

USE OF MAUERMAYER STONE PUNCH TO TREAT POSTERIOR URETHRAL DIVERTICULA CALCULUS IN A PATIENT WITH MULTIPLE CONGENITAL ANOMALIES OF URINARY TRACT

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ABSTRACT

Background: Posterior urethral diverticulum calculus (PUD-C) is a rare urethral lesion that can pose as a diagnostic dilemma and in instances laborious to treat.

Objectives: To report a rare case of posterior urethral diverticulum calculus (PUD-C) treated by the use of Mauermayer stone punch in a patient with double ureter , mal-development of the prostate and chronic viral hepatitis.

Case: A 37year old male, who presented with a year history of bothersome Lower urinary tract symptoms (LUTS) with episodes of purulent urethral discharge. His posterior urethral diverticulum calculus (PUD-C) was confirmed at urethroscopy alongside maldeveloped prostate, hanging verumontanum, urinary bladder trabeculations, and sacculations. He had urethrolitholapaxy using Mauermayer stone punch with a concurrent alleviation of the LUTS.

Conclusion: The pertinent publications on the clinical features, treatment, and the outcome of PUDC were reviewed. Utilization of Mauermayer stone punch for PUDC urethrolitholapaxy is a novel treatment technique. It, however, alleviated the bothersome lower urinary tract symptoms and granted a satisfactory outcome in the index patient.

KEYWORDS: Congenital, Primary, Posterior urethral, Diverticular calculus, Mauermayer stone punch.

INTRODUCTION

PUD-C is a rare urethral pathology that signified the presence of a calculus within a posterior urethral blind ended out pouching. Even though urethroscopy affirmed the diagnosis, when the time-honored manipulation of urethral calculi into the bladder fails¹ for the calculus clogged within a posterior urethral diverticulum; management becomes exceptionally challenging. There is no treatment protocol for the management of PUD-C due to

its rarity. The Urethrolithotomy, Diverticulectomy with urethroplasty is not as forthright as in the case of an anterior urethral diverticulum². The modern minimally`invasive lithotripters are expensive; the devices often delicate, in addition to being out of reach to most centers in the developing world. The open surgical alternatives are invasive and the procedure could be blighted with serious complications especially in patients with chronic viral hepatitis. This case report was on a patient with PUD-C that presented with bladder outflow obstruction secondary to PUD-C with background chronic viral hepatitis who had urethrolitholapaxy using the Mauermayer stone punch, with a gratified outcome.

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CASEREPORT

A 37year old businessman, who presented with a year history of bothersome obstructive and irritative Lower urinary tract symptoms (LUTS). He had 3 episodes of associated purulent urethral discharge with suprapubic



pain and fever treated with antibiotics; however, the predominantly obstructive LUTS persisted. About one month before the onset of LUTS, he had colicky right flank pain that subsided with liberal fluid intake, tramadol, and ciprofloxacin. No flank swelling and no haematuria. He had occasional generalized body itching with past history of jaundice. His other systems are normal. He was married with children and he neither smoke cigarette nor drink alcohol beverages.

On examination, he was well preserved, not in distress, afebrile, anicteric, and not pale. He had neither facial puffiness nor pedal oedema. He had no peripheral stigmata of chronic liver disease. On the abdominal examination, the liver span was 11cm; other findings including the external genital and rectal examinations were all normal.

His abdominopelvic ultrasound at the time of the flank pain revealed echogenic shadow in the right kidney and other features in keeping with nonobstructive renal calculi plus a slightly coarse liver echotexture that had a

span of 10.5cm. The intravenous urogram about a month later, however, revealed calculi in the region of the posterior urethral (Figure 1) with right partial proximal duplicated ureter but no calculi in the upper urinary tract (Figure 2). His urine M/C/S yielded no growth but pus cells of 2-3/hpf, Red Blood Cell was 1+, and sperm cell 4-6/hpf. He was reactive to HBsAg and Anti-HBc but not to HBeAg and Anti-HBs, and the retroviral screening was negative. The liver function test, serum protein and albumin, Full Blood Count and differentials, and the urea, electrolytes and creatinine were all within the normal range. He was co-managed with physicians for the chronic viral hepatitis.

The PUD-C was confirmed at urethrocytoscopy alongside mal-developed prostate, hanging verumontanum (Figure 3&4), bladder trabeculations and sacculations. He had urethrolitholapaxy using Mauermayer stone punch at the same sitting followed by alleviation of his LUTS.

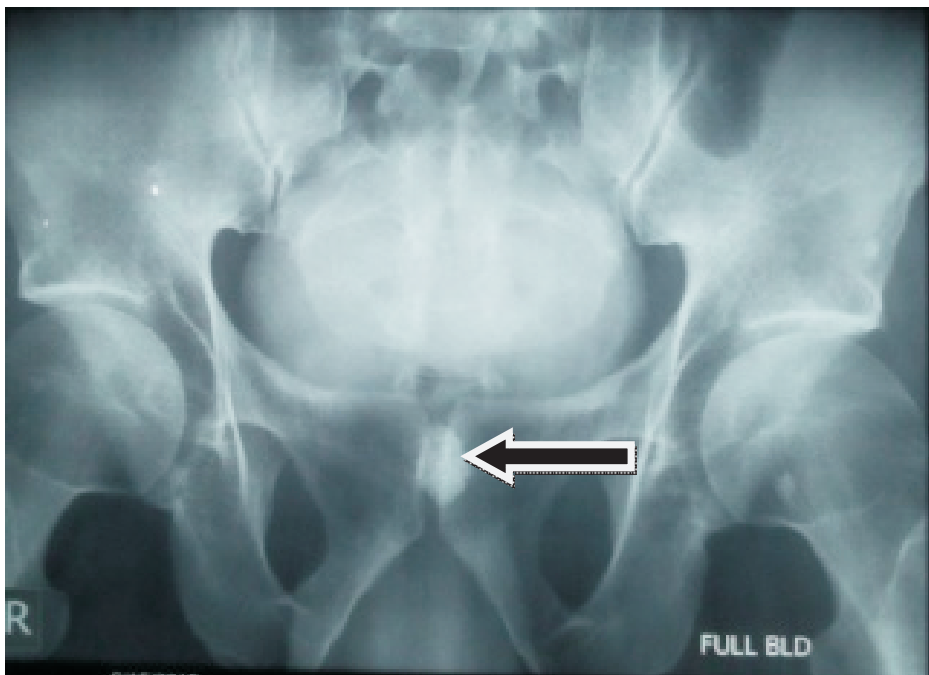


Figure 1: vesical phase of the IVU showing radiopaque shadow (urethral calculi) in the posterior urethral



Figure 2: Intravenous urogram (IVU) showing bilateral functioning kidney with right proximal partial duplicated ureter

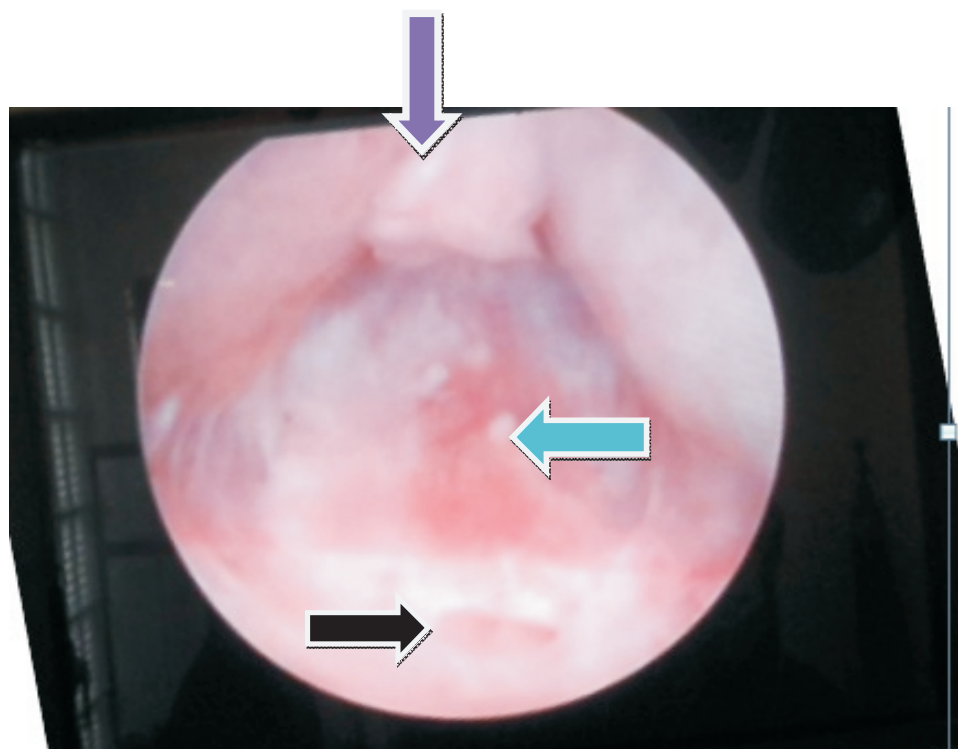


Figure 3: Malformation of the prostate, Posterior Urethral Diverticulum hanging verumontanum apparent after urethrolitholapaxy. Light blue arrow showing the posterior urethral diverticulum, light purple arrow showing the hanging verumontanum, black arrow pointing at the ? opening of ejaculatory duct

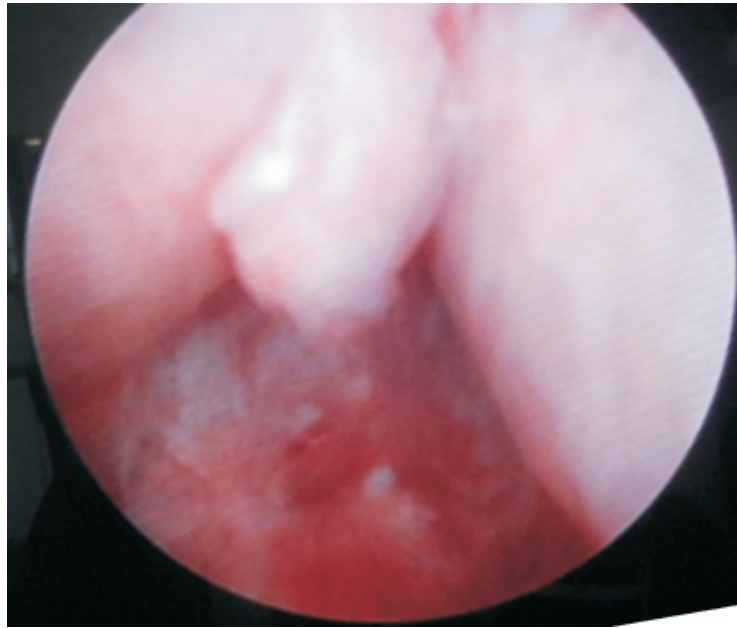


Figure 4: Malformation of the prostate, hyperaemic Posterior Urethral Diverticulum and hanging verumontanum apparent after urethrolitholapaxy.

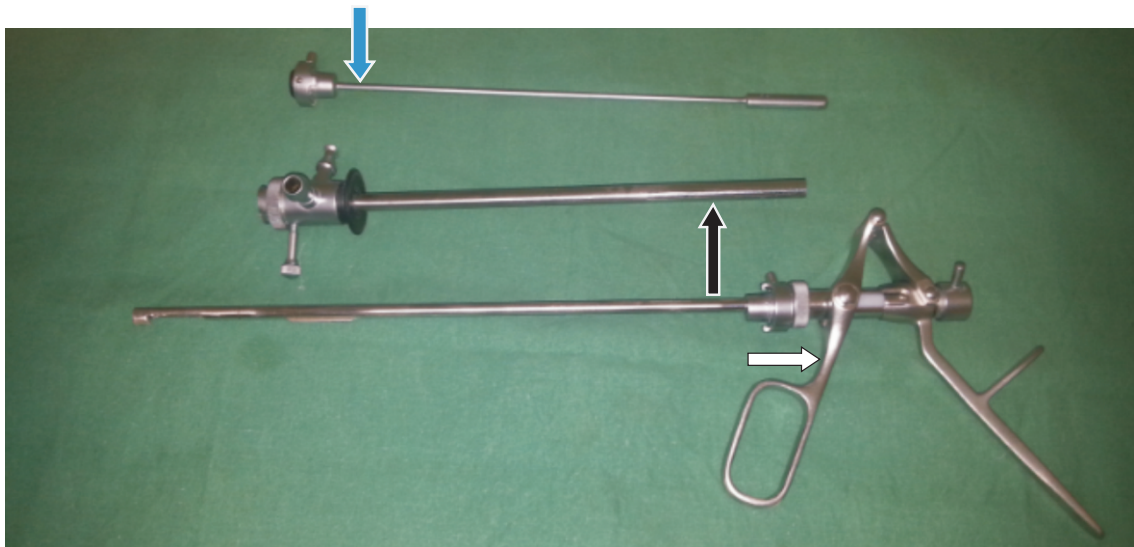


Figure 5: The Mauermayer stone punch use for the urethrolitholapaxy consisting working element (white arrow), the sheath (black in white arrow) and insertion obturator (blue in white arrow)

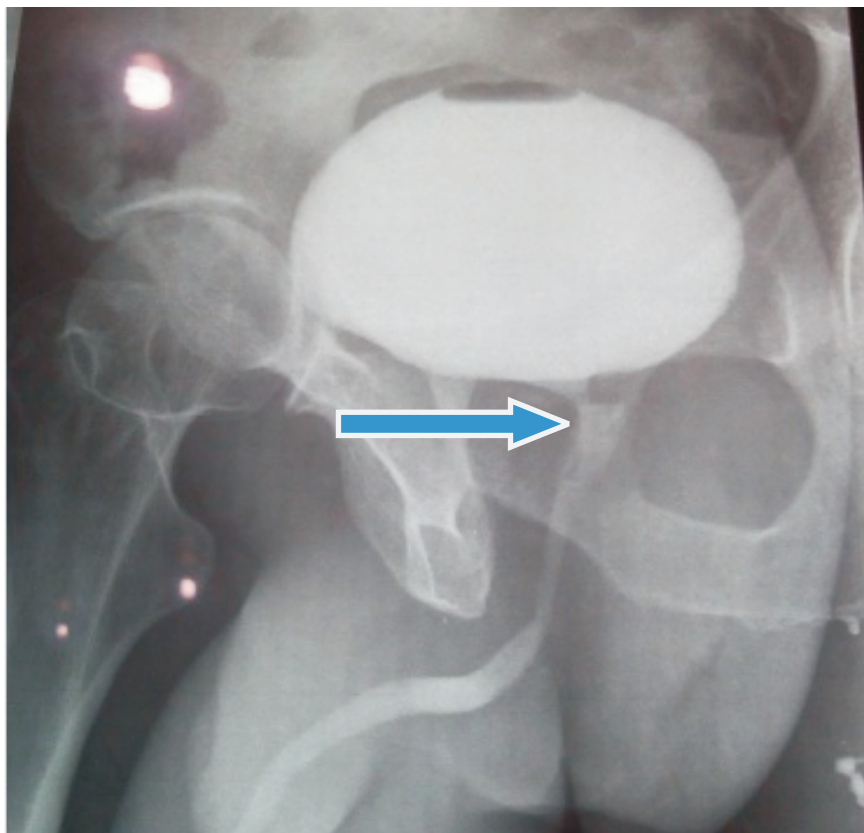


Figure 6: Micturating cystourethrogram (MCUG) with an arrow showing the restricted segment of posterior urethra blind ended out pouching after the urethrolitholapaxy

DISCUSSION

A posterior urethral diverticulum is a rare urethral anomaly that signified blind ended posterior urethral outpouching; in the index patient, it was complicated by impaction of a calculus within the diverticulum. Most posterior urethral diverticula reported in the literature were acquired in provenience. In a review of 95 patients with posterior urethral diverticula, Wachsberg et al established that 93.7% were of acquired aetiology³. They are for the most part the complications of open or laparoscopic anorectal surgeries, urethral trauma or other urethral lesions^{4,5,6}. While the hypothesis for congenital posterior urethral diverticulum was proffered as due to defective or deficient fusion of a sector of the urethral plate⁷. However, our patient had none of the antecedent lesions or history of procedure that could suggest an acquired pathology. The congenital aetiology of the PUD in the index

patient was further attested with the ancillary discovery of prostate and verumontanum maldevelopment during urethroscopy and the right double ureter on intravenous urogram that adds up to multiple congenital anomalies of the urinary tract. These congenital anomalies are not automatically the aetiological factors of the PUD-C since most urolithiasis are actually idiopathic in origin.

The patients with posterior urethral diverticulum could be asymptomatic and hence, likely responsible for the index patient's delayed in presentation until complicated by the calculus and bladder outlet obstruction⁸. The other complications patient may present with include urethritis, and urethral fistula⁹. The diverticula are most often ventrally placed as in the index patient but the dorsally situated outpouching was also reported¹⁰. The index

patient presented with obstructive and irritative LUTS; these symptoms are not specific but the timely diagnostic urethroscopy affirmed the PUD-C. It is projected that posterior urethral diverticulum can cause the bladder outlet obstruction with LUTS and the ensuing complications when it fills up during voiding and compresses the bladder neck and urethra from behind⁸. The PUD-C in the index patient was Young Group IV (Calculi in the prostatic urethra)¹¹ and Jolly type c (pre-formed cavity in the prostate gland)¹². The patient's antecedent right renal colic with an echogenic shadow in the kidney during ultrasonography, the intravenous uroterogram findings that revealed no upper urinary tract calculi but only right double ureter subsequently; the calcium phosphate with calcium oxalate chemical composition of the calculus all supported migratory calculus that is also dubbed primary or autochthonous in the diverticulum. This was radio-opaque and easily visualized on the IVU film (figure 1). Magnesium phosphate is often seen in the indigenous calculus dubbed secondary calculus which is often associated with urethritis¹³. The 3 episodes of urethritis patient had were probably the infective complications of PUD-C and the bladder outlet obstruction. Although few cases of PUD-C have been reported; the index case was, nevertheless, likely the first reported to have urethrolitholapaxy by the use of Mauermayer stone punch. The Mauermayer stone punch has established application in cystolitholapaxy with an advantage of simplicity, low-cost and being autoclavable when compared to ultrasonic, pneumatic, laser and electrohydraulic lithotripters. The instrument is strong, highly cost effective and enables a day case procedure as obtained with the use sophisticated costlier devices (figure 5). Mauermayer stone punch is easy to add to the Urethroscopy armamentarium in the low-resource setting such ours.

Physicians and Surgeons, in particular, are at proclivity of acquiring and spreading hepatitis

viruses with such risks proportionate to the invasiveness of the procedure¹⁴. The urethrolitholapaxy done for the patient was at the same sitting with urethroscopy in the same dorsal lithotomy position with whole procedure lasting less than an hour and bleeding very trivial could reduce such risks to the minimum.

The steps subsequent to diagnostic urethroscopy, entailed stone identification, grasping, crushing and evacuating the stone debris with Ellik evacuator. The postoperative MCUG revealed a wide mouthed diverticulum that drains; no vesicoureteral reflux probably the reasons the patient was initially asymptomatic hence PUD-C recurrence due to the PUD unlikely (figure 6). Other treatments described in the literature included open transvesical prostatolithotomy, bladder neck incision, and bladder neck reconstruction, radical prostatectomy, open retropubic prostatolithotomy, all of which are invasive and the costly minimally invasive endoscopic lithotripsy^{15,16}. The patient had a gratifying outcome at follow-up. The use of Mauermayer stone punch in the index patient was free from intricacy common to the open surgical regimens^{15,16}.

CONCLUSION

Urethroscopy supplementary to high index of suspicion is a requisite for the diagnosis of PUD-C. Since the outcome of the interventions using Mauermayer stone punch in the index patient is highly gratifying and remarkably cost effective it could be recommended for the treatment of PUD-C. Further study will likely affirm its superior cost effectiveness.

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