

Primary vaginal stone in a disabled child

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KEY WORDS

vaginal stone ▶ vaginal foreign body

ABSTRACT

Authors report a case of a large primary vaginal calculus in an eleven-year-old girl. Vaginal stones are relatively rare in children. More frequently, they are seen as a complication in women with vesicovaginal fistula and urethrovaginal fistula. Various causes can lead to vaginal stone formation. In our case, the calculi was due to minor vaginal outlet obstruction and a permanent bedridden state with urinary incontinence and chronic urinary infection. In our patient X-ray film using frontal and lateral views during cystourethrography permitted establishment of the right diagnosis. Digital rectal examination allowed palpation of a hard mass anterior to the rectum indicative of a bladder calculus. The treatment was surgical incision of the vaginal introitus and extraction of the calculi. Plastic dilatation surgery of the vaginal introitus was performed concomitantly.

INTRODUCTION

Vaginal stones are extremely rare in children and may be mistaken for bladder calculi on plain radiography. Vaginal calculi are classified as primary or secondary. Primary vaginal calculi result from vaginal urine pooling and originate from the stasis of urine in the vagina without an obvious nidus. Secondary calculi are the result of crystallization of urinary constituents around a foreign body in the vagina. Primary vaginal calculi form as a consequence of deposition of urinary salts in a patient with urinary tract infection as a result of urethrovaginal fistula, vaginal outlet stenosis, post-traumatic or postsurgical scarring, ectopic vaginal ureter, or neurogenic bladder [1, 2, 3, 4]. We can also meet this problem in adult women with vesico- or urethrovaginal fistula. The most common causes of these abnormalities are gynecologic and obstetric procedures, such as hysterectomy, cesarean section, or complicated delivery [5, 6]. The continuous presence of urine inside the vagina is a prerequisite for stone formation, e.g. in bedridden children with urinary incontinence [4]. Vaginal stones may be solitary or numerous masses. In some cases, the calculi may be easily extracted. In other patients with vaginal outlet stricture or giant dimension of calculus it may be a necessity that it is fragmented or the vaginal wall will require incision and subsequent reconstruction. In all cases, the associated cause should be managed concomitantly [1].

CASE REPORT

An 11-year old girl was referred to our department for urologic evaluation because of a palpable vaginal mass anterior to the rec-



Fig. 1. Screening x-ray before voiding cystourethrography reveals large multi-concentric calculus in the pelvis.

tum, urinary incontinence, and recurrent urinary tract infections. The prescribed antibiotics resulted in only short improvement in urine bacteriology. The child was born with psychomotor retardation and atrophy of optic nerves and she is permanently bedridden. Renal and ureteral ultrasound and renography showed a normal upper urinary tract. Ultrasonography and a plain X-ray of the abdomen before urethrocytography revealed a large multi-concentric calculus in the pelvis (Fig. 1). Cystography, especially in the lateral view, allowed for determining the vaginal location of the calculus (Fig. 2). Voiding urethrocytogram excluded vesicovaginal or urethrovaginal fistulae and other abnormalities of the bladder and urethra.

An examination under general anesthesia confirmed the vaginal location of a giant calculus shaped as the vaginal lumen and measuring 6.5 x 3 x 3 cm (Fig. 3). The vaginal outlet was stenotic. We needed to make two lateral longitudinal 3.0 cm long incisions at the 3 and 9 o'clock positions of the vagina at the level of the hymen because extraction of the calculus was impossible. Subsequently, we employed forceps and, using rotary movements, extracted the cylinder-shaped calculus. The incisions were sutured transversely, thus achieving dilatation of the vaginal introitus. The indwelling catheter was placed in the bladder. The wounds were healed by primary intention. Chemical analysis of the stone confirmed it to be a triple phosphate stone (struvite) with no foreign body nidus observed after crushing. The patient has been symptom-free for over one year of post operative follow-up.



Fig. 2. Frontal view during cystourethrography.

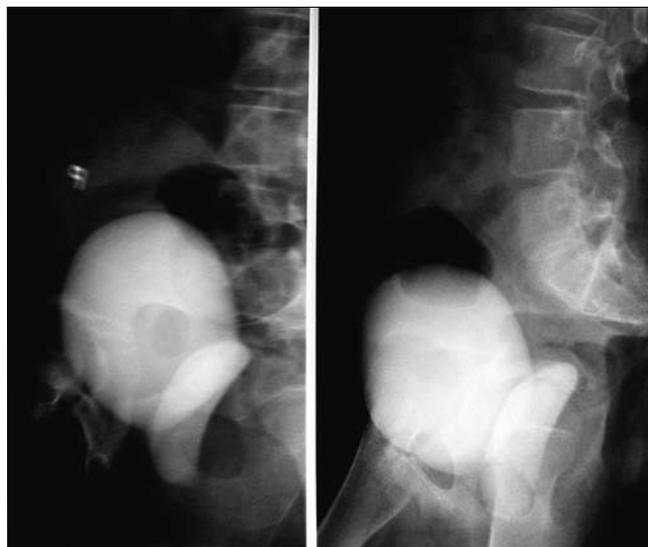


Fig. 3. Lateral views on the cystourethrography.



Fig. 4. Vaginal stone with shape of vaginal cavity.

DISCUSSION

Vaginal calculi in children are uncommon and various causal factors have been reported. Stones in the vagina can be primary or secondary, depending on the absence or presence of the foreign body nidus. Secondary vaginal stones may form around foreign bodies, such as suture materials used during such vaginal corrections as bladder or cloacal exstrophy, feminizing genitoplasty in congenital adrenal hypertrophy, or after urogenital trauma or as a complication of vaginal child birth [1, 5, 8, 9]. Other congenital causes are female hypospadias, vaginal ectopy of the ureter, imperforate hymen with fistula urethrovaginalis or vaginal strictures [2, 5, 12, 13]. Vaginal calculi may be associated with neuropathic bladder with incontinence due to myelodysplasia, cerebral palsy, or multiple sclerosis [4, 10, 11]. Vaginal stones are caused by pooling of urine in the vagina. Urinary stasis in the vagina causes deposition of urinary salts and infection with urease producing bacteria, such as *Klebsiella sp.* or *Escherichia coli*, which can change the physiological acid pH to an alkaline state, predisposing to precipitation of triple phosphate [1, 2, 3, 11].

Calculi in the vagina are difficult to detect solely by ultrasonography, therefore investigations should be carried out with particular care. The most important examination seems to be cystography with the necessary radiograms in the lateral or oblique position. In some complicated cases, for example after urogenital trauma or in congenital abnormalities, the findings may be confirmed by CT of the pelvis [15].

In our patient, several factors contributed concomitantly. The girl was a bedridden patient with a neuropathic bladder and with stricture of the vaginal introitus. Chronic urinary infection facilitated crystallization of the urinary constituents. After introducing anti-inflammatory prophylactic therapy and changing the position of the patient so that she spent more time sitting, urine bacteriology became negative.

CONCLUSIONS

1. Vaginal calculus originates from urinary stasis in the vagina and concomitant infection.

2. Vaginal secondary calculi may be the result of crystallization of urinary constituents around a foreign body in the vagina.

3. Vaginal stones should be included in the differential diagnosis in cases of calculi noted in the pelvis on plain radiographs.

4. Cystography in the lateral view aids in determining the vaginal location of the calculus.

5. The associated causes of vaginal retention of urine should be managed concomitantly.

REFERENCES

1. Plaire JC, Snodgrass WT, Grady RW, Mitchell ME: *Vaginal calculi secondary to partial vaginal outlet obstruction in pediatric patients*. J Urol 2000; 164: 132-133.
2. Oguzkurt P, Ince E, Ezer SS et al: *Primary vaginal calculus secondary to urethrovaginal fistula with imperforate hymen in a 6-year-old girl*. J Pediatr Surg 2009; 44: 11-13.
3. Liu B, Huang X, Lu J et al: *Vaginal calculi secondary to urethrovaginal fistula with vaginal stenosis in a 14-year-old girl*. Urol 2008; 36: 73-75.
4. Bissada N, Hanash KA: *Primary vaginal stones*. Urology 1983; 21: 512-513.
5. Bar K, Szkodny A, Klijer R, Urban M: *Rzadki przypadek olbrzymiego kamienia w pooperacyjnej przetoce pęcherzowo-pochwowej (Gigant calculus in postoperative vesico-vaginal fistula)* Urol Pol 2001; 54: 64-66.

6. Ayhan A , Tuncer ZS, Dogan E: *Results of treatment in 182 consecutive patients with genital fistulas*. Int J Gynecol Obstet 1995; 48: 43-45.
7. Eton B: *Vaginal calculus in a child*. J Obstet Gynaecol Br Commonw 1956; 63: 93-94.
8. Van Eyk NA, Grover S, Fink AM: *Vaginal calculus as a late complication of bladder exstrophy*. J Ped and Adol Gynec 2003; 16: 285-287.
9. Bar-Moshe O, Oboy G, Assi J: *Vaginal calculi in a young woman*. Eur Urol 2000; 37: 505-507.
10. Petrillo CR, Borrelli M, Botelho C: *Primary vaginal calculus in a patient with meningomyelocele*. Arch Phys Med Rehabil 1981; 62: 227-229.
11. Venet C, Clapuyt PH, Wese SX: *Vaginal stone in a teenager*. Br J Urol 1997; 79: 804-805.
12. Grannum RS, Gene RC, George TK: *Vaginal calculus in female with myelodysplasia*. Urology 1983; 22: 294-296.
13. Bhat A, Saxena R, Bhat MP et al: *Female hypospadias with vaginal stones: a rare congenital anomaly*. J Ped Urol 2010; 6: 70-74.
14. Liu B, Huang X, Lu J, Zhang Z et al: *Vaginal calculus secondary to urethrovaginal fistula with vaginal stenosis in 14-year-old girl*. Urol Res 2008; 36: 73-75.
15. Malik R, Pandya VK, Agraval G: *Giant vaginoliths*. Ind J Radiol Imag 2006; 4: 825-826.

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