ENDOUROLOGY NEW VISTAS IN THE MANAGEMENT OF URINARY TRACT DISEASE

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SUMMARY

Retrograde ureteroscopy, using the 12.5 French Storsz Perez-Castro Ellendt operating ureteroscope provides excellent visual access to the whole of the ureteric lumen in most instances. A total of 41 ureteroscopies were performed on a similar number of patients over a period of 12 months since April 1986. Majority of them were for ureteric calculi. Success rate for patients with ureteric calculi below the pelvic brim was 77.4%. A lower success was noted for calculi above the pelvic brim (50%). Retrograde ureteroscopy will eventually make blind basketing of lower ureteric stones an unnecessarily risky procedure and perhaps even obsolete. Ureterolithotomy nevertheless will still have a place in the management of stones that cannot be extracted either due to acute bullous oedema of the ureteric mucosa or in previously explored rigid non-yielding ureters not suitable for ureteroscopy.

INTRODUCTION

Ureteric stones that caused symptoms or those that failed to migrate spontaneously over a period of time or those causing obstruction were previously accessible only by open surgery. Smaller stones however, were subsequently frequented by certain blind or fluoroscopically controlled manipulation by various catheters in the hope that they may be extracted transurethrally. Ellik[2] described a technique that used a special ureteric catheter to hook the stone. Similarly Davis[2,3] described his modification of the same idea and reported a high success rate for his procedure. Subsequent reports by Walsh[4] and Waters[5] noted however, that this procedure was not free of serious complications and even has mortality.

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The use of ureteral dilation and ureteroscopy with rigid instruments described by Lyon[6] and also by Huffman[7] and their respective associates have shown the possibility of direct entry into the ureter. Many of the ureteroscopes are of sufficient length and could in normal circumstances be advanced up to the renal pelvis. The initial experiences with the use of the Perez Castro Ellendt rigid ureteroscope by Karl Storsz in 41 patients would be described.

MATERIALS AND METHODS

From April 1986 to March 1987, 41 ureteroscopies were attempted on a similar number of patients. The major indications for such examinations were for the retrieval of ureteric stones or elucidating the cause for some apparent ureteric obstruction. The main indications to resort to ureteroscopy in relation to ureteric stones were not different to the indications for ureterolithotomy. A few patients had previous attempts at blind dormia basket extractions. Spinal anaesthesia was used in all but one patient. The procedure was performed in lithotomy position on the Siemans Urograph table which has fluoroscopy facility. In conditions where the urine was sterile, a prophylactic antibiotic was given. A single bolus dose of netropycin was the drug of choice used by the author unless there were valid contraindications. An initial retrograde pyelogram was resorted to in all cases to detect any lower ureteric abnormalities that would make subsequent dilatation difficult. The orifice, submu-

cosal, and intramural ureter, would be routinely dilated and ureteroscopy would not be performed if this was not successful. If the ureteroscope could reach the site of the stone (Fig. 1) then ultrasonic lithotripsy was used in all instances to reduce the stone bulk. The smaller fragments would then be basketed or grasped with grasping forceps. If there were indications that the stone may float back then it would be incarcerated in a dormia prior to ultrasonic lithortripsy.

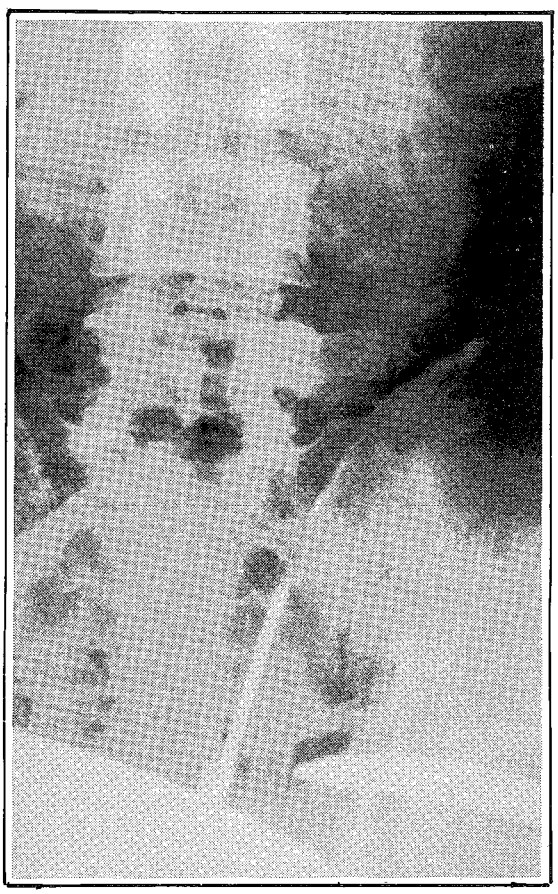

Fig. 1 Ureteroscope advanced to a left ureteric stone and a dormia used to basket the same.

Fluoroscopy was used to ascertain the completeness of stone removal. A post procedure retrograde pyelography would be done if perforation was suspected (Fig. 2). A stent would be left in should this have occurred and removed in 48 hours. Limited intravenous pyelogram was done in six weeks to rule out untoward complications.

Fig. 2 Immediate retrograde pyelogram studies after ultrasonic lithotripsy of an upper ureteric stone: Note extravasation.

RESULTS

The results of the 41 ureteroscopic examinations are shown in Table I. All patients had some form of persistant ureteric obstruction. In 35 patients the cause of ureteric obstruction was due to stones proven by preliminary intravenous pyelogram. All the stones had transverse diameters greater than 6mm. Ultrasonic lithotripsy was used in all patients when the stone was reached. In two patients the larger fragments needed a meatotomy at the ureteric orifice to facilitate removal. In proximal stones (stones above the pelvic brim) the success rate was 50%. In distal stone (stones below the pelvic brim) the success rate was 70.9% and if the two partial successes are included a rate 77.4% is derived. A partial success was defined when one or two smaller fragments floated up to the pelvis. These would eventually be passed spontaneously as the lower ureter was dilated. The three negative ureteroscopies included are those which had no evidence of the stone in spite of reaching almost the pelvis. They are assumed to have passed out the stone prior to the examination. In one patient the lower ureter had a polyp which was biopsied and a similar pathology was noted at the pelvi-ureteric junction. It was a low

grade transitional cell carcinoma (Fig. 3). This patient had a long history of analgesic abuse and was in chronic renal failure. One patient presented with worsening hydronephrosis following a ureteroliteromy for an upper one-third stone a few years ago. Ureteroscopic dilatation of this stricture was performed with the help of a focarty catheter. The area was stented with a double J silastic stent for three months. The patient has done well since. Complications were minimal. One of the failures included a patient with a small perforation at the intramural ureter caused by the guide wire. A stent was inserted and the procedure abandoned. The stent was maintained for 48 hours. Extravasation was noted in one patient after ultrasonic lithotripsy of a proximal (upper one-third ureter) stone (Fig. 2). Here too, the stent was left in with no subsequent problems. All patients who had ureteroscopic examinations had transient haematuria which cleared up in 12 hours. The follow-up presently is too short a period for signifcant comment. All patients seen at least a month after discharge were well and the limited intravenous pyelograms done in patients where the stones were removed showed free flow of dye.

TABLE 1:
RESULTS OF URETEROSCOIC EXAMINATIONS AND ULTRASONIC LITHOTRIPSY

	Proximal Stone	Distal Stone
Success	2	22
Failure	2	7
Partial Succcss	—	2
Total	4	31
Negative Examinations	3	
Transitional Cell Carcinoma	1	
Stenting (stricture)	1	

DISCUSSION

The ureter, described in R.J. Last[8] as part of the urinary tract 25 cms long, has been the most vexating part of the urinary tract to urologists in view of its calibre.

The only passing glances of its insides were at ureterolithotomy and that too, if it was dilated or it was pathologically enlarged. The introduction

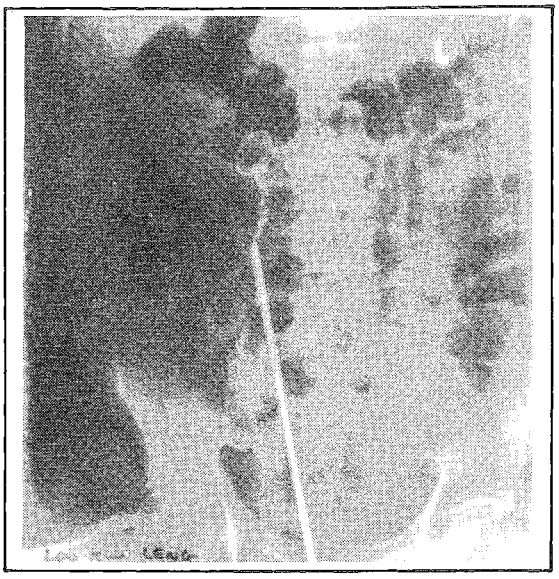

Fig. 3 Retrograde pyelogram through scope: Dye flows up irregular ureter to fill up a percutaneous catheter in the renal pelvis.

of the ureteropyeloscope has changed all this and there is no part of the urothelium that cannot be scrutinized directly with the aid of these optical systems, in the normal course of events. Ureteral stones were till recently removed by open surgery or by basketing if expectant management failed to show downward progression. Dourmashkin's[9] review of 1550 cases of ureteral calculi treated with ureteral dilatation with multiple catheters and balloons produced an overal success rate of 81.5%. This result is commendable. Subsequent reviews[10,11] by different authors using a similar technique had less successful and higher complication rates. Literature in this part of the world is scanty and Sreenevasan[12] using the Davis loop in 100 patients had a success rate of 78%. Here there is no mention of the size of stones removed. His view was that looping with a Davis cathether was a safe procedure for lower one-third ureteric stones. No complications are mentioned. Persistence with basketing or looping stones blindly or under fluoroscopy carries the inherent risk of perforations that would eventually occur especially with partly impacted or large stones. These factors can never be ascertained with any degree of accuracy until the patient develops symptoms or they are closely followed up.

With the evolution of new optical systems in most instances the whole ureter can be scrutinized visually.

Lyon,[6] Ellendt,[13],Martinet-Pineino,[13] and Rutner,[14] have evolved a system of stone manipulation using the rigid ureteroscope giving the whole process of ureteric stone extraction a sense of rationality. The instrument presently being used by the author at the Institute of Urology is the Perez-Castro Ellendt operating ureterorenoscope 12.5 French. With the advent of this instrument the ureter is now divided for practical purposes into a proximal ureter which is above the pelvic brim and the distal ureter below it. This division is more for technical reasons as passage of the ureteroscope beyond the brim can prove difficult especially in older patients with sclerotic iliac vessels. In the present series of proximal stones, there were two successes.

Due to the relatively short urethra the passing of the ureteroscope is always easier in females. The failure was in a 27-year old male where it was found to be difficult to negotiate the iliac vessels without putting undue stress on the scope, and running the risk of breaking it.

In distal stones the reasons for failure was mainly due to acute bullous oedema obstructing the passage of the scope up to the stone. In two cases the ureteroscopy was abandoned due to an inability to access the lower ureter due to marked meatal oedema and an acutely angled ureteral take off beyond the intramural part. This unfavourable anatomy was ascertained by retrograde pyelogram. Ultrasonic lithotripsy was successful in reducing the stone bulk once it was basketed.

Disintegrated stone particles were easily grasped with special grasping forceps. In some instances the size of the stone and adherence to mucosa precluded its entrapment in the dormia. In these cases the ultrasonic burr was directly applied to the stone to reduce it to small fragments. Fragments rarely float up due to the fact that above the site of stone impaction there is a column of urine usually under pressure. In this context the author has been using frusemide or mannitol to assist in a brisk diuresis to flush any fragments that may have inadvertently floated up. Having visualised directly how some stones are adherent to the mucosa, it is not surprising that any blind dormia basketing or looping can be fraught with danger. It is perhaps providence that allow most pysicians doing these latter procedures from getting into serious problems. These small stones would if given a chance have passed out spontaneously in due course. Lingeman[15] reported 17 perforations, two strictures and one avulsed ureter after ureteroscopy and basketing in a series of 206 procedures. These are disturbing figures and it is presumed that many junior residents had a hand in some of the procedures.

Ureteroscopy is not a procedure to be attempted by the inexperienced. One should be adept in all aspects of routine lower urinary tract endoscopy prior to attempting upper urinary tract endoscopy. Eventually these techniques should be essential to the armementarium of the modern urolgoist.

The present policy, though not yet well established in the Institute, would be that all ureteric stones not responding and progressing downwards to conservative measures be subjected to ureteroscopic removal with or without ultrasonic disintegration depending on stone bulk. Larger proximal stones could be manipulated back into the pelvis and removed by percutaneous nephrolithotripsy, a procedure that is currently been done in the Institute.

There will always be a place for the time honoured open ureterolithotomy. There is the occasional ureter that resists that entry of the scope and one should by policy not persist. A faster open operation perhaps will reduce the complications noted by Lingeman.[15] The success rates of transurethral stone extraction will no doubt be less but the patient will be spared the unnecessary complications of forced ureteroscopy. The crux to successful uretersocopy is dilatation of the lower ureter and the current choice for this procedure is the use of hydrostatic pressure classically described by Ruthner.[14] The use of this Rutner balloon dilator is less traumatic and more successful than the olive tip dilators (Storsz)

used by the author presently. A higher stone extraction rate could be expected when this particular catheter is made available.

ACKNOWLEDGEMENTS

The author would like to thank Sisters of the Urology theatre of the Institute of Urology and Nephrology: Ms Goh, Lam, Salbiah, Habidah, Yong, Chan, Siah, Bibah and Sharifah for their assistance and understandingly, and Cik Mariam for typing the manuscript.

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