



STONES/ENDOUROLOGY
ORIGINAL ARTICLE

Safety and efficacy of cystoscopically guided percutaneous suprapubic cystolitholapaxy without fluoroscopic guidance



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KEYWORDS

Safety;
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Cystolitholapaxy;
Outcome;
Fluoroscopy

ABBREVIATIONS

KUB, plain abdominal radiograph of the kidneys, ureters and bladder;
PCCL, percutaneous cystolitholapaxy;
QoL, quality of life;
SWL, shockwave lithotripsy;

Abstract Objective: To evaluate the safety and efficacy of percutaneous cystolitholapaxy (PCCL) under cystoscopic guidance and without fluoroscopy for the management of large or multiple bladder stones.

Patients and methods: Prospectively collected data were reviewed for patients undergoing PCCL with cystoscopic guidance and without fluoroscopy. Patients with a bladder stone burden of ≥ 30 mm were included. Stone fragmentation was achieved using a pneumatic lithotripter through a rigid nephroscope and the fragments were removed with peanut forceps. Patients with concomitant bladder malignancy, previous pelvic radiotherapy, previous pelvic–abdominal surgery, or benign prostate enlargement of > 80 mL were excluded from the study.

Results: In all, 40 male patients were included between July 2011 and June 2014 with a mean (SD) age of 36.9 (17.6) years. A single bladder stone was detected in 22 (55%) patients, whilst 18 (45%) had multiple bladder stones, with a mean (range) stone size of 35 (32–45) mm. The stone-free rate was 100% and the procedure was well tolerated by all patients. No intraoperative bladder perforation, bleeding or major perioperative adverse events were recorded. The mean (SD) hospital stay was 2.2 (0.41) days and the catheterisation time was 1.2 (0.6) days. At 4 weeks postoperatively, no significant stone fragments were found in any of the patients.

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TUCL;
transurethral
cystolitholapaxy;
US, ultrasonography

Conclusion: PCCL under cystoscopic control and without fluoroscopy seems to be an effective and safe technique to remove large or multiple bladder calculi. It represents an alternative treatment option, especially in situations where fluoroscopy is not available, and radiation hazards can be avoided.

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Introduction

Urinary bladder calculi represent ~5% of urolithiasis [1], most commonly solitary although multiple stones are found in ~25% of cases [2]. The management options for vesical lithiasis have changed dramatically with the development of endourological fibre-optic instruments and extracorporeal shockwave lithotripsy (SWL) [3]. Various techniques have been used for the management of bladder calculi, such as open cystolithotomy, transurethral cystolitholapaxy (TUCL), SWL, and percutaneous cystolitholapaxy (PCCL) [4,5]. However, the ideal treatment option for bladder stones remains controversial [3].

Despite its restriction in children with a narrow urethra, TUCL has gradually gained enough popularity to replace open cystolithotomy [6]. PCCL, which uses the principles of percutaneous nephroscopic stone removal under fluoroscopic guidance, is a well-established technique with high efficacy, particularly when treating large or multiple bladder stones, and has fewer adverse events than TUCL [4,5]. Compared with transurethral surgery PCCL has advantages, as stones are visualised better, it is not limited by prostate enlargement, can deal with large and multiple stones, and fragments are easily removed through the large calibre Amplatz sheath [4].

Although, fluoroscopic guidance in PCCL is recommended, it is not always available in many centres in developing countries. Therefore, we report our experience in the present study in treating men with large or multiple bladder stones by suprapubic PCCL, guided with cystoscopy without fluoroscopy. We believe that this may help to increase the therapeutic effectiveness and decrease the morbidity and complications associated with vesical calculi removal procedures.

Patients and methods

A prospectively maintained database for patients who underwent PCCL was reviewed between July 2011 and June 2014 for patients with bladder stones burdens of ≥ 30 mm.

Patients excluded from the study were those with concomitant bladder pathology such as: malignancies, previous pelvic radiotherapy, previous pelvic-abdominal surgery, or severe LUTS secondary to BPH

of > 80 mL, in whom open surgery may be required. The IPSS and quality of life (QoL) index were used to assess the bothersomeness of LUTS.

All patients underwent a complete preoperative evaluation including: a full medical history; physical examination; laboratory investigations including urine analysis, urine culture and sensitivity; preoperative laboratory assessment; and imaging studies including abdominopelvic ultrasonography (US) and plain abdominal radiograph of the kidneys, ureters and bladder (KUB). The details of the operative procedure were explained to all patients before obtaining informed consent.

Surgical procedure

A prophylactic preoperative antibiotic injection was administered to patients with sterile urine; those with bacteriuria were treated according to the culture and sensitivity results. The procedures were performed under caudal or spinal anaesthesia with i.v. sedation. In the lithotomy position, urethrocystoscopy was initially performed and the bladder filled with normal saline to make suprapubic access easier. The anterior wall of the bladder was endoscopically observed to provide continuous intravesical guidance for the percutaneous approach. The cystoscope helps to provide continuous intravesical guidance for the puncture and dilatation during the percutaneous approach and avoids injury of the posterior wall of the bladder and the rectum. Also, all steps of the PCCL can be monitored by the assistant surgeon to avoid slippage of the guidewire or loss of the tract and the sheath, and can be used to direct the nephroscope towards missed stones. The cystoscope was not left *in situ* throughout the procedure but only to establish the access for the percutaneous tract and at the end of the procedure, when suction of the stone fragments was needed.

A suprapubic puncture was made with an 18-G needle through a 1–2 cm transverse skin incision above the symphysis pubis. The obturator was then removed and a 0.97 mm (0.038") floppy-tip guidewire was advanced into the bladder through the needle and coiled inside the bladder. Dilatation of the cystostomy tract over the wire followed, using Alkensis' coaxial dilators, to allow insertion of the Amplatz sheath with an inner diameter of 30 F. A 26-F rigid nephroscope was then advanced into the bladder, and the stones were

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