ORIGINAL ARTICLE

Is DJ Stenting still needed after uncomplicated Ureteroscopic lithotripsy? A Randomized Controlled Trial

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ABSTRACT

The objective of the study was to assess the need for ureteral stent after uncomplicated ureteroscopy for ureteric stones using intracorporeal lithotripsy. A total of 204 patients underwent ureteroscopic lithotripsy for ureteric stones at the department of urology Sharif Medical city hospital(SMCH), Sharif medical and Dental college, Lahore between March 2008 and March 2010. After stone fragmentation, 199 patients were enrolled in our study and they were randomly divided into two groups: the first group (stented, 99 patients) had ureteric stents inserted postoperatively, while the second group (nonstented, 99 patients) had no stenting. The stent was removed at two weeks interval. Patients in each group were assessed for success, operative time, postoperative pain, irritative voiding symptoms, hematuria, and stricture formation. The two groups were comparable with respect to patient age, gender and mean stone size. Mean operative time in the stented group was 42 minutes (range 15-60), compared to 37 minutes (range 20-45) in the nonstented group. Irritative voiding symptoms were seen in 30.31% of the stented group, compared to 28.29% in the nonstented group. 29 patients (29.2%) in the stented group patients and 11 patients (11.1%) in the nonstented group required two or more oral analgesic tablets a day in the immediate postoperative period. Re-admission to the hospital for pain control was necessary in one patient in the nonstented group. 10 patients (10.11%) and 8 patients (8.08%) developed hamaturia in the stented and the nonstented groups respectively. The stone-free rate and stricture formation showed no difference between the two groups. Ureteral stent is not necessary after uncomplicated ureteroscopy for ureteric stone management using intracorporeal shock wave lithotripsy. The ureteral stent placement has no extra advantage while it is bothersome to patient in term of cost and later on in its retrieval.

Keywords: Ureteral stent, ureteroscopy, ureteric stone.

INTRODUCTION

Ureteric stones are very common in all age groups. With the improvement in the size of ureteroscope and in the device for better and small fragmentation of stones, complication of intracorporeal lithotripsy has been reduced. This procedure is now a days, treatment of choice for mid and lower ureteric stones[1,2]. In most of centers, surgeons like to use DJ stent after this procedure due to less complication including impaction of stone and stricture and formation[3,4]. It is also considered that DJ stent insertion facilitates passage of stone fragmentationdue to passive dilatation. However DJ stent is not totally harmless, it can cause considerable complications[3,4,7].

In literature complications with stent were reported in10 to 85% of cases[1,3]. And these complications include irritative voiding symptoms, hematuria, infections, encrustation pyelonephritis and stent breakage. Denstedt et al concluded that significant difference was seen in symptoms in patient who were without stent but there were no difference in term of stone free status[5]. Patient with DJ stent have to go under cystoscopic removal of stent which definitely increases overall cost of procedure.

The aim of our study was to assess the need for routine use of stent after uncomplicated ureteroscopic stone disintegration in ureteric stones.

MATERIALS AND METHODS

The study was a prospective randomized controlled trial and was done in Urology department, Sharif Medical & Dental College Lahore. The study period was between March 2008 to march 2010(25 months). Total 204 patients were included in this study irrespective of size and site of the stone. All those patients having bilateral ureteric stones, renal failure, solitary kidney, previous failed ureteroscopy, or pregnancy were excluded from our study. Patients who had significant mucosal injury or ureteral perforation intra operatively were also excluded.

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Of the 204 patients who underwent ureteroscopy with intracorporeal lithotripsy for ureteric stones, five were excluded because they did not meet the selection criteria of the study. Remaining 198 patients were randomly divided into two groups: stented group A having 99 patients and non stented group B with same Number of patients. Informed consent was taken before operation. Then intracorporeal lithotripsy was done with 8.9 Fr rigid ureteroscopy and stone fragmentation was done with Swiss lithoclast under general anesthesia.

A safety guide wire 0.032 inch was inserted through cystoscope under fluoroscopic control. Stones were fragmented with pneumatic lithotripsy during procedure. Continuous irrigation was done for better visualization. At the end of procedure, patients were randomized into two groups. In group A, a DJ stent 6Fr, 25 cm was placed under fluoroscopic guidance either through ureteroscopic operative channel or via cystoscopy. All patients received prophylactic intravenous third generation cephalosporin at the time of induction, and continued 5 days on an oral quinolone.

At the end of the procedure, patients were transferred to the recovery room for observation, and were discharged once they had stable vital signs, satisfactory pain control, and tolerance for oral diet. All patients were evaluated by KUB at two weeks to check stone free status. Patients with double J stent were scheduled for cystoscopic removal after two weeks under local anesthesia. Follow up IVU was performed at 3 months post operatively to evaluate the urinary tract and identify ureteric stricture formation. The outcome measures were post-operative pain, irritative urinary symptoms, hematuria, number of visits to emergency room, late complications and stone free status.

RESULTS

The two study groups were comparable with respect to patient age, sex, and stone size. Operative time was calculated from the time of cystoscopy to the final removal of the endoscope, the mean operative time in the nonstented group was 37 minutes (range 20-45) compared to 42 minutes (range 15-60) in the stented group, with no significant difference in time to fragmentation and retrieval
of stones, table 1.

Post-operative pain was evaluated by the requirements for oral analgesia and the need for hospitalization for pain control. In the nonstented group, 11(11.1%) patients required more than one tablet of oral analgesic a day, 5(5.05%) patients visited the emergency room due to renal colic that was not responding to oral analgesics and two of them (2.02%) required hospitalization for pain control. On the other hand, 29(29.2%) patients in the stented group required more than one tablet of analgesic a day, seven patients (7.07%) visited the emergency room due to renal colic that was not responding to oral analgesics. However, none of the patients in the stented group required hospitalization,table2.

Irritative voiding symptoms and macroscopic hematuria were seen more in the stented group, as 30(30.31%) patients from this group experienced dysuria and frequency, as compared to 28(28.29%) patients from the nonstented group. 48 hours post-operatively, macroscopic hematuria was noticed by 10(10.11%) patients in the stented group, compared with 8 patients (8.08%) in the nonstented group table3.

Regarding post-operative complications, 11 patient from the stented group and 12 patients from non stented group developed fever 24 hours after ureteroscopy, without signs of septicemia and were admitted for intravenous antibiotics for three days and were discharged on oral antibiotics without sequale. One other patient (1.01%) was admitted with blood clot retention that was treated by urethral catheterization for 48 hours, and was then discharged with normal voiding. Table 3. At two weeks postoperatively, the stone-free rate was 100% in both groups. No hydronephrosis or ureteral stricture formation were detected by intravenous pyelogram three months postoperatively.

Table 1. Characteristics of patients in the two study groups

Parameters	**Stented group (A)**	**Non stented group (B)**
No. of patients	99	99
Average age/ years	41 (range 23-70)	45(range 21-65)
Male/ Female	61.38(1.60:1)	53.46 (1.15:1)
Average Stone size/ mm	09 (range 7-15)	10(range 6-16)
Operative Time/ minutes	42 (range15-60)	37 (range 20-45)

Table 2. Post-operative pain, analgesic requirements, emergency room visit and hospitalization for pain control.

Parameters	Stented group (%)	Non stented group
No pain	56(56.6%)	77(77.7%)
Two or more tablet Daily	26(29.2%)	11(11.1%)
No. visits to Emergency	7(7.07%)	5(5.05%)
Hospitalization Due to Pain	0(0%)	1(1.01%)

Table 3. Post-operative symptoms and complications.

Parameters	Stented group	Non stented group
Irritative	30(30.31%)	28(28.29%)
Hematuria	10(10.11%)	8(8.08.1%)
Fever	11(11.12%)	12(12.13%)
Clot retention	1(1.01%)	0(0%)

DISCUSSION

Urolithiasis is one of the most common and oldest diseases of urinary tract[9]. Now days, ureteroscopy is one of the commonest procedures among variety of endourological surgeries and is being done for number of indications including ureteroscopic stone fragmentation and its removal[19].Stenting after ureteroscopy has been recommended to prevent the development of ureteral stricture, it also facilitates passage of stone fragments and promotes ureteral healing after ureteroscopy[4]. In 1999, Hosking et al have concluded that routine placement of ureteral stent following uncomplicated ureteroscopic removal of distal ureteral stone was not necessary[6] and same observation was seen in our study. A few prospective randomized trials have recently been reported in the literature, and all showed no difference in stone free status between stented and nonstented groups[8,13,14]. In our study, irritative voiding symptoms in the stented group were seen in 30.31% of patients, as compared to 28.29% of patients in the nonstented group. These results were comparable with all above mentioned studies where they claim that post operative pain and irritative voiding symptoms were reduced with omission of ureteric stents[8,13,14].

Routine placement of ureteral stent after ureteroscopy increases the overall cost of the procedure[17]. In our study non stented group was cost effective as compared to stented group and same was reported by Netto et al. They assessed that cost effectiveness of ureteroscopy in non stented group was cheaper by 30%. Furthermore, removal of the stent using local anesthesia is more traumatic than the initial ureteroscopy procedure using general anesthesia[10].

Postoperative pain in our study was less in non stented group as compared to stented group. In the stented group, 29.2% of patients required two or more analgesic tablets a day for pain control but none of them required hospitalization for intractable pain. The increased intrapelvic renal pressure, especially while voiding, explains this increased incidence of pain. Ramsay et al demonstrated in porcine model that ureteral intubation cause an increase in intrapelvic renal pressure which was the reason for more pain in the patients with stent[15].

The development of ureteral stricture is a well-established long-term complication following ureteroscopy. However, the incidence of ureteral stricture is dramatically decreased in recent years due to the advancements made in endourologic technology[16,20]. In this study no stricture formation was found as compared to the other studies. Denstedt et al, in his prospective study on 58 patients following ureteroscopic lithotripsy for a lower ureteric stone, found no stricture[5]. Chen et al revealed absence of stricture formation in stented and nonstented patients[18]. Similar results were found in our study.

CONCLUSION

There were no difference between stented and nonstented group following ureteroscopic lithotripsy in term of stone passage and development of ureteric stricture. However, we noticed less pain and relatively less irritative urinary symptoms in the nonstented group. In addition, stenting was associated with an increase in cost. Therefore, we recommend that stent replacement should not be performed routinely following uncomplicated ureteroscopic lithotripsy for small ureteric stones.

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