Original Research Article

DOI: http://dx.doi.org/10.18203/2349-2902.isj20175896

Role of dilatation of intramural ureter in patients with lower urinary tract symptoms (LUTS) in UVJ and pre UVJ calculus: an observational study

Narasimhaiah Krishnappa¹, Asif Khan², Saraswathi Sakranaik³*

Received: 06 November 2017 **Accepted:** 02 December 2017

*Correspondence:

Dr. Saraswathi Sakranaik, E-mail: drsarasbmc@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Various literature sources describe three narrowest anatomic spots in the ureter as the most potential points for ureteric calculi to form and these are: the pelvi-ureteric junction (PUJ), the point where the ureters cross over the iliac vessels and the ureterovesical junction (UVJ).

Methods: This study included patients who presented with symptomatic obstructing ureteric calculi and who required uretero renoscopic lithotripsy (URSL). The procedure was selected according to stone size, location and degree of impaction.

Results: Of the total of 100 patients, 43 were females and 57 were males. 69 patients had Lower Urinary Tract Symptoms and 31 patients had no Lower Urinary Tract Symptoms with the calculi. The age of the patients ranged from 17 years to 65 years and the stone size ranged from 7mm to 15mm. Lower ureteric calculi with LUTS are good indicators.

Conclusions: We can approach lower ureteric calculi without use of dilators or 6/7.5ureteroscope in patients with LUTS.

Keywords: Dilators UVJ, LUTS, Pre UVJ calculi, URSL

INTRODUCTION

Watchful waiting and minimally invasive interventional (e.g., ESWL and ureteroscopy) treatment are the two modalities for the management of lower ureteric calculi. The choice of the best method to be done largely depends on the availability of different type of equipments, type and size of calculi, requirements of the patient and the skills of the surgeon. After open stone surgery recuperation lasts about 4 to 6 weeks and repetitive surgery is more difficult. Recovery with extracorporeal

shock wave lithotripsy frequently is unimportant and some extracorporeal shock wave lithotripsy units are run on an outpatient basis. ¹

The stone load continues to be the primary factor in determining the appropriate treatment for a patient with ureteral calculi.² Where a failed expectant treatment may be complicated with hydronephrosis, impaired renal function or uro-sepsis, interventional methods are not always devoid of complications. Precise diagnosis of underlying condition is crucial to successful management

¹Department of Surgery, Adichunchanagiri Institute of Medical Sciences, BG Nagara, Bangalore, Karnataka, India

² Department of Community Medicine, Quassim University, Kingdom of Saudi Arabia, Adichunchanagiri Institute of Medical Sciences, BG Nagara, Bangalore, Karnataka, India

³Department of Community Medicine, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

of patients with renal colic. Ureteral stones can be managed medically with analgesics, with extracorporeal shock wave lithotripsy, ureteroscopic lithotripsy and also laparoscopic ureterolithotomy. Data on the location, size, and shape of the stone is necessary in the choice of a proper treatment method. Various literature sources describe three narrowest anatomic spots in the ureter as the most potential points for ureteric calculi to form and these are: the pelvi-ureteric junction (PUJ), the point where the ureters cross over the iliac vessels and the ureterovesical junction (UVJ).³

Ureteric calculi presentation is one of the common disorders encountered in urological practice. The treatment of a ureteric calculus relies on its location, site of impaction and size.⁴ For the stones that do not pass in a spontaneous manner or with medical expulsive therapy, then shock wave lithotripsy (SWL) and ureteroscopy (URS) are the commonest and effective treatment modes.⁴ Treatment outcome is more beneficial for calculi found in the lower third of the ureter compared to the upper third of the ureter.⁵ The incidence of stone disease in India ranged from 20.34 per 10,000 hospital admissions in the 1960s to 28.48 per 10,000 hospital admissions in the 2000s.6 The purpose of this study was to assess the importance of dilatation in patients who had Lower Urinary Tract Symptoms (LUTS) for lower ureteric calculi.

METHODS

A prospective study was conducted on 100 consecutive patients between March 2015 to February 2017 presenting with impacted and symptomatic ureteric calculi who required URSL.

The analysis was carried out on the day of URSL procedure. A detailed history was taken. More importance was given for Lower Urinary Tract Symptoms like increased frequency, dysuria, sense of incomplete emptying and haematuria in addition to other history.

All the patients had x-ray of KUB and ultra sound scanning abdomen and some patients had CT scan-KUB region to diagnose the presence of a calculus in the ureters. X-ray films were reviewed in addition to per operative findings and the location of calculus in the ureter was categorized as pre UVJ and UVJ calculi. The size of calculi causing obstruction was noted. This study included patients who presented with symptomatic obstructing ureteric calculi and who required ureteroscopic lithotripsy (URSL). The procedure was selected according to stone size, location and degree of impaction.

Exclusion criteria

Previous history of ureteric surgery, patients who passed their calculi spontaneously or following the use of medical expulsive therapy (MET), patients with lower ureteric stones other than UVJ and pre-UVJ stones. Also, cases where dilatation of ureter is not required were excluded.

In addition to other pre-operative work-up, Urethro cystoscopy was performed under spinal anaesthesia. The procedure commenced with cystourethroscopy. During the cystourethroscopy, cystoscopic bladder changes were recorded, with special reference to UVJ findings, like hyperaemia bullous oedema. After cystoscopy, a single terumo glide wire was inserted in to the pelvicalyceal system under C-arm guidance. For inserting glide wire, a semi rigid ureteroscopy of 8/9.8 was used routinely, instead of cystoscope. Since, inserting glide wire using ureteroscopy is easy and less assistant dependent, a relatively thick glide wire "0.0035" glidewire was inserted beyond the stone.

The thick glide wire stabilizes the scope. Whenever the stone was relatively big, the tip of the ureteroscopy was negotiated beyond the stone. In the process of advancing the tip beyond stone, the proximal thicker portion of the ureteroscopy dilates the lower ureter. The dilated ureter and the UV Junction helps in extraction of stones. Even relatively bigger fragments could be extracted easily. Stones and fragments were extracted by using graspers and baskets.

The stones that could not be extracted directly were fragmented using pneumatic lithotripter. Because of soft tissue oedema of surrounding tissues and UVJ, even larger stones were basketed out, without fragmenting. The procedure was terminated after DJ stenting and catheterizing the bladder. Since the procedure was done, using irrigation under pressure, DJ stenting was done routinely. All the patients were discharged within 24 hours from the time of procedure.

Statistical analysis

Results were analysed with SPSS for Windows (version 16). Means, standard deviation was determined and were compared using Chi square and the Student t test. P value <0.05 was considered statistically significant.

RESULTS

Of the total of 100 patients, 43 were females and 57 were males. 69 patients had Lower Urinary Tract Symptoms and 31 patients had no Lower Urinary Tract Symptoms with the calculi. The age of the patients ranged from 17 years to 65 years and the stone size ranged from 7 mm to 15 mm. calculus was located in UVJ in 56% and pre-UVJ in 44% patients (Table 2).

69 patients manifested LUTS with UVJ/pre UVJ Stones, in 63 patients ureteroscopy was performed without dilating the ureteric orifice. URSL was done using 8/9.8 semi rigid ureteroscopies. In 4 patients ureteric orifice

was not admitting the ureteroscope the orifice was dilated with Nottingham's dilator.

Table 1: Distribution of lower urinary tract symptoms among study subjects.

Lower urinary tract symptoms	Males	Females	Total
Increased frequency	7	14	21
Dysuria	10	15	25
Sense of incomplete emptying	6	9	15
Haematuria	4	4	8
None	14	17	31

In 2 patients the UV junction and surrounding tissues were inflamed severely, and the location of the ureteric orifice could not be easily localised. The inflamed edematous mucosa was resected using TUR loop. After resecting the edematous mucosa ureteric orifice was localised and stones were retrieved without dilating the ureteric orifice.

Table 2: Location of calculus.

Location of calculus	Males	female	es
UVJ	17	39	56
Pre-UVJ	20	24	44
Total	17	39	56

Table 3: Distribution of size of the calculus among the patients.

Size of calculus (mm)	Males	Females	Total
7	7	4	11
8	3	3	6
9	8	7	15
10	6	7	13
11	4	10	14
12	6	4	10
13	8	4	12
14	5	12	17
15	1	1	2

Table 4: Type of procedure based on the size of the calculus.

Size of the stone	Ureteroscopy	Dilatation	Total
7-9	23	9	32
10-12	26	11	37
13-15	20	11	31
	69	31	100

Chi Square=0.4429; Degrees of Freedom=2; p-value= 0.8013

In remaining 31 patients who are not manifesting LUTs, in 16 patients UV junction was dilated using Nottingham dilator. This was done under C-arm guidance. In few cases 6/7.5 ureteroscopy was used instead of Nottingham dilator. The average duration of the procedure was 30

minutes. 10 to 30 minutes in presence of LUTS and 20 TO 45 minutes in patients who are not manifesting LUTS.

DISCUSSION

Our study found that the ureteric calculi are most concentrated in Pre-UVJ and UVJ sites. This was similar to that found by Ordon et al.⁷ As most stones less than 5mm pass spontaneously relatively larger stones require intervention in the form of medical expulsive therapy or other modalities.^{8,9} Shock wave lithotripsy (ESWL) and ureteroscopy are the treatment options for stones 1cm. or less in the distal ureter.⁹ Several studies have demonstrated the clinical efficacy of ESWL in fragmenting and clearing ureteric calculi.¹⁰ Supporters of ESWL claim that it is effective and non-invasive, and can be done on an outpatient basis with intravenous sedation.¹¹

Watchful waiting is best for small stones which are not causing acute symptoms and are more likely to pass in a spontaneous manner, although it may occur with discomfort to the patient. Spontaneous passing relies upon size of the stone, shape, location and related ureteral oedema (which probably depends on the length of time that a stone has not moved on). Ureteral calculi 4-5mm in size have a 40-50% likelihood of spontaneous passing. In contrast, stones >6mm have less than 5% likelihood of spontaneous passing. Most of the stones that pass do so within a 6 weeks period after the onset of symptoms. Smaller, distal and right-sided calculi are more likely to pass in a spontaneous manner. 14,15

Duration to stone passage is extremely variable and depending on stone size, location and side. Degree of pain, and patient gender and age had no bearing on the time to stone passage. Of ureteral calculi 95% 2 to 4mm. pass spontaneously but passage may take as long as 40 days. Treatment may be required in 50% of ureteral calculi greater than 5mm Conservative management to permit spontaneous passing of stone is preferable provided that passing is in all likelihood in a reasonable period of time, with satisfactory patient symptoms and a low risk of complications. 16 Conservative management is not suitable if infectious symptoms are present, and patient symptoms are intolerable, or if conservative management is considered a potential threat to kidney function. In yet another study, spontaneous passing of ureteral calculi occurred in 76% of the patients with ureteral stones of <5mm, in 60% of the patients with stones of 5-7mm and in 48% of the patients with stones of 7-9mm.¹⁷ Although treatment modalities are different and include CT scan, they have though minimal, deleterious effects on the patients. 18,19

Most of the patients with UVJ and pre UVJ stones manifest LUTS. Patients manifesting LUTS do not require ureteric orifice dilatation and in them Ureteroscopy is relatively easy and time saving. ¹⁰ Also,

Uretroscopy results in stone free rates of almost 95% in a single session.⁶

CONCLUSION

Lower ureteric calculi with LUTS are good indicators. We can approach lower ureteric calculi without use of dilators or 6/7.5 ureteroscopy.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- 1. Finlayson B, Ackermann D. Overview of surgical treatment of urolithiasis with special reference to lithotripsy. J Urol. 1989 Mar;141(3 Pt 2):778-9.
- 2. Eisenberger F, Fuchs G, Miller K. Extracorporeal shockwave lithotripsy (ESWL) and endourology: An ideal combination for the treatment of kidney stones. World J Urol. 1985;3:41-7.
- 3. El-Barky E, Ali Y, Sahsah M, Terra AA, Kehinde EO. Site of impaction of ureteric calculi requiring surgical intervention. Urolithiasis. 2014;42(1):67-73.
- 4. Bader MJ, Eisner B, Porpiglia F, Preminger GM, Tiselius HG. Contemporary management of ureteral stones. European Urol. 2012; 61(4):764-72.
- 5. Leijte JA, Oddens JR, Lock TM. Holmium laser lithotripsy for ureteral calculi: predictive factors for complications and success. J Endourol. 2008;22(2):257-60.
- Marickar YMF. Epidemiology of Stone Disease in Kerala, South India. In: Talati JJ, Tiselius H-G, Albala DM, Ye Z, editors. Urolithiasis: Basic Science and Clinical Practice. London: Springer London;2012:47-51.
- 7. Ordon M, Schuler TD, Ghiculete D, Pace KT, Honey RJDA. Third Place: Stones Lodge at Three Sites of Anatomic Narrowing in the Ureter: Clinical Fact or Fiction? J Endourol. 2013;27(3):270-6.
- 8. Papadoukakis S, Stolzenburg J-U, Truss MC. Treatment Strategies of Ureteral Stones. EAU-EBU Update Series. 2006;4(5):184-90.

- Segura JW, Preminger GM, Assimos DG, Dretler SP, Kahn RI, Lingeman JE, et al. Ureteral stones clinical guidelines panel summary report on the management of ureteral calculi. J Urol. 1997;158(5):1915-21.
- 10. Anagnostou T, Tolley D. Management of Ureteric Stones. European Urol. 2004;45(6):714-21.
- 11. Lotan Y, Gettman MT, Roehrborn CG, Cadeddu JA, Pearle MS. Management of ureteral calculi: a cost comparison and decision making analysis. J Urol. 2002;167(4):1621-9.
- 12. Sowter SJ, Tolley DA. The management of ureteric colic. Curr Opin Urol. 2006;16(2):71-6.
- 13. Ramesh A, Karthick P, Shiva KR. Medical expulsion therapy for ureteric calculus possible!. ISJ. 2016 Dec 13;3(1):113-8.
- Marshall LS. Urinary stones disease. In: Amend WJ Jr, Barbour S, Baskin LS, Berger TG, Bloom AL, Bretan PN Jr, et al editors. Smith's Urology. New York: McGraw Hill; 2004:256-290.
- 15. Ueno A, Kawamura T, Ogaa A, Takayasu H. Relation of spontaneous passage of ureteral calculi to size. Urology. 1977 Dec;10(6):544-6.
- 16. Miller OF, Kane CJ. Time to stone passage for observed ureteral calculi: a guide for patient education. J Urol. 1999 Sep;162(3 Pt 1):688-90.
- 17. Ordon M, Andonian S, Blew B, Schuler T, Chew B, Pace KT. CUA Guideline: Management of ureteral calculi. Canadian Urol Assoc J. 2015;9(11-12):E837-E851.
- 18. Song H-J, Cho S-T, Kim K-K. Investigation of the Location of the Ureteral Stone and Diameter of the Ureter in Patients with Renal Colic. Korean J Urol. 2010;51(3):198-201.
- Jellison FC, Smith JC, Heldt JP, Spengler NM, Nicolay LI, Ruckle HC, et al. Effect of low dose radiation computerized tomography protocols on distal ureteral calculus detection. J Urol. 2009 Dec;182(6):2762-7.

Cite this article as: Krishnappa N, Khan A, Sakranaik S. Role of dilatation of intramural ureter in patients with lower urinary tract symptoms (LUTS) in UVJ and pre UVJ calculus: an observational study. Int Surg J 2018;5:205-8.