

Frequency of Proximal Migration of Ureteric Stone during Ureteroscopic Pneumonic Lithotripsy in KPK

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ABSTRACT

Objective: To Study the Frequency of Proximal Migration of Ureteric Stone during Ureteroscopic Pneumonic Lithotripsy.

Study Design: Descriptive / cross sectional / Experimental study

Place and Duration of Study: This study was conducted at the department of Urology, Lady Reading Hospital Peshawar, from Jan 2019 to May 2020.

Materials and Methods: Sample size was calculated using WHO calculator and total 160 patients were enrolled with 5% margin of error and 95% confidence interval and consecutive nonprobability sampling technique was used. All patients having urinary stone of size less than or equal to 15mm, age 30-70 years and both genders were included in the study whereas all those who had previous history of ESWL, dj stent placement ,age less than 30 and > 70 were excluded from the study.

After taking permission from ethical committee of the hospital, patients were admitted in the department and informed consent was taken. Detailed history and examination was performed and diagnosis was made by using x-ray KUB, Ultrasound abdomen and CTU or IVU (having normal RFTs). Data was recorded on a predesigned proforma and was analyzed using the statistical program SPSS version 20. Frequency and percentages were calculated for categorical variables like gender and stone migration. Descriptive statistics like mean \pm standard deviation was calculated for numerical variable age and size of stone.

Results: During the study period 160 cases (83 male and 77 female) of ureteric stones were included in the study. In total 20 (12.5%) patients proximal stone migration was observed.

Conclusion: It is concluded from our study that proximal stone migration during pneumatic lithotripsy was major complication. And preventive measures were made for it.

Key Words: proximal migration of urteric stone, intra corporeal lithotripsy, pneumatic lithotripsy

Citation of article: Fiaz S, Ikram Ullah, Hayat N, Shahab M. Frequency of Proximal Migration of Ureteric Stone during Ureteroscopic Pneumonic Lithotripsy in KPK. Med Forum 2020;31(12):174-177.

INTRODUCTION

Urolithiasis is a major clinical and economic burden for health care system. Stone disease incidence and prevalence is increasing as suggested by International epidemiological data¹. Worldwide 2 and 20% of population has stone disease, Prevalence of urolithiasis in Pakistan is from 4% to 20%, Ureteric stones most

often present with acute flank pain and hematuria². Patients can present with severe pain in emergency.

Most common between 30 to 60 years. Most of the stones pass by itself without intervention. 77% of stones having size less than 5mm pass spontaneously, while more than 5 mm have a lesser than 46% chances of spontaneous passage. Distal and proximal ureteric stones have chances of spontaneous passage of 71% and 22% respectively. Intervention is required in patients having solitary obstructed kidney, unbearable pain, failure of conservative treatment, uro sepsis due to stones and sometimes on patient choice. Treatment options for ureteric stones include extracorporeal shock wave lithotripsy (ESWL), ureteroscopic lithotripsy, and ureter lithotomy (open and laparoscopic). Choice of Treatment is dependent upon stone size, location, patient' preference and end urological facilities availability. Ureteroscopy (URS) with lithotripsy is most commonly performed procedure². Transurethral lithotripsy (TUL) is the treatment of choice for lower

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Received: June, 2020

Accepted: September, 2020

Printed: December, 2020

and middle ureteral calculi. It has also been used for treatment of upper ureteral and renal stones. Based on recent studies, its use as a tray treatment modality for upper third ureteral stones has become popular; however, extracorporeal shockwave lithotripsy (ESWL) is still the treatment of choice⁴. Multiple modalities are used for intra corporeal lithotripsy, including electrohydraulic, ultrasonic, and pneumatic laser lithotripters. In early 1990 Pneumatic lithotripsy (PL) was introduced. Several reports indicate very high success rates.² It is less-costly and simple to manage as compared to laser, ultrasonic and electrohydraulic lithotripsy. Even for larger stones it is safe and highly efficacious procedure particularly in distal ureter⁵. Complication of Pneumatic Lithotripsy include ureteral perforation, mucosal trauma, avulsion, ureteric stricture, urospeis, stone migration, postoperative hematuria, fever, flank pain^{1,5}. Proximal stone migration is a common problem during ureteroscopic lithotripsy, especially when the pneumatic lithotripter is used⁷. The documented incidence of stone migration is 11.36%⁶.

MATERIALS AND METHODS

A descriptive cross sectional study was performed at the department of Urology, Lady Reading Hospital Peshawar, from 1st Jan 2019 to 30th May 2020. Sample size was calculated using WHO calculator and total 160 patients were enrolled with 5% margin of error and 95% confidence interval and consecutive nonprobability sampling technique was used. All patients having urinary stone of size less than or equal to 15mm, age 30-70 years and both genders were included in the study whereas all those who had previous history of ESWL, dj stent placement, age less than 30 and > 70 were excluded from the study.

After taking permission from ethical committee of the hospital, patients were admitted in the department and informed consent was taken. Detailed history and examination was performed and diagnosis was made by using x-ray KUB, Ultrasound abdomen and CTU or IVU (having normal RFTs). Data was recorded on a predesigned proforma and was analyzed using the statistical program SPSS version 20. Frequency and percentages were calculated for categorical variables like gender and stone migration. Descriptive statistics like mean ± standard deviation was calculated for numerical variable age and size of stone.

All results organized in the form of tab

Inclusion Criteria: Proximal Migration of Ureteric Stone during Ureteroscopic Pneumonic Lithotripsy

Exclusion Criteria: All the patients without stone of kidney were excluded from the study.

RESULTS

Duration of my study was from 1st jan 2019 to 30th May 2020.

A total of 160 patients (51.8% males and (48.2% female) were included (TABLE 1)

Proximal migration of stone noted in 20 patients (12.5%). (TABLE 2)

Among the male patient 11(13.25 %,) and in female 11.6 % were noted with stone migration. P value > 0.05(0.924). (Table 3)

Patients further categorized on basis of stone size.

Group 1(stone size from 8-10mm), including 46 patients. Stone migrated in 5(10.86%) patients.

Group 2 (stone size from 11-15mm, including 114 patients. Stone migration occurred in 15(13.15%). P value 0.846(>0.05).(Table 4)

Age limit was 31 -70 years. Further distributed in 4 groups.

Group A age limit (31-40 years) include 62 patients. Stone migration was noted in 8(13.33%) patients.

Group B age limit (41 -50 years) included 56 patients. Stone migration was noted in 6(10.7%) patients.

Group C age limit (51 - 60 years) included 26 patients and stone migration reported in 3 (11.5%).

Group D age limit (61 -70 years) including 16 patients with incidence of stone migration in 2 patients (12.5%). P value was <0.05(0.867) non-significant. (Table 5)

Mean age of the patient is 45 years and standard deviation of 10.1. Mean of stone size is 11.9 mm and standard deviation 2.1(table 6).

Table No.1: Frequency Distribution of Gender (N=160)

Gender	Frequency	Percent
Male	83	51.8
Female	77	48.2
Total	160	100.0

Table No.2: Frequency Distribution of Upward Stone Migration (N=160)

Stone Migration	Frequency	Percent
Yes	20	12.5
No	140	87.5
Total	155	100.0

Table No.3: Cross Table of Gender with Upward Stone Migration (N=160)

Gender	Number of patients	Stone migration	Percentage	P-value
Male	83	11	13.25%	0.912
Female	77	9	11.6%	
Total	160	20	12.5%	

Table No.4: Cross Table of Upward Stone Migration with Stone Size (N=160)

Stone size	No of Patients	Frequency of stone migration	Percentage	P-value
8 to 10 mm	46	5	10.86%	0.814
11mm to 15mm	114	15	13.15%	
Total	160	20	12.5%	

Table No.5: Cross Table of Age with Upward Stone Migration (N=160)

Age groups (years)	No of patients	Frequency of stone migration	Percentage	P-value
31- 40	62	9	14.51%	0.867
41 - 50	56	6	10.7%	
51 - 60	26	3	11.5%	
61 - 70	16	2	12.5%	
Total	160	20	12.5%	

Table No.6: Mean and Standard Deviation of Stone Size and Age (N=160)

	n	Minimum	Maximum	Mean	Std. Deviation
Stone Size	160	8mm	15mm	11.919	2.1656
Age of Patient	160	31years	70	44.20	10.149

DISCUSSION

Urolithiasis has a high incidence in the countries of Afro-asian stone belt having urological workload of 40-50%.

In hospitals. Management of ureteric calculi depends upon the size and location, stone of <5 mm in distal ureter has chances of spontaneous passage up to 98%, for stone of size up to 1cm in proximal ureter ESWL should be the first option, ESWL and ureteroscopy are the available options for ureteric stones. ESWL is minimally invasive and needs no anesthesia but the retreatment rate is high, URS gives higher stone clearance, but need anesthesia. In our experience Pneumatic lithoc last was found cost effective and more user's friendly⁸.

In a study reported the comparison of ESWL and ureteroscopy both has an excellent stone-free rate (86% to 90%) for stones smaller than 1cm, whereas ureteroscopy have better result for larger stones i.e Ureteroscopy vs shock wave lithotripsy (67% vs 73%). In bleeding diathesis and pregnancy preference was given to ureteroscopy over ESWL.⁹

SWL is non on vasive and due to this generally accepted as the prior treatment option for ureteral stones, but PL with ureteroscopy has the advantage of higher and quick stone clearance rate and is good

alternative. Pneumatic lithotripsy is preferred over ESWL in cases where quick stone removal is desired like for larger ureteric stones with more chances of obstruction, impaction and infection apart from this , PL may be chosen as the first line treatment rather than SWL for stones larger than 1cm. Main complications observed were migration of a complete stone or its fragments (7.1%), urosepsis (4.5%) and perforation of ureter(1.3%)¹⁰.

Some Perioperative complications associated with PL includes proximal stone migration into the kidney 7.2%, Damage to ureteric mucosa in (3.5%), ureteral perforation (1.7%), avulsion of ureter in (0.4%), and in (0.2%).cases it is converted to open surgery. Early postoperative complications included, Loin pain (18.4%), pelvic discomfort (5.5%), hematuria (7.3%), and urinary tract infection (5%)¹¹.Proximal stone fragments migration during pneumatic ureteroscopic lithotripsy is a common issue⁷.A study has documented this incidence of stone migration about 11.36%⁶. Another study has reported 3.1 % in lower and 7.6% in upper ureteric stone.^{12,13,14,15,16}

CONCLUSION

Our study showed that stone or its fragments migration was a big issue which urologist encounter during pneumatic lithotripsy of urteric stone, which further resulted in the procedure incompleteness, added procedure, prolong hospital stay, economical burden. That's why use of proper measures like N trap, Stone cone, Lidocaine jelly, Lithocatch etc. Should be taken to avoid the above consequences.

Author's Contribution:

Concept & Design of Study:	Shaukat Fiaz
Drafting:	Ikram Ullah
Data Analysis:	Noorul Hayat, Muhammad Shahab
Revisiting Critically:	Shaukat Fiaz, Noorul Hayat
Final Approval of version:	Shaukat Fiaz

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

REFERENCES

1. Benjamin W, Turney, John M, Jeremy G. Nobel and Stephen R, Keoghane. Trends in urological stone disease. BJU Int 2011;1082-7.
2. Khan AA, Hussain SA, Khan NU, Majeed SMK, Sulaiman M. Safety and efficacy of ureteroscopic pneumatic lithotripsy. J Coll Physicians Surg Pak 2011; 21(10):616-9.
3. Khumukcham S, Gupta S, Lodh B, Kangjam SM, Akoijam KS, Sinam RS. Ureteroscopic lithotripsy as day care procedure: Our early experience in

- regional institute of medical sciences. *J Med Soc* 2013;27(1);52-5.
4. Taie K, Jasemi M, Khazaeli D, Fatholahi A. Prevalence and management of complications of ureteroscopy seven-year experience with introduction of a new maneuver to prevent ureteral avulsion. *Urol J* 2012;9(1);356-60.
 5. Rajpar ZH, Paryani JP, Memon SU, Abdullah A. Intracorporeal lithotripsy: a viable option for proximal ureteric stones. *JPMA. J Pak Med Ass* 2012;62(8):781-4.
 6. Ullah I, Wazir BA, Alam K, Islam M, Shah F, Khan SA, Evaluation of safety and efficacy of ureteroscopic lithotripsy in managing ureteral calculi. *Ann Pak Inst Med Sci* 2011;7(3):119-2.
 7. Farahat YA, Elbahnasy AEM, Elashry OM. A randomized prospective controlled study for assessment of different ureteral occlusion devices in prevention of stone migration during pneumatic lithotripsy. *Urol* 2011;77(1): 30-5.
 8. Rizvi SAH, Naqvi SAA, Hussain Z, Hashmi A, Hussain M, Zafar MN, et al. The Management of Stone Disease. *BJU Int* 2002;89(1);62-8.
 9. Kijvikai K, George E, Haleblan, Glenn M, Preminger GM, Rosette JDL. Shock Wave Lithotripsy or Ureteroscopy for the Management of Proximal Ureteral Calculi: An Old Discussion Revisited *J Urol* 2007;178:1157-63.
 10. Tunc L, Kupeli B, Senocak C, Alkibay T, Sözen S, Karaoglan U, et al. Pneumatic lithotripsy for large ureteral stones: is it the first line treatment? *Int Uro Neph* 2007;39(3):759-64.
 11. Aridoğan A, Zeren S, Bayazit Y, Soyupak B, Doran S. Complications of Pneumatic Ureterolithotripsy in the Early Postoperative Period. *J Endourol* 2005;19(1): 50-3.
 12. Ceylan K, Sunbul O, Sahin A, Gunes M, Ureteroscopic treatment of ureteral lithiasis with pneumatic lithotripsy: analysis of 287 procedures in a public hospital. *Urol Res* 2005;422-5.
 13. Stephen P Dretler. Prevention of retrograde stone migration during ureteroscopy. *N R Urol* 2006; 3:60-1.
 14. Elashry OM, Tawfik AM. Preventing stone retropulsion during intracorporeal lithotripsy. *N R Urol* 2012;9:691-8.
 15. Maislos SD, Volpe M, Albert PS, Raboy A. Efficacy of the Stone Cone for Treatment of Proximal Ureteral Stones. *J Endourol* 2004;18(9): 862-4.
 16. Zehri AA, Ather MH, Siddiqui KM, Sulaiman MN. A Randomized Clinical Trial of Lidocaine Jelly for Prevention of Inadvertent Retrograde Stone Migration During Pneumatic Lithotripsy of Ureteral Stone. *J Urol* 2008;180(3).