Original article

Symptomatic Male Urethral Diverticula- Presentation, Diagnosis and Management

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ABSTRACT

Objective- To report our experience of aetiology, diagnosis, management and outcomes of uncommon male urethral diverticula managed at a single institute.

Patients and Methods: After due approval from local ethical committee, the caserecords of 8 male patients including a child presenting with urethral diverticula in a 10 year period (2002-2012) were retrospectively analysed with regard to presentation, diagnosis, management and outcomes.

Results: The Aetiological factors included Trauma, Previous urethral surgeries like Visual internal urethrotomy and infection. The common site of diverticula was peno-scrotal junction, followed by distal penile urethra. Two patients were treated with primary excision and establishment of urethral continuity and rest with two stage procedures. The outcome was poor in one patient of primary excision who presented later with stricture at the anastamotic site.

Conclusions: Unlike in female population, male urethral diverticula are uncommon but should always be thought of in young men with obstructive urinary symptoms and in those with a past history straddle injuries. Treatment if individualized leads to good outcomes. Higher number of diverticula following visual urethrotomy needs further studies to determine the utility of the procedure as definitive treatment for stricture urethra.

INTRODUCTION

Urethral diverticula are saccular dilatations of urethra maintaining a communication with the true urethral lumen by a discrete orifice. Urethral diverticula are arguably common in females owing to poor urethral support and frequent periurethral abscesses. On the other hand they are uncommon clinical entities in males. Great majority (67-90%) of male urethral diverticula are acquired resulting commonly from urethral infection, trauma and obstruction [1-4]

In this study we analyse 8 male patients managed for urethral diverticula at a medical college hospital during the period of ten years (2002-2012).

PATIENTS AND METHODS

During the decade from 2002 to 2012, 8 male patients were diagnosed with symptomatic urethral diverticula at a medical college hospital in India. A retrospective review of their medical records was undertaken with a view to analyse their presentation, diagnosis, treatment and outcomes.

The mean follow up period was 60 months.

All of the eight patients were evaluated with Ascending urethrogram, Voiding cystouretrography and Urethroscopy when indicated.

The follow up consisted of repeated flowmetries and additional investigations when indicated.
RESULTS
Out of 8 patients one was congenital as diagnosed by age at presentation (10 Years), and finding of anterior urethral valve on voiding cystourethrography. The remaining seven patients had acquired diverticula with a mean age at presentation as 42.5 years (25-60 years).
The various aetiologies of the urethral diverticula were as depicted in Table 1.
The presentation in both categories was similar with obstructive lower urinary tract symptoms, failure to empty the bladder, recurrent urinary tract infections and acute urinary retention in two patients with acquired diverticula. Pulpable perineal swelling was noted in 2 patients [Table 3].
The diagnosis of Urethral diverticulum was confirmed with retrograde urethrogram and voiding cystourethrogram. In two patients who presented with acute retention, the investigations done after preliminary suprapubic cystostomy for failure to catheterize.
Two patients had antecedent straddle injury prior to the development of diverticulum. Four patients had undergone visual internal urethrotomy on more than three occasions, before presenting with diverticulum.
All the diverticula were ventral in location, involving pendulous urethra in four and penoscotal junction in the rest [Table 2]. Those diverticula which developed after multiple visual internal urethrotomy were most distal, located just proximal to the meatus.
The diameter of the diverticula varied from 2-6 cm (mean of 4 cm), the largest being those resulting from trauma.
The child with anterior urethral valve and diverticulum was treated with endoscopic resection of valve with excellent outcome. Excision of the diverticulum and primary closure of urethra was attempted in three patients using local urethral tissue. One patient had poor outcome with stricture which was treated with BMG as dorsal onlay.
Four patients with post urethrotomy diverticula, being juxta-meatal and smaller diameters were treated only with stage 1 urethroplasty.
Follow up varied from 18 to 60 months (mean of 39 months). All patients except one patient who required repeat reconstructive procedure for stricture, had good outcomes with normal flow rates and no infection episodes.

DISCUSSION
Urethral diverticula in males are an uncommon entities. Though simplistic classifications as Congenital Vs Acquired and Primary Vs Secondary are available, they remain mainly academic as the treatment of each diverticulum needs to be individualised.
In Congenital diverticula, the full thickness of the urethral wall is involved with a urothelium lining the diverticulum. On the contrary, the acquired diverticula being infective or traumatic are lined by granulation tissue and the walls are devoid of urethral smooth muscle fibres[5].
Several theories have been proposed for occurrence of congenital urethral diverticula, including incomplete urethral duplication [6]; Intraluminal rupture of periurethral cysts and urethral obstruction like anterior urethral valves[7]. Segmental developmental defect of spongiosum leading to ventral dilatation of urethra, lacking the usual support is the most commonly held theory [8].
Darrel Allen and others, in their series, could find spongiosal defect in six of the seven congenital diverticula and suggested that these could be a part of spectrum of congenital anomalies [1]. In our series, the lone congenital diverticulum was managed endoscopically, hence the anomaly could not be determined.
Acquired diverticula, on the other hand have an overt cause like infection, Stricture disease, long
term catheterisation and trauma which could be accidental or iatrogenic. In our series trauma was the cause in six of the seven patients with four following visual internal urethrotomy and two after straddle injuries.

It is expected that the congenital diverticula present earlier than the acquired diverticula, though it is not universal. The delay could be due to difficulty in diagnosis, health seeking behaviour of patients and many diverticula remaining asymptomatic until complications.

The presentation is similar in both the categories, predominantly being obstructive in nature; others are recurrent infections, post void dribble, perineal swelling emptying on pressure. Two of our patients presented with acute retentions that could not be catheterised and two patients presented with penoscrotal swellings. Often a high index of suspicion is needed to diagnose this uncommon condition.

The diagnostic work up includes ascending urethrogram, voiding cystourethrography and Urethroscopy. Though magnetic resonance imaging has been used to diagnose these entities[3], however adding urethral ultrasonography to the fluoroscopic modalities gives excellent details like location, volume, neck size and associated urethral pathologies [9]. In our series the diverticula were ventral aspect of pendulous and penoscrotal junctions in equal proportions of four in each.

The diverticula are managed by conservative, endoscopic and open surgical methods. McAninch and others in their series, suggested conservative measures for small asymptomatic diverticula by post void compression to reduce stasis and hence complications[9]. Prophylactic antibiotics were also suggested to keep the urine sterile with an option of intervention at a later stage should complications arise. None in our series were managed conservatively as all were symptomatic with an average diameter of 4 cm.

Endoscopic management by deroofing diverticula, though appearing attractive is not proposed for all diverticula as the chances of successful outcomes are uncommon with possible late complications of recurrence and urethrocutaneous fistula [2, 10]. The poor urethral support in the acquired diverticula makes it prone for complications. In our series only one case of congenital diverticulum was managed endoscopically with resection of anterior urethral valve and deroofing, for better drainage. We did not encounter any complications.

The goal of any operative procedure for diverticulum is excision of diverticulum, restoration of urethral continuity and to provide adequate additional tissue support to obviate urethrocutaneous fistulae [11]. The technical modification one may need to adopt depends upon the urethral defect left after excision of the diverticulum. In smaller defects, the urethral continuity is established either by longitudinal closure of the defect or spatulated anastamosis after adequate urethral mobilisation [12-13]. For larger defects Ventral onlay graft urethroplasty or staged urethroplasty are considered [14]. In our series one patient was managed after excision of diverticulum-primary closure in three using local tissues. One of these developed stricture at the primary site, after two months was salvaged with dorsal onlay BMG urethroplasty. Four diverticula which followed visual internal urethrotomy and located just proximal to the external urethral meatus were laid open with an option for tabularisation at a later stage. Since all four voided well after first stage, did not opt to undergo the second stage. Walter Parker et al reported a case of urethral diverticulum following visual urethrotomy , managed by excision and primary urethral anastomosis [15] We believe repeated urethrotomy
leads to loss of urethral support and hence diverticula. We strongly feel visual urethrotomy though easier to perform, has its share of complications including that of urethral diverticulum. Hence the urge to offer as a definitive treatment needs to be tempered.

Patients were followed up with periodic flow rates for periods ranging from 18 to 60 months. All patients had good outcomes except one patient who developed stricture following primary excision and anastamosis, hence required a further procedure.

**CONCLUSION**

Urethral diverticula in males, unlike in females are rare entities. The treatment needs to be individualised to achieve good outcomes. The high rate of acquired diverticula following visual urethrotomy in our series underscores the need for further studies to determine the utility of visual Urethrotomy as a definitive treatment for stricture urethra.

**Conflict of Interest:** None declared.

**Ethical committee Approval:** This study was conducted after due approval from the local ethical committee.

**Figure 1:** Retrograde urethrogram showing penile urethral diverticulum

**Figure 2:** Retrograde urethrogram showing peno-scrotal post traumatic diverticulum
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