

Transurethral Cystolithotripsy Using Holmium Laser

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ABSTRACT

Background: The bladder stones have been said to constitute 5% of urolithiasis in developed countries. The use of holmium laser has revolutionized the treatment of bladder stone. **Aim:** To share our experience as a single centre in the use of laser in the treatment of small bladder stones. **Patients and methods:** A prospective study between 2015 and 2019. A total number of 85 patients with bladder stone more than 1.5 cm were included in the study. Sex, size of stone, time of procedure, stone clearance, hospital stay complications were analysed. **Results:** A total of 85 patients with bladder stone underwent transurethral cystolithotripsy LA. The mean age of the patient was 52±7 years. There were 80 males and 5 females. The mean size of stone was 1±1.2cm. The mean operation time was 40±10 minutes. The complete stone clearance was achieved in all the patients. None of the patients required hospital stay following the procedure. **Conclusion:** Transurethral holmium laser lithotripsy is an effective and safe procedure for large bladder stones. This procedure can be easily performed as a day care procedure.

Keywords: Bladder stone, Cystolithotripsy, Laser, Urolithiasis

INTRODUCTION

The management of bladder calculi has steady improved with the holmium laser revolutionising urinary lithiasis. The holmium laser has demonstrated with several trials, its superiority over other methods of stone clearance with dusting and minimal mucosal damage [1]. The worldwide incidence of urolithiasis is assessed at 14% while the incidence of bladder stone makeup 5%of urolithiasis [2,3]. The endoscopic method for the management of bladder calculi includes the use of energy sources such as laser, pneumatic and ultrasound which are of course very helpful in the clearance of small bladder calculi with minimal morbidity. Open surgery remains the only way to remove the majority of larger stones intact; there is however, an attendant greater morbidity [4]. The aim of our study is to demonstrate the use of laser in the treatment of small bladder calculi.

PATIENTS AND METHODS

This study was done between 2015 and 2019. A total number of 85 patients with bladder stones were sampled and those with more than 1.5 cm were included in the study. Sex, size of stone, time of procedure, stone clearance, hospital stay complications were analysed. The diagnosis was made with ultrasound scan of the bladder with dimensions and cystoscopy done to establish any bladder outlet obstruction, foreign bodies or any congenital malformations such as posterior urethral valves. Abdominal radiograph of the kidney ureters and bladder was done. Urine was kept sterile with prophylactic antibiotics. All the patients received subarachnoid block and placed in a lithotomy position. A rigid cystoscope size 18Fr was used for the initial cystoscopy and some patients had multiple bladder stones as shown in the Figure 1. Thereafter a 500 micron laser fiber inserted through the working channel was to dust the stone at a power

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of 30W as shown in Figure 2. The dusted particles were frequently evacuated using the Elliks evacuator and subsequently irrigated for clearance. At the end of the procedure, a size 18Fr 3way Foley catheter was used for a continuous irrigation postoperative period for 5 hours and later discharged home same day. Stone clearance was assessed using the ultrasound scan second day postoperative period and a check cystoscopy was done a week later for assessment of complete clearance.



Figure 1: Multiple bladder stones



Figure 2: Holmium laser directed at the bladder stone

RESULTS

In all, 85 patients diagnosed with bladder stone had transurethral laser cystolithotripsy. Three patients had multiple small stones while 82 patients had solitary calculi. The mean age of the patients was 52 ± 7 years. There were 80 males and 5 females. The mean size of stone was 1 ± 1.2 cm. The mean operation time was 40 ± 10 minutes. A Complete stone clearance was achieved in all the patients. There were no major complications during surgery and patient's parameters remained within normal ranges. A slight hematuria was observed following mucosal injuries but was cleared after irrigation. There was no blood transfusion done for any of the patients. None of the patients required hospital stay after following the procedure.

DISCUSSIONS

Bladder stones constitute 5% of all urolithiasis [2]. At present, there is no consensus about the optimum management of cystolithiasis. Several options are widely chosen ranging from transurethral or percutaneous cystolithotripsy to open surgery and shock wave lithotripsy. Several factors such as stone size, number, patient's history of treatment, general health status, availability of equipment and of course the surgeon's preference should be considered in making the appropriate decision [5]. In our study, we utilized holmium laser for the bladder calculi of less than 1.5 cm. One of the commonly associated injuries during cystolithotripsy was urethral injury which was commonly caused by the use of very large cystoscope of about 26 Fr size and also the poor skill of negotiating the urethra [6]. In our patients, we used the size 18 Fr cystoscope and thereafter drained the bladder with size 18 Fr 3way Foley catheter. Although we did not get any significant bladder injury, Althunayan and colleagues reported bladder perforation that resulted in urinary diversion [7].

CONCLUSION

In general, laser use in bladder stone surgery is dependent on the size of the stone and other structural anatomy of the lower urinary tract; however its overall safety is higher than other forms of bladder calculi treatment.

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