Case Report

A malignant mimicker: Endometriosis presenting as a large solid–cystic pelvic mass with lymphadenopathy and distal ureteral invasion

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Introduction

Endometriosis presents with various imaging features. The most common site of endometriosis is the ovary, followed by the pelvic peritoneum. Less frequently affected sites include the deep subperitoneal tissues, the gastrointestinal tract, the urinary bladder, the thorax, and subcutaneous tissues.

We present a rare case of endometriosis with atypical symptoms and radiographic features. The patient initially presented with hematuria. Evaluation revealed a pelvic mass with skip lesions extending to the distal ureter, mimicking malignancy. Focal endometriosis in the right external iliac region resembled nodal metastasis. These findings led clinicians and radiologists to suspect a malignant process. Consequently, endometriosis should be considered in the differential diagnosis under specific circumstances.

Keywords: Carcinoma, Endometrioma, Endometriosis, Hematuria, Ureteritis, Ureteric invasion.

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Introduction

Endometriosis is a common benign disease among women, particularly during their reproductive years, affecting approximately 10% of the female population [1]. One proposed theory suggests that endometriosis results from the retrograde flow of endometrial tissue through the fallopian tubes during menstruation. Endometriosis may occur within the pelvic cavity and involve pelvic organs such as the ovaries (endometriomas), uterosacral ligaments, rectosigmoid colon, abdominal wall, peritoneum, or urinary tract, consistent with deep endometriosis [1,2].

While urinary tract endometriosis is rare, accounting for approximately 1-2% of all cases of endometriosis. The urinary bladder is the most common site of involvement within the KUB system [3]. Ureteral involvement is uncommon; when present, it may result in hydronephrosis and hydroureter [2]. Imaging modalities such as ultrasonography (US), computed tomography (CT) and magnetic resonance imaging (MRI) play crucial roles in identifying the cause of hydronephrosis and characterizing pelvic masses. However, a definitive diagnosis requires histologic confirmation obtained through intervention [2]. In this report, we present a case of ureteral endometriosis presenting with hematuria, evaluated using multimodality imaging, and confirmed by histopathological examination, which guided the diagnosis and management.

Case summary

A 46-year-old woman with no underlying disease or history of medication use presented with persistent hematuria for 10 days and right lower abdominal pain. She denied any prior similar symptoms, dysuria, or abnormal urine color. Physical examination revealed no palpable abdominal mass or fever. The patient had a history of a previous transabdominal hysterectomy for the removal of a large uterine myoma at another hospital. However, information regarding the pathological findings from the previous operation was unavailable.

The patient was initially diagnosed with a urinary tract infection, based on urinalysis demonstrating a white blood cell count of approximately 10-20 cells per high-power field (HPF), and was prescribed Ofloxacin for three days; however, her symptoms did not improve. Subsequent bedside ultrasonography revealed severe right hydronephrosis and right hydroureter extending to the ureterovesical junction. The patient was then referred to a gynecologist. Transvaginal sonography demonstrated a multiloculated hypoechoic complex cystic mass measuring approximately 4.5×4.7 cm in the left adnexa (Figure 1A), accompanied by a heterogeneous solid mass measuring approximately 3.4×2.4 cm (Figure 1B), with an additional suspicious solid mass in the cul-de-sac shown in Figure 1C.

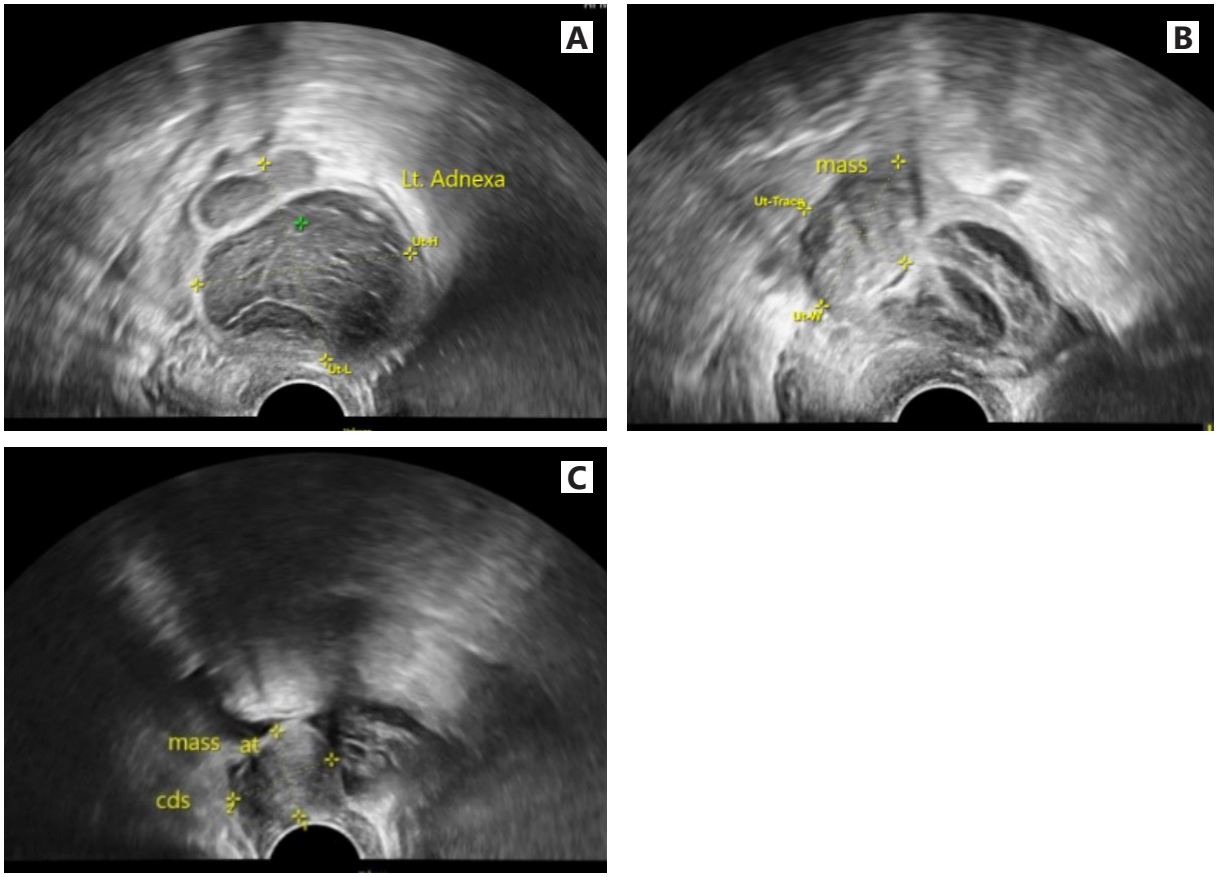


Figure 1. *Transvaginal sonography. Sagittal ultrasound images demonstrate a multiloculated hypoechoic complex cystic mass in the left adnexa measuring 4.5 x 4.7 cm (A), with an associated solid component measuring 3.4 x 2.4 cm (B), and an additional suspicious solid mass in the cul-de-sac (C).*

Further CT urography (Figures 2A and 2B) revealed an 8.2 x 6.3 x 8.3 cm complex solid-cystic mass with enhancement of the solid component, predominately located in the left pelvic cavity, consistent with the previous ultrasound findings. The lesion involved bilateral pelvic sidewalls and extended to the mesorectal region (arrows in Figures 2A and 2B). Minimal ascites was also observed in the perirectal region (asterisk in Figure 2B). The mass involved the right parametrium and invaded the right distal ureter, resulting in severe right hydronephrosis. It also abutted the left distal ureter (arrows in Figure 2C), causing mild left hydronephrosis and hydroureter (Figure 2D). In addition, an ill-defined, heterogeneous, enhancing mass measuring approximately 2.7x1.7 cm was identified in the right external iliac region, in contact with the right external iliac vessels (Figure 2E), resembling a pathologic lymph node. Malignancies such as ovarian cancer, endometrial cancer, or transitional cell carcinoma of the urinary tract with metastatic lymphadenopathy were therefore suspected.

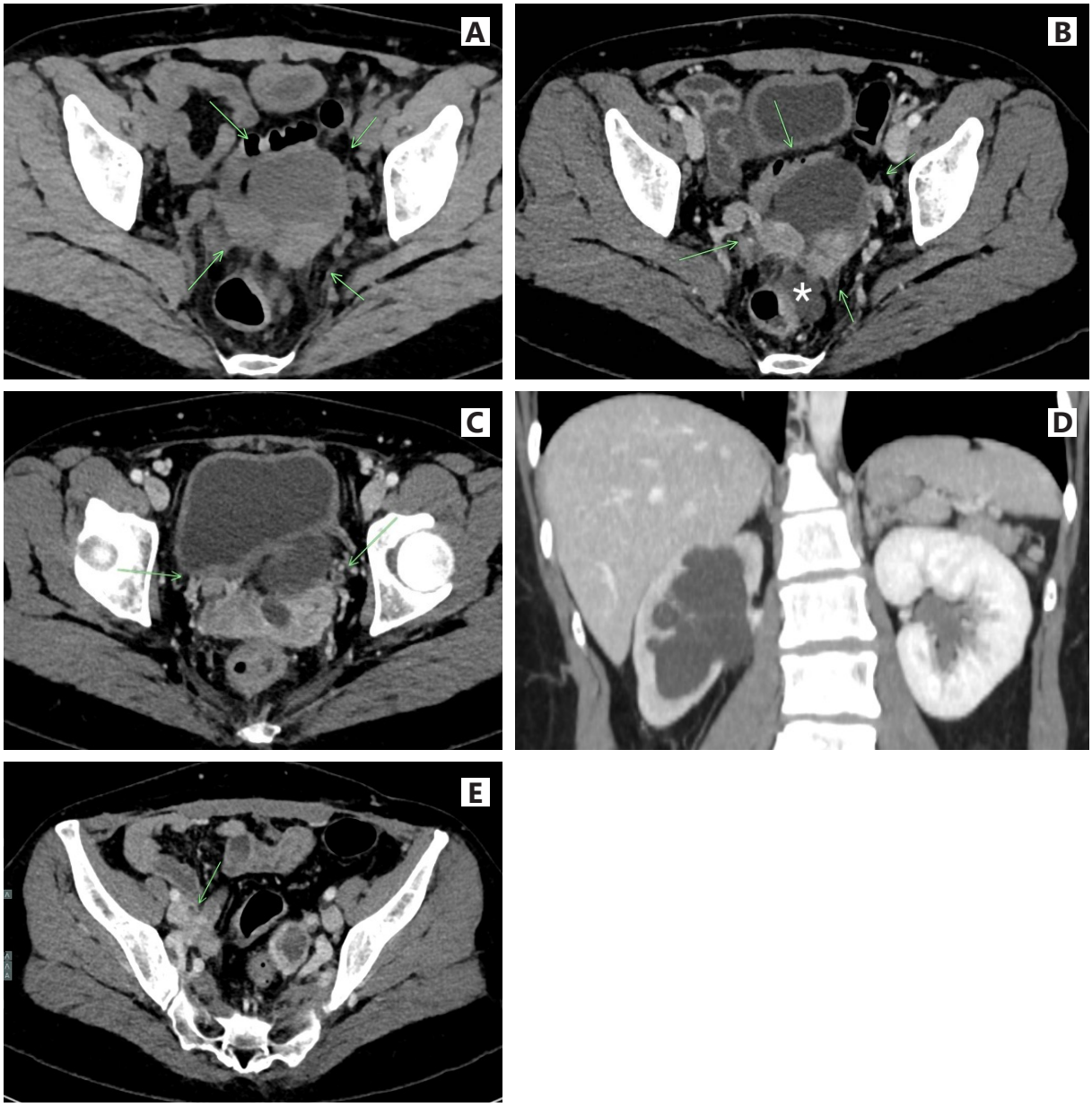
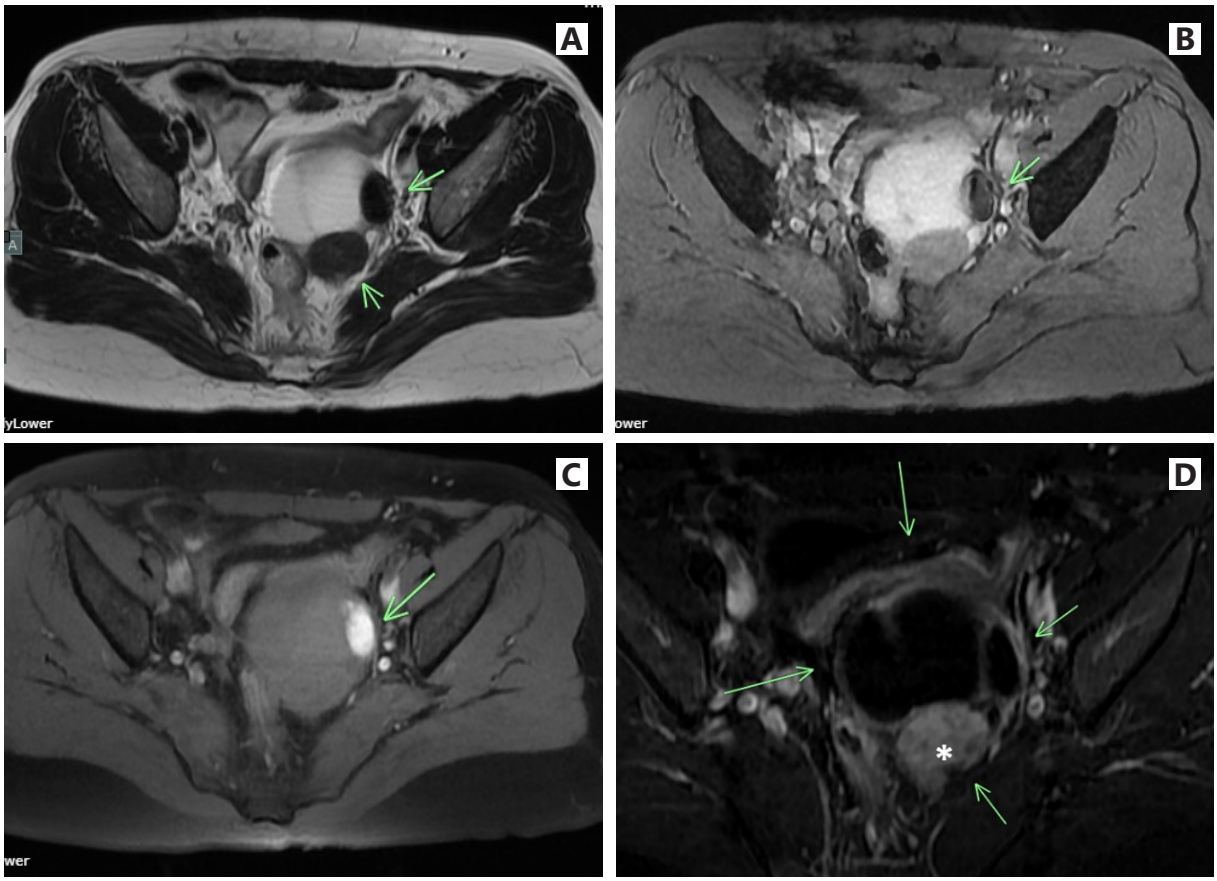


Figure 2. *Conventional CT of the whole abdomen. (A) shows a non-contrast axial image of the pelvic cavity, and (B) depicts the post-contrast study, revealing an irregular, heterogeneous, enhancing complex solid-cystic mass. The mass involves the bilateral distal ureters (C), resulting in right hydronephrosis and mild left hydronephrosis (D). Another heterogeneous enhancing mass is noted along the right pelvic side wall (E).*

The patient underwent pelvic MRI for further evaluation of the mass (Figure 3). MRI demonstrated the same complex solid-cystic mass previously seen on ultrasound and CT in the pelvic cavity, with dark signal intensity of the solid component on T2-weighted (T2W) images, and areas of susceptibility artifact (arrows in Figures 3A and 3B). Portions of the solid component showed high signal intensity on T1 fat-saturation (T1FS) image (arrow in Figure 3C). Peripheral blooming susceptibility artifact was observed on T2 gradient echo (GRE) sequence. Post-contrast subtraction images revealed enhancement of the posterior solid component (asterisk in Figure 3D); however, there was no evidence of restricted diffusion (arrows in Figures 3E and 3F).

Consistent with the prior CT findings, the heterogeneous enhancing mass in the right external iliac region demonstrated low signal intensity on the T2W image (arrows in Figure 3G), with areas of high signal intensity on the T1FS image representing hemorrhagic component (asterisk in Figure 3H). The lesion showed minimal enhancement on the post-contrast T1FS subtraction image (Figure 3I). The coronal T2W image demonstrated involvement of the right distal ureter, with associated right distal hydroureter (Figure 3J).



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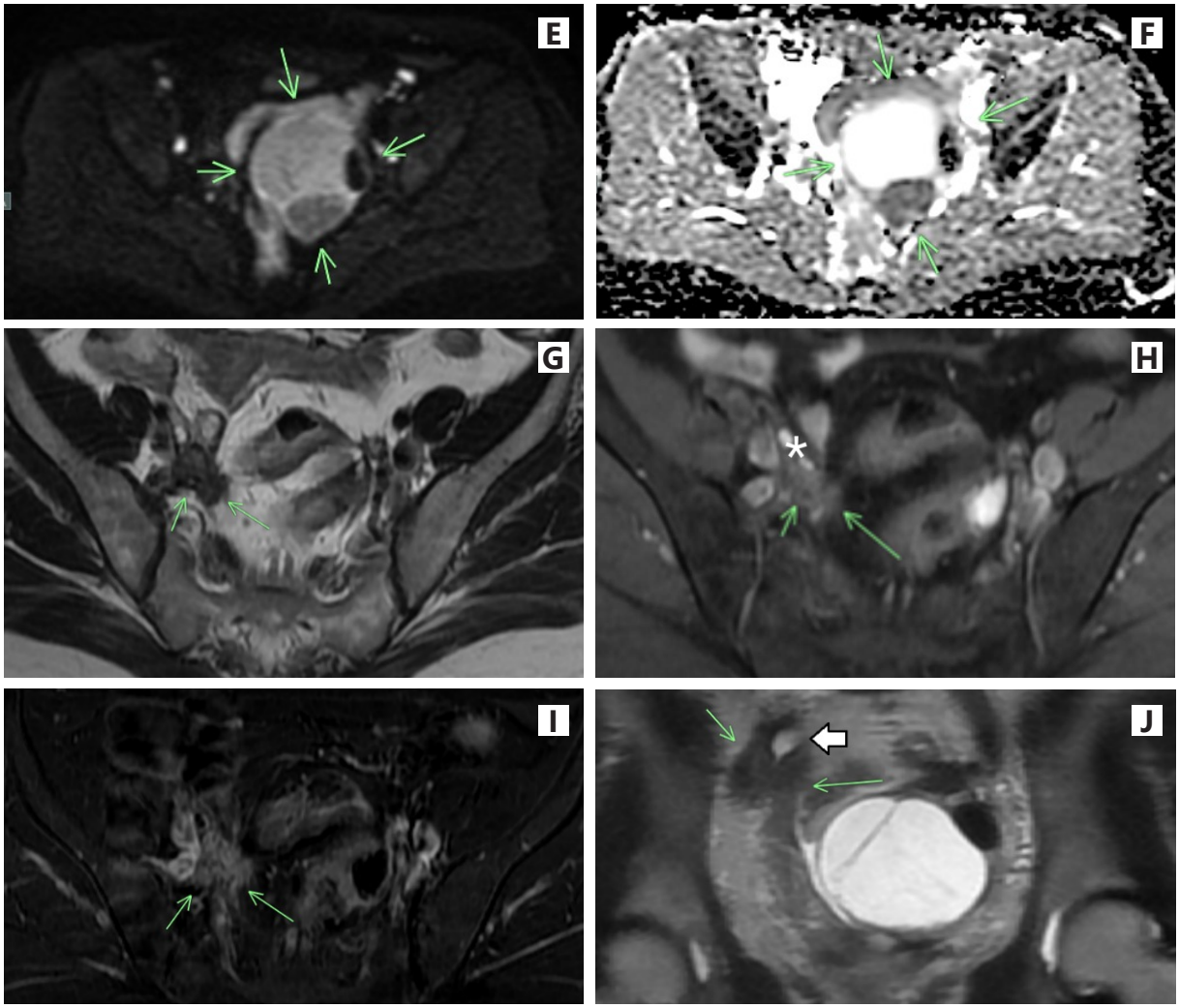

Figure 3. *A 1.5 Tesla MRI scan of the pelvic cavity revealed a complex solid-cystic mass with dark signal intensity (SI) on T2-weighted imaging (T2WI) of the solid component (A). Signal voids were observed within portions of the solid component on the gradient-echo (GRE) image (arrow in (B)). The T1-weighted fat saturation (T1FS) image demonstrated areas of hyperintense signal within the mass. A focal enhancing solid component was identified on post-contrast images (asterisk in (D)); however, there was no evidence of restricted diffusion on diffusion-weighted imaging (DWI, b=800) (E) or on the apparent diffusion coefficient (ADC) map (F). An additional irregular, spiculated, heterogeneous lesion demonstrated intermediate-to-low SI on the T2W image (G) and intermediate SI on the T1FS image, with foci of high signal intensity on the T1FS image suggestive of hemorrhagic components (asterisk in (H)). This lesion showed minimal enhancement on the post-contrast T1FS subtraction image (I), with evidence of right distal ureter involvement on the coronal T2W image (J).*

Further evaluation by a urologist included cystourethroscopy for double-J stent placement, which revealed a well-defined endoluminal filling defect within the right distal ureter, measuring approximately 2-3 cm in length and located about 3 cm from the right ureteral orifice (Figure 4). Partial laser resection of the mass was performed, and histopathological examination confirmed the diagnosis of endometriosis (Figures 5 and, 6).

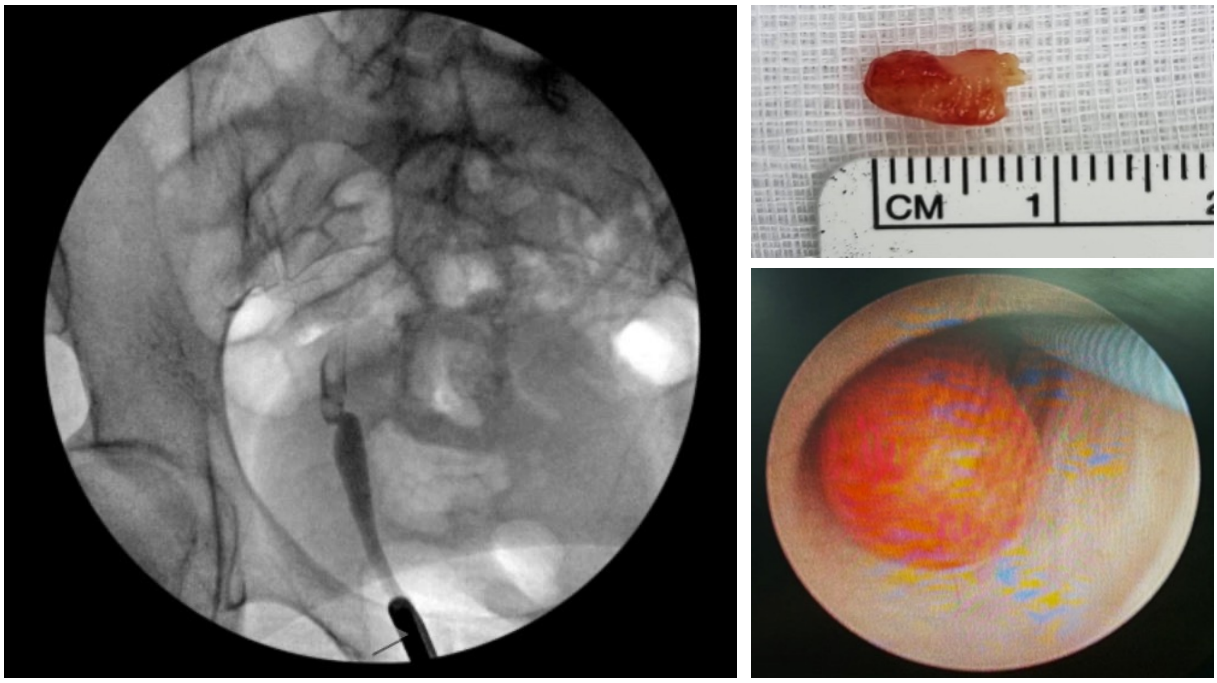

Figure 4. *Retrograde pyelography shows an intraluminal filling defect within the right distal ureter.*

The tissue biopsy obtained from the right ureter showed a small polypoid lesion with denuded surface epithelium and small hemorrhagic foci. The structure consisted of tubular-shaped glands lined by columnar epithelial cells and stroma resembling endometrium tissue (Figure 5). The diagnosis of ureteric endometriosis was confirmed by immunohistochemical staining for CK7, CK20, PAX-8, CD10, ER, and PR (Figure 6).

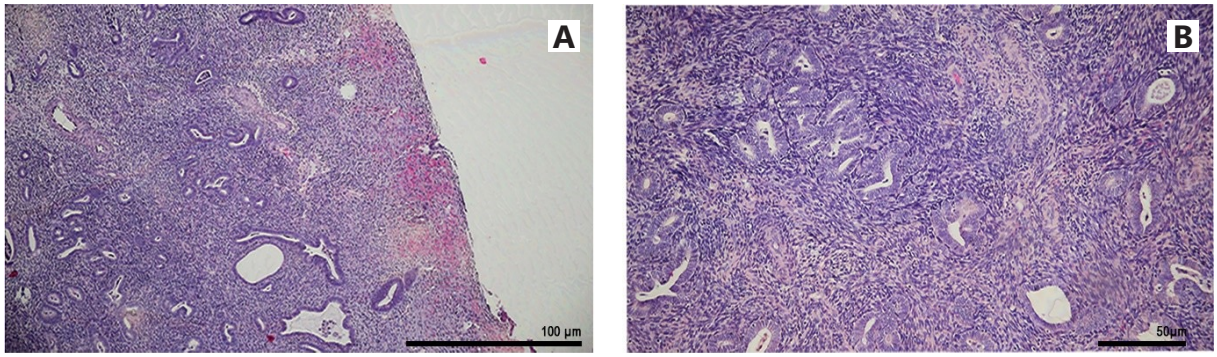

Figure 5. *The histopathological examination (A and B) reveals a polypoid tissue with a denuded surface and scattered hemorrhage. The lesion is composed of endometrial glands and stroma, along with hyalinized blood vessels. The specimen does not contain a muscle layer (Hematoxylin and eosin stain; x100 and x200).*

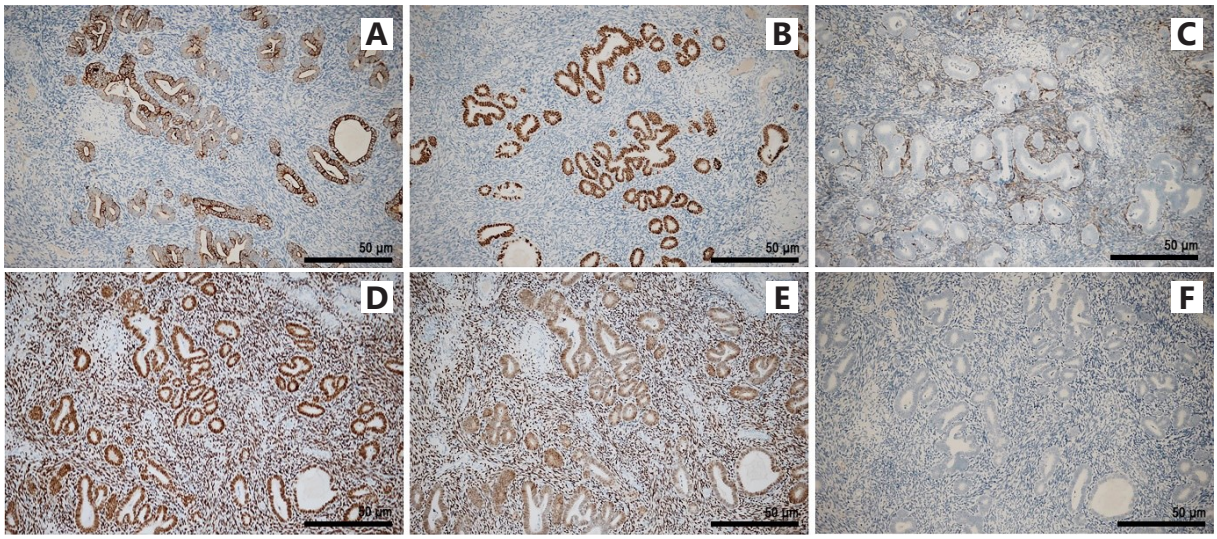

Figure 6. *Immunohistochemistry reveals that CK7 (A) and PAX-8 (B) highlight the endometrial glands. CD10 exhibits cytoplasmic staining specifically in the stromal cells (C). The estrogen receptor (ER) (D) and progesterone receptor (PR) (E) are positive in both the endometrial glands and stroma. CK20 shows negative staining (F).*

The patient was diagnosed with ureteral endometriosis with an associated endometrioma and was treated with a gonadotropin-releasing hormone (GnRH) agonist. A baseline MRI of the pelvic cavity was performed before treatment. A follow-up MRI after hormonal therapy revealed a reduction in the size of the complex solid-cystic mass within the pelvic cavity (Figure 7).

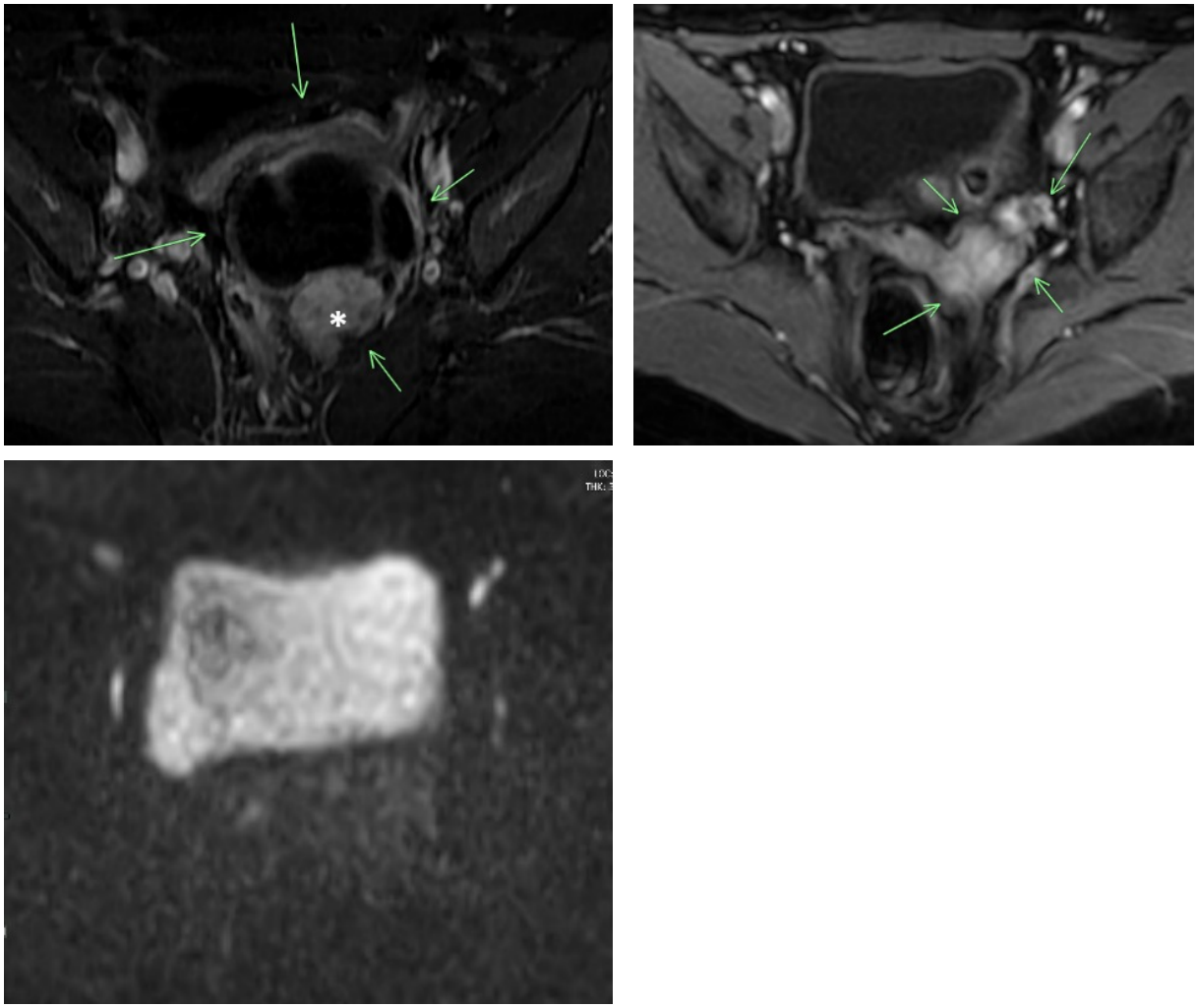

Figure 7. *1.5 Tesla MRI scan of the pelvic cavity. Before treatment with GnRH (A), a complex pelvic mass was observed. After treatment, there was, an interval decrease in size, with a residual enhancing solid component in the left pelvic cavity on the post-contrast subtraction image (B). There is no evidence of restricted diffusion (DWI B=800) within the enhancing solid nodule (C).*

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Discussion

This case illustrates a heterogeneous mass involving the right distal ureter and a complex solid-cystic mass in the left adnexa. The lesion caused architectural distortion and an irregular intraluminal filling defect of the right distal ureter on retrograde pyelography, along with an irregular mass observed on conventional CT and MRI imaging. Evidence of ureteral obstruction, including hydronephrosis and hydroureter, was also noted on the CT study. These imaging findings are more likely to be misinterpreted as urothelial neoplasia.

Pathological examination of a surgical biopsy from the intraluminal filling defect revealed endometriosis. Ureteral endometriosis is relatively uncommon, accounting for approximately 1% of all endometriosis cases [1]. It can be divided into extrinsic and intrinsic ureteral endometriosis based on the depth of ureteral wall infiltration. Extrinsic ureteral endometriosis, the more common form, involves invasion of the adventitia or periureteral tissues, whereas intrinsic ureteral endometriosis is confined to the muscularis and/or mucosa of the ureter wall [4].

Retrospective evaluation of the pyelography of this case suggested intrinsic ureteral endometriosis, as indicated by the presence of an irregular mucosal lesion in the right distal ureter. However, this finding may have been influenced by inadequate tissue sampling, as pathological analysis did not show evidence of muscular involvement [4].

Regarding the complex solid-cystic mass in the left pelvic cavity, it appeared as a large cystic lesion with focal hyperintensity on T1W images and hypointensity on T2W images, consistent with the T2 shading sign. These imaging features are characteristic of an endometrioma, suggesting ovarian endometriosis. In addition, these findings raise the possibility of deep endometriosis involving the surrounding pelvic structures [5].

Additionally, the areas of enhancement observed on imaging may be attributable to inflammation, fibrosis, granulation tissue, or fibromuscular hyperplasia surrounding ectopic endometrial glands. In this case, the likelihood of malignancy is lower because the enhancing lesion does not demonstrate restricted diffusion [1,2].

For this case, because biopsy confirmed endometriosis and the follow-up MRI after gonadotropin-releasing hormone (GnRH) agonist therapy showed a reduction in the size of the suspicious mass, endometriosis is the most likely diagnosis. According to an

article by Aki et al., the response of endometriosis to hormonal therapy, such as GnRH agonists, is not uniform. A good response is generally observed in cases of endometriosis that do not exhibit T2 shading [6]. As observed in this case, portions of the lesion demonstrating T2 shading remained visible on post-treatment imaging, whereas other components showed a decrease in size.

However, follow-up MRI still revealed some solid components, and although no definite restricted diffusion was observed on DWI images, ongoing clinical and imaging surveillance is recommended to monitor for potential malignant transformation [1,2].

Disclosure instructions

Clinical information, baseline data, and imaging studies were obtained from the medical records and the Picture Archiving and Communication System (PACS) at Srinagarind Hospital, Khonkaen University, Thailand.

During the preparation of this manuscript, the author used ChatGPT to assist with grammatical correction and to improve sentence structure, clarity, and coherence. Following the use of this tool, the author reviewed and edited the content as necessary and takes full responsibility for the integrity and accuracy of the publication.

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