

Vaginal calculi secondary to urethrovaginal fistula with vaginal stenosis in a 14-year-old girl

Ben Liu · Xiao Huang · Junjie Lu · Zhigen Zhang ·
Ping Wang · Zheng Huang

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Abstract The author reports a case of vaginal calculi secondary to urethrovaginal fistula with vaginal stenosis in a 14-year-old girl. The initial urethrovaginal fistula and vaginal stenosis resulted from pelvic trauma after a traffic accident, with subsequent surgical urethral realignment and anterior colporrhaphy without success. The patient had continuous urinary incontinence for a duration of 11 years after surgery, and was finally diagnosed with urethrovaginal fistula with primary multiple vaginal calculi in our hospital. Surgeries were performed to remove the stones and repair the urethrovaginal fistula. Colpoplasty was also given by an obstetrician–gynecologist to solve the vaginal stenosis. After the procedure, the girl urinated normally. At her 3-month follow-up, the patient had no sign of urine leakage.

Keywords Vaginal calculi · Urethrovaginal fistula · Vaginal stenosis

Introduction

Vaginal calculi are rare, especially in children, and are classified either as primary or secondary. Primary vaginal calculi are believed to originate from the stasis of urine in the vagina with or without vaginal outlet obstruction, whereas secondary vaginal calculi are the result of crystallization of

urinary constituents around a foreign body in the vagina [1]. Following trauma, the rare appearance of urethrovaginal fistula in female children mainly occurs in the proximal part of the urethra or bladder neck [2]. Vaginal stenosis in childhood has been reported with scarring equal to that after trauma or surgery, such as vaginoplasty or repair of bladder exstrophy. Vaginal outlet obstruction is infrequently associated with primary vaginal stones, which form as a result of the chronic pooling of urine in the vagina [3].

We recently treated a complicated case of primary vaginal calculi secondary to urethrovaginal fistula and vaginal stenosis in a 14-year-old girl, who had a surgical history of urethral realignment and anterior colporrhaphy after pelvic trauma 11 years ago.

Case report

A 14-year-old girl came to our outpatient clinic because of urinary incontinence lasting 11 years. The girl's mother recalled that the girl suffered a trauma in a traffic accident 11 years ago. The diagnosis was pelvic fracture with urethral disruption and colporrhhexis. The girl underwent a urethral realignment and anterior colporrhaphy in the emergency OR. The details of the surgery were not available to us. After the surgery, the girl presented urinary leakage from the vagina at all time, and she required 2–3 pads per day. The girl had frequent urinary tract infections thereafter, but no haematuria or dysuria. She had her menarche at 12 years of age with irregular menstrual periods. Physical examination at the time of admission revealed a rough stone-hard mass that was palpable in the anterior vaginal wall, and the hymen was normal. Urine culture yielded *Escherichia coli*. A plain radiograph of the pelvis showed a multiple rounded density, suggestive of several calculi in

B. Liu (✉) · X. Huang (✉) · J. Lu · Z. Zhang · P. Wang · Z. Huang
Department of Urology, The First Affiliated Hospital,
College of Medicine, Zhejiang University,
No. 79 QingChun Road, 310003 Hangzhou City,
Zhejiang Province, People's Republic of China
e-mail: drliuben@sina.com.cn

X. Huang
e-mail: huangxiao69@hotmail.com



Fig. 1 A plain radiograph of the pelvis showed multiple rounded stones, suggesting several calculi in the pelvis

the pelvis (Fig. 1). Ultrasound examination of the abdomen showed that the uterus was normal, and there were multiple high-level echogenic masses in the superior segment of the vagina below the cervix. Cystoscopy showed no fistulous communication between the bladder and vagina. Speculum examination or vaginoscopy was not performed in order to keep the hymen intact. In a bladder leakage test, 30 minutes after methylene blue was injected into the bladder, there was no obvious leakage of fluid from the vagina. However, during the micturation phase, a little blue fluid could be seen from the vagina. Cystourethrogram demonstrated a normal bladder, with no fistula between the bladder and vagina, while in the urination phase, contrast medium flowed into the proximal vagina revealing an urethrovaginal fistula (Fig. 2). A computerized tomography showed these masses (CT figure 860 Hu) to be posterior to the bladder and anterior to the rectum.

For the surgery, a vertical incision was made into the inferior abdomen under general anesthesia. The stones were palpable in the bladder. The bladder was open in the trigone area. During the operation, the posterior wall of the bladder was dissected sharply. It showed an expanded superior segment of the vagina, which had five white wedge shaped calculi, with a small amount of white muddy fluid inside. The calculi were solid and slick (Fig. 3). After all stones were dislodged, a fistulae orifice of about 0.5 cm in diameter was

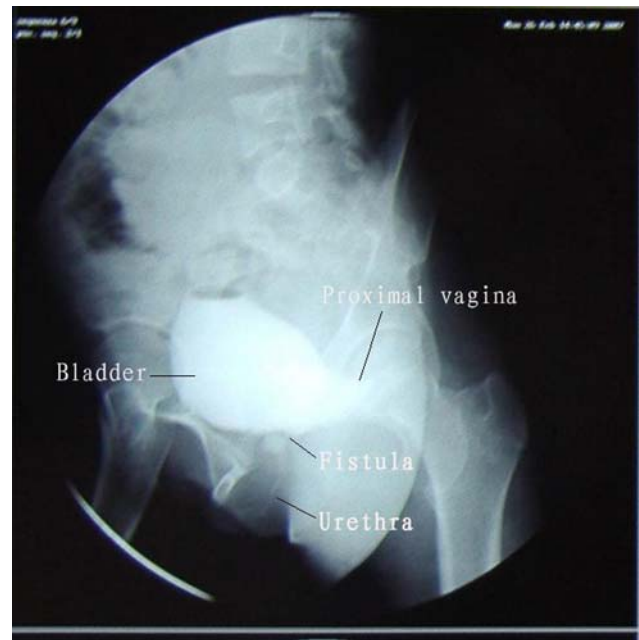


Fig. 2 While in urination phase, contrast medium flowed into the proximal vagina, which revealed an urethrovaginal fistula



Fig. 3 Five irregular but similar primary stones dislodged from the vagina

revealed at approximately 0.8 cm from the internal urethral orifice. About 4 cm above vaginal orifice, an obvious vaginal stenosis, which looked like a pinpoint, was found. No other genitourinary anomaly or nidus was identified. The stenosis was slit and expanded to a normal level. After a complete dissection, closing the vaginotomy and cystotomy with absorbable sutures repaired the urethrovaginal fistula. The urethral catheter was removed 1 week after the operation. Chemical analysis of the stone confirmed its composition as triple phosphate (struvite). During the 3 months follow-up period, the girl had no sign of urinary incontinence at any time.

Discussion

Urethral trauma is an uncommon but possibly serious injury in children. In girls where these injuries are usually associated with pelvic fractures and vaginal tears, primary repair has been advocated, but it is not always associated with an optimal outcome [4]. Urethrovaginal fistulas are relatively rare and usually occur secondary to complications following gynecological or urological procedures. Urethral diverticulectomy and anterior repair are the most common procedures [5]. In our case, traumatic rupture of the patient's urethra associated with pelvic fracture resulted in urinary urethrovaginal fistula and vaginal stenosis. The size of a young child's vagina is small, and the suture of paries anterior vaginase might penetrate too deeply and lead to stenosis. The primary repair operation might be a cause of vaginal stenosis.

Chronic pooling of urine in the vagina causes primary vaginal calculi, which are more common than secondary calculi [3]. The presence of a primary vaginal stone suggests a urinary vaginal fistula, ectopic vaginal ureter, neurogenic bladder, or partial vaginal outlet obstruction [6]. Infection with urease-producing bacteria, such as *Proteus mirabilis*, *Klebsiella* sp., or *E coli*, can change the normally acidic pH of the vagina to alkaline, predisposing the precipitation of triple phosphate (struvite) calculi. Secondary calculi are less common and typically form around nonabsorbable suture material used in vesicovaginal fistula repair, or around a foreign body retained in the vagina [7,8].

The diagnosis of vaginal stones can be difficult and requires the physician to be highly aware of this possible diagnosis [3]. The formation of calculi is slow and remains undetected when it does not cause any symptom in the patient, so a plain film of the pelvis should always be taken when in doubt.

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