

# Male urethral diverticulum uncommon entity: Our experience

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## Abstract

Out pouching of the urethral wall could be congenital or acquired. Male urethral diverticulum (UD) is a rare entity. We present 2 cases of acquired and 1 case of congenital male UD. Case 1A: 40 year male presented with SPC and dribbling urine. Clinically he had hard perineal swelling. RGU revealed large diverticulum in proximal bulbar, irregular narrow distal urethra and stricture just beyond diverticulum. Managed with perineal exploration, stone removal, diverticulum repair and urethroplasty using excess diverticular wall. Case 2A: 30 year male with obstructive lower urinary tract symptoms (LUTS). Retrograde urethrogram (RGU) revealed bulbar urethral diverticulum akin to anterior urethral valve, managed endoscopically. 1 year follow up urine stream satisfactory. Case 3A: 27 year male previously operated large proximal bulbar urethral stone with incontinence. RGU large proximal bulbar UD with wide open sphincter. Treated with excision of excess diverticular wall and penile clamp with pelvic exercises for incontinence. Congenital UD develops due to imperfect closure of urethral fold, Acquired UD occurs secondary to stricture, infection, trauma, long standing impacted urethral stones or scrotal / skin flap urethroplasties. RGU and MCU are the best diagnostic technique to confirm and characterize the UD. Urethral diverticulectomy with urethral reconstruction is the recommended treatment for UD. UD is a rare entity. Especially in males, congenital are even more rare. Management should be individualized. Surgery can involve innovation and/or surgical modifications. We used excess diverticular flap for stricture urethroplasty in one case.

**Key Words:** Retrograde urethrogram, urethral diverticulum, urethroplasties

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## INTRODUCTION

Urethral diverticulum (UD) is a saccular dilatation of the urethral wall, continuous with the true urethral lumen. It is a rare entity, with a peak age incidence of 25–45 years. UD

can be congenital (10%) or acquired (90%).<sup>[1]</sup> The congenital UD may result from incomplete development of the urethra. Acquired UD occurs secondary to stricture, infection, trauma, or postsurgery. Acquired UD more commonly seen in males.<sup>[1-4]</sup>

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We present two cases of acquired and one case of congenital male UD.

## CASE REPORTS

### Case 1

A 40-year-old male had prolonged obstructive lower urinary tract symptoms (LUTS), poor stream and dribbling of urine was taken up for psoas abscess drainage on 16<sup>th</sup> July 15. Intraoperative catheterization was not possible; hence, supra pubic catheterization (SPC) was done. He reported to our center with SPC *in situ* and dribbling urine. Clinically, he had palpable hard perineal swelling. Blood investigations were normal, but significant pyuria on urinalysis. On kidney, ureter, and bladder, revealed prostatic and bulbar urethral stones.

Micturating cystourethrogram (MCU) revealed bladder saccules, left side Grade I reflux with small stone in terminal ureter and dilated posterior urethra. Retrograde urethrogram (RGU) revealed large diverticulum in proximal bulbar, irregular narrow distal urethra, and stricture just beyond diverticulum [Figure 1].

On the basis of history, examination and investigations, provisional diagnosis of proximal penile stricture extending to peno – bulbar junction with proximal UD with stone was made. The stricturous urethra was dissected through midline perineal incision. Stone in diverticulum was opened and removed. The excess diverticular wall was excised, while utilizing remaining

part to repair distal stricture as a rotational flap over 14 French silicone catheter [Figure 2].

After confirming absence of leak by RGU, the per-urethral catheter was removed on the 21<sup>st</sup> postoperative day. The patient voided with the good stream (Q<sub>max</sub> of 18 ml/s), without any postvoid residue [Figure 3]. The patient is doing well at 6 months of follow-up.

### Case 2

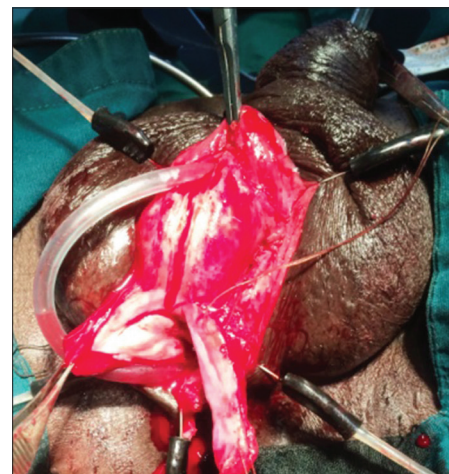
A 30-year-old male having obstructive LUTS, poor stream and straining while micturation for 2 year. Clinically no abnormality seen. Blood investigations were normal. Uroflowmetry shows obstructive and straining pattern with Q<sub>max</sub> of 7 ml/s. Ultrasonography suggested significant postvoid residual urine. RGU revealed anterior UD in the bulbar urethra with its distal hanging edge acting as an anterior urethral valve and distally, no stricture seen [Figure 4]. With this, diagnosis of congenital UD is made and the patient is taken up for surgery. On cystourethroscopy, there was no evidence of distal urethral stricture, but there was anterior UD and its distal hanging edge was incised, proximal urethra was normal. The patient is on regular follow up since 1 year with no complaints and good stream. Postoperative RGU showed persistent diverticulum without an increase in size [Figure 5]. There was no postvoid residual urine.

### Case 3

A 27-year-old male came with complain of dribbling and incontinence of urine. He had a history of open urethrolithotomy in 2007 for calculus in bulbar urethra, post operatively he developed urethro-perineal fistula with incontinence. Urethroplasty was done for fistula closure in 2011. Incontinence persisted, for which he came to us in 2015. Clinically there was palpable swelling at perineum with the scar



**Figure 1:** Retrograde urethrogram and micturating cystourethrogram shows irregular narrow distal urethral stricture, large diverticulum in proximal bulbar with dilated posterior urethra. Bladder show saccules with Grade 1 reflux on left side and stone in left terminal ureter



**Figure 2:** Intra operative image showing excess diverticular wall used as a rotational flap to repair distal stricture

of previous surgery. Blood investigations were normal. RGU revealed a large outpouching in the bulbar region [Figure 6]. The patient underwent diverticulectomy with urethroplasty in 01/2015 [Figures 7-9]. He is on regular follow-up and doing well but incontinent and on the penile clamp.

**DISCUSSION**

UD is rare; it was first described by Hey in a female patient in 1805.<sup>[5]</sup> The UD is classified into congenital and acquired types. The congenital UD occurs due to a developmental defect of urethral folds on its ventral aspect leading to a segmental defect of the urethral wall, most commonly at the peno-scrotal junction. It is characterized by true epithelial lining and wall made up of full thickness urethral musculature.<sup>[1,2]</sup>

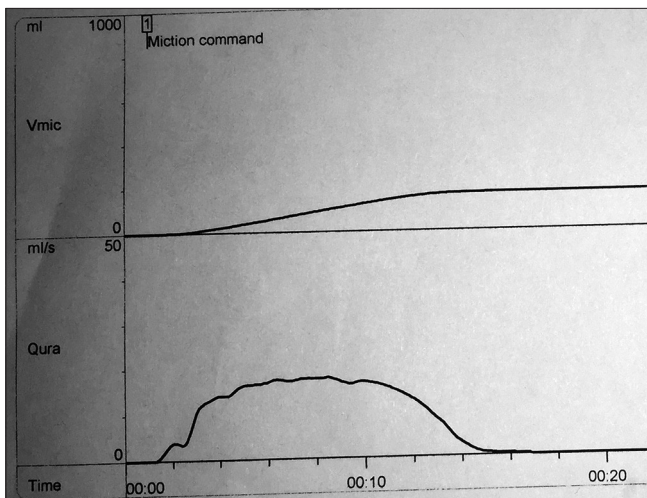
Acquired UD occurs secondary to stricture, infection, trauma, or postsurgery. A UD can also result from an indwelling urethral catheter, urethral dilatation or in a patient on clean

intermittent catheterization. UD can also develop after surgery for hypospadias, urethral stricture, artificial urinary sphincter insertion, and transurethral prostate or bladder procedures. It is lined by granulation tissue, and the wall is devoid of smooth muscle fibers, commonly seen in adults, and involving the posterior urethra.<sup>[4]</sup>

In our study of three cases of UD, the iatrogenic injury was a common cause of developing acquired UD.<sup>[1]</sup>

Theories postulated:

- Increased urethral pressure due to obstruction which leads to herniation of the urethral epithelium, seen in patients with history of previous reconstructive procedures for hypospadias, urethral stricture, or trauma<sup>[1]</sup>
- Urethral ischemia induces fibrosis and scar formation as a result of constant pressure distributed on the penoscrotal angle, seen in male patients with an indwelling urethral catheter<sup>[1]</sup>



**Figure 3:** Postoperative uroflow showing good flow



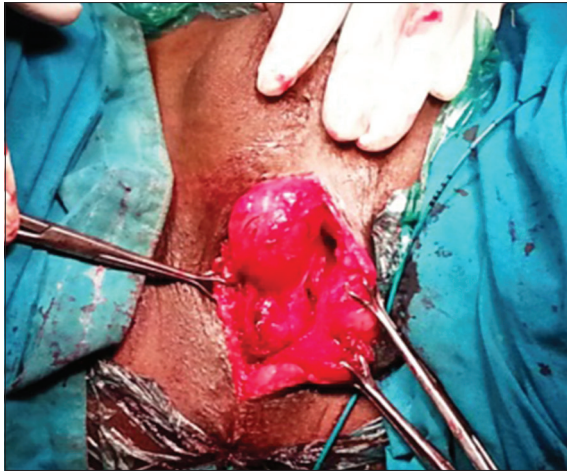
**Figure 4:** Retrograde urethrogram shows anterior urethral diverticulum, distal hanging edge imitate anterior urethral valve



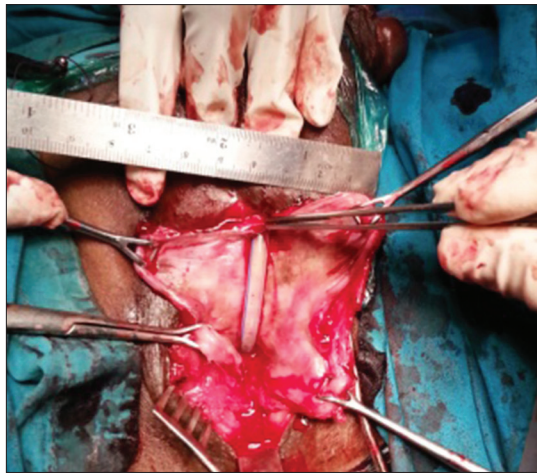
**Figure 5:** Postoperative retrograde urethrogram showing persistent diverticulum



**Figure 6:** Retrograde urethrogram shows large outpouching in bulbar region



**Figure 7:** Intraoperative images showing large diverticulum



**Figure 8:** Intraoperative images showing large diverticulum which was laid open



**Figure 9:** Intraoperative images showing excess diverticular wall which was excised and primary urethroplasty done

- Ganabathi *et al.*<sup>[6]</sup> proposed the rupture of the peri-urethral glands into the urethral lumen secondary to obstruction, which resulted in epithelisation and formation of a

periurethral cavity. Further straining leads to dilatation and increase in size of the diverticulum<sup>[2]</sup>

- Acquired UD can develop secondary to suppuration and necrosis of urethral wall following trauma, instrumentation and drainage of a prostatic or periurethral abscess.<sup>[4]</sup>

Patients with uncomplicated UD remain asymptomatic while complicated UD patients can present with nonspecific LUTS, recurrent urinary tract infection (UTI), pelvic pain, incontinence, postvoid dribbling, dysuria, frequency, urgency, nocturia, or feeling of incomplete bladder emptying. It can also be present as a perineal mass.<sup>[3,4]</sup>

UTI, fistulas and stones formation in the diverticulum are the most common complications associated with UD.<sup>[2]</sup>

Radiological diagnosis of UD is essential for outlining the treatment modality. Magnetic resonance imaging is the gold standard for evaluating a UD in females. Fluoroscopic modalities such as RGU, MCU in conjunction with urethral ultrasonography are the best diagnostic technique to confirm and characterize the UD.<sup>[1,3]</sup> In addition, they demonstrate the location and size of the diverticulum, caliber of the neck, the thickness of the wall of the diverticulum and also provide information about proximal and distal urethra in relation to the diverticulum. Thus helps in planning the management.<sup>[4]</sup>

Depending on the investigations and symptoms of the patient, management of UD is planned. Uncomplicated asymptomatic UD can be managed conservatively provided patient agrees to follow up. UTI in these patients can be prevented by teaching them, postmicturition manual digital compression by which stagnation of urine does not occur.<sup>[4]</sup> Complicated symptomatic UD needs surgical excision of diverticulum and urethral reconstruction that varies from patient to patient and is individually based. The goal of surgery is to excise the UD, maintain the patency and continuity of urethra and an additional tissue cover if required. Urethral diverticulectomy with urethral reconstruction is the recommended treatment.<sup>[1,3,4]</sup>

In case I, we modified the technique of urethral reconstruction using excess diverticular wall to maintain the urethral patency.

In a study by Nadiya *et al.*, 54.5% of patients underwent urethral diverticulectomy and 91% of patients were recurrence free after 2.3 years of follow-up.

## CONCLUSION

UD in the male is a rare finding and poses challenges in diagnosing and reconstruction. RGU and MCU would provide excellent results for diagnosing UD, and it also provides other useful information. Open surgical urethral reconstruction will be the

main-stay treatment modality for complicated UD. Modification during reconstruction depends on surgeon's skill and experience.

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### Conflicts of interest

There are no conflicts of interest.

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