CASE REPORT

Hutch diverticulum presenting as acute urinary retention in early life

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SUMMARY

There are only a few reports of recurrent acute urinary retention caused by obstruction from congenital paraureteral diverticulum. We review the literature and present a case of a 14-month-old boy with bilateral hutch diverticuli who had his first episode of acute urinary retention in the neonatal period caused by left-sided diverticulum. We emphasised the fact that hutch diverticulum should be considered as one of the possible differential diagnoses in a child presenting with acute urinary retention.

BACKGROUND

Acute urinary retention (AUR) is relatively infrequent condition observed in children resulting from neurological causes, severe voiding dysfunction, urinary tract infections (UTI), constipation, adverse drug effect and benign obstructing lesions.¹ Hutch diverticulum (HD) as a cause of AUR is rare, reported mainly in male children. We describe a case and review the literature on bilateral hutch diverticuli presenting as AUR.

CASE PRESENTATION

A 14-month-old male child presented with restlessness, a distended lower abdomen and inability to void for last 16 h. An 8 French Foley catheter was placed per urethra without any difficulty which drained 200 cc of urine. Prior medical records revealed an episode of AUR on 10th postnatal day which resolved after temporary catheterisation and two documented episodes of UTI treated by culture-specific antibiotics. After the first episode of retention, child had been voiding with poor stream and occasional fullness in lower abdomen.

On admission, serum creatine was 1.0 mg/dL and urine examination was normal. Ultrasound (US) revealed bilateral gross hydronephrosis. A voiding cystourethrogram (VCUG) demonstrated a large left-sided bladder diverticulum and bilateral high-grade reflux (figure 1A). Non-contrast CT scan showed large left-sided bladder diverticulum and tiny right-sided diverticulum (figure 1B). At urethrocytoscopy, the urethra was normal, a wide-mouthed left HD and a small right-sided HD were noted in the bladder.

TREATMENT

The patient underwent open bilateral hutch diverticulectomy with Cohen's cross trigonal ureteric reimplantation. Small right-sided diverticulum could be completely everted into the bladder was

excised by an intravesical approach. The large left diverticulum was found extending inferiorly by the side of the bladder neck and posterior urethra displacing and compressing them. It could only be partially everted into bladder and required a combined intravesical and extravesical approach for excision (figure 2A).

OUTCOME AND FOLLOW-UP

A postoperative VCUG demonstrated adequate voiding to completion. At 2-year follow-up, the patient is asymptomatic with good urine flow which was confirmed on US and VCUG (figure 2B).

DISCUSSION

A MEDLINE/PubMed database search from 1970 to 2012 with the keywords 'hutch diverticulum', 'paraureteral diverticulum', 'congenital bladder diverticulum' and 'acute urinary retention' showed a total 53 patients with congenital bladder diverticulum (CBD) presenting with AUR.

Bladder diverticula can be congenital, iatrogenic or most commonly secondary to infravesical obstruction such as posterior urethral valve or due to neurogenic bladder. Paraureteral diverticula or HD are located at or adjacent to the ureteral hiatus where Waldeyer's sheath normally seals the potential space between the intravesical ureter and bladder muscle. As the herniation increases in size, the ureteral orifice subsequently gets incorporated into the diverticulum. This extravesicalisation of the intramural ureter and ensuing ureterovesical incompetence result in vesicoureteric reflux. Some authors support the theory of transient intrauterine bladder outlet obstruction secondary to urethral angulation, a Cowper's gland cyst or posterior urethral membrane² whereas others support the embryological theory of defective incorporation of the mesonephric duct into the bladder at the site of ureter hiatus as the cause of HD.³

HD are found in 0.2–13% of the children with UTIs.⁴ AUR is an unusual and rare presentation of CBD most commonly observed in male children. Only two cases have been reported in women.^{5–6} In the largest series,⁷ the mean age of presentation was 16.8 months (1–36 months). Of the 53 patients reported, 66.04% (35) were infants, 30.19% (16) were children and 3.77% (2) were observed in adults. CBD is usually unilateral and rarely bilateral. CBD are also found in patients with connective tissue disorders such as Ehlers-Danlos, Williams-Elfin facies and Menkes syndrome.^{5–8–10}

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Figure 1 (A) Voiding cystourethrogram at 14 months of age showing hutch diverticula with bilateral reflux. (B) Non-contrast CT scan at 14 months of age showing the large left and small right diverticuli.

The most common presentation of CBD is recurrent UTI secondary to urinary stasis within the diverticulum sometimes leading to septicaemia. Diverticulum can also manifest with poor voiding stream associated with high PVR secondary to reflux of urine into the diverticula with displacement of proximal urethra anteriorly causing outflow obstruction. AUR although rare, can occur when HD is large enough to cause a compression/angulation at bladder outlet/posterior urethra.¹¹ Also the child's posterior urethra surrounded by the immature prostatic tissue can easily be compressed and occluded by an expanding diverticulum. A detailed history of our case can provide some insight into the natural history of HD initially presenting as AUR. If given a catheter free trial, these children may either fail¹¹ or may void with poor stream, but finally land up with recurrent UTI, chronic retention or recurrent AUR episodes which may either occur at short intervals or after prolonged period as observed in our case. Rare presentation of CBD include renal failure⁷⁻⁹ cyanosis of the lower extremities,¹² stone formation and enuresis.¹³

US can detect the diverticula, assess the bladder wall thickness and also helps in assessing upper tract changes. However, US can fail to diagnose if the diverticulum is small and when performed with catheter in situ. US may also be difficult to perform in infants and small children.

VCUG is the investigation of choice to diagnose HD. In addition to anteroposterior view, oblique and lateral films need to obtain so as to demonstrate the diverticula. VCUG will also be able to demonstrate reflux, bladder neck and urethral anatomy in relation to the diverticula. However, there is disadvantage of exposure to radiation.

Cystoscopy is invasive and is performed just before surgery. It helps in assessing the size of the diverticulum, intradiverticula pathology such as stone or malignancy, relation of ureteric orifice to the diverticula and the appearance of the bladder neck and urethra. The bladder is usually smooth walled without trabeculations. Flexible cystoscopy is useful to assess the lumen in cases where neck of diverticulum is narrow.

Small asymptomatic diverticula can be managed conservatively. Giant diverticulum (>1/3rd size of bladder), persistent or recurrent UTI, interference with bladder emptying or outlet obstruction and ureteral obstruction or reflux, presence of intradiverticular disease (tumour or lithiasis) or spontaneous diverticular rupture are absolute indications for surgery.¹³

Diverticulectomy may be undertaken by open, transurethral, laparoscopic and robot-assisted approaches. Transurethral method is ideal for small diverticula; it involves incising the diverticulum at the neck or fulgurating the mucosa. The open method may be

Figure 2 (A) Left diverticulum excised from behind the bladder neck. (B) Postoperative voiding cystourethrogram at a follow-up of 18 months showing no reflux.

extravesical, transvesical or a combined approach. An extravesical approach is ideal for larger diverticula and intravesical approach for smaller ones. Open methods carry significant morbidity related to surgery as well as an increased risk of rectal, vesical and urethral injury. The transvesical approach gives additional advantage of incising the bladder neck in cases of bladder neck hypertrophy and treat intradiverticula pathology. However, there is a risk of injuring the pelvic structures and surrounding peritoneum when it is densely adhered to it.

In the extravesical approach the principle is to dissect close to wall of diverticulum and the muscular defect is meticulously repaired. A combined approach is advisable when there are difficulties in extravesical mobilisation of diverticulae. Ureteric reimplantation is possible in both of the approaches. A staged approach has been advocated especially in neonates and infants presenting with large bladder diverticulum in the form of cutaneous vesicostomy followed by definitive repair 1 year later.⁸ Lately laparoscopic and robotic-assisted excision of CBD has also been proved to be feasible.^{14 15} The outcome following intravesical as well as extravesical approaches is excellent.

Learning points

- ▶ In neonates, infants or children presenting with any obstructive voiding symptoms, including acute or recurrent urinary retention, the possibility of hutch diverticulum should be entertained as a differential diagnosis.
- ▶ Voiding cystourethrogram is the investigation of choice to diagnose hutch diverticulum.
- ▶ Appropriate surgical management (intravesical or extravesical or combined diverticulectomy) ensures a good long-term outcome.

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REFERENCES

- 1 Gatti JM, Perez-Brayfield M, Kirsch AJ, *et al.* Acute urinary retention in children. *J Urol* 2001;165:918–21.
- 2 Blane CE, Zerlin JM, Bloom DA. Bladder diverticula in children. *Radiology* 1994;190:695–7.
- 3 Singal AK, Chandrasekharam VVSS. Lower tract obstruction secondary to congenital diverticula in infants. *Pediatr Surg Int* 2009;25:1117–21.
- 4 Bisset GS III, Strife JL, Dunbar JS. Urography and voiding cystourethrography: findings in girls with urinary tract infection. *AJR Am J Roentgenol* 1987;148:479–82.
- 5 Shukla AR, Bellah RA, Canning DA, *et al.* Giant bladder diverticula causing bladder outlet obstruction in children. *J Urol* 2004;172:1977–9.
- 6 Bogdanos J, Paleodimos I, Korakianitis G, *et al.* The large bladder diverticulum in children. *J Pediatr Urol* 2005;1:267–72.
- 7 Bhat A, Bothra R, Bhat MP, *et al.* Congenital bladder diverticula presenting as bladder outlet obstruction in infants and children. *J Pediatr Urol* 2012;8:348–53.
- 8 Burrows NP, Monk BE, Harrison JB, *et al.* Giant bladder diverticulum in Ehlers-Danlos syndrome type I causing outflow obstruction. *Clin Exp Dermatol* 1998;23:109–12.
- 9 Harcke HT Jr, Capitanio MA, Grover WD, *et al.* Bladder diverticula and menkes' syndrome. *Radiology* 1977;124:459–61.
- 10 Babbitt DP, Dobbs J, Boedecker RA. Multiple bladder diverticula in Williams "Elfin-Facies" syndrome. *Pediatr Radiol* 1979;8:29–31.
- 11 Sheldon CA, Essig KA. Congenital bladder diverticulum causing bladder outlet obstruction: case report and review of literature. *Pediatr Surg Int* 1994;9:141–3.
- 12 Valadez R, Maizels M, Fernbach SK. Lower extremity cyanosis: an unusual presentation of congenital paraureteral diverticula. *J Urol* 1987;138:364–5.
- 13 Verghese M, Belman AB. Urinary retention secondary to congenital bladder diverticula in infants. *J Urol* 1984;132:1186–8.
- 14 Kok KY, Seneviratne HS, Chua HB, *et al.* Laparoscopic excision of congenital bladder diverticulum in a child. *Surg Endosc* 2000;14:501.
- 15 Christman MS, Casale P. Robot-assisted bladder diverticulectomy in pediatric population. *J Endourol* 2012;26:1296–300.

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