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Severe Ureteral Endometriosis Complicated with Hydronephrosis: A Case Report

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Corresponding Author: Weihong Zhao, e-mail: sydeyzwh@sxmu.edu.cn**Financial support:** None declared**Conflict of interest:** None declared**Patient:** Female, 42-year-old
Final Diagnosis: Right hydronephrosis • ureteral endometriosis
Symptoms: Tolerated painful cramps
Medication: —
Clinical Procedure: Right ureteral mass resection and right ureteral stump anastomosis
Specialty: Obstetrics and Gynecology**Objective:** Unusual clinical course**Background:** Endometriosis is a disease characterized by endometrial tissue appearing outside the uterus, mainly involving the peritoneum and pelvic organs. Ureteral endometriosis (UE) is rare, typified by deep infiltrating endometriosis involving the ureter and can result in ureteral obstruction, proximal hydroureter, hydronephrosis, and impairment of renal function. Symptoms may be insidious and nonspecific and may lead to a prolonged disease course. We describe a patient with UE complicated by hydronephrosis.**Case Report:** A 42-year-old woman was admitted to the Urology Department with the incidental discovery of right hydronephrosis. After a thorough examination, she underwent right ureteral mass resection and right ureteral stump anastomosis. The pathology report indicated endometriosis. The patient was given 6 doses of gonadotropin-releasing hormone agonist immediately after surgery, followed by an intrauterine levonorgestrel-releasing system. Postoperative follow-up showed that no recurrence was observed in this year. Here, we briefly summarize the epidemiology, pathogenesis, clinical presentation, imaging, treatment, and prognosis of the disease.**Conclusions:** UE should be listed as one of the differential diagnoses of unexplained hydronephrosis in women of childbearing age, and those with dysmenorrhea should be cognizant of this disease. Active surgical treatment and long-term management should be carried out to obtain better prognosis.**Keywords:** Diagnosis • Endometriosis • Hydronephrosis**Full-text PDF:** <https://www.amjcaserep.com/abstract/index/idArt/937172>

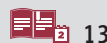
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Background

Endometriosis is a disease characterized by endometrial tissue appearing outside the uterus, mainly involving the peritoneum and pelvic organs, with ovaries and uterosacral ligament being the most common. Ureteral endometriosis (UE) is a relatively rare form of deeply invasive endometriosis (DIE), accounting for 0.1-0.4% of endometriosis [1]. The incidence of UE has increased in recent years. UE most commonly involves the distal ureter, particularly the left side [2], and is considered an aggressive disease [3]. The early symptoms of UE are hidden and lack specificity, making it often missed and misdiagnosed, which often leads to prolongation of the disease course. Furthermore, untimely diagnosis and treatment can cause ureteral dilatation and hydronephrosis, resulting in renal damage. This article analyzes the clinical data of a patient with right ureteral endometriosis with renal pelvis and hydroureter, and discusses its pathogenesis, clinical characteristics, and treatment to provide a basis for the diagnosis and treatment of UE.

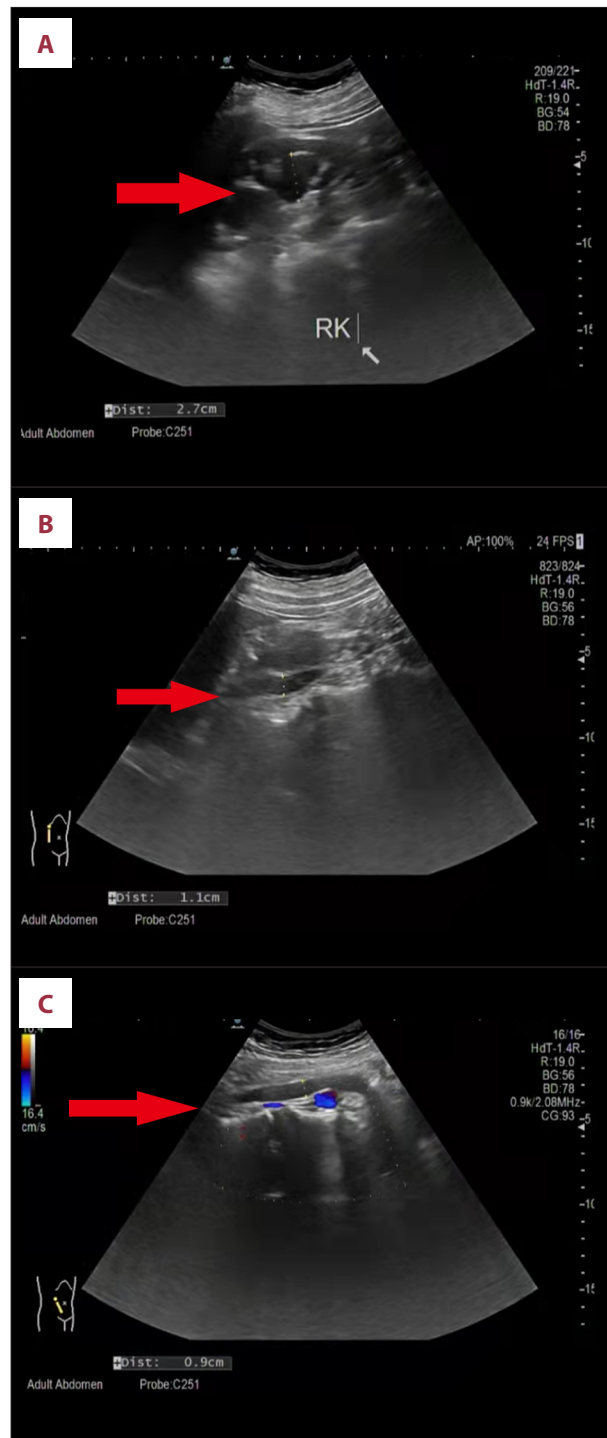
Case Report

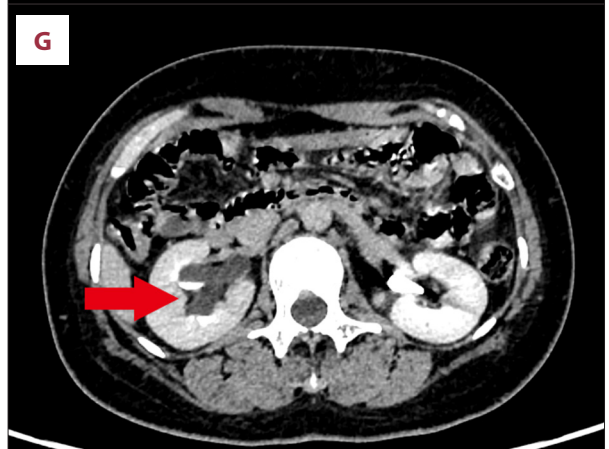
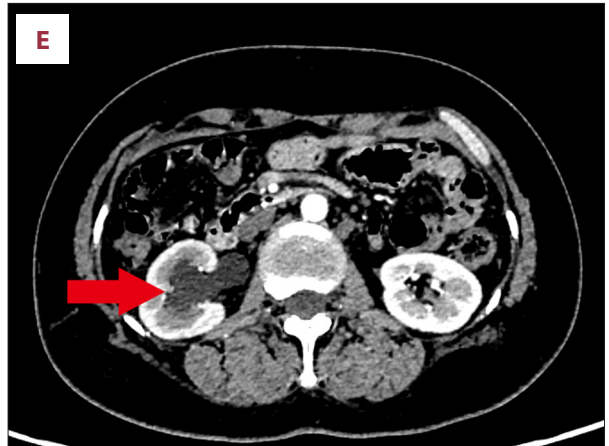
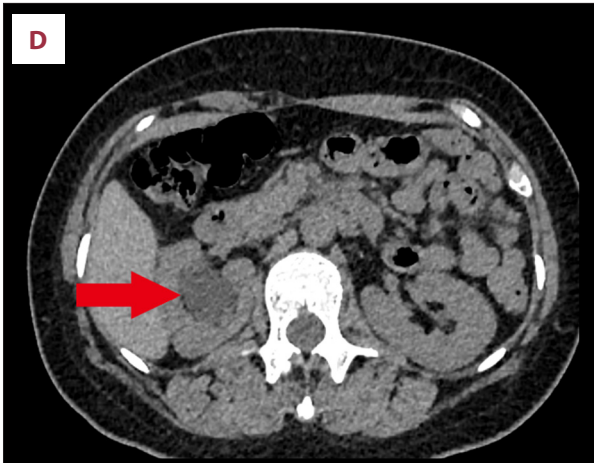
A 42-year-old woman presented with incidental right-sided hydronephrosis and dilated right upper ureter upon physical examination (Figure 1A-1C). On further testing, intravenous pyelography (IVP) showed no visualization of the right renal pelvis and ureter. She denied symptoms of urinary frequency, urgency, or hematuria. The patient noted a monthly menstrual cycle and tolerated painful cramps.

The patient's vital signs were normal. Computed tomography (CT) and contrast-enhanced CT scans showed right kidney and ureteral effusion (Figure 1D-1K). Magnetic resonance imaging of the urinary tract (MUR) showed dilation of the right renal pelvis and ureter, but the lower segment of the ureter entering the bladder was not observed (Figure 1L, 1M). The renal diagram showed that the blood perfusion of the right kidney was significantly reduced (glomerular filtration rate [GFR], 12.16 mL/min) compared with that of the left kidney, indicating severe impairment of right kidney function (Figure 2). Cystoscopy showed a clearly visible right ureteral orifice, no urine ejection, and the insertion of the F-5 ureter for 10 cm was obstructed, suggesting an obstruction.

Laparotomy was then performed under general anesthesia. During the operation, the middle and upper segments of the right ureter were obviously dilated with edema, and the surrounding tissues adhered. After sufficient dissociation, the right ureter was found to be narrowed from the level of the right external iliac artery. The stenosis was about 3 cm long, and the distal end was approximately 10 cm away from the bladder insertion port. The ureteral stricture was completely resected

(Figure 3A), and the surrounding adhesion tissue was separated and removed (Figure 3B). Frozen section was performed for pathological examination, and endometriosis was considered (Figure 3C, 3D). The 2 ends of the ureterectomy site were further dissociated and anastomosed. During the operation, no endometriosis was found in the pelvic cavity. After the operation, an F-5 D-J tube was indwelled in the right ureter under the





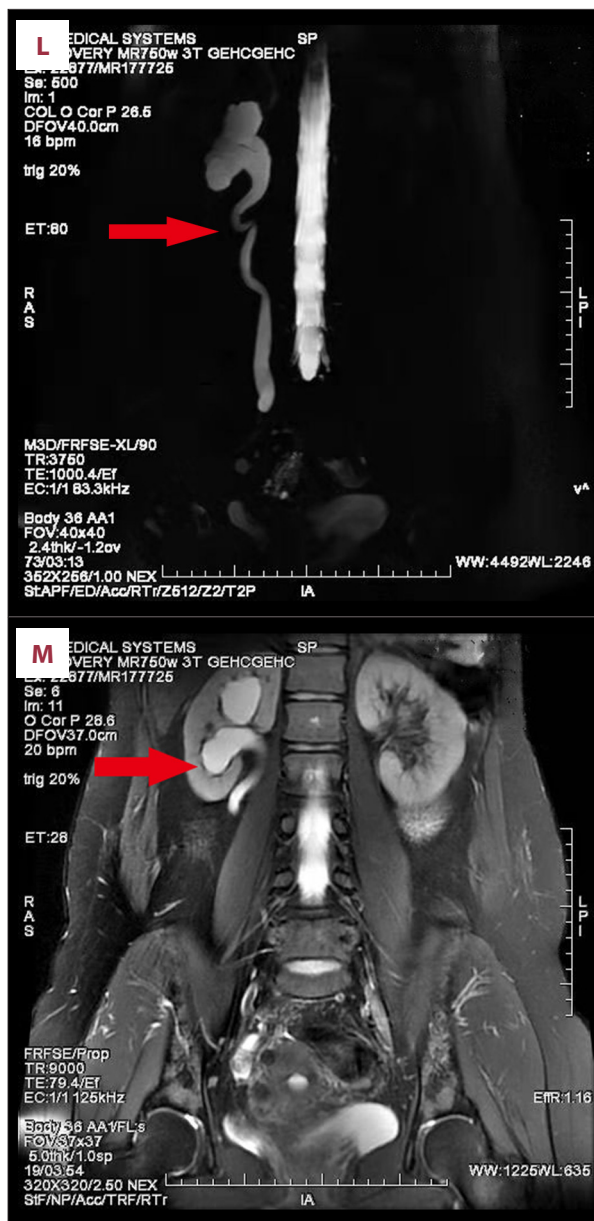
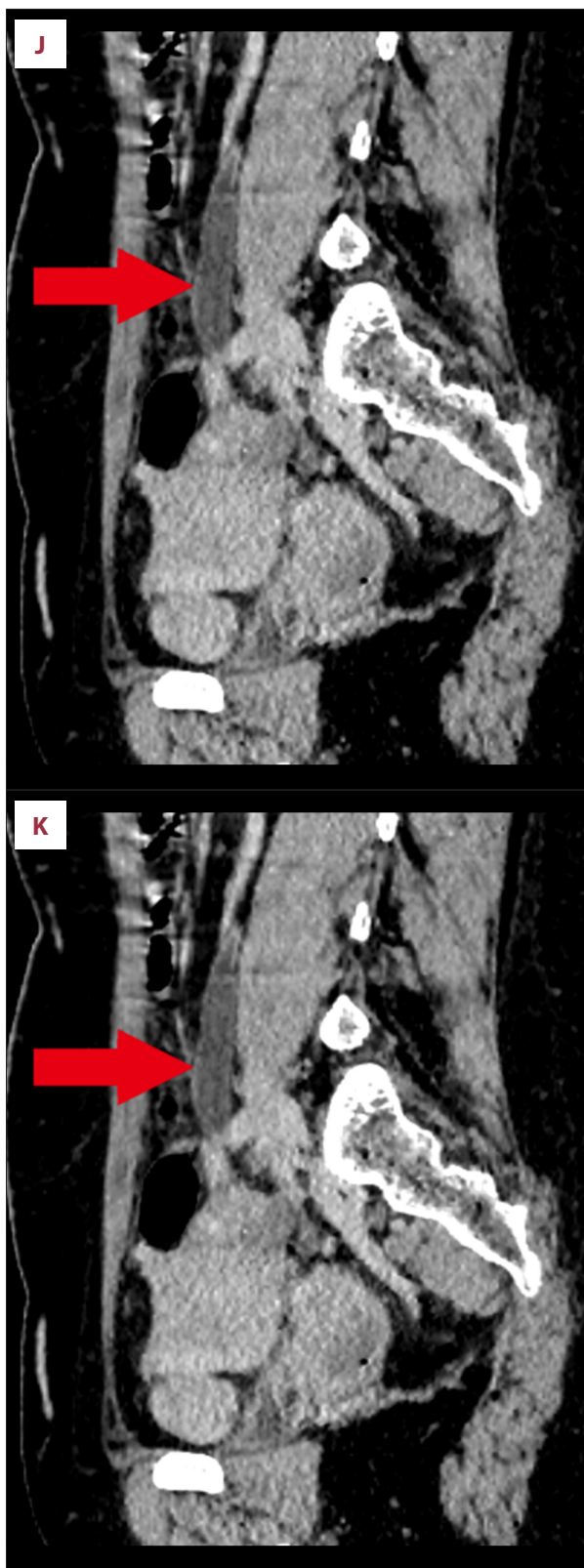


Figure 1. Patient imaging data. **A-C):** Color ultrasound of the urinary system. **(A)** The arrow indicates right hydronephrosis; **(B, C)** Arrows point to right ureteral dilatation. **D-K):** CT and contrast-enhanced CT. **(D)** CT transverse section, the arrow points to the right hydronephrosis; **(E-G)** Enhanced CT transverse section arterial phase, venous phase, and delayed phase, and the arrow points to the right hydronephrosis; **(H)** CT median sagittal **(I-K)** Arterial phase, venous phase, and delayed phase in the mid-sagittal enhanced CT images, arrows point to the dilation of the right lower ureter. **L, M):** MRI of the urinary tract. **(L)** The arrow points to the ureteral stenosis, and hydronephrosis and ureteral dilatation in the lower segment of the stenosis can be seen; **(M)** The arrow points to hydronephrosis.

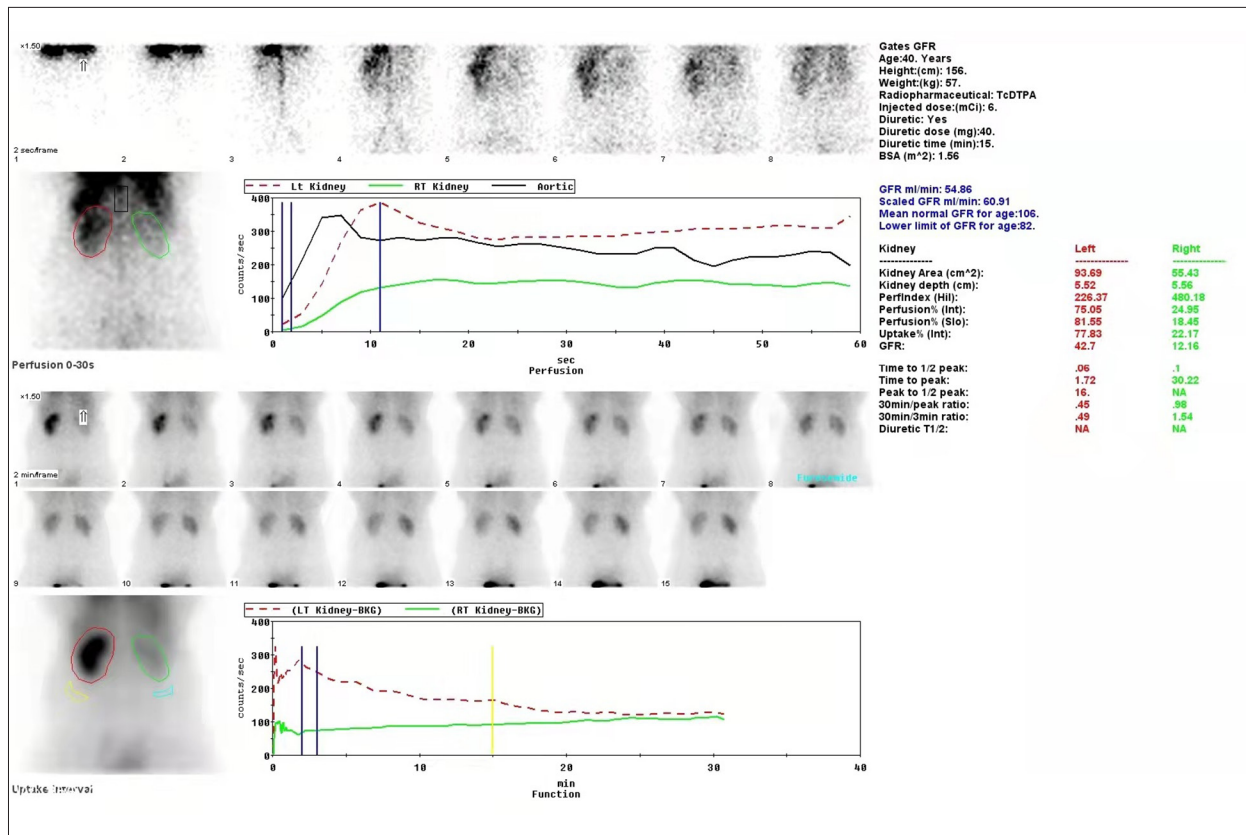


Figure 2. Radionuclide dynamic renal imaging examination. The figure shows that the blood perfusion of the right kidney is significantly lower than that of the left kidney, and the GFR value of the right kidney is 12.16 m/min, indicating severe renal impairment.

cystoscope up to the renal pelvis and was inserted into the pelvis without resistance. Further postoperative paraffin examination showed the following: partial ureteral wall tissue with mild focal uroepithelial hyperplasia and localized submucosal and intermuscular ectopic endometrial glands and mesenchyme, consistent with endometriosis in the right middle ureter; a small amount of smooth muscle, fibrofatty tissue with focal ectopic endometrial glands and mesenchyme, focal hemorrhage, inflammatory cell infiltration, and ferritin deposits, consistent with endometriosis in the right periureteral anatomy (**Figure 3E, 3F**).

Six additional doses of gonadotropin-releasing hormone agonist (GnRH-a) were administered immediately after surgery, followed by intrauterine placement of the levonorgestrel intrauterine release system (LNG-IUS). Immediately after surgery, the patient was generally well. The patient presented to the outpatient urology clinic 3 months after surgery to remove the D-J tube.

Discussion

UE can be divided into exogenous and endogenous types. The former is characterized by obstruction due to the compression

of the surrounding endometrium, whereas the latter is an ectopic occurrence characterized by progression of endometrial tissue lesions in or at the ureteral wall. Exogenous UE is clinically more common and is more likely to cause urinary tract obstruction. In this case, ectopic endometrial glands and stroma were found in the submucosal and intramural areas of the right middle ureter upon postoperative pathological examination, and the surrounding tissues and peritoneal adhesions were severe during the operation, suggesting exogenous endometriosis. Local infiltration of the ureter occurred and eventually involved the ureteral tissue, resulting in hydronephrosis.

Symptoms in patients with UE are often atypical. Fernando et al concluded that after laparoscopic surgery for patients with UE in the past 10 years, dysmenorrhea (76.3%) and pelvic pain (59.6%) were the most common symptoms, and ureteral obstruction symptoms only accounted for 9.9% [4]. In a retrospective analysis of this case, the patient had dysmenorrhea but ignored it because it could be tolerated, reminding clinicians that in cases of dysmenorrhea with hydronephrosis, patients should be alerted to the possibility of urinary tract endometriosis.

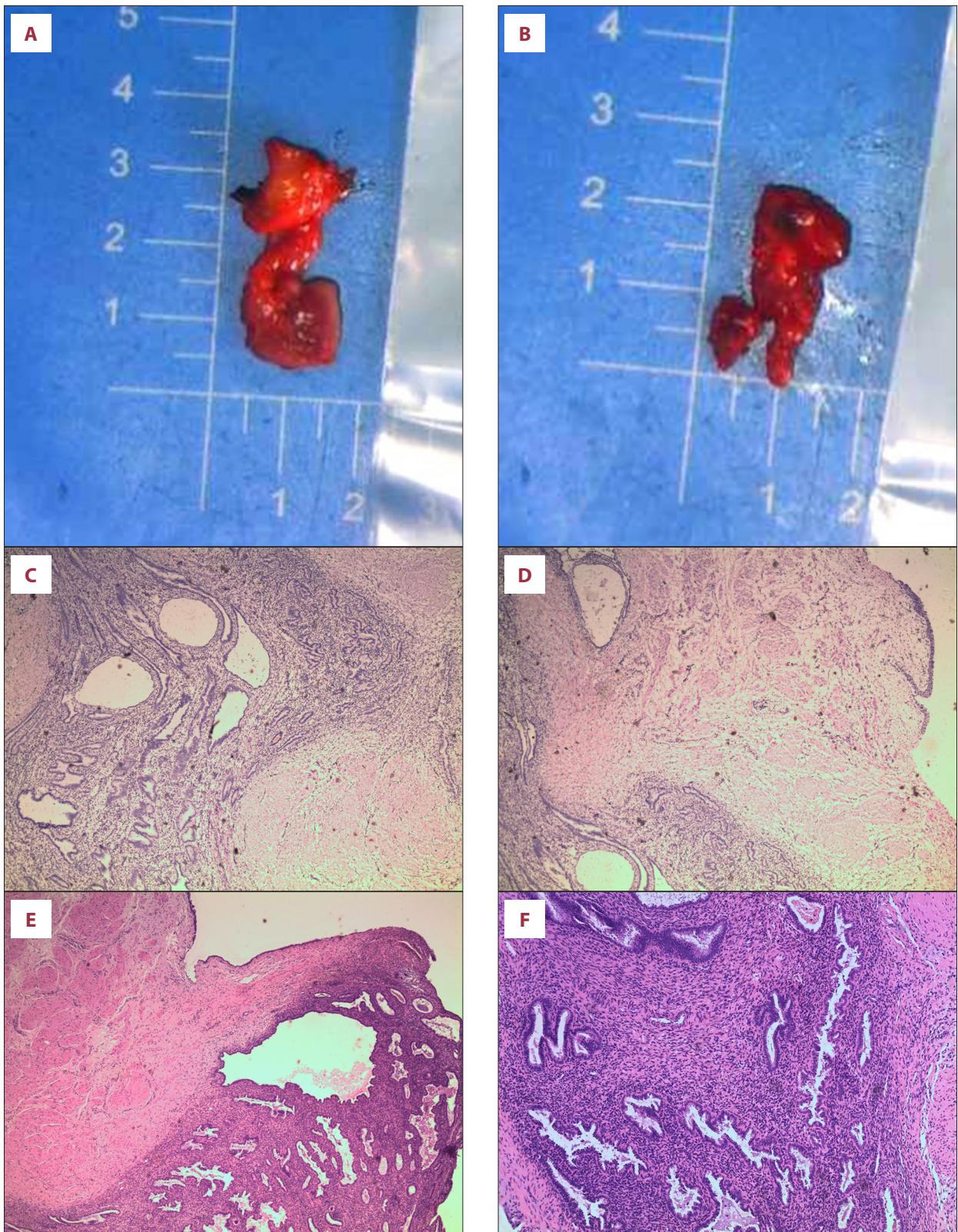


Figure 3. Pictures of surgically removed tissue and pathological pictures of the tissue. (A) Right mid-section stricture ureter; (B) Resection of the surrounding tissue of the ureter; (C, D) Intraoperative quick freezing pathological images, endometrial tissue can be seen in normal ureteral tissue. (E, F) 40× and 100× paraffin section images showing focal endometriosis.

Adequate imaging is necessary for UE. Color Doppler ultrasonography has lower sensitivity and higher specificity in the diagnosis of endometriosis with deep ureteral infiltration, while contrast-enhanced CT has higher sensitivity and lower specificity [5]. Therefore, the use of ultrasound as a first-line auxiliary examination method, and tomography as a supplementary imaging method can improve the diagnostic accuracy and sensitivity. UE presents as hypointense nodules on magnetic resonance imaging (MRI) and hyperintense foci on both T1- and T2-weighted sequences [6]. For deep pelvic endometriosis, MRI results are more accurate than CT for detection [7]. IVP can clarify the location and degree of obstruction and the renal diagram can show the status of renal function. Cystoscopy with transurethral catheter placement can determine the distal site of the stenosis and further exclude other causes of stenosis. In this patient, various imaging examinations failed to detect typical endometriosis lesions, but they helped to identify the site of obstruction and stenosis, the nature of the lesions, and showed details of renal function. The final diagnosis should be based on pathological examination.

The treatment methods of UE vary according to the disease and intraoperative conditions. Surgery is recommended for patients with ureteral obstruction [6]. Laparoscopic ureterolysis is recommended for UE without hydronephrosis [8], whereas in patients with severe UE, the first choice of treatment is segmental ureterectomy combined with ureterotomy or ureterocystostomy [9-11], and long-term postoperative management is extremely important to reduce the recurrence rate [12]. Wu et al [13] assessed the health and economic outcomes of patients from treatment initiation to menopause by designing a Markov model, and the results showed that 6 months of GnRH-a treatment is a cost-effective option for preventing

the recurrence of endometriosis. In the present case, the patient underwent partial right ureterectomy and end-to-end anastomosis, then 6 doses of GnRH-a medication were injected immediately after surgery, and LNG-IUS was subsequently placed. Follow-up results were normal in the first year; however, long-term evaluation is still required.

Conclusions

UE should be listed as one of the differential diagnoses of unexplained hydronephrosis in women of childbearing age, and those with dysmenorrhea should be cognizant of this disease. Active surgical treatment and long-term management should be carried out to obtain better prognosis.

Acknowledgments

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Ethics statement

This study has been approved by the Ethics Committee of the Second Hospital of Shanxi Medical University (IRB approval no.: 2021246).

Declaration of Figures' Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

References:

1. Muthuppalaniappan VM, Wiles KS, Mukerjee D, Abeygunasekara S. Silent obstruction in a young woman with systemic lupus erythematosus: A case report and literature review on kidney injury from ureteral endometriosis. *Postgrad Med*. 2016;128(3):307-10
2. Cavaco-Gomes J, Martinho M, Gilibert-Aguilar J, Gilibert-Estéles J. Laparoscopic management of ureteral endometriosis: A systematic review. *Eur J Obstet Gynecol Reprod Biol*. 2017;210:94-101
3. Fernandes LFC, Ebaid GX, Bassi MA. Bilateral ureteral endometriosis-an indolent, aggressive, and dangerous condition. *Fertil Steril*. 2021;115(1):256-58
4. Cunha FLD, Arcoverde FVL, Andres MP, et al. Laparoscopic treatment of ureteral endometriosis: A systematic review. *J Minim Invasive Gynecol*. 2021;28(4):779-87
5. Zannoni L, Del Forno S, Coppola F, et al. Comparison of transvaginal sonography and computed tomography-colonography with contrast media and urographic phase for diagnosing deep infiltrating endometriosis of the posterior compartment of the pelvis: A pilot study. *Jpn J Radiol*. 2017;35(9):546-54
6. Barra F, Scala C, Biscaldi E, et al. Ureteral endometriosis: A systematic review of epidemiology, pathogenesis, diagnosis, treatment, risk of malignant transformation and fertility. *Hum Reprod Update*. 2018;24(6):710-30
7. Manti F, Battaglia C, Bruno I, et al. The role of magnetic resonance imaging in the planning of surgical treatment of deep pelvic endometriosis. *Front Surg*. 2022;9:944399
8. Uccella S, Cromi A, Casarin J, et al. Laparoscopy for ureteral endometriosis: Surgical details, long-term follow-up, and fertility outcomes. *Fertil Steril*. 2014;102(1):160-166.e2
9. Yang K, Cheng S, Cai Y, et al. Clinical characteristics and surgical treatment of ureteral endometriosis: Our experience with 40 cases. *BMC Womens Health*. 2021;21(1):206
10. Nezhat C, Katler QS. Ureteral endometriosis requiring bilateral ureteroneocystostomy: Saving the endangered kidneys. *Fertil Steril*. 2021;115(1):98-99
11. Alves J, Puga M, Fernandes R, et al. Laparoscopic management of ureteral endometriosis and hydronephrosis associated with endometriosis. *J Minim Invasive Gynecol*. 2017;24(3):466-72
12. Hu Z, Li P, Liu Q, et al. Ureteral endometriosis in patients with deep infiltrating endometriosis: Characteristics and management from a single-center retrospective study. *Arch Gynecol Obstet*. 2019;300(4):967-73
13. Wu B, Yang Z, Tobe RG, Wang Y. Medical therapy for preventing recurrent endometriosis after conservative surgery: A cost-effectiveness analysis. *BJOG*. 2018;125(4):469-77