

Comparison the Efficacy of Extracorporeal Shock Wave Lithotripsy, Ureterolithotripsy and Laproscopic Ureterolithotomy in Treatment of Large Proximal Ureteral Stone

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ABSTRACT

Objective: To determine the usefulness of extracorporeal shock wave lithotripsy, ureterolithotripsy and laproscopic ureterolithotomy in treatment of large proximal ureteral stone.

Study Design: Comparative/prospective study

Place and Duration of Study: This study was conducted at the Department of Urology, Bolan Medical Complex Hospital, Quetta from 1st January 2018 to 30th June 2018.

Materials and Methods: In this study, 62 patients of both genders having large proximal stones >1cm in ureters were included. Patient's ages were ranging from 25 to 50 years. Patient's detailed history including age, sex and socio-economic status was examined. All patients had undergone extracorporeal shock wave lithotripsy, ureterolithotripsy and laproscopic ureterolithotomy treatment.

Results: There were 35 (56.45%) patients were men while 43.55% were women. 27 (43.55%) patients were aged between 25 to 35 years, 25 (40.32%) patients were ages between 35 to 45 years while remaining 16.13% were ages >45 years. 40 (64.52%) patients had urban area residency. 25 patients had undergone treatment with shock wave lithotripsy, 20 patients had ureterolithotripsy and 17 patients were treated with laproscopic lithotomy treatment. Highest successful rate in stone clearance was resulted in patients whom had treated with laproscopic ureterolithotomy as 94.12%.

Conclusion: It is concluded that, the patients whom had treated with laproscopic ureterolithotomy was a highest success rate in clearance of stone. Laproscopic lithotomy shows better result than the other techniques.

Key Words: Extracorporeal shock wave lithotripsy, Ureterolithotripsy, Laproscopic ureterolithotomy, Large proximal stone

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INTRODUCTION

Worldwide, ureteral stone is commonly found in people and it causes acute pain and may lead to hydronephrosis and urinary tract infection. Ureteral stone may also the main cause of renal failure. Small size ureteral stone (<1 cm) is usually pass through the ureter into the bladder, but large proximal stones (>1cm) can take more than two to three weeks to release from the ureters from the bladder.¹ In very serious or bad condition the large stones in the uretus required surgical treatment for removal from the ureters.

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Medical expulsive therapy using alpha blockers and calcium channel blocker have been used for multiple years for the treatment of effected patients with ureteral stones, and that was resulted a highest stone clearance rate as compared to placebo.² Nevertheless, a current multicentre placebo control trialed examination resulted different benefits about the position of medical expulsive treatment.³

Surgical treatment is the better alternative treatment for removal of large proximal stones from the ureters. Moreover, it is controversial that which technique or method is best for the treatment of large proximal stones, some of researches shows that ureterosopic treatment is more successful than the others.⁴ American urological association and European urological association have advocated ureterolithotripsy and shock wave lithotripsy (SWL) as a first alternative treatment for the large proximal ureteral stone and in severe condition may treated with laproscopic ureterolithotripsy method. In developing countries, the success rate by ureterolithotripsy (URS) is high as compared to shockwave lithotripsy and mostly patients were treated with ureterolithotripsy for extraction of large stones.⁵

In our settings ureteroscopy is not commonly available, semi rigid and rigid ureterolithotripsy has been applied for treatment of large proximal stones. Percutaneous nephrolithotomy may cause the multiple surgical complications but laproscopic lithotomy technique for treatment of large stone resulted less complications and high successful rate in clearance of stones from the ureter.⁶

Several studies have been conducted for examine the efficacy of laproscopic lithotomy and ureterolithotripsy in treatment of large proximal ureteral stones and resulted that laproscopic lithotomy is more efficient and results oriented as compared to URS.^{7,8} Fang et al⁹ reported that the clearance rate of stones from the ureters is high in LAP and was resulted LAP 100%, 88% URS.

MATERIALS AND METHODS

This comparative/prospective study was conducted at Department of Urology, Bolan Medical Complex Hospital, Quetta from 1st January 2018 to 30th June 2018. Sixty two patients of both genders having large proximal stones >1cm in ureters were included. Patient's ages were ranging from 25 to 50 years and patient's detailed history including age, sex and socio-economic status was examined. Patients having pregnancy, previous open surgery, ureteral stone with renal failure were excluded from the study. All patients had undergone extracorporeal shock wave lithotripsy, ureterolithotripsy and laproscopic ureterolithotomy treatment. All the data was analyzed by computer software SPSS 17.0.

RESULTS

Out of all 62 patients, 35 (56.45%) patients were men while 43.55% were women. 27 (43.55%) patients were aged between 25 to 35 years, 25 (40.32%) patients were ages between 35 to 45 years while remaining 16.13% were ages >45 years. 40 (64.52%) patients had urban area residency. 25 patients had undergone treatment with shock wave lithotripsy, 20 patients had ureterolithotripsy and 17 patients were treated with laproscopic lithotomy treatment. 35 (56.45%) patients had found stone size 1.2 cm to 1.8cm and 27 (43.55%) patients had found >1.8cm (Tables 1-2).

Causes observed in patients as severe pain, hematuria, hydronephrosis, previous stone treatment and family history of stone disease as 56/62 (90.32%), 37/62 (59.68%), 6/62 (9.68%), 5/62 (8.06%) and 10/62 (16.13%) respectively. Treatment duration mean time (minutes) were noted in all three procedures SWL, URS and LAP UL as 42.9±3.2, 71.2±4.9 and 137±2.7 respectively. 10 (40%) patients had overall stone removal whom treated with SWL, 11 (55%) found by URS and 94.12% (16) had overall stone removal whom treated with laproscopic ureterolithotomy. Highest successful rate in stone clearance was resulted in

patients whom had treated with laproscopic ureterolithotomy as 94.12%. Forty five (72.58%) patients had length of hospital stay was < 1 day and 17 (27.42%) had hospital stay was 1 or more than 1 day after treated with SWL, URS and laproscopic ureterolithotomy procedure. Mean post operative pain on visual scale was noted as 1.4±0.9, 1.7±0.89 and 1.2±0.7 in SWL, URS and LAP UL. Opioid requirement was found in 1 (4%) patients in SWL group, 6(30%) patients in URS group and 9 (52.94%) patients required opioid treatment whom treated with laproscopic ureterolithotomy. We observed voiding symptoms in 10 (40%) patients in SWL group, 11(55%) in URS group and 8 (47.05%) found in laproscopic ureterolithotomy group. Patients' satisfaction rate was high in patients whom treated with URS and laproscopic ureterolithotomy as 90% and 88.23% (Tables 3-5).

Table No.1: Age, gender and residency wise distribution of patients

Characteristics	No.	%
Gender		
Male	35	56.45
Female	27	43.55
Age (years)		
25 -35	27	43.55
35 – 45	25	40.32
> 45	10	16.13
Residency		
Urban	40	64.52
Rural	22	35.48

Table No.2: Distribution of patients in treatment procedures

Procedure	No.	%
Extracorporeal shock wave lithotripsy	25	40.32
Ureterolithotripsy	20	32.25
Laproscopic ureterolithotomy	17	27.41

Table No. 3: Stone size findings

Stone size (cm)	No.	%
1.2 to 1.8	35	56.45
>1.8	27	43.55

Table No.4: Clinical examination of the patients

Treatments	Severe Pain	Hematuria	Hydronephrosis	Stone Treated History	Stone disorder in family
Shock wave lithotripsy (n=25)	18	10	2	0	4
Ureterolithotripsy (n=20)	22	15	2	3	2
Laproscopic ureterolithotomy (n=17)	16	12	2	2	4
Total (%age)	56 (90.32)	37 (59.68)	6 (9.68)	5 (8.06)	10 (16.13)

Table No.5: Findings of procedures

Findings	Shock wave lithotripsy (n=25)	Ureterolithotripsy (n=20)	Lapros-copic uretero-lithotomy (n=17)
Mean time (minutes)	42.9±3.2	71.2±4.9	137±2.7
Stone removal	10 (40%)	11 (55%)	16 (94.12%)
Mean post operative pain on visual scale	1.4±0.9	1.7±0.89	1.2±0.7
Opoid requirement	1 (4%)	6(30%)	9 (52.94%)
Voiding symptoms	10 (40%)	11(55%)	8 (47.05%)

DISCUSSION

Ureteral stone is one of the most commonly found disorder in urological departments. Gradually technical advances have modified the treatment of upper urinary tract stones. Surgical treatment is the better alternative treatment for removal of large proximal stones from the ureters. Moreover, it is controversial that which technique or method is best for the treatment of large proximal stones, some of researches shows that ureteroscopy treatment is more successful than the others.⁴ The main drawback of shock wave lithotripsy are long duration time for treatment and it requires auxiliary method.

Rigid ureterolithotripsy is safe and effective treatment procedure for large proximal ureteral stone and same as resulted in this research.¹⁰ Some of studies shows that ureterolithotripsy procedure for treatment of removal of stone has high rate in clearance of stone as compared to ESWL¹¹ and that findings was same as in our research that stone removal ratio was 55% and 40%. Another study conducted by Cut et al¹¹ also reported that URS and ESWL treatments have better advantages with no major difference in complications rate. Many of studies regarding ureteral stones resulted that stones observed at upper urinary tract may lead to severe complications.¹² The most common and severe complications found in URS treatment procedure is ureters avulsion and perforation and studies shows that the incidence rate 0 to 1%.¹³

In our study, 35 (56.45%) patients were men while 43.55% were women. These results shows similarity to the some other study conducted by Asif et al in which the male ratio was high as compared to females.¹⁴ Twenty seven (43.55%) patients were aged between 25 to 35 years, 25 (40.32%) patients were ages between 35 to 45 years while remaining 16.13% were ages >45 years. In this study we observed highest success rate was achieved from laproscopic ureterolithotomy as 94.12% as compared to ESWL and URS procedure and

some of studies shows the high rate of success resulted from URS as compared to ESWL and these results shows similarity to our study in which URS success rate in clearance of stone was 55% and in ESWL that was 40%.^{15,16}

In the present study, we observed treatment duration mean time (minutes) were noted in all three procedures SWL, URS and laproscopic ureterolithotomy as 42.9±3.2, 71.2±4.9 and 137±2.7 respectively. Highest successful rate in stone clearance was resulted in patients whom had treated with laproscopic ureterolithotomy as 94.12%, these results showed similarity to some other studies in which time duration for treatment is high in laproscopic ureterolithotomy procedure.¹⁷ Laproscopic ureterolithotomy procedure is best in treatment of those patients having complex and severe condition of stones.¹⁸ We observed that 45 (72.58%) patients had length of hospital stay was < 1 day and 17 (27.42%) had hospital stay was 1 or more than 1 day after treated with SWL, URS and laproscopic ureterolithotomy procedure.

We also observed that, patients satisfaction rate was high in patients whom treated with URS and laproscopic ureterolithotomy as 90% and 88.23% , some other studies shows similarity to our results.¹⁹ We observed voiding symptoms in 10 (40%) patients in SWL group, 11 (55%) in URS group and 8 (47.05%) found in laproscopic ureterolithotomy group and these results showed a bit similarity to some other studies conducted regarding treatment of large proximal stones.²⁰

In our study the accuracy rate is better than the other procedures. Moreover, it is not a sufficient research due to small number of patients and many other conditions, we should have to do more work for better treatment and to reduce the mortality and morbidity and also to reduce the mortality and morbidity rate.

CONCLUSION

Treatment for large proximal ureteral stones acquired several treatment laps for removal of stones from the ureters. We concluded that the patients whom had treated with laproscopic ureterolithotomy were a highest success rate in clearance of stone. Laproscopic lithotomy shows better result than the other techniques, but with many of disadvantages in which increase in length of stay in hospital, very expensive than the other procedure and more time consuming. We should have to do more work for better treatment of this cure.

Author's Contribution:

Concept & Design of Study:	Sultan Mohammad Tareen
Drafting:	Abdul Razaque Nasir
Data Analysis:	Abdul Razaque Nasir
Revisiting Critically:	Sultan Mohammad Tareen

Final Approval of version: Sultan Mohammad Tareen

Conflict of Interest: The study has no conflict of interest to declare by any author.

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