

## Ureteral endometriosis: A rare cause of silent obstructive uropathy

### Üreteral endometriozis: Nadir görülen sessiz obstrüktif üropati nedeni

Tevfik YOLDEMİR, Canan CIMSİT

#### ABSTRACT

Endometriosis is defined as the presence of active endometrial tissue outside the uterine cavity affecting 15% of women at reproductive age. Ureteral endometriosis (UE) is a rare type of endometrial involvement affecting 0.1% - 1% of women with endometriosis. UE is quite uncommon and underdiagnosed because of the patients' nonspecific symptoms of endometriosis. However, it is important to diagnose and manage UE treatment since it can lead to renal failure due to silent obstruction of the ureter. This case report describes a woman who presented with cyclic pelvic pain and left flank pain. Imaging studies and laparoscopic findings revealed bilateral endometrioma and deep infiltrating endometriosis (DIE) findings resulting in extrinsic infiltration of the ureter and hydronephrosis.

**Keywords:** Endometriosis, Ureter, Hydronephrosis, Magnetic resonance imaging, Laparoscopy

#### ÖZ

Doğurganlık dönemindeki kadınların %15 oranında etkilendiği endometriozis, fonksiyonel endometrial dokunun uterus kavitesi dışında yerleşmesiyle karakterize bir hastalıktır. Üreteral endometriozis nadir görülen bir tutulum şekli olup endometriozis hastalarında yaklaşık %0.1-%1 oranında görülür. Hastaların endometriozise bağlı nonspesifik şikayetleri nedeniyle tanıda gözden kaçabilir. Tanısının konularak tedavi planlaması son derece önem gerektirir, çünkü sessiz üriner obstrüksiyona neden olduğundan gecikme böbrek yetmezliği ile sonlanabilir. Çalışmamızda, siklik pelvik ağrı ve sol yan ağrısı nedeniyle başvuran kadın hastada bilateral endometrioma ve derin infiltran endometriozis bulguları sonucunda ureterde ekstresek tip

endometrial infiltrasyon ve hidronefrozun görüntüleme yöntemleri ile tespit edilmesi ve laparoskopi bulguları literatür eşliğinde sunulmaktadır.

**Anahtar kelimeler:** Endometriozis, Üreter, Hidronefroz, Manyetik rezonans görüntüleme, Laparoskopi

#### Introduction

Endometriosis is one of the most common gynecologic diseases of the women in reproductive age. Ten percent of these women have involvement of the genitourinary track by endometriosis where the bladder or ureters are the most common sites involved. Ureteral endometriosis (UE) is infrequent accounting for less than 0.3 % of all types of endometiosis [1]. Due to the rare incidence and absence of specific symptoms of UE, the disease is overlooked and presents challenge in diagnosis and treatment. In the absence of proper examination, UE is usually discovered during laparoscopy. Preoperative diagnosis is important both for preventing risk of renal dysfunction and managing surgical approach [2].

#### Case Report

A 36-year-old woman was admitted to the Obstetrics and Gynecology department due to pelvic pain, dysmenorrhea, dyspareunia, infertility, and low back pain. She had a history of laparoscopic endometriosis surgery (LES) for aspiration of endometrial cysts three years ago and had pain free periods for two years. Her symptoms which were cyclic and concurring with menses became apparent for the last months. A progressive left flank pain that had been going on for several menstrual cycles was also noted. The rectovaginal examination revealed tenderness and pain on

Tevfik Yoldemir (✉)

Department of Obstetrics and Gynecology, School of Medicine, Marmara University Training and Research Hospital, Pendik, Istanbul, Turkey

Canan Cimsit

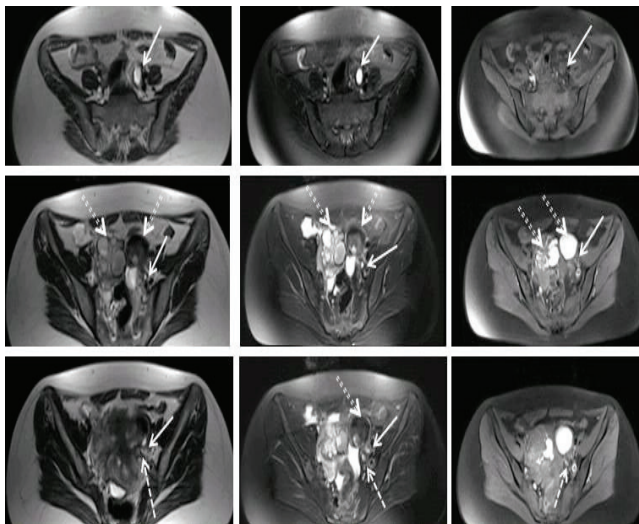
Department of Radiology, School of Medicine, Marmara University Training and Research Hospital, Pendik, Istanbul, Turkey

Submitted/Gönderme: 13.02.2016

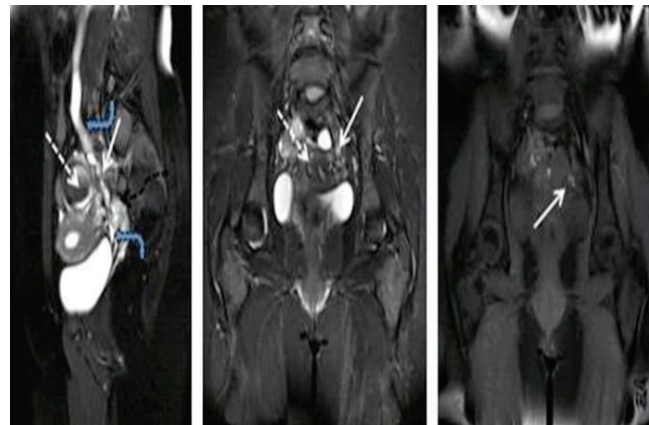
Accepted/Kabul: 24.03.2016

both of the ovaries. The vaginal ultrasonography confirmed bilateral endometrioma with some fluid in the pouch of Douglas. Laboratory tests were as follows: Hemoglobin: 10.2 g/dL; HCT: 33%; Creatinine: 0.7mg/dl; uric acid: 3.3 mg/dl; urea nitrogen of 11mg/dL; CA- 125 level: 25 U/ml; serum electrolytes, amylase, lipase, and blood glucose levels were normal. Urinary sediment did not contain hematuria or pyuria. The urine culture indicated no bacterial growth, and urine cytology revealed no malignant cells.

Pelvic magnetic resonance imaging (MRI) was performed for detecting deep infiltrating endometriosis (DIE) lesions. MRI showed fluid in cul-de-sac and posterior and midline displacement of both ovaries. There were numerous endometriomas in the right ovary, largest measuring 2.5X2 cm in diameter. Left ovarian endometrioma measuring 4X4 cm in size had shading on T2W images and was hyperintense on fat-saturated T1W images (Fig. 1). Ureter dilatation was noted in the pelvic MRI. The dilated left ureter coursed posteriorly along the left endometrioma where the periureteric fat signal was abolished in nearly 180 degrees of circumferential contact. The diameter of the ureter decreased to normal size as it passed a paraureteric nodule which is adherent laterally to the pelvic portion of the ureter and posteriorly to the left endometrioma (Figs. 1, 2). MRI diagnosed extrinsic type of UE.



**Figure 1.** Fluid in cul-de-sac and midline displacement of bilateral ovarian endometriomas (white double dotted arrows). MRI shows the dilated left ureter (white solid arrow) coursing posteriorly along the left endometrioma and decreasing in diameter to normal size as it passed the paraureteric nodule (dotted arrow) which is adherent laterally to the ureter and posteriorly to the left endometrioma in axial T1W and T2W images (axial T2W images are sequenced on the right, axial fat-saturated T2W images in the middle, axial fat-saturated T1W images on the left column).

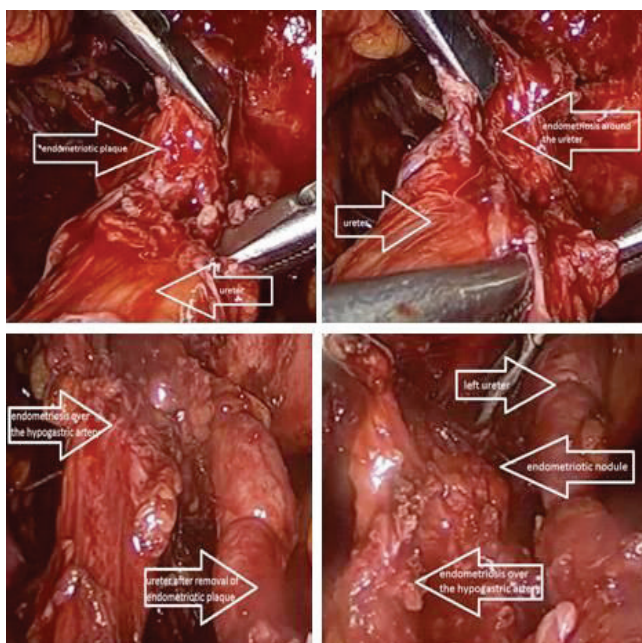


**Figure 2.** Pelvic portion of the ureter and hypogastric artery are under extrinsic compression of left endometrioma and DIE nodule. Note the change of the diameter of the left ureter back to normal size below the deep infiltration site (white dotted arrow: endometrioma with shading on T2W images, white solid arrow: nodule showing hyperintensity both on T2W and fat-sat T1W images, bent arrow: ureter, black curved arrow: rectovaginal space). MRI findings diagnosed extrinsic type of ureteral endometriosis which was confirmed by laparoscopy.

LES was offered after all the complications and possible outcomes of the surgery were discussed with the patient. During the LES, the sigmoid colon was found to cover the left ovary and the left tube. After the sigmoid was taken down with sharp dissection the ovary was freed from the pelvic side. The left ovarian endometrioma was drained and it was scraped from the underlying peritoneum and later was hung up to the abdominal wall by a 0 prolene suture.

There was a left sacrouterine endometriotic nodule extending deep into the left pelvic side wall. The left pararectal fossa was opened near the pelvic brim, while the path of the ureter was visualized. The ureter was dilated above the endometriotic area. Ureter was encircled with endometriotic fibrotic tissue. Careful dissection was done both in the Kobayashi and Latzko's spaces. Fibrotic tissue was excised with careful consideration to the ureter. The ureter was freed till the tunnel. Later the endometriotic plaque extending over to the left hypogastric artery was dissected off the vessel. Finally, the endometriotic nodule originating from the left sacrouterine ligament and extending to the pelvic side wall was excised after the ureter was mobilized (Fig. 3).

Later the left endometrioma was excised from the ovary. The right ovarian endometrioma was drained considering that the patient was willing to achieve pregnancy in the near future.



**Figure 3.** Photographs taken during laparoscopy showing left ureter, hypogastric artery, endometriotic nodule, and endometriotic plaques.

## Discussion

Urinary tract involvement is reported in 1%- 4% of patients with endometriosis [3]. The most common location is the bladder (80%) followed by the ureters, kidneys and urethra [4]. UE is a rare type of endometrial involvement affecting 0.1%- 1% of women with endometriosis [1]. Patients with ureter involvement are asymptomatic in approximately 30% of cases and due to the non-specific symptoms and silent obstruction, they have the risk of progression to renal dysfunction if untreated [5]. Diagnosing UE is quite difficult mostly because of unawareness of this entity. Early diagnosis decrease morbidity such as renal function loss as a consequence of hydronephrosis.

Imaging has the key role to map the lesion and assist preoperative management as in all endometriotic site involvements. Ultrasonography, laparoscopy, intravenous urography, ureteroscopy with endoluminal ultrasound, computed tomography (CT), MRI, and MR urography are common diagnostic tools used to confirm the existence of UE [6]. Ultrasound is the first method that should be applied for endometriomas. The sensitivity of transvaginal ultrasound was best for intestinal and bladder disease and slightly less accurate for uterosacral and rectovaginal involvement because of poor penetration [7]. Laparoscopy is the reference standard diagnostic tool. MRI has been shown to have higher accuracy in detecting endometriotic

lesions and evaluate areas otherwise inaccessible by laparoscopy in the presence of dense adhesions. Addition of fat-suppressed sequences and susceptibility weighted imaging sequences facilitated the detection of even small endometriotic foci [7]. In patients with suspected UE, intravenous urography and ureteroscopy with endoluminal ultrasound are performed to rule out other causes of ureteral obstruction [8].

Ureteral endometriosis has two major pathological types, namely extrinsic and intrinsic, with the former being the most common. In the extrinsic type endometrial tissue involve only the adventitia of the ureter or the surrounding tissue whereas in the intrinsic type endometrial tissue invades muscularis propria, lamina propria, and ureteral lumen [9]. In the extrinsic form, patients present with ureter strictures, ureteral obstruction, and hydronephrosis because ureteral tunics are affected by the adherence of the surrounding structures. Intrinsic endometriosis occurs because of hematogenous or lymphatic spread [2].

On MRI, ureteric wall invasion is evaluated according to the contact circumference between the ureter and the endometriosis lesion: The lesion is classified extrinsic if the contact circumference is less than 180 degrees; intrinsic if the circumference is over 360 degrees. If the circumference is between 180 and 360 degrees, the conclusion depends on the other MRI signs such as periureteric fat signal changes, parametrial nodule presence, and extrinsic compression of a lesion in contact with the ureter [5]. Silloe et al., compared the sensitivity and specificity of MRI and surgery to detect intrinsic/extrinsic types against the histologic gold standard [5]. They concluded that MRI appeared to be more sensitive (91% vs 82%) but less specific (59% vs 67%) than surgery for the diagnosis of intrinsic form of ureteric location. They have also revealed that analysis of contact circumference was successful such that if the disease surrounded the ureter less than 180 degrees then the possibility of intrinsic endometriosis were less than 10%. In our case MRI defined extrinsic type of UE and was confirmed by laparoscopy.

Asymmetric involvement in UE with left ureter dominance and distal segment infiltration has been reported in previous cases. Unlike bladder endometriosis hematuria occurs in 15% of patients where cyclic hematuria is usually associated with the intrinsic type [9]. Ureteral involvement is usually due to the spreading of deep endometriosis infiltrating rectovaginal space or uterosacral ligaments and is associated with ipsilateral endometriomas [10]. Our patient had no hematuria and asymmetric involvement of the left ureter with bilateral endometrioma and nodular infiltration

of the uterosacral ligament.

The general purpose for the treatment of UE is to relieve the ureteral obstruction for protection of renal function and treat pelvic endometriosis that UE accompanied with. Therapeutic methods for endometriosis are medical and surgical therapies [2]. Ureterolysis is suggested to be the first choice option for patients with mild hydronephrosis whereas resection of the ureter with ureteroneocystostomy is suggested to be suitable for patients with moderate to severe hydronephrosis. In this case even though the endometriotic nodule with its extension as plaque formation was severely adherent to the ureter it was possible to excise the diseased tissue off of the ureter without the need for segmental ureterectomy and later re-anastomosis.

Due to the rare incidence and nonspecific symptoms of pelvic endometriosis, UE is frequently underdiagnosed. In the absence of novel preoperative investigations, UE is usually discovered during laparoscopy. Effective treatment options and type of surgical approaches depend on the stage, location, and depth of the lesion. It is important to diagnose UE and manage treatment since it can lead to renal failure because of silent urinary tract obstruction. We suggest upper urinary tract ultrasound for patients with endometriosis.

**Conflict of interest:** None

## References

1. Nezhat C, Nezhat F, Nezhat CH, Nasserbakht F, Rosati M, Seidman DS. Urinary tract endometriosis treated by laparoscopy. *Fertil Steril* 1996; 66:920-4.
2. Mu D, Li X, Zhou G, Guo H. Diagnosis and treatment of ureteral endometriosis: study of 23 cases. *Urol J* 2014; 11:1806-12.
3. Pérez-Utrilla Pérez M, Aguilera Bazán A, Alonso Dorrego JM, et al. Urinary tract endometriosis: clinical, diagnostic, and therapeutic aspects. *Urology* 2009; 73:47-51.
4. Krüger K, Gilly L, Niedobitek-Kreuter G, Mpinou L, Ebert AD. Bladder endometriosis: characterization by magnetic resonance imaging and the value of documenting ureteral involvement. *Eur J Obstet Gynecol Reprod Biol* 2014; 176:39-43.
5. Sillou S, Poirée S, Millischer AE, Chapron C, Hélénon O. Urinary endometriosis: MR imaging appearance with surgical and histological correlations. *Diagn Interv Imaging* 2015; 96:373-81. doi: 10.1016/j.diii.2014.11.010. Epub 2014 Dec 31.
6. Yohannes P. Ureteral endometriosis. *J Urol* 2003; 170: 20-5.
7. Cimsit C, Yoldemir T, Guclu M, Akpınar IN. Susceptibility-weighted magnetic resonance imaging for the evaluation of deep infiltrating endometriosis: preliminary results. *Acta Radiol*. 2015. pii: 0284185115602147. [Epub ahead of print]
8. Lusuardi L, Hager M, Sieberer M, et al. Laparoscopic treatment of intrinsic endometriosis of the urinary tract and proposal of a treatment scheme for ureteral endometriosis. *Urology* 2012; 80:1033-8.
9. Hsieh MF, Wu IW, Tsai CJ, Huang SS, Chang LC, Wu MS. Ureteral endometriosis with obstructive uropathy. *Intern Med* 2010; 49:573-6.
10. Rozsnyai F, Roman H, Resch B, et al. Outcomes of surgical management of deep infiltrating endometriosis of the ureter and urinary bladder. *JSLS* 2011; 15:439-47.