

CASE REPORT

Saddlebag Periurethral Diverticulum: A Case Report with Interesting MRI Pictorial Review Images

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ABSTRACT

Female urethral diverticulum (UD) is a rare condition with atypical imaging findings and is increasingly being diagnosed due to advances in imaging. We report a unique case of saddlebag periurethral diverticulum in a 30-year-old female and highlight its clinical presentation, diagnostic challenges, and management. The patient presented with lower urinary tract symptoms and a painful perineal swelling during micturition. The initial flexible cystoscopy revealed no abnormalities. However, subsequent magnetic resonance imaging (MRI) using a phased-array coil identified a 3.8 cm x 3.1 cm multiseptated, multicystic periurethral lesion with a saddlebag configuration encircling the urethra. The lesion displaced the adjacent structures, including the bladder base and vaginal lumen. Following a urinary tract infection (UTI), the patient was treated with dual antibiotics, leading to symptom improvement and reduced swelling. Despite being offered surgical intervention, she opted for conservative management with no symptom recurrence during follow-up. This case underscores the importance of MRI in diagnosing UD and highlights conservative management as a viable option for selected cases.

Malaysian Journal of Medicine and Health Sciences (2026) 22(2):1-4. doi:10.47836/mjmhs.v22i2.1565

Keywords: Urethral diverticulum; Saddlebag diverticulum; Female pelvic MRI; Conservative management; Case report

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INTRODUCTION

Female UD is a rare and often underdiagnosed pathological disease characterized by localized outpouching of the urethral mucosa into the periurethral tissues. The reported prevalence varies between 0.6% and 6%, predominantly affecting women between the third and sixth decades of life (1-3). While the exact incidence remains unclear due to the non-specific nature of its symptoms and potential for misdiagnosis (1,2), studies from North America, Europe, and parts of Asia have shown increasing detection rates with the advent of advanced imaging modalities (1-3). In Malaysia and other Southeast Asian regions, documented cases remain limited, suggesting under-reporting or diagnostic challenges in routine clinical practice.

The clinical presentation can be subtle or overlap with other common urological or gynecological conditions, often leading to delayed diagnosis. Currently, MRI has become the gold standard for assessing the presence, extent, and complications of UD, particularly given its increasing detection with modern imaging (4,5). Herein, we present a rare 'saddle bag' UD case detected in our local hospital setting.

CASE REPORT

The patient was a 30-year-old female with a history of primary infertility and complained of painful perineal swelling felt during micturition for seven months. She claimed that the size of the swelling initially remained similar but increased over the past month. Consequently, she developed LUTS, including frequency and urgency. However, vaginal discharge or fever was not observed. She sought initial medical attention at a private clinic approximately six months after symptom onset and was empirically treated with antibiotics; however, the swelling persisted.

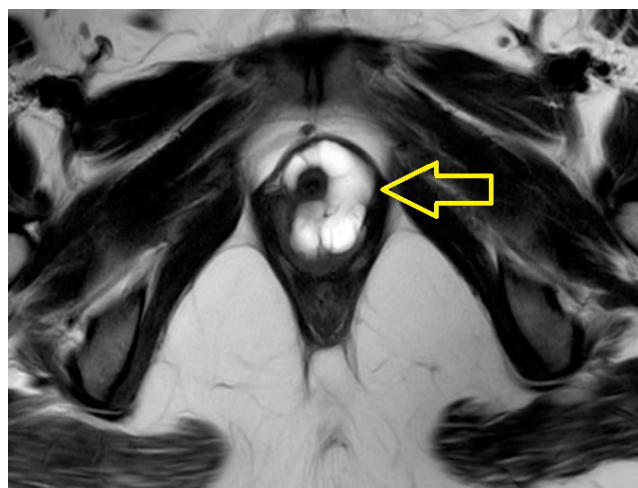


Figure 1: T2-weighted axial magnetic resonance imaging demonstrates a well-demarcated multiseptated periurethral cystic lesion encircling the urethra, with a characteristic saddle-bag configuration.

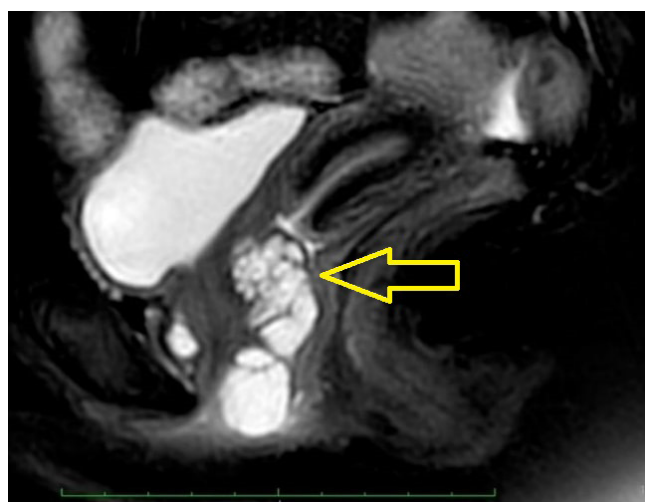


Figure 2: T2-weighted sagittal magnetic resonance imaging scan showing the diverticulum relative to the level of the bladder neck and urethra. The diverticulum extends anteriorly and posteriorly to the urethra.

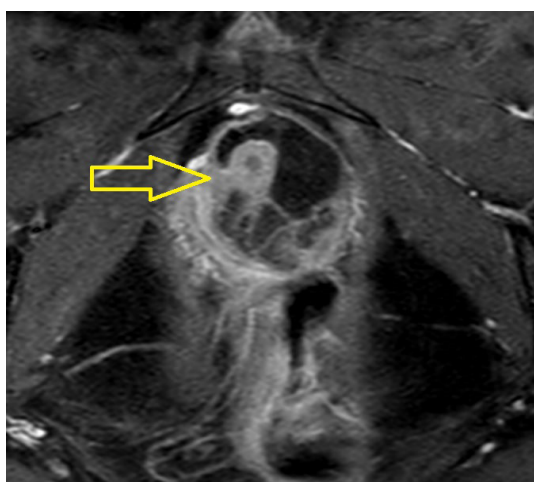


Figure 3: T1-weighted post-contrast axial magnetic resonance imaging depicting peripheral heterogeneous enhancement of the diverticulum.

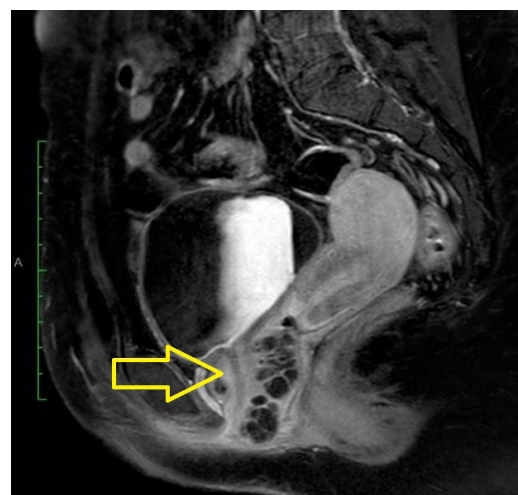


Figure 4: T1-weighted post contrast sagittal – magnetic resonance imaging scan showing the diverticulum displacing the bladder base upwards minimally and exhibiting mass effect onto the vagina causing slit like appearance of the vaginal lumen.

Owing to persistent symptoms and swelling, she was referred to our center, where clinical evaluation was followed by flexible cystoscopy. On examination, the external meatus appeared to be slit-like. Upon per vaginal examination, swelling with a cystic-like consistency was noted at the six clock position. It was smooth and nontender on palpation. Flexible cystoscopy revealed a slightly erythematous urethra, but no lesions were observed. As cystoscopy did not reveal any urethral abnormalities, MRI was subsequently performed approximately one month after her initial clinic visit at our institution, which showed well-demarcated multiseptated multicystic-like periurethral lesion which encircled the urethra, with a characteristic saddle-bag axial configuration, measuring 3.8 cm x 3.1 cm in anteroposterior dimension and width (Figure 1-4). It extends along the entire length of the urethra and minimally displaces it towards the right side. The lesion showed fluid-like signal intensity with peripheral heterogeneous enhancement on post-contrast sequences, and no restricted diffusion on DWI/ADC mapping. It minimally displaced the bladder base upwards. Posteriorly, there was a mass effect on the vagina causing a slit-like appearance of the vaginal lumen. Superiorly, it abuts the cervix; however, the clear fat plane is preserved. The clear lateral plane with the bilateral levator ani was preserved. The constellation of findings was suggestive of saddlebag periurethral diverticulum.

The patient had an episode of UTI and was prescribed dual antibiotics for two weeks. Upon completion of the antibiotics, the patient claimed that her symptoms improved and the size of the swelling reduced. During follow-up, the examination confirmed reduced swelling in the visible urethral meatus. The patient was given the option of surgery to remove the lesion; however, she

refused surgery and subsequently opted for conservative treatment. During subsequent follow-up, she had no complaints of LUTS or UTI symptoms.

The patient was monitored over 6 months following the initial presentation and treatment. Follow-up evaluations included clinical examinations at regular intervals (monthly for the first three months, then every other month), during which the patient remained asymptomatic with no recurrence of UTIs or LUTS. No additional imaging was performed during the follow-up, as the patient remained clinically stable and showed no indication of recurrent or residual lesions.

DISCUSSION

A UD is defined as the focal outpouching of the urethra in the periurethral space (1). The etiology of UD can be congenital or acquired (1-3). Congenital UD are rare and develop from cloacogenic rests, Gartner duct cysts, and Müllerian duct cysts (1,3). In contrast, acquired UD is believed to be caused by infection and obstruction of the paraurethral glands or disruption of the periurethral fascia due to obstetric trauma or urethral or vaginal surgery (1-4). UD can occur as single or multiple, wide or narrow necked, unilocular, or multicompartmental, such as saddle diverticula, which surround the urethra (2) and are typically located in the posterolateral wall of the mid urethra (1-3). Compared to the more commonly encountered simple cystic or unilocular diverticula, which tend to present as single, localized periurethral cysts, the saddlebag configuration represents a more complex, circumferential lesion encasing the urethra. Due to their localized nature, simple cystic diverticula typically have a straightforward diagnosis and surgical approach. In contrast, saddlebag diverticula pose greater diagnostic and therapeutic challenges because of their multiloculated, enveloping morphology and proximity to critical pelvic structures. Recognition of such atypical variants is crucial to avoid misdiagnosis and guide appropriate treatment planning.

The clinical presentation of patients with UD is non-specific, and the usual complaints are urinary incontinence, dysuria, urgency, urethral pain, post-void dribbling, dyspareunia, and recurrent UTIs (1-5). Voiding cystourethrography is the initial diagnostic modality for UD (1). It demonstrates contrast-filled periurethral cystic lesions (1). Double-balloon urethrography demonstrates similar findings with higher sensitivity than voiding cystourethrography; however, it is not commonly used because it is more invasive and technically challenging (1-3). Ultrasound has also been used to detect UD via the transabdominal or transvaginal/transrectal routes. Both could show periurethral cystic lesions; however, the latter is more sensitive, and the orifice communicating with the urethral lumen can be identified (1). The diverticular wall and internal contents can be visualized well using ultrasound, particularly in the presence of

solid components (2). The presence of color Doppler flow can differentiate tumors from complicated fluids (1).

UD on CT appears as a periurethral cystic lesion with wall thickening and enhancement (1,2). In addition, intradiverticular fluid debris levels, calculi, or solid masses can also be identified on CT. CT Voiding Urethrography and Virtual Urethroscopy are new techniques with recent advances in multidetector CT. A diluted contrast agent is infused into the urinary bladder, and images of the lower urinary tract are acquired during voiding (1). Contrast material-filled periurethral cystic lesions with a relationship between the diverticular orifice and the surrounding organs, the urethra and urinary bladder, are well shown in this imaging technique.

Meanwhile, in some instances, MRI helps assess the extent of the diverticular cavity, such as cases of saddle-shaped diverticula, which helps evaluate the extent anterior to the urethra (5). It also helps to assess the internal architecture of the diverticulum, such as internal septations or outer walls (3). Furthermore, small occult urethral lesions can be identified using thin slices (1). Intravenous contrast allows differentiation of inflammation from malignancy in the UD (1,2). The UD typically appears as a paraurethral cystic lesion that exhibits hypointense signal on T1-weighted imaging and hyperintense signal on T2-weighted imaging, with enhanced diverticular walls and septa on contrast-enhanced T1-weighted imaging (1,2,4). Atypical signal intensity on T2-weighted imaging may be observed in cases of proteinaceous or hemorrhagic content (4). The presence of irregular enhancement or mass-like components within a diverticulum on post-contrast images may suggest infection or malignancy (2).

CT and ultrasound were not performed in this case because MRI was deemed the most appropriate modality for comprehensive anatomical evaluation following inconclusive cystoscopy. MRI was selected because of its superior soft-tissue contrast, multiplanar capability, and ability to delineate the periurethral lesion's extent, complexity, and internal architecture without ionizing radiation. Additionally, the absence of acute complications or suspicion of calculi or solid masses reduces the need for CT imaging. Transvaginal ultrasound was not pursued because of the deep-seated and circumferential location of the lesion, which may have limited sonographic visualization.

Complications of UD include recurrent UTIs, urinary incontinence, calculi, and intradiverticular tumors (1,3,4). Recurrent UTIs occur in 30–50% of patients, as seen in our case. Cross-sectional imaging may demonstrate enhanced thick walls or multiple septa, whereas fluid-debris levels may be seen on US, CT, or MRI (1). Calculus formation is seen in 1.5 to 10% of patients and can be visualized on US, CT, MRI, or

plain radiography in cases of large calculi (1,3). The surgery of choice for UD is transvaginal or endoscopic diverticulectomy (1,4).

Surgical excision remains the standard treatment for UD, particularly in symptomatic cases or those with complications such as calculi or malignancy (1,4). However, surgery also carries risks including urethrovaginal fistula, urethral stricture, incontinence, and recurrence. Conversely, conservative management, which typically involves monitoring and symptom control (e.g., antibiotics for infection), has been shown to be effective in asymptomatic or mildly symptomatic patients (2,4,5). Boyce and Belfield noted that asymptomatic or minimally symptomatic cases could be monitored safely without surgery, provided regular clinical surveillance is maintained (2). This finding reinforces the feasibility of a non-surgical approach in carefully chosen cases, aligning with the favorable outcome observed in our patient. In our case, the patient experienced significant symptom relief and reduction in lesion size following antibiotic therapy and chose conservative follow-up with no recurrence at 6 months. This finding supports the notion that conservative management may be viable for those without complications.

CONCLUSION

This case highlights the diagnostic importance of MRI in complex or atypical cases of UD, particularly when initial evaluations, such as cystoscopy, are inconclusive. Clinicians should consider this diagnosis in women with persistent LUTS and perineal swelling. Moreover, conservative management may be a suitable alternative to surgery in selected cases, particularly in asymptomatic

patients without complications. Radiologists and clinicians should be familiar with rare configurations, such as the saddlebag diverticulum, as early recognition can significantly influence management and outcomes.

ACKNOWLEDGEMENTS

Written informed consent was obtained from the legal authorized representative of the patient for the publication of this case report. Thank for the all contributors.

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