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Case Series.

Endoscopic Management of Large Distal Ureteric Stones: A Case Series

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ABSTRACT

Ureteric stones are a significant cause of patient morbidity and urological emergency depart visits. Management of stones depends on multiple factors related to clinical presentation, stone size, location and composition. Treatment can be conservative or medical in smaller stones, but in larger stones active intervention is needed.

We are presenting 6 cases for patients with large Ureteric stones treated at our urology department. The stones measured between 12mm and 29mm, and were all located in the lower third of the ureter. All patients had successful endoscopic stone fragmentation using Holmium YAG Laser under general anesthesia. This report proves that endoscopic laser fragmentation can be done for large distal ureteric stones under day case basis. Hence, decreasing the length of hospital stay, and avoiding complications associated with Laparoscopic or open surgical removal.

Keywords: Large Ureteric Stones, Endoscopic Treatment For Ureteric Stones, Ureteroscopy, Laser Treatment.

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INTRODUCTION

Acute ureteric colic is a common complaint in the emergency department. The reported lifetime risk of ureteric stones ranges from 10-15%. Rates of incidence are influenced by patients' race, climate, sex and age.[1] When the stone is smaller than 5 mm, expectant management can be tried. For stones between 5- 10 mm, medical management can be satisfactory, while for larger stones extracorporeal shock wave lithotripsy, ureteroscopic removal and laparoscopic or open surgery are all commonly employed modalities of treatment. We report the date of 6 cases of large Ureteric stones that were treated successfully with uretroscopic laser fragmentation and stone extraction.

CASE PRESENTATION

Case 1

A 37 years old medically free female patient Presented to our urology department with intermittent right loin pain for 3 months. Computed tomography (CT) showed large (18 mm) ureteric stone at the right vesico-ureteric junction with consequent moderate hydronephrosis (figure 1). The patient was prepared and signed consent for endoscopic fragmentation of the ureteric stone, as a day surgery case. Retrograde study was done and safety guide wire was inserted. The Holmium YAG Laser (30 watts) was used to fragment the stone. Stone fragments were extracted by dromia basket, and a 7 F ureteric stent was inserted. A Follow up plain KUB showed fragmentation of two thirds of the stone. The procedure lasted 75 min.

Three weeks later, the patient underwent a second session of laser endoscopic stone fragmentation with complete stone extraction, without stent insertion. The procedure lasted 35 min.

Case 2

A 40 years old healthy male- apart from right sided developmental dislocation of the hip- was worked up for back pain. Incidental right lower ureteric stone was discovered on plain film of the lumbar spine. Accordingly a Non-contrast CT scan was done and showed a 14mm stone in the right lower ureter (figure 2).

The Patient was prepared and consented for endoscopic stone fragmentation by laser. The procedure was done after retrograde study and safety guide wire insertion. Two thirds of the stone was fragmented, nonetheless the procedure was stopped due to impaired vision. As a result, a 4.8 Fr stent was inserted. The Procedure lasted 35 min.

One month later a similar procedure with completion of stone extraction was done. The procedure lasted 30 min.

Case 3

A 17 year old male patient presented with classic left renal colic. The patient had a history of Cystolithotomy and left sided Ureterolithotomy when he was 2 years old. CT KUB showed 29 mm ureteric stone in the left distal ureter (figure 3).

The Patient was prepared and signed for endoscopic stone fragmentation. A retrograde study showed incomplete duplex

system that ends few centimeters above the stone. Laser stone fragmentation with dromia basket extraction was done. Post-operative KUB showed 50 % reduction in stone size. The Procedure lasted around 60 min. A 4.8 F ureteric stent was inserted.

The Patient documented discomfort, and dysuria, an earlier completion (after 1 week only) was scheduled. Complete fragmentation of the stone was done, and ureteric stent with thread was left in place due to ureteric edema. Two days later the stent was removed and the patient was doing well.

Fig 1: 18 mm long right vesico ureteric junction

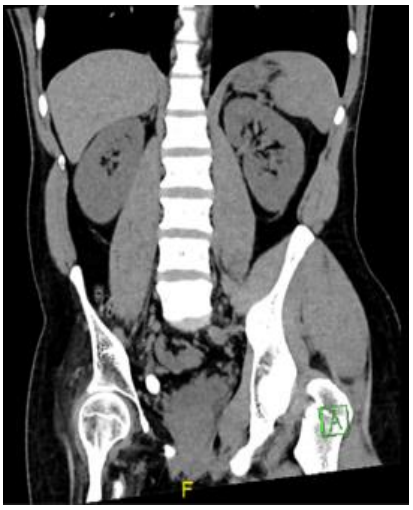

Figure 2: 14 mm lower right ureteric stone

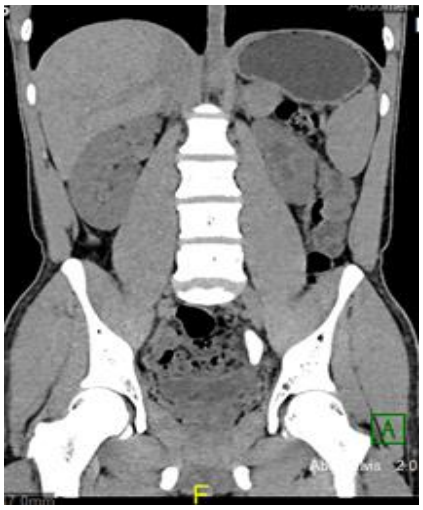

Figure 3: 29 mm long lower left ureteric stone

Case 4

A 26 year-old medically free male patient presented to our emergency department with renal colic. Consequently a CT scan was done and showed a 10 mm stone in the left lower calyx of kidney and 2 ureteric stone in the left lower ureter, just over each other, each measuring 8 mm (figure 4).

Patient was prepared and signed for endoscopic stone management. Retrograde study was performed and safety guide wire was inserted. Complete stone fragmentation and extraction using laser was done. No stent inserted was needed. The procedure lasted 55 min.

Case 5

A 23 year old male patient with no significant medical history presented to our ER with right sided renal colic. The CT Scan showed 12 mm X 8 mm distal right Ureteral St with subsequent marked right hydro-uretero-nephrosis (Figure 5).

The Patient was prepared and consented for endoscopic stone removal. The visual ueterscope showed granulomatous tissue obscuring the stone, located medially like a shelf. Multiple trials were needed to visualize the stone; nevertheless, successful laser fragmentation was done with complete extraction of the stone. A 4.8 Fr stent was inserted. The procedure lasted 45 min. Flexible stent removal was done two weeks later.

Case 6

A 64 year old medically free male patient presented with right sided loin pain for few months. Consequent CT scan showed a 15 mm right lower Ureteric stone and left renal stone (figure 6).

The patient was prepared and consented for endoscopic stone fragmentation. Retrograde study was done and Safety guide was inserted. A complete stone fragmentation and extraction was done following retrograde study and guide wise insertion. The procedure took 60 min. A ureteric stent size 4.8 Fr was inserted which was removed 4 weeks later by flexible cystoscope.

Figure 4: Two left lower ureteric stones 8mm each

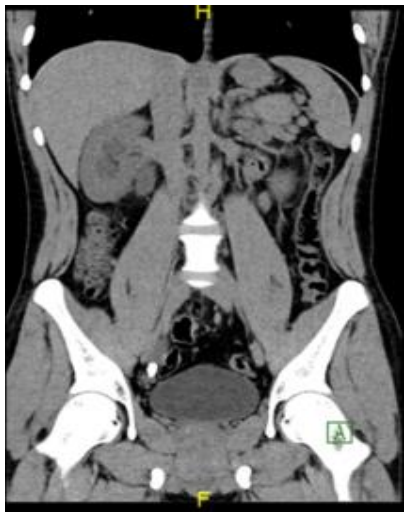

Figure 5: 12 mm right lower ureteric stone

Figure 6: 15 mm lower right ureteric stone

DISCUSSION

Acute renal colic is a common complaint observed in the emergency room. It is usually described as an acute flank pain radiating to the groin and it is often caused by ureteral stones.[1]

Small stones from the kidney, ≤2 to 4 mm in size, usually pass spontaneously along the ureter down to the bladder, ≤ 40 days, and causes minimal obstruction.[2,3] Accordingly, conservative management can be successful. However, when the stone is considered big enough ≥ 5mm, the rate of passing it spontaneously decreases. In such case, the possibility of obstruction is high and medical intervention is mostly required. The indicators for intervention include: (i) evidence of persistent obstruction; (ii) failure of stone progression; and (iii) persisting colic. Medical expulsive therapy with alpha-receptor antagonists potentially shortens the duration and increases the likelihood of spontaneous stone passage. Consideration should be given to offering it to patients with distal ureteral stones less than 10mm in size.[2]

When the stone is large enough, typically, the patient would have a severe, intermittent pain that radiates downward from the loin into the groin as the stone travels from the kidneys down the ureter and into the bladder.[5] Furthermore, a big ureteric stone will cause a high probability of interaction between the stone surface and ureteral mucosa, which can induce inflammation at the stone site. This may promote a decrease in ureteral compliance and luminal diameter, further inhibiting stone passage.[6] Hence, a serious complication of ureteric stones is renal obstruction and subsequent infection and sepsis. This is considered a medical emergency and prompt decompression of the kidney is required. Decompression can take the form of Percutaneous Nephrostomy insertion or retrograde ureteric stent insertion.[7]

A number of factors must be considered in determining the optimal treatment for patients with renal or ureteral calculi. These factors may be grouped into four categories: stone factors (location, size, composition, presence and duration of obstruction); clinical factors (symptom severity, patient's expectations, associated infection, obesity, coagulopathy, hypertension and solitary kidney); anatomic factors (horseshoe kidney, ureteropelvic junction obstruction and renal ectopia); and technical factors (available equipment, expertise and cost).[2]

Computed tomography is the most accurate imaging modality in diagnosing a patient with renal colic.[8] Therefore, for all patients discussed above, CT KUB was done.

There is no clear definition of large ureteric stone, however most guideline use 10mm as cut-off point when considering treatment options. Typically, when stone removal is indicated SWL (Shock Wave Lithotripsy) and Ureteroscopy (URS) are the two most commonly offered interventional procedures that are both acceptable as first-line treatments.[9] For proximal ureteral stones <10 mm, SWL had a higher stone-free rate than URS (90% vs. 80%), whereas for stones >10 mm, URS had superior stone-free rates (79% vs. 68%). the stone-free rate for mid-ureteral stones was not statistically significantly different between URS and SWL, whereas for distal stones, URS yielded better stone-free rates overall and in both size categories.[2] Ultimately, the size and location of stones, the urologist's expertise and the availability and access to resources and appropriate technologies remain the principal criteria to inform treatment choice for the management of ureteric stones. Common methods of intracorporeal ureteroscopic lithotripsy include pneumatic, electrohydraulic, and Holmium:YAG (Ho:YAG) laser. Treatment of ureteral stones with Ho:YAG lithotripsy is superior ($p < 0.05$) to pneumatic lithotripsy when comparing stone-free rate (95–98.6% vs. 80–86%),operative time (15–20 vs. 25–33 mins),and need for additional treatment.[2] Recently, Laparoscopic Ureterolithotomy, which is minimally invasive alternative to open surgery, has been described for the treatment of large ureteral stones.[10] Despite that, when minimal invasive procedures fails, the need for open Ureterolithotomy and invasive open surgery is still necessary in order to obstinate ureteral stones.[11]

Treatment by uretroscopy is highly successful and minimally invasive. Moreover, it is associated with minimal morbidity in the hands of skilled urologists. It can be used with larger and multiple stones, and has high immediate stone-free rates possibly resulting in decreased patient anxiety and resultant increased patient satisfaction.

On the other hand, the complication for ureteroscopy and ureteral stone fragmentation includes; granuloma which is defined as a calcium oxalate particles embedded in the ureteral wall that causes ureteral stricture.[12] In addition, proximal migration of stone fragments during ureteroscopic lithotripsy is a common problem influenced by pressure of irrigation solution, type of energy for lithotripsy, site and degree of fixation of the stone to the ureteral wall, and degree of proximal ureteral dilation.[13] Devices such as Stone Cone[13] and Dormia Basket are used in order to facilitate safe extraction of small particles after laser fragmentation. In case of pneumatic lithotripsy, the Stone Cone was reported as a safe and efficient device in preventing proximal stone migration during ureteroscopy.[14] Furthermore, impacted stone may also occur after the procedure, which is defined by the inability to pass a guidewire or catheter on initial attempts.[15] The only documented limitation of endoscopic large distal stone management we faced in our experience was the completion of the treatment in one session. Within this limitation, none of the patient discussed in this series required more than two sessions, regardless of the stone size.

CONCLUSION

Successful Treatment of large (more than 10 mm) distal ureteric stone can be achieved by endoscopic stone lithotripsy on day case basis, Given proper pre-operative planning, and good experience. This results in decreasing the need for Laparoscopic or open Ureterolithotomy; hence decreasing the hospital stay and providing more patient satisfaction.

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REFERENCES

1. Gupta Ameet, Aboumarzouk Omar M, Jefferies Matthew T, Kynaston Howard G,Datta Shibs. Calcium channel blockers as medical expulsive therapy for ureteric stones. Cochrane Database of Systematic Reviews. 1 July 2014. [CochraneLibrary]

2. Michael Ordon, MD, FRCSC, Sero Andonian, MD, FRCSC, Brian Blew, MD, FRCSC, Trevor Schuler, MD, FRCSC,Ben Chew, MD, FRCSC, and Kenneth T. Pace, MD, FRCSC. CUA Guideline: Management of ureteral calculi. Can Urol Assoc J. 2015 Nov-Dec; 9(11-12): E837–E851. [PubMed]

3. 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.[PubMed]
4. Tom Dehn. The management of ureteric. J Urol. 1990 Feb;143(2):263-6. [PubMed]
5. Omid Iravani, Ern-Wei Tay, Boon-Huat Bay, Yee-Kong Ng. Unilateral ureteric stone associated with gross hydronephrosis and kidney shrinkage: a cadaveric report. Anat Cell Biol. 2014 Dec; 47(4): 267–270. [PubMed]
6.Geoffrey R Nuss, BA, Judson D Rackley, MD, Dean G Assimos, MD. Adjunctive Therapy to Promote Stone Passage. Rev Urol. 2005 Spring; 7(2): 67–74. [PubMed]
7. Luis Osorio, Estêvão Lima, Riccardo Autorino, Filinto Marcelo. Emergency management of ureteral stones: Recent advances. Indian J Urol. 2008 Oct-Dec; 24(4): 461–466. [PubMed]
8. Ziauddin Khan, Alaeddin A. Yaqoob, Tanweer A. Bhatty. Spontaneous retrograde migration of ureterovesical junction stone to the kidney; first ever reported case in the English literature in human. Urol Ann. 2016 Apr-Jun; 8(2): 229–232. [PubMed]
9. Zanetti G. Ureteral stones: SWL treatment. Arch Ital Urol Androl. 2011 Mar;83(1):10-3. [PubMed]
10. Rajiv Rathod, Prashant Bansal, and Srinivas Gutta. A giant ureteric calculus. Indian J Urol. 2013 Jul-Sep; 29(3): 263–264. [PubMed]
11. Lee WC, Hsieh HH. Retroperitoneoscopic ureterolithotomy for impacted ureteral stones. Chang Gung Med J. 2000 Jan;23(1):28-32. [PubMed]
12. Dretler SP, Young RH. Stone granuloma: a cause of ureteral stricture. J Urol. 1993 Dec;150(6):1800-2. [PubMed]
13. Rodríguez García N, Fernández González I, Pascual Mateo C, Chiva Robles V, Luján Galán M, Llanes González L, Berenguer Sánchez A. Stone Cone: a device that prevents ureteral stone migration during intracorporeal lithotripsy. Arch Esp Urol. 2005 May;58(4):329-34. [PubMed]
14. Tarek Gameel, Mohamed Radwan, Ahmed Ramadan, Mutie Alkathiri, Adel Omar. A comparison of Stone COne versus lidocaine jelly in the prevention of ureteral stone migration during ureteroscopic lithotripsy. Ther Adv Urol. 2011 Oct; 3(5): 203–210. [PubMed]
15. Morgentaler A, Bridge SS, Dretler SP. Management of the impacted ureteral calculus. J Urol. 1990 Feb;143(2):263-6. [PubMed]

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