Original Article

Feasibility And Efficiency Of Ureterorenoscopy As A Day-care Procedure For Treatment Of Ureteric Calculi

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ABSTRACT

Objective: To assess the feasibility and efficiency of ureterorenoscopy as a day-care procedure for treatment of ureteric calculi in order to reduce their heavy workload and to spare resources for reducing long waiting list of elective advanced urological surgeries for patients admitted as an indoor category.

Study design: Prospective descriptive study.

Place and duration of study: The study was conducted in Urology department of PNS Shifa, Karachi from July 2017 to March 2018.

Methodology: All patients who presented to our institute for ureteric calculi with normal creatinine and no urosepsis were included in the study. The ureterorenoscopy procedure was carried out either in spinal anesthesia or general anesthesia using laryngeal mask. Post-operative outcomes criteria for feasibility were assessed as 'rate of complications that required admission in the hospital'.

Results: A total of 164 patients underwent ureterorenoscopy. Out of these 151 successful ureterorenoscopy procedures for urolithiasis were performed with 98% stone clearance. Majority of patients went home the same day with no sequel, only twelve patients were kept for a day or two for minor complications. Nine of these had severe pain postoperatively requiring parenteral analgesia and were discharged on first postop day. Three had developed fever and were discharged on second postop day. No confounding factors were found to predict the readmission event.

Conclusion: A day care ureterorenoscopy is a safe procedure in a full time day care setting, with a rapid turnover and clinically safe outcome with few and trivial complications requiring readmission.

Key Words: day-care, outcome, ureterorenoscopy, ureteric calculi.

INTRODUCTION:

Ureterorenoscopy was first introduced in 1980 for diagnostic and therapeutic purposes[1]. With advancements in optics and lithotripsy mechanics, the procedure was refined and a wide range of ureteric pathologies were targeted. Narrow caliber scopes and additional accessory mini instruments[2] led to improvement in postoperative outcomes including rapid recovery and minimal postoperative sequel[3-5].

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Received: 17-08-18
Accepted: 23-11-18

For treatment of ureteric calculi, Extracorporeal Shock Wave Lithotripsy (ESWL) and ureterorenoscopy have been compared for efficacy in terms of stone clearance and complication rates[6,7]. Ureterorenoscopy for upper and middle ureteric calculi has 90-96% and 92-97% stone clearance rate respectively[8-10] however, it is the treatment of choice for lower ureteric calculi with 100% stone clearance rate by 2nd postop day[11,12].

ESWL does not require anesthesia but the immediate stone clearance rates are not comparable to ureterorenoscopy because there is delayed or prolonged stone clearance time, sometimes up to 4 months and that too with multiple ESWL sessions[13,14]. These factors lead to poor patient satisfaction rates and a compromised life style and comfort during the whole experience of the treatment sessions with ESWL. On the other hand ureterorenoscopy for upper and mid ureteric calculi although requires anesthesia (spinal or general)[15-19], do take the lead over ESWL as immediate patient satisfaction is almost 95 to 100%[20-22] and that it saves multiple interventions, surgeons' time and effort as well as over utilization of facility.

Ureterorenoscopy had been generally performed in an indoor settings but discharging the patient on the same day as outcome measure, has led to the feasibility of converting it as a day care procedure in various settings where ever it has been objectively studied multiple times. In all these evaluations 68 to 100% patients were discharged the same

day leading to the possibility of converting the facility into a day care setting [3,4]. However, with regard to converting it into a complete outdoor procedure the outcome analysis must be documented in order to prevent unnecessary burden on the patient and the hospital indoor capability.

Our institute is among the heaviest workload laden urology center. There is very high turnover of patients with comparatively limited indoor space resulting in constrained admissions. In this study we assessed the possibility of performing the ureterorenoscopy as a day care procedure after analyzing the readmission rates and frequency of complications.

METHODOLOGY:

This prospective descriptive case series review included patients undergoing ureterorenoscopy in Urology department of PNS Shifa, Karachi from July 2017 to March 2018. All those patients who presented with ureteric calculi were evaluated for day care procedure. Those presenting with urosepsis, raised creatinine, solitary kidney and significant co-morbidity were excluded from the study. A complete preoperative work up included baseline blood tests and CT-KUB (plain) for stone evaluation. The surgery was performed in a dedicated day care unit from 0800 to 1500 hrs. Patients were discharged from the day care unit after 4 to 6 hours post-operatively. All procedures were carried out by experienced urologists who had performed more than 500 ureteroscopic procedures. An 8 Fr semi-rigid ureterorenoscope with 02 channels was used in all cases. A perioperative antibiotic and a ureteric safety guide-wire were considered mandatory. A stone cone was used to prevent the proximal migration of the stones. The stones were broken with lithoclast and retrieved with graspers or Dormia basket. DJ stents placement was left at the operator's discretion. Postoperatively the patients were monitored for pain, hematuria and fever. They were kept on oral antibiotics and analgesics for 3 days.

Patient demographics, stone size and location, DJ stent placement, stone clearance (estimated by postoperative X-ray KUB), completion of procedure and post-operative complications were recorded. Those who required prolonged hospital stay, the reason and duration of indoor stay were also recorded. The data was analyzed by SPSS version 22.0.

RESULTS:

A total of 164 day care ureterorenoscopic procedures were performed for ureteric stones (137 males and 27 females, mean age 34 years, range 14 to 70). In 13 procedures ureters were not negotiable and they were stented with DJ stent under fluoroscopic guidance. 151 successful ureteroscopic procedures were performed; the size, number and the location of the stones are shown in Table 1. Out of 151 patients 135 patients had stone clearance during the primary procedure accounting for immediate clearance rate of 90%. Difficult ureter was encountered in 13 patients for which placing a DJ stent and a successful ureterorenoscopy was possible after 3 weeks.

Twelve patients were kept for more than 24 hours and were shifted to the indoor facility from day care (Table 2). Nine of these had severe pain and vomiting postoperatively requiring parenteral fluids and analgesia. Six out of nine were those in whom DJ stent was not placed. They were discharged next day. Three had developed fever which required parenteral antibiotics for 3 days after which they were discharged on oral antibiotics. From among the total of 164 cases 16 cases having upper ureteric calculi the stone was pushed back into the kidney and a DJ stent was placed; these were dealt with ESWL later on. Record was evaluated to detect reasons predictive of delayed recovery (Table 3). Placement of DJ stent was found to be of value in preventive severe pain and vomiting requiring admission.

DISCUSSION:

Day care procedures or ambulatory surgery where patient does not stay in the hospital overnight due to rapid post-operative recovery has reduced the overall cost for the said surgeries. Ureterorenoscopy is one of very few urological procedures which have been considered for the day care setting due to its short operative time and quick post-operative recovery.

In our study the adequacy of URS for the ureteric stones in our day care setting was efficiently demonstrated. Out of 164 cases over all stone clearance was 90%. Ten percent were those with upper ureteric calculi in which partial stone breakage was achieved along with the stone being pushed back into the kidney. These required ESWL in later setting. In cases of middle and lower third ureteric calculi complete stone clearance was 100%. The findings concur with other studies where stone clearance rates for middle and lower third ureteric calculi were 91 to 96% [23-26].

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Stone size	***Number of stones***
Stone size (mm)	
< 5	16
6-10	92
>10	56
Radiolucent	30
Location	
Left / Right	81 / 83
Ureteric site	
Upper	29 (18%)
Middle	52 (32%)
Lower	83 (50%)
TOTAL	**164**

Table-1 Size Number and location of the stones.

Reason for admission	No of Patients	Procedure	Inpatient Treatment	Duration of admission (days)
Pain and Vomiting	9	No DJ stent was placed	IV fluids and opioid analgesics	2
Fever	3	Stones larger than 10mm	IV antibiotics for 3 days	3

Table-2. Cause of admission of Day care patients and their management.

Factor	*Not admitted*	*Admitted*
Number	152	12
Mean (range) age, years	34 (14-64)	39 (23-70)
Peri-operative antibiotics	All	All
No DJ placed	8	9
Large stones(>10mm)	53	3
Median(range) operative time, mins	28 (16-45)	31 (17-48)

Table-3. Predictive causes of delayed recovery.

parenteral fluids and analgesia. All of them were without DJ stent postoperatively. They were discharged next day on oral analgesia. Three had developed fever which required parenteral antibiotics for 3 days after which they were discharged on oral antibiotics.

In our study the rate of readmission as an indoor case has been seven percent (12 patients), five percent were due to severe pain and vomiting while remaining two percent were admitted due to fever. Those who presented with severe pain and vomiting were those in whom no DJ stent was placed. In 17 patients out of 164 no stent was placed post-operatively and out of them 9 had severe pain that required readmission. Cheung et al reported higher postoperative pain especially on the 3rd postoperative day in those who were stented with DJ. The pain was also found to be more in females especially on the first and second postoperative days. However, they could not identify any predictive factors for unplanned admission[24]. In our study the male to female ratio was 4:1. Moreover, absence of DJ stent was the cause of the severe pain, which might be due to missed residual fragments impacted temporarily in the ureter. Yip et al reported 2 out of 61 patients (3%) readmitted with severe postoperative pain[23]. Similarly Bromwich et al also reported a successful day care ureterorenoscopy on 64 patients with only 3 patients (4%) admitted postoperatively for pain only. There was also no predictive factors identified for the unexpected admissions[26]. Bloom et al reported readmission rate of 5.8%. These patients were admitted for pain control and all of these were those who were not stented after the ureterorenoscopy[27]. Tan et al also reported a safe and successful day care ureteroscopic procedure with reporting of readmission due to pain in 10% of those cases who had either bilateral procedure, middle and upper ureteric stone clearance or history of psychiatric ailment[28].

In our study, those presenting with fever (2%) were managed conservatively with parenteral antibiotics. All recovered in three days and were discharged on oral antibiotics without any sequel. There was no confounding factor observed for the occurrence of fever. Bloom et al documented 3% incidence of fever requiring readmission. They too could not identify any confounding factors leading to fever. However, antibiotic prophylaxis was mandatory in their set of patients. All the patients were discharged 3 days after with oral antibiotics[27]. Taylor et al found no significant predictors of immediate or delayed admission. They documented infection as the cause of delayed admissions. Those patients who developed complications of infection after ureterorenoscopy (one each with pyonephrosis, PUO and pyelonephritis) received perioperative antibiotics. In the absence of randomized controlled study it cannot be said with assertion that the use of prophylactic antibiotic reduced the complications to what extent precluding readmission although empirically it did prevent complications apparently. This finding agrees with previous randomized controlled trials, where the use of prophylactic antibiotics in endoscopic procedures significantly reduced the complication rates[29].

Technological improvement in ureteroscopes have resulted in negligible morbidity and stone clearance rates up to 100% for middle and lower ureteric calculi. In all patients who fulfill the criteria for local day-surgery, ureteroscopies can be performed as a safe day-care procedure, although less than 12% of these may subsequently require readmission. If social and anaesthetic criteria are fulfilled, there is no urological condition that prevents a day-care ureterorenoscopy. All patients should receive perioperative antibiotics for the procedure. We recommend routine stenting after ureterorenoscopy, as we found the placement of stent to be protective of pain that might avoid readmission. The extra cost and acceptable negligible morbidity resulting from stent placement is insignificant as compared to the added cost and burden of prolonged admission in the hospital.

CONCLUSION:

In spite of general anaesthetic requirement, ureterorenoscopy in expert hands is minimally invasive and offers early stone clearance, with good patient satisfaction and a swift postoperative recovery. Day-care ureterorenoscopy is feasible and cost effective preference in management of ureteric stones.

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