Original Article

COMPARISON OF URETERO RENOSCOPIC (URS) LITHOTRIPSY WITH AND WITHOUT DJ STENTING IN MID AND DISTAL URETERIC STONE.

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ABSTRACT:

OBJECTIVE: The objective of the study was "To compare the efficacy of Ureterorenoscopic (URS) lithotripsy with and without DJ stenting in mid and distal ureteric stone.
INTRODUCTION: Ureteric stenting following fragmentation of stone is routine in most of the centers, however their overuse has been questioned because their use is not free of complications and problems. Literature review reveals that post ureterorenoscopic lithotripsy, DJ Stent insertion does not support the idea of routine DJ Stent placement in every patient.
MATERIALS & METHODS: A total of 60 patients with single ureteric stone in mid or distal ureter, 20 to 60 years of age of both genders were included. Patients with h/o previous open ureterolithotomy, any chronic disease and urinary disorders were excluded. Patients were divided in two groups, 30 patients in each group by randomised method. Patients in group A underwent URS lithotripsy without DJ stenting and those in group B underwent URS lithotripsy with DJ stenting. Patients were followed till one month and efficacy (in terms of 100% clearance rate) and complication rate was assessed.
RESULTS: The mean age of patients in group A was 39.21 ± 6.83 years and in group B was 38.78 ± 6.91 years. Out of 60 patients, 41 (68.33%) were males and 19 (31.67%) were females with male to female ratio of 2.16:1. Efficacy (100% clearance rate at 1 month and no post-operative complication) of URSL without DJS was 83.33% while in URSL with DJS was 56.67% with p-value of 0.024 which is statistically significant.
CONCLUSION: This study concluded that efficacy (in terms of stone clearance and complication rate) of URS lithotripsy without DJ stenting is higher compared to with DJ stenting in mid and distal ureteric stone.
KEYWORDS: pneumatic lithotripsy, stone clearance, complication, stent.

INTRODUCTION:

Urolithiasis is one of the oldest and commonest diseases of upper and lower urinary tract. Pakistan is part of the Afro-Asian stone forming belt, where the prevalence of calculi ranges from 4% to 20%[1]. These stones may grow and enlarge in the kidney or may enter into the ureter. The spontaneous passage of stones is 80% in patients with stone size less than 4 mm and spontaneous passage is very low when the stone size is more than 7 mm. So when the size of the stone in the ureter becomes more than 6-7 mm then, it needs active manipulation for the stone removal[2].

The management of ureteric stones has been changing from conservative to open surgery, minimal invasive surgery, extracorporeal shock wave lithotripsy, endoscopic removal and laparoscopic surgery[2]. Intracorporeal lithotripsy with ureterorenoscopy has emerged

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as treatment of choice for ureteric (especially mid and lower) stones. Along with SWL, ureteroscopic manipulation of a stone is a commonly applied method of stone removal. A small endoscope, which may be rigid, semirigid, or flexible, is passed into the bladder and up the ureter to directly visualize the stone. Ureteroscopy is especially suitable for removal of stones that are 1-2 cm, lodged in the lower calyx or below, cystine stones, and high attenuation ("hard") stones. The double J ureteral stents have become one of the most basic and valuable tools in the urological practice[3]. A double J stent is a soft tube that is placed during surgery or as an emergency relieve of obstruction. Stents are placed in the ureter which is the tube that runs from the kidney to the bladder[4]. Indwelling ureteral stents provide direct drainage of the upper urinary tract to the bladder without the need for external diversion[5]. The indications for insertion of stents into the urinary tract has expanded significantly during the last decade. Stents now are inserted routinely in patients with ureteral obstruction and for the prevention of complications following open or endoscopic procedures[6].

Ureteric stenting following fragmentation of stone is routine in most of the centers, however their overuse has been questioned because their use is not free of complications and problems. Despite tremendous advances in stent biomaterials and design, JJ stents are not free of complications and problems and the search for an ideal JJ stent may remain utopian[3,7].

Initially, very few side effects were reported[9]. But later on many publications demonstrated that indwelling ureteral stents can cause lower abdominal pain, septicemia and haematuria[8]. Literature review reveals that post ureterorenoscopic lithotripsy DJ Stent insertion does not support the idea of routine DJ Stent placement in every patient. Rasool M et al[8] has shown the better efficacy of Ureterorenoscopic lithotripsy without DJ stent placement i.e. 80%, compared to those patients in which DJ stent was placed after URS i.e. 48%.

The rationale of this article is to compare the efficacy of Ureterorenoscopic (URS) lithotripsy with and without DJ stenting in mid and distal ureteric stone, in local population so it could be evaluated that either DJ stent placement has any beneficial role or just an economic burden on the patients undergoing ureterorenoscopy for ureteric stone. Moreover, their routine use could be minimized and encouraged in selected cases only.

MATERIALS AND METHODS:

SAMPLE SELECTION

Inclusion Criteria:

a. All patients with single ureteric stone in mid or distal ureter diagnosed on ultrasonography (stones are demonstrated as bright echogenic foci with posterior acoustic shadowing) and intravenous urography (an obstructive nephrogram which may be prolonged and hyperopaque with increasing opacity over time, delayed excretion, dilatation to the point of obstruction, or blunting of the calyceal fornices).
b. Stone size from 5-12 mm.
c. Patients of 20-60 years of age of either sex.

Exclusion Criteria:

a. Patients with multiple stones.
b. H/o previous open ureterolithotomy.
c. Patients with pyonephrosis and sepsis.
d. Patients with any chronic disease i.e. chronic renal failure, chronic liver disease and with H/O any chronic drug usage.
e. Patients with urinary disorders i.e. proteinuria, recurrent urinary tract infection, congenital urinary tract obstruction and bladder outflow obstruction.
f. Severe coagulopathies.
g. Pregnant females.
h. Patients not willing for procedure.

After permission from the ethical review committee, total number of 60 patients who were admitted to Department of Urology, Sheikh Zayed Hospital, Rahim Yar Khan from 7th April 2014 to 6th October 2014 fulfilling the Inclusion/Exclusion criteria were selected. After taking informed written consent and explaining all the risks of the procedure, patients were divided into two equal groups i.e. A & B by using random number tables. In group A, URS lithotripsy without DJ stenting was done while in group B, URS lithotripsy with DJ stent placement was done. All procedures were performed by single surgeon i.e. professor of

urology. The investigations done before the procedure were blood complete examination, urine routine examination, urine culture, USG abdomen, serum creatinine level, uric acid levels and IVU.

The procedure was performed in all patients under general anesthesia. Pre-operative antibiotics were given to make urine sterile before ureteroscopy. Patient was placed in semi-lithotomy position with head side tilted a little upward. Ureterorenoscope of 9 Fr was inserted over a guide wire in all patients. Stone localized and pneumatic lithotripsy was done with probe of 1 mm tip under focused vision. Multiple transmitted shocks were given and stone disintegration was done into small particles until whole stone was fragmented. In group A patients, no DJ stent was placed after the procedure while in group B, DJ stent was placed after URS. DJ Stent was kept for 2-3 weeks in stented group patient and removed endoscopically. Patients were followed till one month and efficacy (as per operational definition) was assessed at the end of one month. This all data was recorded on a specially designed proforma which contained two parts. Part 1st included the patient's bio-data while part 2nd contained the study variables (Annexure-I).

RESULTS:

Age range in this study was from 20-60 years with mean age of 38.97 ± 6.78years.The mean age of patients in group A was 39.21 ± 6.83years and in group B was 38.78 ± 6.91years. Out of 60 patients, 41 (68.33%) were males and 19 (31.67%) were females with male to female ratio of 2.16:1. Mean size of stone was 9.35 ± 1.51 mm.

Table 1. Patients according to size of stone.

Size of stone (in mm)	Group A (n=30)		Group B (n=30)		Total (n=60)	
	Frequency	%age	Frequency	%age	Frequency	%age
5-8 mm	13	43.33	11	36.67	24	40.0
>8-12 mm	17	56.67	19	63.33	36	60.0

Mean size of stone = 9.35 ± 1.51 mm

Table 2. Frequency of patients with 100% stone clearance at 1 month in both groups.

	Group A	Group B
Yes	28	24
No	2	6

P-value = 0.129 which was not statistically significant.

Table 3. Complication rate in both groups

Complications		Group A (n=30) No. (%age)	Group B (n=30) No. (%age)	P-value
UTI	Yes	**02 (6.67%)**	**04 (13.33%)**	**0.389**
	No	**28 (93.33%)**	**26 (86.67%)**	
Painful Trigone Irritation	Yes	**00 (0.0%)**	**07 (23.33%)**	**0.005**
	No	**30 (100.0%)**	**23 (76.67%)**	
Hematuria	Yes	**02 (6.67%)**	**02 (6.67%)**	**1.000**
	No	**28 (93.33%)**	**28 (93.33%)**	

Table 4. Comparison of Efficacy between both Groups (n=60).

		Group A (n=30)		Group B (n=30)	
		No. of Patients	%age	No. of Patients	%age
EFFICACY	**Yes**	25	83.33	17	56.67
	No	05	16.67	13	43.33

P value is 0.024 which is statistically significant.

DISCUSSION:

With the advent of pneumatic lithotriptor in 1990 it has rapidly gained popularity in the management of ureteric calculi because of its superior efficacy. Pneumatic or ballistic lithotripters are often used with 2.4 Fr. probes for Semi rigid ureterorenoscopy. Since 1978, when the double-J stent and the single-pigtail stent were introduced by Finney and Hepperlen and colleagues to the urological society, ureteral stent usage has become a routine practice for every urologist, although it is not free of side effects. Most commonly it may causes lower urinary tract symptoms for which various pharmacological measures has been done such as use of alpha blockers and anti cholienergics[10,11,12]. Over the course of time, many improvements on ureteral stent design and composition material have taken place in an attempt to improve the efficacy of the stents. Routine ureteral stenting has been questioned in many studies.[13,14] Ureteric stenting following fragmentation of stone is routine in most of the centers, however their overuse has been questioned.[13] Robert et al negates the routine use of stents following uncomplicated ureteroscopic lithotripsy. Robert et al[14] assessed his patients with intraoperative variables of stone burden, need of ureteral dilatation, overall operating time and post-operative analgesics requirement, stent related complications. In our study, almost similar intra-operative variables i.e. age, stone size for both groups were formulated for comparable results. Baseline variables were not significantly different in both groups in our study as reported by Srivastava A et al.[15]

In our study, the mean was 38.97 ± 6.78 years. The mean age of patients in group A was 39.21 ± 6.83 years and in group B was 38.78 ± 6.91years. These results are also quite similar to results of Rasool M et al[3] and Hossain JMZ et al[16] who has shown mean age of 38 & 39 years respectively in their studies. Out of the 60 patients in our study, 41 (68.33%) were male and 19 (31.67%) were females with ratio of 2.16:1. This male predominance was also seen in many previous studies[13,14]. So, our study showed that majority of patients with ureteric stones presented were in 3rd and 4th decades of life with male predominance.

In this study we included patients with stone size of 5mm to 12mm with mean size of stone was 9.35 ± 1.51 mm. The size of stone in different studies ranged from 5mm to 33mm[17]. In our study, we have limited our study to stone size of 5mm to 12mm for comparable efficacy of URSL and stenting results in both groups. We included only patients with mid and distal ureteric calculi. Many previous studies report majority of patients having URSL had lower and mid ureteric stones.[18]

In our study, it was seen that there is statistically not any significant difference in both groups regarding stone clearance rate and all complications except a complication of painful trigone irritation which is more seen (p=0.005) in DJ stenting group (group B) because it occurred in patients due to the lower end of DJ stent. Complications associated with the use of ureteral stents are basically mechanical in nature and are related to stent material. In our study, painful trigone irritation was observed as the most common complication of DJ stent and found in 23.33% patients. Ahmad I et al[19] and Pansota MS et al[20] have come across this rate as 12% and 13%

respectively. Shao Y et al[21] and Memon NA et al[22] have come across this rate as 10.0% and 9.0% respectively. Although the reported rate of painful trigone irritation in these studies is quite lower compared to our study but they all have found this complication as the commonest complication of DJ stent placement. On the other hand, Arshad M et al[23] had found this rate (27.27%) very much comparable to our study. This painful trigone irritation was managed by anti-cholinergics in most of the patients while removal of DJ stent was done in those patients who did not respond to anti-cholinergics.

In our study, efficacy (100% clearance rate at 1 month and no post-operative complication) of Group A (URSL without DJS) was 25 (83.33%) while in Group B (URSL with DJS) was 17 (56.67%) with p-value of 0.024 which is statistically significant. Literature review reveals that post ureterorenoscopic lithotripsy, DJ Stent insertion does not support the idea of routine DJ Stent placement in every patient. Rasool M et al[8] has shown the better efficacy of Ureterorenoscopic lithotripsy without DJ stent placement i.e. 80%, compared to those patients in which DJ stent was placed after URS i.e. 48%. However, on study published by Chew BH states that long-term stent implantation is helpful as it promotes healing of mucosal injury caused by surgeries and prevents the formation of ureteral strictures[24]. In another study published by Chauhan VS states that open-ended catheter drainage for 2 days is better tolerated for flank pain and irritative bladder symptoms when compared with an indwelling double J stent for 2 weeks, without any significant difference in complications or efficacy[25]. A survey carried out showed that 63% of the surgeons still routinely stented patients following URL[26]. The cost of saving and increased comfort should be weighed against the potential for severe post-discharge complications. Alpha-blockers effectively reduced the morbidity of ureteral stents[27]. A meta-analysis showed that, tamsulosin and alfuzosin, which were the most commonly applied drugs, had the similar function to relief the stents-related discomfort[28] .

Nabi G et al[29] recently published a systematical meta analysis on stenting after URS. They summarized that patients with stents after URS have significantly higher morbidity in the form of irritative lower urinary symptoms with no influence on SFR, rate of urinary tract infections, requirement foranalgesia, or long term ureteric stricture formation. Another complication is forgotten double J stent that can lead to stone formation and in many cases double J stent removal is so difficult that nephrectomy has to be done.[30,31]

Therefore, our study concludes that patients without stents after URSL have higher efficacy i.e. fewer complications than stented patients. Stented patients of had severe bladder spasm and required earlier stent removal. Patients without bladder symptoms also need second procedure for DJS removal. Therefore, every patient of URSL does not need temporary ureteric stenting and it should be reserved for complicated cases.

CONCLUSION:

This study concluded that efficacy (in terms of stone clearance and complication rate) of URS lithotripsy without DJ stenting is higher compared to with DJ stenting in mid and distal ureteric stone.

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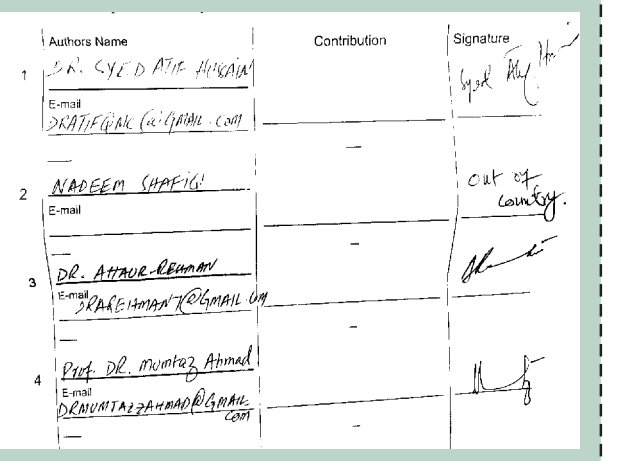

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"COURTESY COSTS NOTHING,

BUT BUYS EVERYTHING"

Hazrat Ali (Karmulha Wajhay)