



## Inflammation and Infection

## Female urethral diverticulum containing calculi: A rare and tricky condition



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## Introduction

A female urethral diverticulum (UD) is an uncommon clinical entity. It occurs in 0.6–6% of the female population.<sup>1</sup> The diagnosis is often delayed as the symptoms can be misleading.<sup>1</sup> The complications are mainly local consisting in malignant degeneration, urinary infection and stone formation. The latter is reported in 1.5–10% of cases.<sup>2,3</sup> The key steps in the management of UD with calculi are: a high index of suspicion, the use of imaging studies and open surgical excision.<sup>4</sup> Through presenting a case of female UD with calculi and a literature review, we deal with the diagnostic, therapeutic and evolutive aspects of this pathology.

## Observation

A 54-year-old woman presented to the Urology Clinic complaining of a 2-years history of urinary frequency, lower abdominal pain and sensation of a vaginal lump ‘coming down’. She also reported spontaneous calculi discharge. There was no history of dysuria or dyspareunia. She had three pregnancies all with vaginal delivery and only one of them was performed by forceps. The general patient examination was normal. Genital examination revealed a large mass of approximately 4 cm protruding from the anterior vaginal wall and positioned on the midline less than 2.5 cm of the urethral meatus (Fig. 1). Firmness was present in her rectal vault. Urine dipstick analysis demonstrated leucocyturia but there was no growth in her urine culture. The postvoiding film of an excretory urographic series demonstrates a cystic formation involving the urethra, consistent with UD, within which there was multiple calculi (Fig. 2).

Cystourethroscopy, performed using a round-ended cystoscope (without a beak), to enable dilatation of the female urethra by irrigation, showed scarcely calculi at the diverticulum.

The decision was made to perform a surgical extraction of the calculi and diverticulectomy. Spinal anesthesia was used for surgery. Before initiating the procedure, a Foley 20 probe was placed and Lidocaine (1%, 10ml) with adrenaline was used for vaginal-wall infiltration. After transvaginal surgical excision via an anterior vaginal

wall inverted U incision, a careful dissection of the diverticulum down to the level of its neck was performed. This incision allowed total removal of about thirty calculi (Fig. 3). The urethral mucosa was closed using vicryl 4/0. A two layer closure (urethral fascia and muscularis; vaginal mucosa) was performed using vicryl 2/0.

A vaginal pack was left in for one day and the Foley catheter for fourteen days. Histology confirmed the absence of malignancy. Follow-up examination after few months showed no abnormality.

## Discussion

Originally described by William Hey in 1805, female UD is a relatively rare urologic disease.<sup>5</sup> The prevalence of UD in women is between 0.6% and 6%, and associated stone formation is reported to occur in 1.5%–10% of cases.<sup>1</sup> UD can present in many ways, including dysuria, dyspareunia, postvoid dribbling, feeling of a mass, and recurrent urinary tract infections.<sup>2</sup> The diagnosis of UD is often delayed because of its non-specific clinical presentation combined with its relative rarity.<sup>1</sup> The cause of diverticula remains largely unknown. Recurrent infections and dilation/abscess in paraurethral glands are hypothesized as the most common risk factor for the development of UD in women. Pregnancy and/or vaginal delivery with or without instrumentation lead also to diverticulum formation.<sup>1</sup> As a consequence of delayed diagnosis, women may encounter several complications, such as calculus formation and neoplastic degeneration. Stasis of infected urine with deposition of salts and occasional mucoid desquamation of the epithelial lining is known to be the casual factor for stone formation. A focused genital examination revealed an anterior vaginal wall lump in 52–90% of patients.<sup>1</sup> The most important diagnostic sign of a calculus in the diverticulum is a palpable hard mass on the floor of the urethra.

In patients with UD, cystourethroscopy may show the ostium in only 30% of patients due to inflammation or a small urethral lumen. Other investigations to confirm UD are retrograde and voiding urethrocytography, retrograde urethrocytography with positive pressure tests, intravenous urography and ultrasonography.<sup>5</sup> Ultrasound is a non-invasive examination with excellent accuracy and high sensitivity with no

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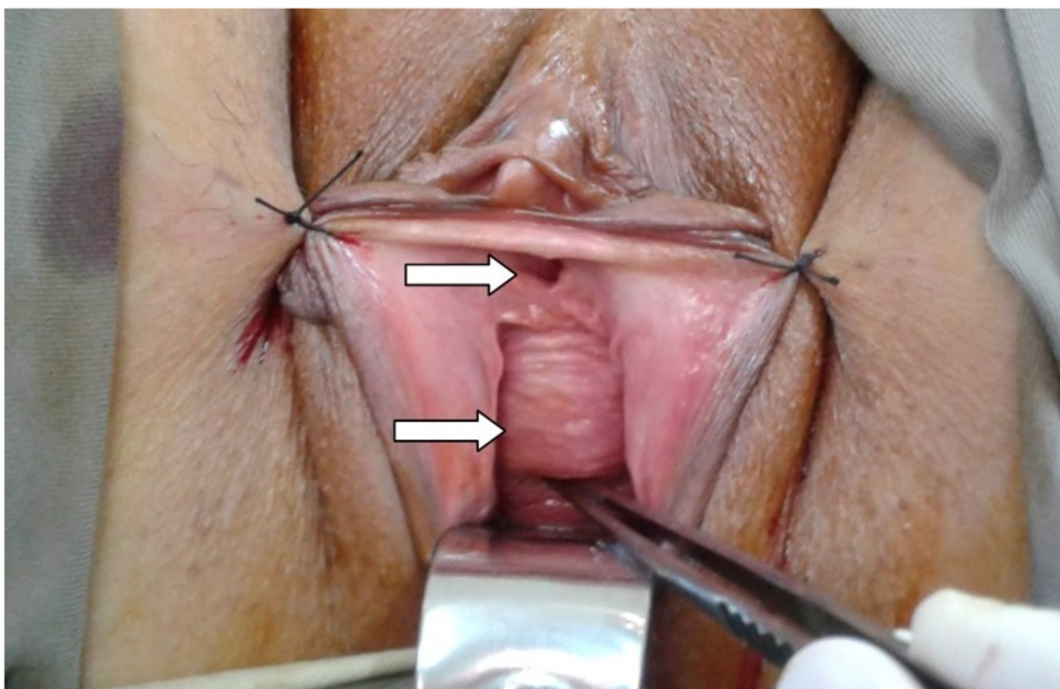


Fig. 1. A UD bulging through the anterior vaginal wall on clinical examination before surgery. (upper arrow, urethral meatus; lower arrow, diverticulum).



Fig. 2. Postvoiding cystourethrogram shows a cystic formation at the level of the midurethra containing multiple calculi (arrow).

risk of allergy or risk of radiation. However ultrasound remains to be an, operator-dependent technique which can miss small diverticula. Other diagnostic techniques require specific hardware and remain operator dependent, such as MRI with endorectal coil. A stone could also be visualized within the diverticula by one of these diagnostic

modalities. Reported minimally-invasive treatment options include marsupialisation, fulguration and endoscopic de-roofing, although the most effective treatment is transvaginal surgical excision. A supine position, which was adapted for our patient, allows a good exposure of distal lesions and allows an easy and complete excision of the

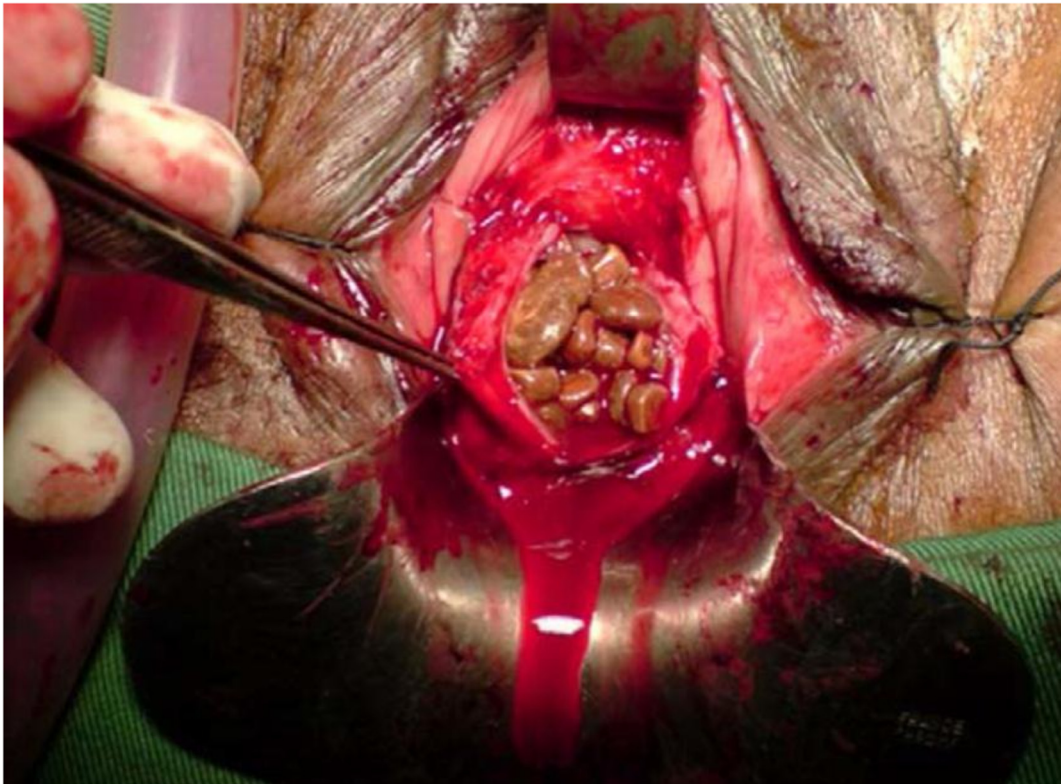


Fig. 3. Transvaginal diverticulectomy: a U vaginal incision allowed total removal of about thirty calculi.

diverticulum. By opting for a U incision, our objective was to reduce the risk of fistula and postoperative stenosis. The best way to close the diverticular collar is in three layers. This technique has a good success rate with short-term follow-up, although there are risks of diverticulum recurrence, fistula formation and de novo stress urinary incontinence.

### Conclusion

Female UD especially with calculi is a rare and unique condition that requires high clinical suspicion for diagnosis. In recent years, MRI has become the gold standard imaging study for UD diagnosis and surgical planning. Surgical approach with litholopaxy followed by diverticulectomy may reduce subsequent development of urethrovaginal fistula formation.

### Conflicts of interest

None declared.

### Funding sources

None.

### Consent

The patient has signed written informed consent and accepted the case report submission.

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