

Radiographic Features of Intrinsic Ureteral Endometriosis: a case report

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Endometriosis is defined as the presence of endometrial tissue in an ectopic position. It occasionally involves the urinary tract. Ureteral endometriosis may be either intrinsic or extrinsic, where the intrinsic ureteral endometriosis refers to disease caused by the actual invasion of the ureteral wall by the endometriosis. This form has often been mistaken for a primary ureteral neoplasm, with consequent nephroureterectomy. We reported a case of ureteral endometriosis in a 47 year-old female patient suffered from unilateral hydronephrosis. Left antegrade pyelography revealed a tubular filling defect in the left distal ureter with left hydronephrosis, and computed tomography (CT) demonstrated a soft tissue in the left distal ureter. Under the impression of malignant urothelial tumor, segmental resection of distal ureter was performed. The pathologic findings revealed elements of endometrial glands and stroma in the ureteral lumen. Extragenital intraureteral endometriosis was diagnosed. We should be aware of such diagnostic pitfalls to distinguish this lesion from polypoid ureteral tumor before operation.

Key words: Endometriosis; Ureter, stenosis obstruction; Urography

Endometriosis is commonly seen in the ovary, fallopian tube, rectovaginal septum, and pelvic peritoneum and cul-de-sac. In addition, it has been described in the skin, lungs, diaphragm, gastrointestinal tract (colon), laparotomy site, umbilicus, obturator nerve and axillary lymph nodes [1, 2]. Involvement of the genitourinary tract has been reported at an incidence of 1.2%, with peak age incidence at 30 to 35 years [3, 4]. The ratio of bladder-to-ureteral-to-urethral involvement is 40:5:1 [5]. Ureteral endometriosis is a rare entity, and its diagnosis requires a high index of suspicion. Because of its association with silent renal obstruction, up to 47% of patients will required nephrectomy at the time of diagnosis for nonfunctioning kidney or ureteral endometrial lesion mimicking transitional cell carcinoma [2]. Ureteral endometriosis is often asymmetric, more commonly involving the distal segment of the left ureter [6]. The close anatomical proximity of the distal ureter to the female reproductive organs makes it an ideal target for the development of extrinsic compression of the ureter [6].

CASE REPORT

A 47-year-old female suffered from soreness sensation over the left flank for two weeks. Ultrasound and intravenous pyelography performed in other hospital disclosed left distal ureteral obstruction with left hydronephrosis. She was then transferred to our hospital for further evaluation. Physical examination revealed knocking tenderness over left flank. She denied any history of previous operation and major medical disease. The routine laboratory tests in this admission were within normal range. Left percutaneous nephrostomy (PCN) with left antegrade pyelography, abdominal CT, and left ureteroscopy were performed.

Left PCN with left antegrade pyelography showed a tubular filling defect measuring 2 cm in the left distal ureter with left hydronephrosis (Fig. 1). Abdominal

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CT demonstrated a soft tissue density with poor enhancement in the left distal ureter (Fig. 2). The left ureteroscopy showed a red polypoid mass at the left distal ureter about 3 cm away from the left ureteral orifice.

The patient received segmental resection with ureteroureterostomy over left distal ureter. At surgery, a polypoid mass measuring $2 \times 0.6 \times 0.6$ cm was found in the left distal ureter. Histological examination revealed the presence of the elements of endometrial glands and stroma within smooth muscle fibers and fibrous connective tissue (Fig. 3). The final pathological diagnosis is extragenital intraureteral endometriosis.

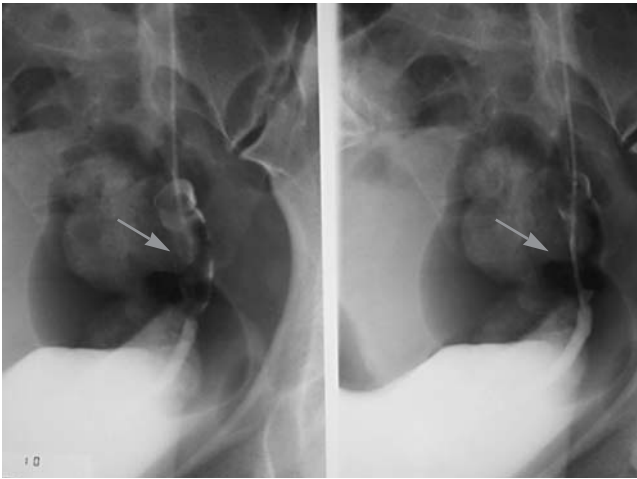


Figure 1. Left antegrade pyelography shows a tubular filling defect (arrow) measuring 2 cm in the left distal ureter with left hydronephrosis.

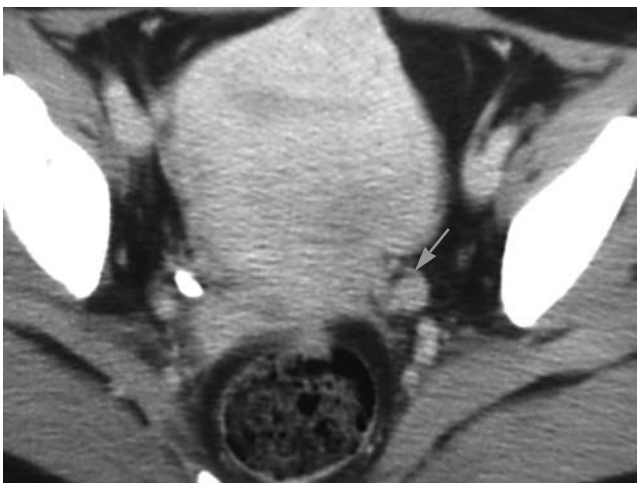


Figure 2. Abdominal CT demonstrates a soft tissue density (arrow) with poor enhancement in the left distal ureter.

DISCUSSION

There are two major pathological types of ureteral endometriosis: extrinsic and intrinsic. Extrinsic ureteral endometriosis, the more common type (80%), represents endometrial glandular and stromal tissue within the submucosa and adventitia of the ureter [7-9]. In contrast, the intrinsic endometriosis (20%) involves the uroepithelial and submucosal layer [10]. The pathophysiology of endometriosis, especially as it pertains to ureteral involvement, remains unclear. Several theories have been proposed to explain the mechanism of endometrial “tissue transport” outside the uterus [2, 5, 11, 12]. These mechanisms include direct extension into or outside the uterine wall (adenomyosis), lymphatic or hematogenous spread, retrograde menstrual flow through the fallopian tube and metaplastic reaction of the Müllerian or Wolffian duct remnants. The evidence of higher incidence of endometriosis in the patients with a history of pelvic surgeries, is supporting the theory of direct extension [5, 13].

It is generally believed that excretory urogram is a first screening imaging examination in assessing intrinsic ureteral endometriosis [5, 9, 13-15]. Its use in the diagnosis of ureteral endometriosis is often prompted by symptoms of renal colic from blood clots or cyclical hematuria. Previous authors have considered the radiologic findings to be nonspecific. These include hydroureteronephrosis, narrowing of the pelvic ureter [8, 16, 17], and rarely, an intraluminal ureteral mass [18]. Although the findings of hydronephrosis and narrowing of the pelvic ureter



Figure 3. The pathologic findings (H&E 100x) reveal elements of endometrial glands and stroma within smooth muscle fibers and fibrous connective tissue.

may be nonspecific, excretory urography will localize the level, degree and laterality of ureteral involvement. Intrinsic endometriosis creates a filling defect within the lumen of the ureter, thereby mimicking numerous urological conditions such as radiolucent stones and transitional cell carcinoma. Coupled with retrograde or antegrade pyelographic studies, excretory urography may be helpful in the diagnosis of the ureteral strictures secondary to the intrinsic or extrinsic endometriosis, whereas CT is useful in the diagnosis of extrinsic ureteral endometriosis [3, 13], identification of the extent of disease, the degree and level of obstruction.

As reported by Bazot et al [19], MR imaging demonstrates high accuracy in prediction of deep pelvic endometriosis in specific locations as follows: torus uterinus, uterosacral ligaments, vagina, recto-vaginal septum, rectosigmoid colon, and bladder. Signal intensity abnormality were observed as hyperintense foci on T1-weighted images and small hyperintense cavities observed on T2-weighted MR images [19]. In 1994 Siegelman et al [20] reported that seven of their eight pelvic endometriosis masses had similar features on MR images: intermediate signal intensity on T1-weighted images with punctuate foci of high signal intensity and low signal intensity on T2-weighted images. These lesions were enhanced after administration of contrast material. Moreover, MR imaging could help in the differentiation of deep pelvic endometriosis from peritoneal metastases [20]. Although our case is not located in the usual position as described above, we thought that MRI may be helpful in making preoperative diagnosis.

The ability of delineating the above characteristics of the ureteral lesion is of definite value in differential diagnosis, especially in excluding the possibility of primary mucosal lesions. Differential diagnosis for intraluminal filling defects includes urothelial malignant tumors, sloughed papilla, ureteral calculus, tuberculosis, and amyloidosis. Urothelial malignancy commonly presents as an intraluminal filling defect with marginal cupping immediately above and below the lesion. CT is helpful in distinguishing radiolucent stones from soft tissue filling defects and extrinsic from intrinsic lesion. Tuberculosis may occasionally produce a single short stricture of the ureter, but more commonly the ureteral segment of involvement is long and frequently the strictures are multiple. Furthermore, tuberculous changes in the ureter are almost always accompanied by renal or vesical abnormalities [9]. Amyloidosis may appear as a localized stricture in the distal ureter. However, only few cases have been reported in females [21], and not all of them

were in the premenopausal age group.

In conclusion, ureteral endometriosis is a rare disease whose presenting symptoms may vary and its imaging findings are non-specific. The final diagnosis requires a high index of suspicion and relies heavily on ureteroscopic biopsy or operation. Anyway, when encountering an ureteral mass in women of child-bearing age, endometriosis should be considered in the list of differential diagnosis. ◆

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内生性輸尿管子宮內膜異位在醫學影像之表現： 病例報告

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子宮內膜異位常見於卵巢、輸卵管及骨盆腔，但較少見於輸尿管。輸尿管子宮內膜異位可以分為内生性和外生性兩種型態，其中内生性型態又更少發生，但因為這種型態在醫學影像上常和惡性的輸尿管移行型上皮癌相似，而使病人接受不必要的手術。我們報告一病例病理證明為内生性輸尿管子宮內膜異位，順行性腎盂造影看到一管狀的遠端輸尿管缺損病灶，電腦斷層發現一個軟組織腫瘤在遠端輸尿管。雖然内生性輸尿管子宮內膜異位並不常見，但當一育齡婦女發現有上述影像學的表徵時，應將内生性輸尿管子宮內膜異位列入鑑別診斷。

關鍵詞：子宮內膜異位；輸尿管，狹窄或阻塞；尿路攝影