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CASE REPORT

Female Urethral Diverticulum and its Management: Case Report and Literature Review

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Abstract

Female urethral diverticulum is a rare pathology. Its discovery is often incidental, usually during complications that may be infectious, lithiasic, or degenerative.

We report a clinical case of female urethral diverticulum revealed by episodes of recurrent infections. Surgical treatment was performed by a vaginal approach, with good postoperative outcomes.

Keywords: Diverticulum, Urethra, Infection

Résumé:

Le diverticule de l'uretre feminin est une pathologie rare. Sa découverte est souvent fortuite à l'occasion des complications qui peuvent être infectieuse, lithiasique ou dégénérative.

Nous rapportons un cas clinique de diverticule de l'uretre feminin révélé par des épisodes de surinfections. La cure chirurgicale a été réalisée par un abord vaginal avec une bonne évolution post opératoire.

Mots clés: Diverticule, Urètre, Infection.

1. Introduction

Urethral diverticulum is a rare condition defined as a herniation of the urethral mucosa through the smooth muscle fibers composing the urethral wall. It forms a dead end or cavity that most often communicates with the urethral lumen, creating a protrusion into the vaginal space [1]. Its etiopathogenesis remains poorly understood and may be congenital or acquired [2,3].

Imaging diagnosis is often incidental, usually triggered by complications such as infections, lithiasis, or degeneration. The treatment is surgical, consisting to transvaginal diverticulum excision [4]. We report the case of a 42-year-old woman whose urethral diverticulum was revealed by episodes of recurrent infections. Surgical treatment was performed by a vaginal approach, with good postoperative outcomes.

The aim of this report is to raise awareness among clinicians about this condition in the context of lower urinary tract symptoms in women, which may reveal a urethral diverticulum—a condition whose treatment remains surgical.

2. Case presentation

A 42-year-old woman, primigravida, primiparous, with a history of gestational diabetes, presented to the urology department with lower urinary tract symptoms including recurrent cystitis, pelvic pain, and dyspareunia evolving over three years.

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Vaginal examination revealed a fluctuant mass through the anterior vaginal wall with purulent discharge from the urethral meatus upon pressure, suggesting a fistulized abscess.

Urethrocystoscopy showed a diverticular orifice on on the ventral side of the urethra, approximately 1 cm from the external meatus. Concurrent vaginal palpation led to the drainage of purulent secretions, achieving complete evacuation of the cavity.

Ultrasound revealed a semi-filled bladder with anechoic content and thin walls. Subvesically, a thick-walled, vascularized cystic formation was identified posterior and slightly to the left of the urethra, measuring 23x13x22 mm, with mildly heterogeneous content (Figure 1).

Pelvic MRI with gadolinium contrast revealed a cystic lesion originating from the posterior wall of the proximal third of the urethra, measuring 25×18×34 mm, extending posteriorly and laterally to the right. The lesion showed a fluid level and circumferential thickening of its walls, compatible with recurrent infections, suggestive of a posterior urethral diverticulum (Figure 2).

Urine culture identified Klebsiella pneumoniae and Escherichia coli.

Following targeted antibiotic therapy, diverticulectomy was performed by a vaginal approach without complications. The procedure involved a U-shaped incision of the anterior vaginal wall, dissection of the periurethral fascia, exposure (Figure 3a), and opening of the diverticulum (Figure 3b). The diverticular walls and neck were excised over a 16 Charrière urethral catheter placed at the beginning of the procedure. Closure was performed in three layers : urethral suturing with separate 4.0 PDS stitches, a leak test with methylene blue (which showed no leakage), reinforcement with Vicryl 3.0 (Halban fascia), and closure of the vaginal wall with 2.0 Vicryl. A vaginal gauze dressing was placed.

Postoperative recovery was uneventful, with catheter removal after 15 days. Histopathological analysis showed no signs of malignancy.

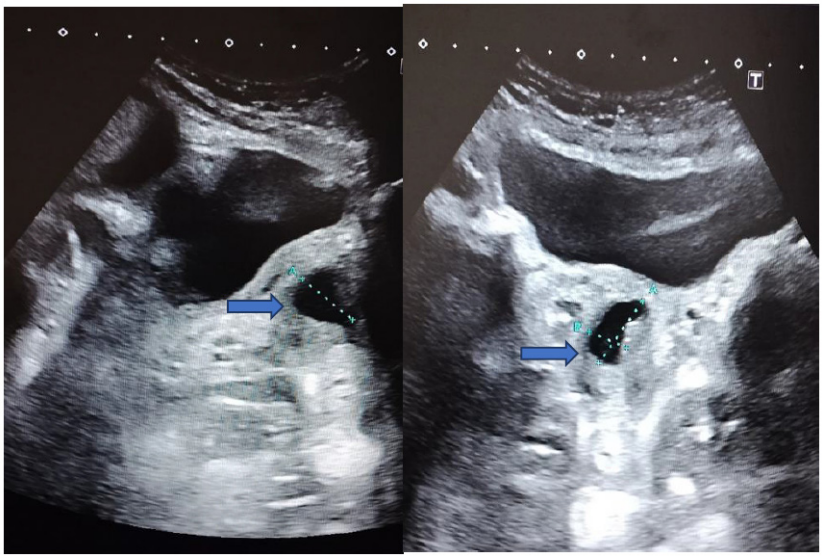

Figure 1 (a, b). *Ultrasound showing a cystic formation with thickened walls arising from the urethra.*

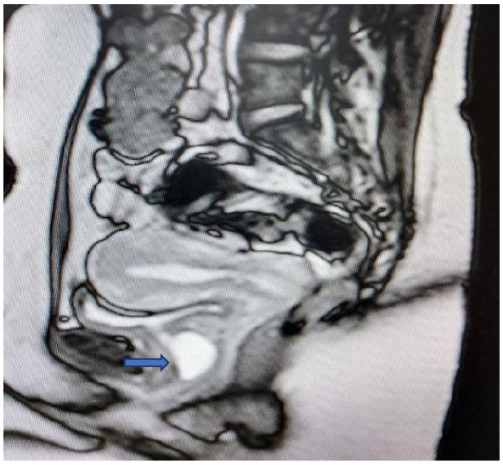

Figure 2. *Pelvic MRI demonstrating a diverticular sac arising from the urethral wall*

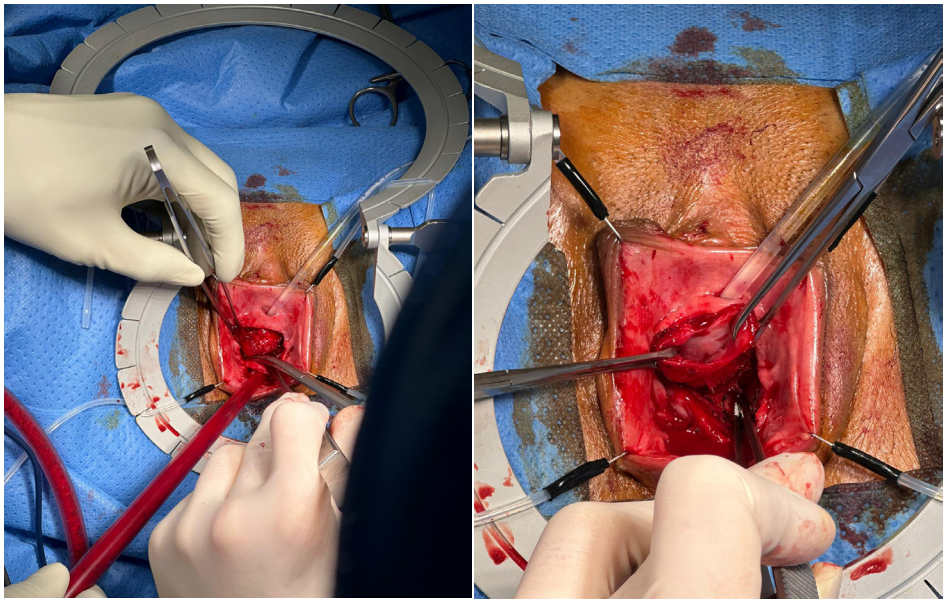

Figure 3(a, b). *Intraoperative images showing diverticulum exposure (a) and opening (b).*

3. Discussion

Female urethral diverticulum, commonly referred to as a "suburethral pouch," is a herniation of the urethral mucosa through the smooth muscle fibers of the urethral wall, forming a cavity communicating with the urethral lumen and protruding into the vaginal space [1].

This is a rare condition with an underestimated incidence, reported between 0.6% and 6% in the literature [3,5]. Its etiopathogenesis is poorly understood and likely multifactorial, with both congenital and acquired origins [2]. The most widely accepted theory, known as Routh's hypothesis, suggests that infection of the periurethral glands leads to obstruction of their ducts and cyst formation, which, upon rupture into the urethral lumen, results in a diverticulum [6].

It typically affects young women, with a mean age of diagnosis around 37.5 years [7,8]. Ben Amna's Tunisian series of 21 patients found the highest prevalence between 20 and 40 years of age (76%) [4]. Our patient was 40 years old.

About 20% of cases are asymptomatic [4,9], but complications such as abscess formation, cystitis, lithiasis, and malignant degeneration may occur [1]. Symptoms vary but commonly include lower urinary tract symptoms such as frequency, dysuria, post-void dribbling, stress incontinence, and recurrent urinary infections [4,5], as was the case in our patient.

The classical "3D" triad described by English-speaking authors—dribbling, dyspareunia, and dysuria—is often a clinical clue [8,10].

Imaging is required for confirmation. Voiding cystourethrography (VCUG) is the first-line radiological exam, visualizing the diverticular neck and providing key anatomical information [8]. Ultrasound is a non-invasive, reliable alternative, especially effective via the vaginal or endourethral route. It identifies closed-neck diverticula, evaluates the sac's content and wall for stones or tumors [1].

Magnetic Resonance Imaging (MRI) with gadolinium is currently the gold standard, with near-100% sensitivity, and can detect small or non-communicating diverticula [3,8].

Urethrocystoscopy, after confirming sterile urine, helps locate the diverticular neck—most often on the posterior wall between 4 and 8 o'clock [1,6]. In our case, the neck was at 5 o'clock. Combined with vaginal palpation, this procedure allowed guided drainage of the diverticular abscess.

Based on clinical and radiological findings, Leach [4,11] proposed a preoperative prognostic classification system called LNSC3, evaluating location, number, size, and characteristics (shape, communication, continence).

The treatment of choice is transvaginal diverticulectomy [3]. Key steps include a U-shaped anterior vaginal wall incision, careful dissection to the diverticulum while preserving periurethral fascia, excision flush with the neck (or preserving the edges in case of a wide neck), followed by a three-layered closure in a staggered fashion over a transurethral catheter [4]. Some authors recommend interposing a fat graft from the labia majora between the periurethral fascia and the vaginal wall in case of poor tissue quality [3,12].

The duration of urethral catheter drainage is typically 10–15 days, as supported by several studies [8].

Postoperative complications may include recurrence, stress urinary incontinence, urethrovaginal fistula, and urethral stricture [4,5,8].

4. Conclusion

Female urethral diverticulum is a rare condition affecting young women. It manifests with voiding disturbances and recurrent urinary tract infections—symptoms that should prompt further imaging workup. The treatment remains surgical, consisting of transvaginal diverticulectomy.

Conflict of Interest

The authors declare no conflict of interest.

5. References

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