use of small caliber, ultrathin ureteroscopes. More over rigid ureteroscopy can be performed in a very safe and efficient manner, if one can care for proper patient positioning, balloon dilation, maximum visibility, progress under direct vision, positive pressure with irrigant and knowledge of uses of various devices¹³. It has been observed that ureter withstands more trauma than expected¹⁸ and majority of complication can be managed conservatively.

In our experience ureteroscopy is a very useful, effective and dependable procedure. It helped us to diagnose all patients, where radiological means failed. Additionally it provided endoscopic treatment under the same anaesthesia with minimum complications. It helped in proper decision making in all cases. It has been concluded that ureteroscopy provides an invaluable addition to conventional methods as a diagnostic tool¹⁹.

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