

CASE REPORT

Congenital Bladder Diverticulum in a Neonate Simulating Posterior Urethral Valves

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ABSTRACT

Primary bladder diverticulae are rare anomalies of the bladder. They usually present with recurrent urinary tract infections and dysuria. We present a case of retrovesical diverticulum, which presented with urinary retention behaved like a case of posterior urethral valves. A high index of suspicion and a well performed micturating cystourethrogram helps in clinching the diagnosis. Excision of these diverticulae with or without ureteric reimplant is curative in most cases.

Key words: Bladder outlet obstruction; Congenital primary bladder diverticulum; Posterior urethral valve

INTRODUCTION

Neonatal bladder outlet obstruction (BOO) is a well-recognized entity. Most commonly, it is associated with posterior urethral valves (PUV). Rarely, other space-occupying lesions in the pelvis, like a rectal duplication cyst, might impinge on the bladder neck and urethra and cause BOO [1]. Primary congenital bladder diverticula (PCBD) are rare and usually present with urinary tract infections (UTIs). We report a case of congenital bladder diverticulum causing BOO in a neonate.

CASE REPORT

A 15-day-old, term born male, with an uneventful perinatal period, presented to the emergency with a history of progressive abdominal distention for 3 days and poor urinary stream. Abdominal ultrasound revealed bilateral hydronephrosis (HUN) and a grossly distended posterior urethra (4 cm × 3 cm). Serum urea and creatinine at presentation were 70–3.0 mg%, respectively, with arterial blood gases showing metabolic acidosis. A provisional diagnosis of PUV was made. The baby was catheterized, and antibiotic treatment was initiated. Post-catheterization, the serum urea, and creatinine normalized to 17–0.2 mg%, respectively, within 5 days. The metabolic acidosis was corrected. Micturating cystoure-

throgram (MCU), however, ruled out PUV; it showed a normal capacity bladder with multiple diverticula (Figure 1). The largest diverticulum, measuring 3.1 cm × 2.7 cm, was seen arising from the posterolateral wall of the bladder on the right side. The right ureter was seen draining into it. This was associated with Grade III vesicoureteral reflux on the right side. Post-void film revealed moderate amount of residual urine in the diverticulum.

The patient was taken up for surgery after fluid and electrolyte correction and optimization of renal functions. Intraoperatively, a large retrovesical diverticulum was seen pressing onto the bladder neck. Excision of the bladder diverticulum with a Paquin's right ureteric reimplantation was done. Postoperatively, the neonate had an uneventful recovery. The urethral catheter was removed on post-operative day 10 after which, he voided spontaneously in a good stream. A repeat ultrasound done after 4 weeks showed complete resolution of the HUN, no diverticulum was visualized. The repeat MCU after 6 months showed normal anatomy. Dimercaptosuccinic acid scan done subsequently showed no scars on either side.

DISCUSSION

Congenital BOO is an association of clinical findings, wherein the normal outflow of urine from the fetal

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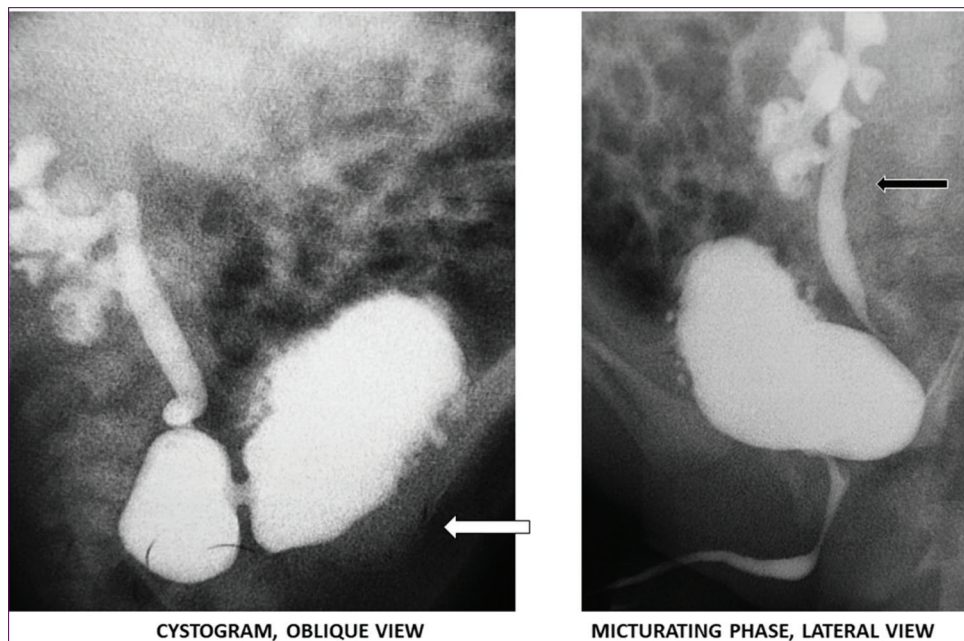


Figure 1: Micturating cystourethrogram pictures showing the retrovesical diverticulum (white arrow), Grade III vesicoureteral reflux (black arrow) with a normal posterior urethra

bladder is impaired. The most common causes of congenital BOO are PUV, urethral atresia, and prune belly syndrome. Rarer causes may include prolapse ureteroceles, syringocele, hydrocolpos, and congenital bladder diverticula. Antenatally, fetal BOO will most commonly present as urinary tract dilatation and fetal oligohydramnios. The most severe presentation is as neonatal respiratory failure subsequent to pulmonary hypoplasia. Later presentations include an abdominal mass, urinary ascites, UTI, or renal failure. Bladder dysfunction is commonly seen [2].

PCBD are relatively uncommon and occur almost exclusively in males, with only two cases having been reported in females [3]. To the best of our knowledge, there have been only three reports of bilateral primary diverticula in the pediatric age group [4-6]. Most of the patients present in the first decade of life, although presentation has been reported as late as adulthood. The mean age of presentation was 16.8 months in a series of 12 patients reported by Bhat et al. [5]. The neonatal presentation as seen in our case is rather unheard of (Table 1).

PCBD are more commonly located in the posterolateral wall of the bladder at the ureteric orifice, which progressively gets incorporated into the diverticulum. As the diverticulum enlarges cranially, it can lead to ureteral obstruction and unilateral hydronephrosis (HDN). Rarely, these may arise posteriorly. The retrovesical location of the diverticulum may produce symptoms of BOO. This diverts more urine to the diverticulum, setting off a vicious cycle [7].

If symptomatic, PCBD usually present as recurrent UTI, hematuria, voiding dysfunction, or bladder stones. Our

patient presented with poor stream and pyonephrosis. Most of the other authors have reported a similar presentation. Bhat et al., however, have reported two cases that presented with a mass abdomen [5].

Antenatal diagnosis is rare, but prenatal scans may show unilateral HDN with diverticula [8]. Ultrasound is the preferred initial imaging modality. Diagnosis is challenging, with differentials being bladder ears, hourglass bladder, and vesical hernias. The diverticulum may be visualized along with associated ipsilateral upper tract dilatation [5]. About 30% of the times, the diverticulum may be missed on the initial ultrasound, but some degree of HUN is usually present [4]. Contrast studies may demonstrate the diverticulum as an outpouching from a full bladder on oblique films (Figure 1). A medial deviation of the ureter is also suggestive [5]. Magnetic resonance urography has been proposed as the ideal imaging modality for the diagnosis of PCBD. We, however, had a working diagnosis of PUV, and therefore opted for an MCU, in which the diverticulum was clearly delineated. We consider a well carried out MCU to be the best imaging modality in all patients presenting with BOO.

Management of congenital bladder diverticula varies with presentation. Small, asymptomatic diverticula may be followed conservatively. Surgical excision, however, is indicated in case of recurrent UTI, associated reflux and ureteral or bladder obstruction. Diverticulectomy may be done with or without reimplantation of the ureter. Open, laparoscopic, and vesicoscopic approaches have been described [7-9].

Patients, who present before upper tract damage has set in, have better treatment outcomes. A repeat ultra-

Table 1: Comparison between the cases reported in literature [7,8-11]

Study	Bhat, 2012 [5]	Wickramasuriya, 2008 [6]	Sheldon, 1994 [7]	Oge, 2002 [11]	Present study
Type of study	Case series	Case report	Case report	Case report	Case report
Number of cases	12	1	1	1	1
Age	16.08 months (mean)	3 months	3 months	2.5 years	2 weeks
Sex	All males	Male	Male	Male	Male
Presentation	Acute retention (5) Recurrent UTI (5) Mass abdomen (2)	Recurrent acute urinary retention	Acute retention of urine	Features of BOO×3 months	Features of BOO with pyonephrosis
USG	Diverticulum (8) Hydronephrosis (12)	Cystic mass below the bladder	Mild left hydronephrosis with cystic pelvic mass	–	Bilateral HDUN with internal echoes and a grossly dilated posterior urethra.
MCUG	Diverticulum (12) reflux (9)	Bilateral diverticula obstructing the bladder base. No evidence of PUV or VUR	Large diverticulum on the inferior aspect of bladder. No reflux.	Large left-sided diverticulum on the posterolateral aspect	Retrovesical diverticulum on the right
Management	Open diverticulectomy with reimplantation	Open diverticulectomy with bilateral reimplantation.	Cystoscopy followed by open diverticulectomy and reimplantation of ureter	Cystoscopy followed by open diverticulectomy and reimplantation of ureter	Open diverticulectomy with reimplantation
Follow-up	Suprapubic leak (1) mild hydronephrosis (2) Grade III VUR (1)	Not reported	DTPA showed no obstruction and symmetrical split function MCUG showed no reflux	MCUG and IVU; normal UDS after 6 months; good capacity stable bladder	Good voiding on catheter removal with resolution of HDUN on USG at 4 weeks
USG: Ultrasonogram, MCUG: Micturating cystourethrogram, UTI: Urinary tract infection, PUV: Posterior urethral valves, VUR: Vesicouretric reflux, BOO: Bladder outlet obstruction, IVU: Intravenous urogram, DTPA: Diethylenetriaminepentacetate					

sound done 4–6 weeks after the surgery usually demonstrates a resolution in the HUN and diverticula. Voiding difficulty following surgery is seen in some patients. It might be secondary to residual anatomic obstruction or functional bladder dysfunction [10]. Those patients have persistent post-operative dysfunctional voiding need to undergo a repeat MCU and a urodynamic evaluation [3].

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