Efficacy and safety of ureteroscopy in the management of patients with upper urinary tract diseases at Duhok hospitals.

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Abstract

Introduction: Urinary tract diseases are one of the most widespread diseases of human being. The introduction of endoscopes and minimal invasive procedures has revolutionized the treatment of those diseases. Aim of the study: To evaluate the diagnostic and therapeutic efficacy of the ureteroscopy in our locality. Patients and methods: A prospective study done at Dohuk hospitals for one year duration, a total of a 30 patients underwent ureteroscopy for diagnostic and therapeutic purposes(21 females and 9 males). Initial cystoscopy performed, ureteral access gained by guide wire then ureteroscopy completed under general anesthesia. In patients with failed procedure, other methods of treatment were applied. Results: In (80%) of patients the procedure was done for therapeutic indications, and in (20%) was for diagnostic purposes. Successful therapeutic procedure in first session was (85.7%), a second trial was needed in (9.5%) and one patient (4.8%) need other form of treatment. The mean operation time was 32.5 minutes. The mean hospital stay was 1.5 days. Complications were encountered in (23.3%), in form of residual stones in (10%), bleeding in(6.7%), sepsis in (3.3%) and in (3.3%) failure to access the ureter. Conclusion: Ureteroscopy represents effective and safe procedure with controllable low rate complications.

Introduction

The first description of an endoscopic view in the ureter came from two great urologists Hugh H. Young and Vector F. Marshall1. In 1912 Hugh H. Young passed a rigid cystoscope into the dilated ureter of a patient with posterior urethral valve 2. In 1964 Victor F. Marshall passes a 3mm fibroscope into the distal ureter which visualized a ureteral stone 3. Miniaturization in optics and electronics had lead to the development of instruments that can be used to access the upper urinary tract in retrograde or antegrade fashion. 4

In 1979 Lyon in conjunction with Richard Wolf instruments, developed an endoscope that measured 23cm in length, allowing access to distal ureter in both male and female 5

Further advances in endoscope technology have led to the development of
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A new generation of high-density fiberoptics encased within a rigid ureteroscope. As a consequence of this progress not only has ureteroscopes management of urinary calculi become more amenable and safer, but also endoscopic oncologic treatment is gaining an increasing role.

Flexible ureteroscopes follow the topographic anatomy of ureter more easily and facilitate inspection of middle and lower calyces, however, the use of instruments through flexible ureteroscope are limited for size and flexibility of working instruments such as stone forceps, and flexible ureteroscopes dose not offer the optical quality and durability of rigid instruments.

The aims of the study is to evaluate our experience in the field of ureteroscopic surgery, regarding effectiveness, safety and complications of the procedure in our locality.

Patients and Methods

A prospective study was conducted at Azadi Teaching Hospital and Dohuk Private Hospital during the period from July 2008 to July 2009. During this year of study a total of 30 patients (21 females and 9 males), were involved for the evaluation of the ureteroscopic use in Dohuk hospitals. Preoperative evaluation of patients included A detailed history, Physical examination, Laboratory investigations & Radiological examination.

The procedure was performed in the operative theater under general anesthesia and preoperative antibiotic coverage (cefotriaxon or cefotaxim 1gm intravenously).

With the patient in dorsal lithotomy position, a preliminary cystoscopy and retrograde floppy-tipped guide wire advancement to the affected ureter was initially done. Then cystoscope was removed while keeping the guide wire in place. A rigid ureteroscope with a caliber of 10.5 Fr. or 12 Fr. was introduced alongside the guide wire till the level of the lesion was reached (stone, JJ or mass).

Initially a direct vision stone basket or forceps tried to retrieve small stones or JJ stent. The large stones were fragmented by Swiss pneumatic lithoclast and their fragments removed by forceps or basket.

When uretersoncopy was undertaken for diagnostic purposes, the ureteroscope was advanced to the level of suspected lesion (were carefully checked) and then any detected lesion was treated accordingly.

At the end of procedure, rechecking was done by revisualizing the ureter by ureteroscope, and a JJ stent was put in selected patients (single kidney, residual fragments, bleeding or obstructed ureter). The bladder then evacuated and a
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Foley's catheter was put for all of the patients. All patients were put on analgesics and antibiotics (mainly cephalosporins or quinolones) post-operatively for three days. Post operatively the patients were checked by KUB, abdominal US for residual stones and JJ stent position, then they were followed up in an outpatient basis until they became free from stone fragments. JJ catheter was eventually removed after 3-4 weeks.

**Results**

A total of 30 patients were included in the study, 21 females (70%) and 9 males (30%)( ureteral accessed easier in females due to short urethra and in old males with enlarged prostate which also may interfere to access ureter). The mean age of patients was 37.6 years (range 16-70 years). In 24 patients (80%) ureteroscope was therapeutically used and in 6 patients (20%) the procedure was done for diagnostic purposes. In 16 patients (53.3%) the procedure was done on the right side while in the other 14 patients (46.7%) it was performed on the left side.

In 21 cases (70%) the time of operation (from time of induction of anesthesia to the end of the procedure) was less than 30 minutes, in 7 cases (23.3%) the time of operation was 30-60 minutes and in 2 cases (6.7%) the time of operation exceeded 60 minutes. The mean procedure time was 32.5 minutes.

Ureteral accessed in 29 patients (96.7%), and in 1 patient (3.3%) the ureteral access failed to obtain. No per operative dilatation of the ureteral orifice was done. Although 18 patients (60%) were already on ureteral stent pre operatively (which gives some dilatation to the ureter).

Out of 24 patients with therapeutic indications, 20 patients (83.3%) had stones, 3 patients (12.5%) had migrated JJ stent and one case (4.2%) had migrated JJ with uerteric stone.

The instruments used through ureteroscope to deal with uerteric foreign bodies (stones, JJ stent) were the stone extraction basket (6 cases-25%), lithoclast (9 cases-37.5%), and stone forceps (9 cases -7.5%).

Out of 21 patients with stones, 10 patients (47.6%) had lower uerteric stones, 9 patients (42.9%) had mid-uerteric stones and 2 patients (9.5%) had upper uerteric stones. Stone size ranged from 0.6cm to 1.5cm.

The therapeutic procedure was regarded to be successful if migrated JJ stents or stones were removed (as intact or in fragments) and patient became stone free at time of operation or after 3-4 weeks at JJ removal. For 4 patients with migrated JJ stent, all of them were successfully removed at time of procedure.
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Out of 21 patients with stones, 18 patients (85.7%) became stone free (12 patients 57.1%) at time of operation and 6 patients (28.6%) after 3-4 weeks at time of JJ stent removal, 2 patients (9.5%) a second session of uretrosopy was needed and only 1 patient (4.7%) need other treatment. So therapeutic successful rate in first session were (87.5%).

In 14 patients (46.7%) JJ stent was put after uretrosopy, and was removed after 3-4 weeks.

Complications were reported in 7 patients (23.3%). Although all patients had haematuria postoperatively (microscopic or frank) but only 2 patients (6.7%) had bleeding which were treated conservatively with antibiotics and hydration, necessitating longer hospitalization, but with out blood transfusion.

Three patients (10%) had residual stones, owing to of their relative large size and unavailability of lithoclast at the time of procedure. Two of them were treated with a second trial of uretrosopy (with lithoclast) and the other one was treated by an open surgery. In one patient (3.3%) the procedure of uretrosopy failed due to narrow ueteric orifice and unavailability of ueteric dilators. One patient (3.3%) developed features of systemic sepsis and was treated by hospital admission, antibiotics and hydration.

Postoperative Hospital stay was one day in 22 patients (73.3%), two days in 6 patients (20%), 1 patient (3.3%) stayed for 5 days, and last 1 patient stay for 6 days. Mean post operative stay was (1.5 days). Diagnostic uretrosopy done in 6 patients, in 3(50%) of them uretrosopy was done for evaluating of a lesion seen in IVU (two were negative and one proved to be inflammatory), in 2of them for a dilated ureter with unknown cause (no cause was identified following the procedure) and in the last one; the ureteroscope was done to search for a migrated JJ stent failed to be seen during Cystoscopy.

Discussion

Uretrosopy has gained widespread use for diagnosis and treatment of diseases in the supravesical urinary tract. Before ESWL and uretrosopy, open ueterolithotomy was the only technique available for stone removal and required general anesthesia 1. The endourologic approach substituted open stone surgery as transurethral surgery of the prostate substituted open prostatectomy 23.

Uretrosopy and ESWL are the predominant methods for treating urolithiasis in addition to PCNL, which continues to be important 24. Although more invasive than ESWL, uretrosopy with small, rigid, or flexible endoscopes is the most efficient technique for treatment and removal of ureteral stones 13. Renal stone disease is the ailment of young
people, and this was observed in the present study where the mean age of patients with stone was 35.6 years.

Although general anesthesia was used in all patients in this study. However, Hosking et al. were report a successful use of sedation rather than anesthesia for ureterolithotripsy and the employment of flexible ureteroscopy with malleable probes applicable for laser lithotripsy or electrohydraulic lithotripsy.

In the present study, ureteral access was achieved in 29 patients (95.5%). These results are comparable with studies conducted by Glenn et al. and Tan Peng K. et al., whose results of ureteral access were 95% and 96%, respectively.

In this study, the ureter was accessed using ureteroscope without dilators and this is comparable to a study conducted by Cheung et al. (18).

Stone-free rates reported by Matsuoka et al. 28, Shroff et al. 29, Razvi et al. 30, and Devarajan et al. 31 were 84%, 87%, 85%, and 86%, respectively. These are similar to the present study result of 85.7% (18 patients). However, these rates are apparently less than the rate of 96% reported by Tan Peng K. et al. 27.

Successful removal of migrated JJ stent was achieved in all of our 4 patients involved in the study. This corresponds to the study conducted by Meeks et al., which reported successful removal of all stents (5 patients) without complications.

JJ stent was put post-ureteroscope for 14 patients (46.7%) in the present study. This rate was less than the rate reported by Cheung et al., which was 56%, and this may be attributed to their study on outpatients in an attempt to minimize postoperative complications. Rane et al. suggests that routine stenting is not necessary after ureteroscopy.

However, Stephen P. Dretler suggests that, in order to get out of troubles following ureteroscopy, ureteral stents should be placed for all patients.

The mean operation time in the present study was 32.5 minutes; this is longer than the procedure time reported in the literature. Stephen Y. et al., reported mean operation time (26.4 minutes). This could be due to our initial experience in ureteroscopy.

Complication rate in the present study was 23.3% (7 patients), which is rather similar to a study reported by Stephen Y. et al., which reported a complication rate of 25% for minor complications (renal colic, haematuria, ureteral perforation, etc.). Major complications requiring surgical correction in the aforementioned study occurred in a rate of 3%. Still, these results are significantly more than the complication rates reported by Hofbauer J. et al., with a complication rate less than 5%. This may be ascribed to their use of smaller semirigid ureteroscope.
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Impossibility of accessing ureter occurred in one patient (3.3%) involved in this study a result comparable to the result of 3.7% reported by P. Geavlete et al 22. Two patients (6.7%) had bleeding in the present study. This is higher than the rate of bleeding and persistent haematuria recorded by P. Geavlete et al, (2.14%). This may be explained by a forceful manipulation of rigid ureteroscope to access stones 22.

The mean post operative hospital stays 1.5 days was reported in this study, which is shorter than mean hospital stay 2.53 days reported by Stephen Y. et al 35. However, Cheung et al 18, conceder the ureteroscopy as an out patient procedure and the patients were discharged on the same day.

Conclusion

In spite of our initial experience and shortage of optimal instruments, still the outcome of first session successful ureteroscopy and complication rate are with in the range of other endoscopic centers.

We recommend the availability of smaller and flexible ureteroscopes for the procedure to be more safe, less complicated and even the operation can be done under local anesthesia with intravenous sedation and as an out patients procedure.

References

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<table>
<thead>
<tr>
<th>Number of patients</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Female 21</td>
<td>70%</td>
</tr>
<tr>
<td>Male 9</td>
<td>30%</td>
</tr>
<tr>
<td>Right 16</td>
<td>53.3%</td>
</tr>
<tr>
<td>Left 14</td>
<td>46.7%</td>
</tr>
<tr>
<td>Therapeutic 24</td>
<td>80%</td>
</tr>
<tr>
<td>Diagnostic 6</td>
<td>20%</td>
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Table-1 the relation of number and percentage of patients to sex, site and type of indication
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**Table-2.** Number and percentage of patients in relation to therapeutic indications

![Bar chart for Table-2]

**Table-3** Number of patients and percentage of instruments used through ureteroscope

<table>
<thead>
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<th>Instrument</th>
<th>Number of patients</th>
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<tbody>
<tr>
<td>Forceps</td>
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<td>37.5%</td>
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<tr>
<td>Lithoclast and Forceps</td>
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<td>37.5%</td>
</tr>
<tr>
<td>Basket</td>
<td>6</td>
<td>25%</td>
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</table>

**Table-4** Complications of ureteroscopy

![Bar chart for Table-4]