Original Article

Role of Double J Stent in patient with Renal Stones undergoing Extracorporeal Shockwave Lithotripsy

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ABSTRACT

Background and Aim : The use ureteral stents can reduce the complications after extra corporeal shock wave lithotripsy (ESWL). However, the insertion of double J stents during ESWL is controversial. This study was aimed to determine whether the stenting prior to ESWL will increase the stone clearance rate in patients with renal calculi less than 2 cm.

Materials and Methods: Patients who had lower ureteric calculi of size ranging from 5-20 mm in diameter and treated with ESWL were included.

Results: Total 60 patients were included in the randomized prospective study. Gender, stone side and stone nature had no significant influence on clearance. Features like dysuria, pyuria, requency and urgency showed significant correlation with stented patients.

Conclusions: Stenting prior to ESWL significantly increases the stone clearance rate in patients with renal calculi. Parameters like gender side or stone nature had no influence in clearance following ESWL. Frequency, urgency, dysuria and pyuria were significantly more in stented patients.

Keywords: Corporeal shock wave lithotripsy, double J stenting, renal calculi

INTRODUCTION

The prevalence of nephrolithiasis is estimated to be between 5% and 12% and varies according to age, gender, race, and geographical location. [1] Men affected more commonly than women, with a male to female ratio of 2:1 or 3:1. The incidence of nephrolithiasis peaks in the fourth to sixth decades of life. [2]

Current modalities for the management of the renal calculi are extracorporeal shock wave lithotripsy (ESWL), percutaneous nephrolithotomy (PCNL), laparoscopic and open surgery. The introduction of shock wave lithotripsy (SWL) for the treatment of renal stones by Chaussy et al. in 1980 has been the revolution of the century.[3]

It fragments the stone to smaller size which ease its passage through distal urinary tracts. It brings along with a set of complications like those related to stone fragmentation, stone passage, and infection due to its effect on renal and extra renal tissues.

Incomplete fragmentation may cause the residual stones to block the ureters, a condition described by term "Steinstrasse" meaning "stone street".

The insertion of DJ stents during ESWL of renal calculi is controversial. [4]

The older rationale was Double J stenting showed significant advantages in ESWL patients, particularly to resolve the problem of steinstrasse. This study was aimed to find the extent of ureteral stent affected stone fragments passage in patients who underwent SWL stones less than 2 cm in diameter. [5]

MATERIALS AND METHODS

Study Design

This study was a prospective observational study.

Sample Size

Total 60 patients were studied, 30 in each group.

Study Centre

This study was conducted by Department of Urology, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, Telangana.

Study Population

Patients who are diagnosed to have Renal calculi and underwent Extra corporeal shockwave lithotripsy in urology department, CAMIS , Karimnagar.

Inclusion Criteria

Patients greater than 18 years undergoing ESWL for urinary tract calculi will be included in the study.

These underwent thorough clinical, general, systemic examinations and the required investigational procedures to exclude any neurological, organic and systemic cause for their symptoms.

Only those patients who had no obvious neurological, organic and systemic causes were included in the study.

Exclusion Criteria

- Patient not willing for inclusion in the study.
- Age less than 18 years and greater than 60 years.
- Pregnant woman.
- Mental disorders or illnesses
- History of previous ureteral stenting.
- Previous urinary bladder pathology.
- Urinary tract infections.

Methods

Patients were randomly assigned into two groups. Group A was stented with 3.8 Fr DJ stent prior to ESWL with standard procedure as described by Sulaiman et al and Group B was given ESWL without stenting.

All patients were given shocks in the range of 2000-3000 at 1 Hz with Lithotripter. All patients were given diuretics and alpha blockers post procedure.

Pre-procedural imaging comprised KUB, intravenousurography films and ultrasound of the kidney and upper ureter.

Post procedural imaging was performed by KUB films immediately after the session to evaluate fragmentation, then at 2 weeks to detect clearance and assess the need for further treatments, as well as at 1 month to evaluate complete clearance.

Successful ESWL was defined as either complete stone clearance with the lack of any visible fragments on radiological studies or the presence of clinically in significant fragments of size 4 mm.

Patients with recent open or endoscopic surgical intervention, radiolucent calculus, multiple stone, distal obstructions, and children were excluded.

Consent was obtained from the patient or their relatives and the study design was approved by the Institute Ethics Committee, CAIMS, Karimnagar.

Figure 1 : Intravenous urogram showing lower

RESULTS

Table 1: Demographic Profile

Sr. No.	Gender	Total no of Patients
1	Male	42
2	Female	18

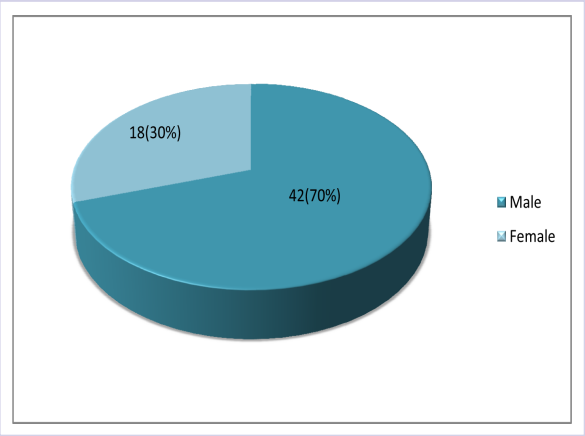

Figure 2: Demographic Profile.

In present study total male patient studied 42 and female 18 (Table 1).

Table 2: Total no of Stented and Non Stented patients

Sr. No.	Side	Total no of Stentedpts	Total no of Non stentedpts
1	Right	16	17
2	Left	10	17
3	Total	26	34

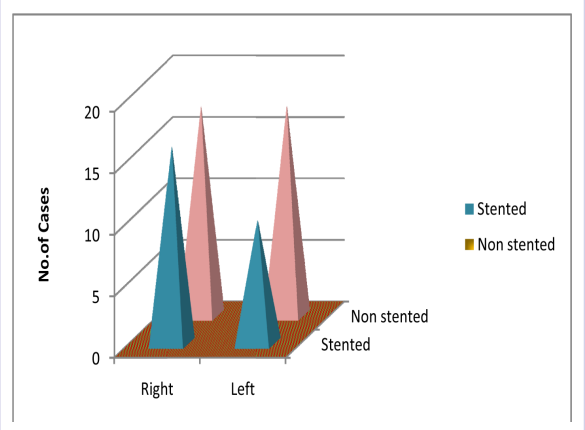

Figure 3: Total no of Stented & Non Stented patients.

In our study total stented 26 patient out which (right 16 & left 10) , Non stented 34 (right 17 & left 17) (Table 2).

Table 3: Rate of stone Clearance in stented & Non Stented patients

Sr. No.	Clearance	Stented	Non stented	Chi sq	P value
1	Yes	22	20	4.6	0.03
2	No	4	14		
3	Total	26	34		

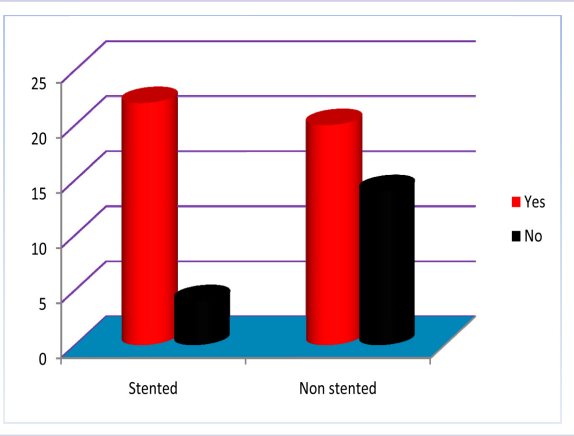

Figure 4 : Rate of stone Clearance in stented and Non Stented patients.

In our study out of 26 stented patients 22 patients have complete stone clearance while out of 34 non stented patients 20 patients have complete clearance of stone (Table 3)

Table 4: Various Morbidities in stented and Non stented patients

Sr. No.	Symptoms	Stented	Non Stented	Total	P value
1	Pain	5	3	8	0.4
2	Dysuria	13	5	18	0.05
3	Urgency	11	3	14	0.03
4	Haematuria	8	3	11	0.13
5	Frequency	4	8	12	0.24
6	Pyeuria	7	3	10	0.20

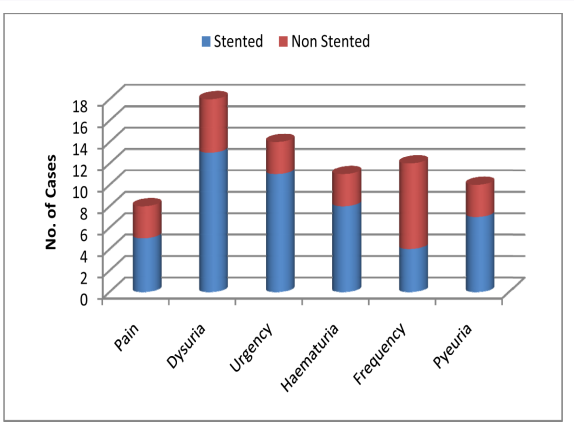

Figure 5: Various Morbidities in stented & Non stented patients.

In our study stented patients have more complications than non stented patients (Table 4).

DISCUSSION

ESWL is it is the only non invasive therapy option and can be performed without anaesthesia in outpatient setup the first choice for the treatment of lower polecalyceal stones up to 1 cm and favored by urologists and patients.[6]

There was always a controversial debate whether lower pole stones are a good target for ESWL therapy. A prospective randomized trial showed that there is poor stone clearance for lower pole stone following shock wave lithotripsy. The disintegration rate of lower calyceal stones treated by ESWL is comparable to stones in other locations within the kidney.

A study on 687 patients on the efficacy of extracorporeal shock wave lithotripsy for isolated lower pole calculi compared with isolated middle and upper calyceal calculi recommended that ESWL as the primary treatment of choice for calculi less than 2.0 cm in all calyceal locations. However, the role of lower of calyceal anatomy to predict the success of ESWL iscontroversial. [7]

Previous study showed that, stone size is a better predictor of outcome. Another study on pediatric age group showed that there was no significance for lower calyceal pelvicanatomy with regard to stone clearance after SWL. Due to the unfavorable spatial anatomy of the lower pole collecting system, the clearance of the fragments was not as likely.

In another study, it was shown that placement of DJ stents were for free stone rate or enhancing passage of the fragments during SWL in renal stones with diameter less than 2.5 cm. [8]

In our study, we found better stone clearance rate of lower calyceal stones treated by ESWL, after stenting, probably because of better fragment passage byureteric stent. But symptoms like frequency, urgency, dysuria and pyuria were significantly more in patients with DJ stents, a finding which is in accordance with previous studies.

The limitations of this study such as difference in sample size in groups such as between denovo stones and recurrent stones, or between stented and non stented patients of stone size of less than 1cm warranted a detailed multicentre study.

CONCLUSION

Stenting prior to ESWL significantly increases the stone clearance rate in patients with renal calculi. Success rate of ESWL was significantly increased when stone size is <1 cm in both stented and non- stented group. Parameters like gender, stone side, or stone nature had no influence in clearance following ESWL. Frequency, urgency, dysuria andpyuria were significantly more in stented patients.

CONFLICT OF INTEREST:

The authors declared no conflict of interest.

FUNDING: None

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