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Case Report

Deep pelvic endometriosis causing ureteral obstruction ☆☆☆

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ARTICLE INFO

Article history:

Received 9 January 2024

Accepted 3 June 2024

Keywords:

Deep pelvic endometriosis

Ureter obstruction

Computed tomography

Magnetic resonance imaging

ABSTRACT

Endometriosis is a chronic disease characterized by the presence and growth of endometrial glands and stroma outside of the uterine cavity. The pathogenesis is unclear, but a common theory attributes the condition to retrograde menstruation into the peritoneal cavity via the fallopian tubes. Hormonal influence causes these ectopic tissues to undergo cyclical bleeding, resulting in subsequent inflammation and scar tissue formation; however, it can affect postmenopausal women. In rare instances, endometriotic lesions can obstruct the ureter and result in hydronephrosis and subsequent loss of renal function. This condition presents with nonspecific symptoms and is known as an often-silent disease, resulting in challenging and delayed preoperative diagnosis. In this article, we report the case of an asymptomatic 65-year old female who was diagnosed with deep pelvic endometriosis, which obstructed the right distal ureter. We focus on optimizing diagnosis and management through the application of radiological imaging modalities, specifically computed tomography (CT) and magnetic resonance imaging (MRI).

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Introduction

Affecting 2%–5% of postmenopausal women, endometriosis is a chronic condition characterized by endometrial tissue deposits and growth outside of the endometrium [1]. Deep

pelvic endometriosis, where the endometriotic implants are more than 5 mm beneath the peritoneum, can affect the gastrointestinal tract, pelvic cul-de-sac, and urinary tract, leading to reactive inflammation, severe fibrosis, and adhesions [1]. Ureteral involvement, especially in postmenopausal women, is rare and can cause subsequent hydronephrosis and

☆ All authors contributed equally to the writing of this manuscript and declare no conflicts of interest. Further, there was no funding associated with this report.

☆☆ Competing Interests: The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Ryan C. Rizk, MS, Mohammad Yasrab, MD, Edmund M. Weisberg, MS, MBE, and Linda C. Chu, MD, have no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Elliot K. Fishman, MD, receives grant funding from GE Healthcare and Siemens, and is a founder and stockholder, HipGraphics.

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<https://doi.org/10.1016/j.radcr.2024.06.012>

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renal injury. Imaging plays a fundamental role in the diagnosis of endometriosis; however, certain radiological presentations can mimic other acute conditions and lead to misdiagnoses and delays in treatment [2]. We report the case of a 65-year-old female with unilateral extrinsic ureteral involvement by endometriosis, which resulted in severe hydronephrosis. We discuss the imaging and pathological findings.

Case presentation

A 65-year-old female was undergoing surveillance of a recent biopsy-proven right adnexal endometrioma after the discovery of her cancer antigen 125- tumor marker increase to 70 U/mL (0-35), concerning for malignant transformation. Her past medical history was notable for a total abdominal hysterectomy due to uterine fibroids in her thirties. The patient was asymptomatic and denied abdominal pain, bloating, weight loss or gain, and change in bowel or bladder habits. A subsequent CT scan of the abdomen and pelvis (Figs. 1A-E) revealed an irregular, infiltrative right adnexal mass, increased in size from a previous MRI (Figs. 2A-D) 2 years earlier, measuring 7 × 5.5 × 9.5 cm, previously 3.4 × 3 × 5.2 cm. The mass invaded the rectosigmoid colon and right posterolateral aspect of the urinary bladder, and encased the right internal and external iliac vein and right internal iliac artery. Additionally, there was markedly severe chronic right hydronephrosis with severe cortical thinning secondary to obstruction of the right lower ureter by the right pelvic mass. An asymmetric thickening of the right bladder wall was seen as well as a left renal cyst with overlying cortical scarring. The patient underwent an exploratory laparotomy with mass debulking, which included mass resection, right radical nephrectomy, right ureteral resection, lower anterior resection, partial excision of the bladder, and colostomy. The pathology report indicated that the masses involving the rectum, posterior bladder, and right ureter were focal endometrial-type complex hyperplasia with focal atypia arising in a background of endometriosis. For treatment, the tumor board recommended letrozole for endometriosis suppression and surveillance, based on the concern that there was a potential high risk of ovarian cancer in the future given the focal endometrial-type complex hyperplasia and focal atypia seen in association with endometriosis. The patient is clinically stable and undergoes routine follow-ups.

Discussion

Deep pelvic endometriosis is a chronic condition characterized by endometriotic implants that extend 5 mm beneath the peritoneum [3]. These implants can involve the urinary tract, and most commonly the bladder (15%) and ureters (4.5%), accounting for only 1% of all endometriosis patients but up to 53% of patients with deep infiltrating endometriosis [4]. As seen in our case, urinary tract involvement is often associated with extensive pelvic involvement [5]. Ureteral endometriosis is defined as any instance where endometriosis causes

compression or distortion of normal ureteral anatomy, with or without hydronephrosis [6]. The distal ureter is the most common part of the ureteral segment involved, along with a unilateral and left ureter predisposition [6]. Furthermore, ureteral obstruction can be an extrinsic or intrinsic disease. Extrinsic obstruction occurs due to external compression by adjacent endometriotic lesions as well as fibrosis and is four times more common [7]. This obstructive uropathy can lead to severe hydronephrosis and acute kidney injury.

The prevalence of urinary tract endometriosis is unclear, since approximately 50% of women with this condition may be asymptomatic [8]. It typically affects women ages 30–35 and, although rare, can occur in postmenopausal women most often involving the ovaries (79.2%) [5,9]. In one third of patients, clinical presentations of deep pelvic endometriosis are nonspecific and include dyspareunia, pelvic pain, dysuria, urinary frequency, lumbar pain, dysmenorrhea, or recurrent urinary tract infections [5]. There is symptom overlap in conditions such as pelvic inflammatory disease, appendicitis, bowel obstruction, renal disease, malignancy, and urinary obstruction [4]. Primarily due to this disease's nonspecific presentations and unknown etiology, approximately 30% of patients have reduced kidney function at the time of diagnosis and 47% require nephrectomy [5]. Differential diagnosis of ureteral endometriosis includes invasion by cervical cancer [6].

Currently, laparoscopy and biopsy for histologic analysis is the standard for diagnosing endometriosis [10–12]. However, imaging modalities such as CT, magnetic resonance imaging (MRI), and transvaginal sonography (TVS) are important for disease detection and preoperative planning. The features of deep endometriomas can be challenging to interpret considering the rare manifestations and the high likelihood of neoplastic lesions in postmenopausal patients [2]. MRI is crucial in outlining the surgical boundaries for resection of complicated ureteral endometriosis and is considered the best imaging technique for ureteral evaluation [6]. On T2-weighted images, ureteral lesions appear as hypointense, solid nodules with spiculated margins and dilatation upstream of the ureter [6]. MRI features in this case included a predominantly solid, lobulated, and spiculated mass with intrinsic T1 hypointensity and heterogeneous enhancement in the region of the right ovary/adnexa.

Although CT features for deep pelvic endometriosis are poorly specific, CT is often the first-line imaging modality, can eliminate other possible diagnoses, and along with patient's relevant history, can assist with diagnosis. On contrast-enhanced CT, deep pelvic endometriosis appears as a soft-tissue density mass, often similar to diverticulitis, and malignant or benign neoplasms [1]. Additionally, they are seen with characteristic bowel tethering and scarring. In our case, CT revealed severe hydronephrosis and because of the patient's history of uterine fibroids, endometriosis was included in the differential diagnosis. Initially, the invasive/infiltrative appearance of the adnexal mass was suspicious for invasive cancer; however, percutaneous biopsy confirmed endometriosis.

Depending on the extent of pelvic and urinary involvement, treatment for endometriosis can include medical suppressive therapy, surgery, or both. The goal is to preserve kidney function, eliminate symptoms, and solve urinary obstruction [5]. In postmenopausal women, treatment often includes

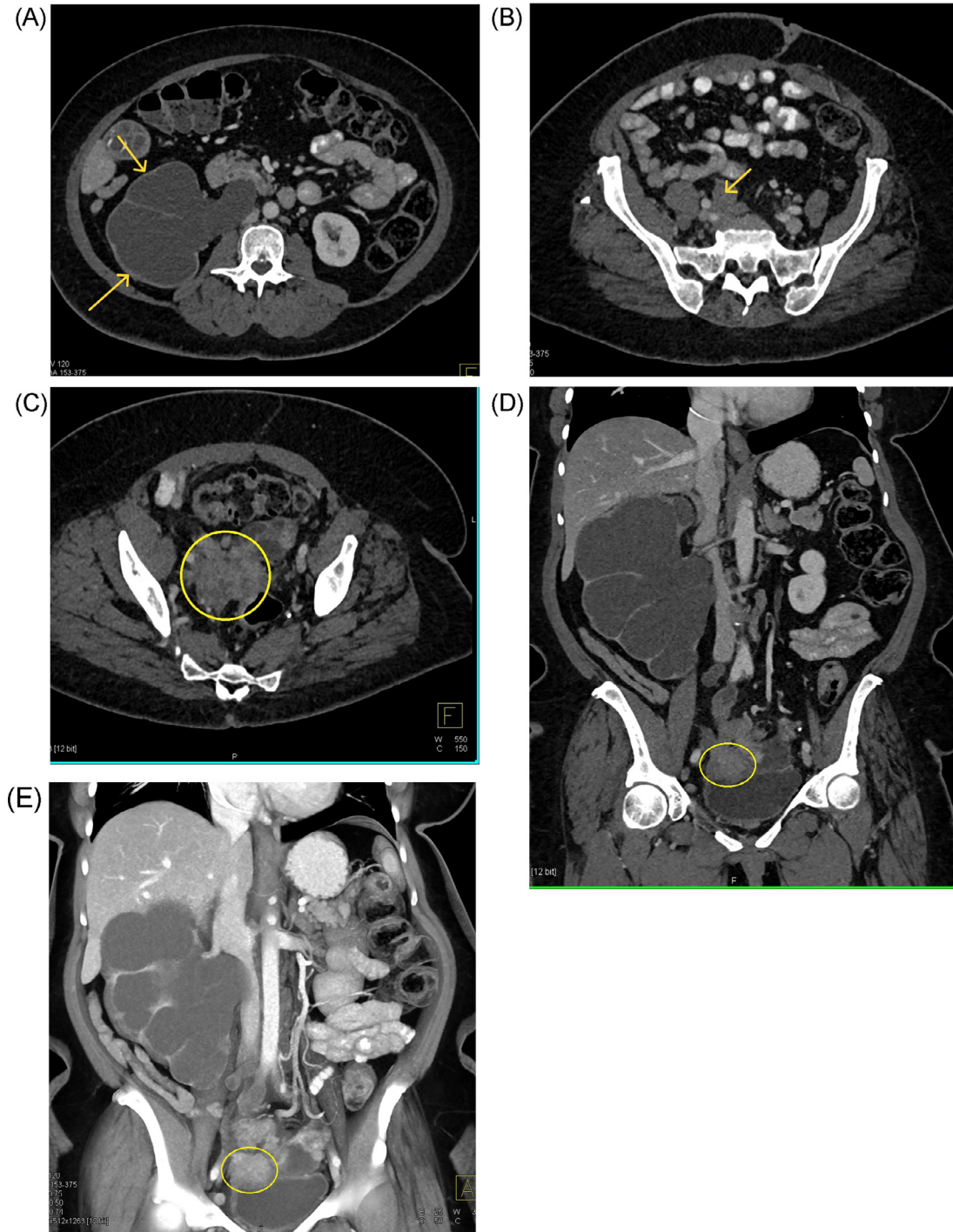


Fig. 1 – (A-E) A 65-year-old female with a past medical history significant for benign endometriosis presented for a follow-up CT scan after the discovery of Cancer Antigen 125- tumor marker increase to 70 U/mL (0-35), concerning for malignancy. (A) Marked right hydronephrosis with no residual cortex in the right kidney defined (arrows). (B) Dilated right ureter with mass obstructed the ureter (arrow). (C) Infiltrating mass obstructs ureter and appears to involve bladder (circle). Mass is suspicious for neoplasm. (D, E) Coronal and 3D volume-rendered views demonstrate the mass (circles) obstructing distal right ureter and infiltrating the bladder suspicious for malignancy.

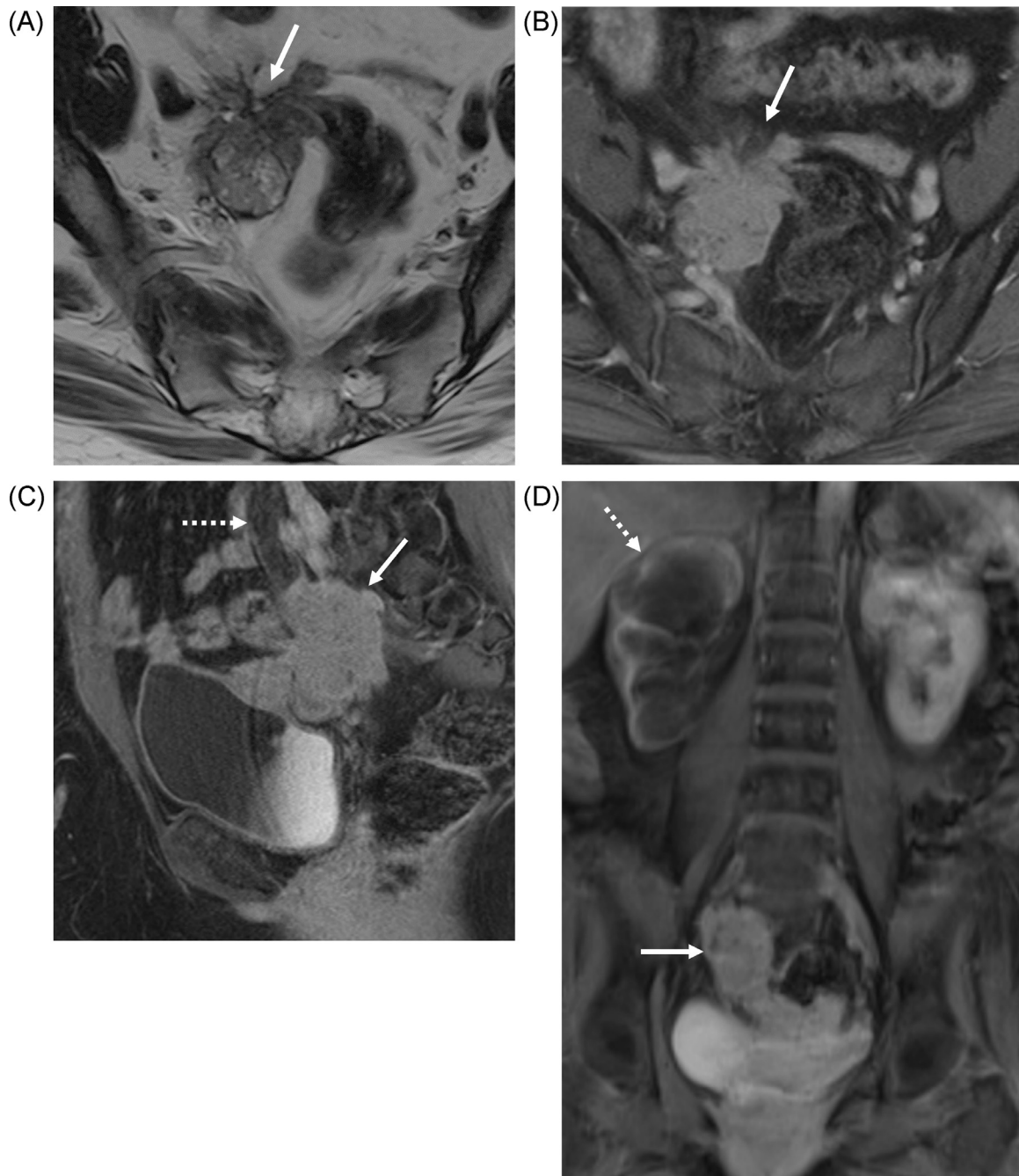


Fig. 2 – (A-D) Axial T2-weighted MR image (A) and axial IV contrast-enhanced T1-weighted MR image (B) of the pelvis showed a spiculated heterogeneously enhancing right pelvic mass (arrow) with encasement of the right distal ureter and tethering of adjacent small bowel. Sagittal IV contrast-enhanced T1-weighted MR image (C) showed the spiculated right pelvic mass with tethering to the bladder (arrow) and obstruction of dilated right distal ureter (dotted arrow). Coronal IV contrast-enhanced T1-weighted MR image (D) showed the right pelvic mass (arrow) with severe right hydronephrosis and cortical thinning (dotted arrow) from chronic obstruction.

surgery, especially when there is ureteral obstruction. If the renal function remains, the endometriotic lesions can be removed or a stent placed to limit the progression of loss of renal function. However, if renal function is lost (less than 15% assessed by scintigraphy), nephrectomy is the best course of treatment [5]. In cases such as ours, where the

risk of surgery was higher than the risk of malignant formation, surgery should not be performed until the lesions begin to show malignant characteristics. Additionally, letrozole and anastrozole have been found effective in reducing symptoms and the size of endometriotic lesions, but there is a risk of associated side effects [3]. In our case, despite severe obstruction

and hydronephrosis, the patient was asymptomatic for three years. Ultimately, due to the growth of the pelvic masses, she underwent complex surgical resection and is actively undergoing letrozole treatment with imaging surveillance.

Conclusion

Ureteral involvement from endometriosis is a rare condition, especially in postmenopausal women. High clinical suspicion of endometriosis when extrinsic obstruction of the distal ureter and hydroureteronephrosis are seen on imaging can allow for prompt treatment intervention and lessen the probability of renal function loss.

Patient consent

The patient reported in the manuscript signed the informed consent/authorization for participation in research, which includes the permission to use data collected in future research projects such as the presented case details and images used in this manuscript.

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