

Bilateral very large calcium oxalate stones in the seminal vesicles: case report and literature review

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Abstract A 29-year-old man with hypospadias and bilateral undescended testicles presented with recurrent attacks of lower urinary tract infections and painful ejaculation. He was diagnosed to have very large bilateral seminal vesicle stones. The pelvis X-ray showed two radio-densities located in the pelvis with symmetrical appearance while Ultrasound showed them as echogenic structures with posterior acoustic shadowing. In magnetic resonance imaging (MRI) of the pelvis they appeared hypointense in both T1-weighted and T2-weighted images while pelvic computed tomography scan (CT scan) showed bilateral huge stones in the seminal vesicles. The stones were extracted by open surgery through the bladder after trans-urethral excision of the ejaculatory ducts. Here, we report the first case of bilateral, large, heart-shaped, calcium oxalate monohydrate of seminal vesicle calculi with brief literature review.

Keywords Seminal vesicle calculi · Calcium oxalate stones · Pelvic CT scan · Pelvic MRI · Seminal vesicle ultrasound

Introduction

The seminal vesicles (SV) are paired secretory glands located just posterior to the bladder. They originate as a diverticulum from the ampulla of the vas deferens (approximately at 8 weeks of gestation) [1]. Their function is to produce seminal fluid that can support and maintain sperms. Seminal vesicle fluid composes up to 80% of the ejaculate volume. The SV contributes fructose, prostaglandins, and the majority of proteins in the ejaculate. The nuclei of seminal vesicle calculi (SVC) are composed of epithelial cells and a mucoid substance that is covered with lime salts [2], usually calcium phosphate, carbonate, urate, phosphate and struvite. Schwartz hypothesized that most if not all of extraosseous calcifications in the body arise from a nidus of carbonate apatite [3]. Since 1965, only eight cases of clinically significant SVC were reported in the world literature; their majority occurs in men above 40 years and few in children [3]. We report the first case of bilateral, large, heart-shaped, calcium oxalate monohydrate of SVC that removed surgically.

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Case report

A 29-year-old married infertile male patient presented with recurrent attacks of lower urinary tract infections for the past few years. He was complaining of dysuria, urgency, frequency, lower abdominal and perineal pain, and painful ejaculation. He had no history of hematuria or hematospermia. In his past medical history he had, bilateral undescended testicles with left orchiectomy, right orchi-dopexy, and penoscrotal hypospadias with failed multiple trials of repair. Neither the patient nor his family had

history of stone diseases. He was azoospermic as a previous testicular biopsy revealed no spermatogenesis.

Clinical examination revealed the presence of right atrophic testicle, empty left hemiscrotum, and a penoscrotal hypospadias with scars of previous operations. The digital rectal examination revealed the presence of a stony hard mass anterior to the rectum with inability to define its border with concomitant extrusion of pus through the external urethral meatus. Urine analysis revealed turbid urine, alkaline pH, proteinuria, numerous red blood cells per high power field, few epithelial cells, and triple phosphate crystals. 24-h urine collection was done to evaluate the excretion rate of calcium, oxalate, and uric acid and was found to be normal. Urine culture revealed the presence of infection of *E. coli*-sensitive for cefuroxime, gentamicin, nitrofurantoin and cefixime (cefixime). His renal function tests were within normal limits. Tuberculosis, hepatitis B, C, and HIV tests were negative. Parathyroid hormone level and related metabolic functions were normal, the prostatic specific antigen, complete blood count, blood electrolytes (including calcium), glucose, and uric acid were within standard values. Karyotyping showed 46XY genotype. The pelvis X-ray (Fig. 1) showed two adjacent, symmetrical, heart-shaped densities located in the pelvis in the projection of the urinary bladder. Ultrasound of the pelvis showed bilateral oval shaped echogenic structures with posterior acoustic shadowing consistent with calcified lesions below the urinary bladder, but the prostate could not be seen. Therefore, magnetic resonance imaging (MRI) and magnetic resonance urogram (MRU) of the urinary tract was performed and a small size prostate was identified. Two hugely calcified lesions were seen in the SV area and appeared of low signal in both T1-weighted (Fig. 2a) and T2-weighted (Fig. 2b) images. Each lesion measured around (7 × 4 × 3.5 cm) and no other urinary tract morphologic abnormality could be

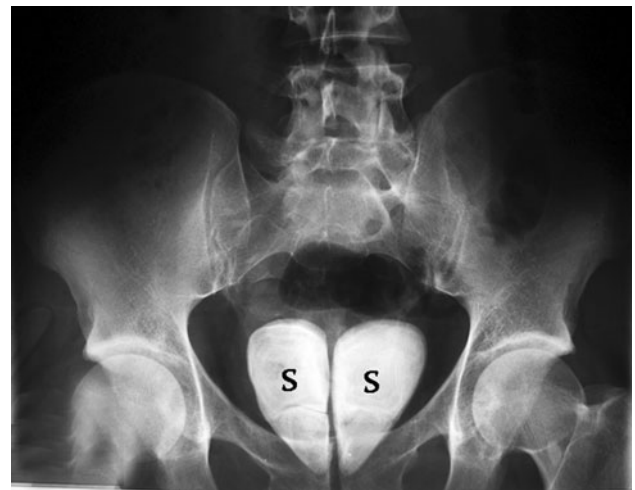


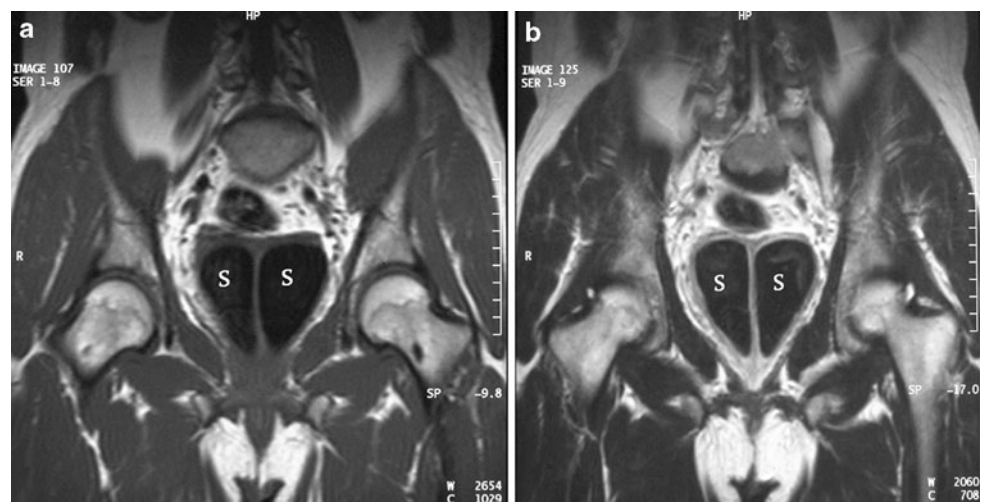
Fig. 1 Pelvic X-ray showing two adjacent densities in the pelvis over the projection of the urinary bladder

detected in MRI and MRU. Pelvic computed tomography scan (CT scan) was performed (Fig. 3) due to its superiority in calcifications and radiodensity (HU value) measurement. It showed bilateral huge SVC posterior to the urinary bladder with a density of over 1000 HU. ^{99m}Tc DTPA renal scintigraphy was utilized to evaluate the function of the upper urinary tract and was found to be normal.

Cystometry and voiding cystourethrogram showed a stable bladder, no flow obstruction, and no evident reflux into the ureters or ejaculatory ducts. Diagnostic cystoscopic examination showed widely opened utricular openings of both ejaculatory ducts, which allowed a 15.5Fr rigid cystoscope to pass into the SV where the huge stones were found.

Broad-spectrum parenteral antibiotics were given according to culture sensitivity. After the lower urinary tract infection was put under control, Intra-operatively,

Fig. 2 Coronal T1 weighted (a) and T2 weighted (b) images of the pelvis showing the two stones in the seminal vesicles that appear hypointense on both sequences



huge openings of the utricle seen and only limited excision between the bladder neck and posterior edge of the common opening of the utricle was done, it was not enough to put the cystoscope around the stone. Therefore, cystostomy was done with further extension of the previous transurethral excision. The two large stones were manipulated by forceps and removed separately. The seminal vesicles were preserved upon patient's preoperative decision. They were two brown-colored large stones (Fig. 4), and their composition was found calcium oxalate monohydrate. Post operatively, the patient was doing well without any complications, fully continent and his symptoms improved.

To our knowledge, this is the first reported case of bilateral, symmetrical heart-shaped, seminal vesicle stones that composed of calcium oxalate monohydrate.

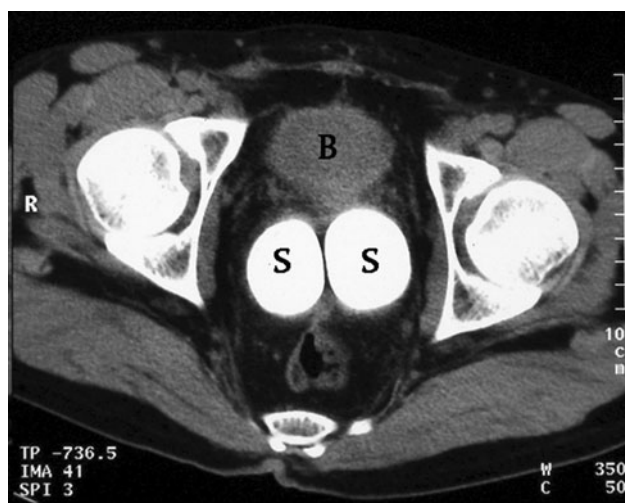


Fig. 3 CT of the pelvis showing two adjacent dense stones (S) in the seminal vesicles just behind the urinary bladder (B)



Fig. 4 Photograph of the two huge brown-colored calcium oxalate monohydrate stones extracted from the seminal vesicles

Discussion

Seminal vesicle calculi are extremely rare and their exact incidence is unknown. Based on previous reports, their formation was correlated to obstruction, infection, anomalies in the SV or urinary tract reflux into the ejaculatory ducts [3]. The first case of SVC was reported in 1928 and thereafter, only few cases are published in the world literature. In a historical review published in 2006, Singh et al. found only three cases out of 20 and they ascribed, as large bilateral SVC, therefore, their case was the fourth [4]. The fifth case was reported in 2008 [5]. Thus, our case is the sixth regarding size. Moreover, it is the first case of bilateral, heart-shaped, calcium oxalate monohydrate SVC of such a huge size (Table 1).

The interior of seminal vesicles was examined safely in 37 patients by an innovative transutricular seminal vesiculoscopy technique. Yet, their study was diagnostic and not therapeutic [6]. The outcome of transrectal US study to evaluate 276 males with low ejaculate volume and azoospermia demonstrated that; 12 (4.4%) had stones: five stones (42%) in the ejaculatory ducts, four stones (33%) in the vas deferens, and three stones (25%) in the SV [3, 7]. Cho et al. evaluated 17 men with hematospermia by MRI and they detected 19 stones; were five (26%) in the prostate, eight (42%) in the SV, four (21%) in the ejaculatory ducts, and two (11%) in the mullerian duct cysts [3, 8]. These studies encouraged the employment of imaging techniques to discern significant calculi in males with infertility and in particular those with low volume azoospermia as in our case. Imaging techniques utilized in our case, proved to be of great diagnostic value and the findings were identical to those reported in the literature.

The symptoms of SVC range from asymptomatic to perineal pain, testicular pain, hematospermia, painful ejaculation [5, 9] and passing granules in semen [10]. These cases were treated by open surgery via suprapubic, transrectal, or perineal approach with the excision of SV [3]. While in the present case, the patient experienced dysuria, frequency, urgency, pain in lower abdomen and perineum with painful ejaculation and were treated surgically with preservation of seminal vesicles upon patient's preoperative decision.

Abnormalities of the SV may affect any age group and become obvious after sexual maturity. Agenesis, hypoplasia, and congenital cysts of the SV may associate cryptorchidism [1]. A methodical literature review did not show any association between hypospadias and anomalies of the SV. However, another report affirmed the possible association between SVC and cryptohypoplasia, obstructive azoospermia, infertility, and hematospermia [4]. Contrast to other findings, Namjoshi in 2002 was detected a

Table 1 Giant seminal vesicles stones reported in english literature

Author/year	No. of cases	Side	Size	Diagnostic modality	CT density (HU)	Stone composition	Clinical presentation	Outcome
Kilciler/2002 [8]	2	Case 1 Left	NA	KUB	NA	NA	Perineal and testicular pain	Vesiculectomy
		Case 2 Bilateral	Rt 12 mm, Lt 10 mm	TRUS				
				KUB	NA	NA	Terminal pain on urination, hematospermia	Stones removed by perineal approach
				TRUS				
Namjoshi/2002 [11]	1	Bilateral	Rt 35 × 35 × 50 mm Lt 30 × 20 × 45 mm	KUB	>1150HU	NA	Lower abdominal pain, frequency	NA
Singh/2006 [4]	1	Bilateral	30 × 40 mm	CT scan				
				KUB	>1000 HU	Magnesium and ammonium phosphate	Frequency, dysuria, lower abdominal pain	Patient refused surgery
				TRUS				
				CT scan				
Yun/2008 [9]	1	Left	60 × 35 × 35 mm	KUB	NA	Carbonate apatite	Incidental	Laposcopic stone removal and partial vesiculectomy
				CT scan				
Present case/2010	1	Bilateral	Rt 70 × 40 × 35 mm Lt 70 × 40 × 35 mm	KUB	>1000 HU	Calcium oxalate	Dysuria, urgency, frequency, lower abdominal pain, painful ejaculation	Stone surgical extraction
				US				
				CT				
				MRI				

NA not available, HU hounsfield unit, TRUS transrectal ultrasound, US pelvic ultrasound, KUB kidney, ureter and bladder radiography, CT computerized tomography, MRI magnetic resonance imaging

bilateral, large star-shaped SVC in one patient who has no any genitourinary or anorectal anomalies [11].

The shapes of SVC reported previously have included bean shaped [4], and star shaped [8]. Yet, it is for the first time to report a SVC with symmetrical heart-shaped exterior as in this case. Compositions of SVC formerly reported were integrated calcium carbonate, urate, phosphates, magnesium ammonium phosphate, and mucoid substances [3, 8]. However, the composition of our SVC was calcium oxalate monohydrate.

This case is intended to highlight the occurrence of this rare abnormality. In addition to preventing diagnostic errors, careful interpretation of pelvic images to the possibility of bilateral seminal vesicle calculi whenever such heart-shaped densities are seen on the plain X-ray that may be recognized as a diagnostic sign in the future.

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