Urology Case Reports 40 (2022) 101886

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

A case of posterior urethral valve identified in an older child by straining to void

Hidenori Nishio [a], Kentaro Mizuno [a,*], Taiki Kato [b], Tetsuji Maruyama [b], Takahiro Yasui [b], Yutaro Hayashi [a]

[a] Department of Pediatric Urology, Nagoya City University Graduate School of Medical Sciences, Nagoya, Japan
[b] Department of Nephro-urology, Nagoya City University Graduate School of Medical Sciences, Nagoya, Japan

ARTICLE INFO

Keywords:
Posterior urethral valve
Straining to void
Transurethral incision
Urethral obstruction

ABSTRACT

Posterior urethral valves (PUVs) are the most common cause of congenital urethral obstruction. However, the diagnosis of a PUV is sometimes difficult. A 13-year-old Japanese boy and his mother visited our hospital, and his mother complained that he frequently strained to void although he had no complaint. Uroflowmetry revealed a plateau-shaped curve and a voiding cystourethrography (VCUG) revealed a PUV. Thus, we performed a transurethral incision of the PUV, and his voiding status improved. Because some patients with mild PUV may not notice their dysuria, we believe that VCUG should be performed without hesitation when a urethral lesion is suspected.

1. Introduction

Congenital obstruction of the urethra is one of the most devastating urinary tract anomalies and is life-threatening in the neonatal period. The presence of posterior urethral valve (PUV) is still relatively common and comprises the vast majority of congenital urethral obstructions.

Typical PUVs are diagnosed in neonates with a history of prenatal bilateral hydronephrosis or infants with acute pyelonephritis associated with massive bilateral vesicoureteral reflux (VUR). However, diagnosis of a PUV is sometimes difficult because of its variation in severity and morphology.[1]

Here, we report a case of PUV in an older child who had strained to void. Following uroflowmetry, urethral stricture was considered likely, but a voiding cystourethrography (VCUG) revealed a PUV.

2. Case presentation

A 13-year-old Japanese boy and his mother visited our hospital for follow-up of a bilateral orchiopexy performed when he was aged 2. He underwent surgery for double outlet right ventricle at the age of 1 year and 8 months. He was afebrile, with normal vital signs. His urine specimen was normal. Abdominal ultrasonography revealed no hydronephrosis and no urinary tract abnormalities. Although he had no complaint, his mother complained that he frequently strained to void. Therefore, we arranged a detailed investigation of his voiding.

Uroflowmetry revealed a plateau-shaped curve (maximum flow rate, 13.8 mL/s; average flow rate, 9.0 mL/s; voided volume, 236.2 mL) (Fig. 1a), and abdominal ultrasonography after voiding showed 20.0 mL of residual urine. A magnetic resonance imaging scan showed a bladder diverticulum, but the appearance of the spinal cord was normal. We suspected that the indwelling urethral catheter used following cardiac surgery might have caused a urethral stricture. However, the VCUG revealed a PUV and a bladder diverticulum with no vesicoureteral reflux (Fig. 1b and c). We speculated that the bladder diverticulum occurred due to obstruction of the urethra resulting from the PUV.

Under general anesthesia in the lithotomy position, cystourethroscopy did not reveal a urethral stricture, but PUV type I (Fig. 2a and b). We performed a transurethral incision on the valvular lesion in the 12 o'clock position using a cold knife (Fig. 2c and d). 12Fr. A Foley catheter was inserted, and the operation was completed.

One month after surgery, uroflowmetry revealed a bell-shaped curve (maximum flow rate, 21.0 mL/s; average flow rate, 12.4 mL/s; voided volume, 235.9 mL) (Fig. 3a), and abdominal ultrasonography after voiding showed no residual urine. VCUG also revealed no PUV, and the

Abbreviations: PUV, posterior urethral valve; VCUG, voiding cystourethrography; VUR, vesicoureteral reflux.

* Corresponding author. Department of Pediatric Urology, Nagoya City University Graduate School of Medical Sciences, 1, Kawasumi, Mizuho-cho, Mizuho-ku, Nagoya, 467-8601, Japan.
E-mail address: kmizuno@med.nagoya-cu.ac.jp (K. Mizuno).

https://doi.org/10.1016/j.eucr.2021.101886
Received 7 September 2021; Received in revised form 8 October 2021; Accepted 11 October 2021
Available online 12 October 2021

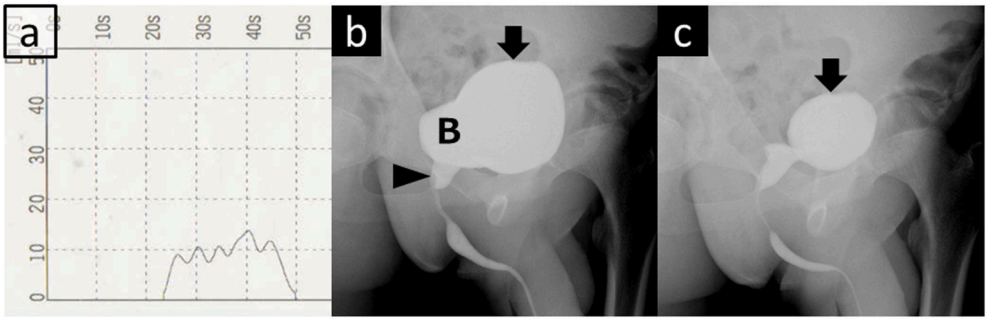

Fig. 1. The findings of uroflowmetry and voiding cystourethrography (VCUG) before transurethral valve incision
(a) Uroflowmetry revealed a plateau-shaped curve. (b, c) VCUG revealed a dilated posterior urethra and valve leaflets obstructing the flow of contrast material from the bladder. The arrow indicates a bladder diverticulum. The arrowhead indicates a dilated posterior urethra. B; bladder.

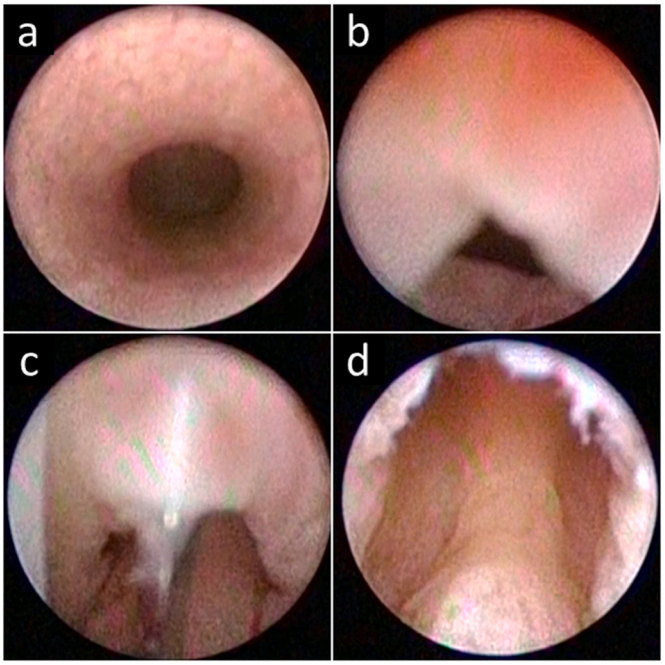

Fig. 2. Cystourethroscopic findings and transurethral incision
(a) Cystourethroscopy revealed no stricture at the bulbar urethra. (b) Cystourethroscopic photograph of PUV type I before incision. (c) During incision using a cold knife. (d) After incision.

size of the bladder diverticulum appeared to have decreased (Fig. 3b and c). Two years after the operation, his straining to void disappeared, and there was no recurrence of the uroflowmetry findings.

3. Discussion

PUVs are the most common cause of congenital urethral obstructions. The degree of urethral obstruction caused by PUVs varies.[1] Today, PUVs are usually detected during infancy by prenatal ultrasound. Generally, the more severe an obstruction is, the earlier the voiding symptoms appear. In the most severe cases of PUVs, oligohydramnios causes fetal death, or the consequential pulmonary hypoplasia causes death in infancy.[2] Although the mortality rate in patients with PUVs has significantly decreased in the past decades, approximately a quarter of the patients developed chronic kidney disease during the long-term follow-up.[3]

On the other hand, they may rarely be diagnosed during later childhood, adolescence, or even adulthood. With a better understanding of functional voiding disorders, valves are now an uncommon cause of minor voiding dysfunctions.[1] However, late presentation of PUVs has been associated with renal insufficiency in approximately 35% of school-aged children, although the most common presenting symptoms were diurnal enuresis and urinary tract infection.[4] Thus, similar to severe cases of PUVs, late-presenting cases also need to be diagnosed and treated.

Ultrasound is sensitive in detecting fetal hydronephrosis, but the specific diagnosis of PUVs is more difficult. The VCUG is a useful tool in diagnosing PUVs because it defines the anatomy and gross function of the bladder, bladder neck, and urethra. In PUV, the VCUG often demonstrates a trabeculated bladder, bladder diverticula, and severe vesicoureteral reflux. The VCUG should be considered in boys older than 5 years who have voiding complaints, especially in association with diurnal enuresis or urinary tract infection.[3] However, it is often difficult to determine whether VCUG should be performed because VCUG is more invasive than uroflowmetry.

Because his mother complained that he frequently strained to void although he had no complaint in the present case, we investigated his

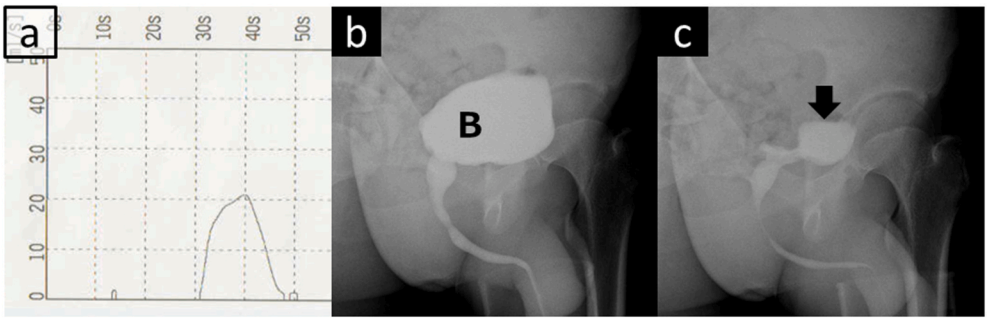

Fig. 3. The findings of uroflowmetry and VCUG after transurethral valve incision
(a) Uroflowmetry revealed a bell-shaped curve. (b) VCUG revealed that the flow of contrast had been improved, and the bladder diverticulum did not appear remarkable. B; bladder. (c) The size of the bladder diverticulum (arrow) appeared to have decreased.

voiding thoroughly. Then, PUV was successfully diagnosed by the VCUG findings after the uroflowmetry. Although the present case was mild PUV and he might have no subjective symptoms, the VCUG revealed the typical findings of PUV. Thus, VCUG should be performed without hesitation to diagnose when we suspect a urethral lesion, at least by abnormal findings of uroflowmetry.

4. Conclusion

Some patients with mild PUV may not notice their dysuria, as in the present case. We believe that VCUG should be performed without hesitation when we suspect a urethral lesion.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

None.

References

1. Pieetti RV. The mild end of the clinical spectrum of posterior urethral valves. *J Pediatr Surg.* 1993;28:701–704.
2. Churchill BM, McLorie GA, Khoury AE, Merguerian PA, Houle AM. Emergency treatment and long-term follow-up of posterior urethral valves. *Urol Clin North Am.* 1990;17:343–360.
3. Heikkilä J, Holmberg C, Kyllönen L, Rintala R, Taskinen S. Long-term risk of end stage renal disease in patients with posterior urethral valves. *J Urol.* 2011;186:2392–2396.
4. Bomalaski MD, Anema JG, Coplen DE, Koo HP, Rozanski T, Bloom DA. Delayed presentation of posterior urethral valves: a not so benign condition. *J Urol.* 1999;162:2130–2132.