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Indian Journal of Obstetrics and Gynecology Research

Journal homepage: www.ipinnovative.com

Original Research Article

Ureteral endometriosis – Our experience

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ARTICLE INFO

Article history:
Received 28-11-2019
Accepted 27-04-2020
Available online 12-09-2020

Keywords:
Ureteral endometriosis
Ureterolysis
Ureteroureterostomy
Ureteroneocystotomy
Nephroureterectomy
Endometriosis
Laparoscopic surgery

ABSTRACT

Introduction: Ureteral endometriosis is a rare disease affecting women of childbearing age, which presents with nonspecific symptoms and may lead to severe morbidity. The ureters can be involved either extrinsically and/or intrinsically by endometriosis. In this study we have retrospectively assessed the patients presenting to us with ureteral endometriosis.
Materials and Methods: Between July 2009 and December 2019, (17) women of childbearing age presented to the urological services of the hospital with complaints of lower abdominal pain, dysmenorrhea, dysuria and a range of other symptoms.
Results: Pain in lower abdomen was the most common symptom and was cyclical in the majority of the patients. Only 2 patients had undergone surgery (diagnostic laparoscopy) previously for pain in abdomen and normal ultrasonography.
Conclusions: Ureteric endometriosis is rare but a cause of severe morbidity in those that have deep infiltrating endometriosis. Can lead to ureteric obstruction and at times loss of function. An index of suspicion in women in child bearing age is important. Hormonal manipulation along with surgical intervention is beneficial in most patients.

1. Introduction

Endometriosis is a clinical disorder characterized by the ectopic presence and growth of functional endometrial tissue, glands, and stroma, outside the uterus.[1] It is estimated that about 5%–20% of women are believed to be affected, however most are asymptomatic.[2] The ovaries, the uterosacral ligaments, the fallopian tubes, the cervix, and the cul-de-sac are the organs that are commonly involved. Ureteral endometriosis is a rare disease affecting women of childbearing age, which presents with nonspecific symptoms and may result in severe morbidity.[1] This was first described by Cullen in 1917 and constitutes 0.1%–0.4% of genitourinary tract endometriosis.[3,4] Ureters are the second most common site of the urinary tract affected by endometriosis, however there has been an increase in incidence over the years probably because of the increased awareness.[5,6]

The theory of retrograde menstrual endometrial implantion onto peritoneal surfaces and persisting is a plausible explanation for most lesions and is most widely accepted.[7] An alternative theory is that of coelomic metaplasia with differentiation of mesothelial cells into endometrium like tissue, has also been proposed.[8] Stem cells have also been linked to the pathogenesis of disease.[9] However none of the proposed theories have independently proved the exact mechanism of the development of endometriosis.

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https://doi.org/10.18231/j.ijogr.2020.080

Ureteral endometriosis involves the ureters asymmetrically, with the left pelvis more commonly involved than the right, due to the anatomical differences of the pelvis.[10] The distal segments of the ureters and bladder are frequently involved due to their proximity to the reproductive organs.[5] The ureters can be involved either extrinsically and/or intrinsically by endometriosis. In the extrinsic type, the endometrial glandular and stromal tissue involves only the adventitia of the ureter or surrounding connective tissues, whereas in the intrinsic type, the muscularis propria, lamina propria, or the ureteral lumen is involved.[11] We report our series of patients diagnosed to have ureteral endometriosis.

2. Materials and Methods

Between July 2009 and December 2019, (17) women of childbearing age presented to the urological services of the hospital with complaints of lower abdominal pain, dysmenorrhea, dysuria and a range of other symptoms. The hospital case records of these patients were retrospectively reviewed and analysed following permission obtained from the institutional/university ethical committee. The demographic data, clinical status, principal symptoms, and any previous treatment was noted. Pain intensity was classified into four subtypes: mild, moderate, severe, or incapacitating. It was defined as mild when no medication was required for its control, moderate when over-the-counter analgesics administered at home were capable of controlling it, severe when parenteral medication administered in a hospital was required, and incapacitating when it prevented the patient from carrying out routine activities.

The blood and urine biochemistry reports, imaging records were reviewed. Similarly, the biopsy records and Histopathological reports were reviewed and analysed. The images of all patients undergoing video-laparoscopy as well as all surgical findings were recorded and tabulated. The disease was staged based on the American Society for Reproductive Medicine (ASRM) classification (1996). The number of sites of endometriosis, the presence of ovarian endometriosis and the side of the affected ovary, and the presence of peritoneal endometriosis or of the deep form of the disease (>5 mm of depth) in the retrocervical and rectum-sigmoid sites were noted, as well as the presence of lesions in the bladder and ureter. Statistical analysis was carried out using the SPSS soft- ware program. Statistical significance was defined as P<.05.

3. Results

The clinical data of the (17) patients was as shown in the Table 1. Pain in lower abdomen was the most common symptom and was cyclical in the majority of the patients. Only (2) patients had undergone surgery (diagnostic laparoscopy) previously for pain in abdomen and normal ultrasonography. Physical examination revealed no obvious clinical sign or finding. Ultrasonography in all the patients revealed partial fullness of the pelvicalyceal system on the affected side. Cystoscopy was normal in all the patients and retrograde ureterogram showed narrowed lower ureter on the affected side.

The video-laparoscopy findings are summarized in Table 2. The bladder was not affected by endometriosis in any of the patients with ureteral endometriosis (Figure 2). Lesions were unilateral in eight of the patients, and bilateral in the remaining nine patients. All the lesions were localized in the lower third of the ureter.

Laparoscopy and ureterolysis was performed in 13(76.47%), open nephroureterectomy was done in three (17.6%) patients with non-functioning kidney and bilateral double J stenting done in one patient. All patients were put on hormonal therapy.

Table 1: Demographics of patients with ureteral endometriosis.

S. No	Characteristics	n (%)
1	Age	34.88±2.75
	Symptoms – Pain in abdomen	17(100%)
2	Dysuria	10(58.8%)
	Dysmenorrhea	4(23.5%)
	Haematuria/Pyuria	-
	Infertility	3(17.6%)
3	Previous surgeries	2(11.7%)
4	Previous Pregnancy	11(64.7%)
5	Previous deliveries	11(64.7)
6	Caesarean deliveries	4(23.5%)
7	Abortion	5(29.4%)

Table 2: Video laparoscopic finding

S. No		n (17)
1	Stage 1 or II	0
2	Stage III or IV	17(100%)
3	Number of sites affected	4.64±1.96
4	Peritoneum	7(41.1%)
5	Ovary	8(47.05%)
6	Retrocervical	11(64.7%)
7	Rectosigmoid	9(52.9%)

4. Discussion

Making a clinical diagnosis of Ureteral endometriosis is a challenge. The complaints of are usually non-specific, making it necessary for multiple medical specialties to be involved. Patients may present with incapacitating dysmenorrhea, dyspareunia, pelvic pain, symptoms related with the involvement of rectovaginal septum, uterosacral ligaments, broad ligaments, and the ovaries.[12–14] Patients could also present with more specific symptoms associated

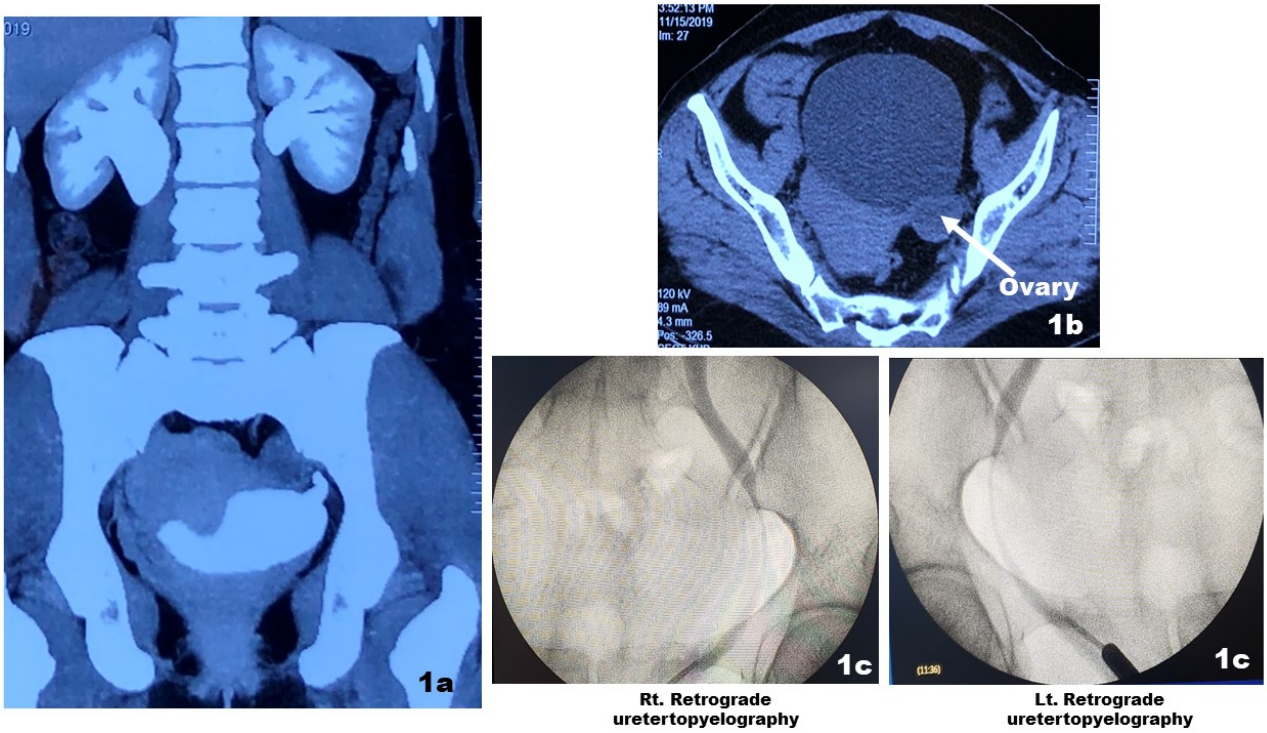

Fig. 1: a: Contrast CT showing bilateral hydronephrouretrosis with thickened bladder wall; **b:** CT scan showing left ovary with cystic appearance; **c:** Retrograde uretertopyelography showing dilated upper ureter and narrow lower ureters

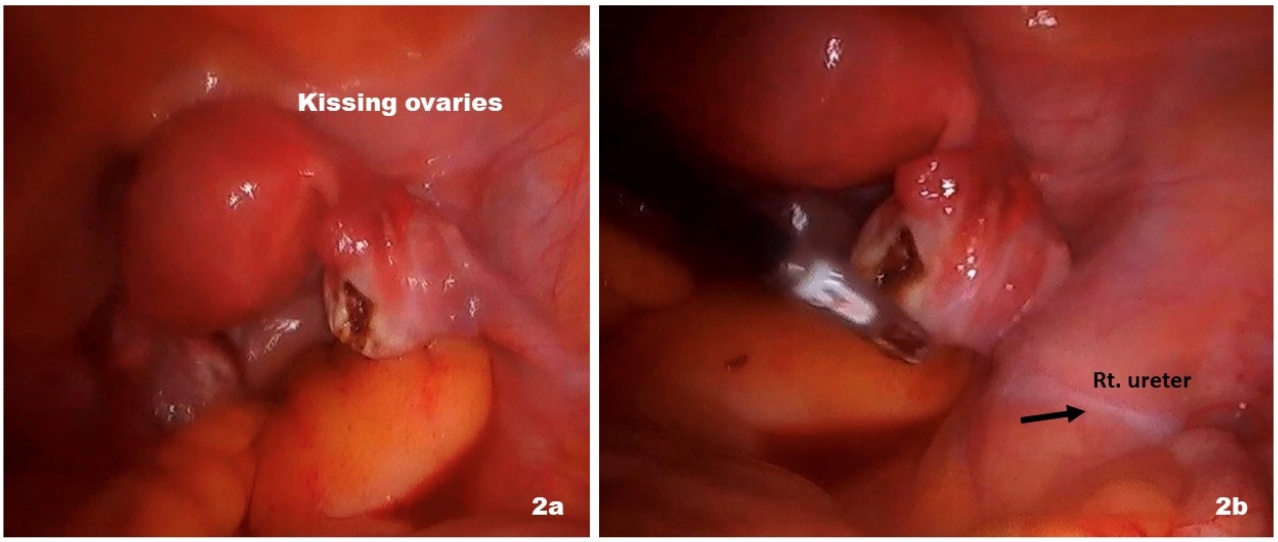

Fig. 2: a: Video laparoscopy showing bilaterally cystic ovaries medially focused like kissing ovaries; **b:** Video laparoscopy showing the course of the Rt. Ureter being involved by retroperitoneal endometriosis

with the urinary tract such as flank or abdominal pain, renal colic, hematuria associated with flank pain, or cyclic gross haematuria. Unexplained hypertension and silent renal failure may also occur as the disease may run asymptomatic for a long period of time. The risk of renal failure in such cases could be as high as 25%-50%.[15]

Whenever patients of childbearing age present with either no symptoms or non-specific symptoms, a high index of clinical suspicion is required. Evaluation of the urinary tract is a must in all such cases whenever deep infiltrating endometriosis is suspected and more particularly if the rectovaginal septum is affected by nodules of >3 cm.[16] Patients with rectocervical endometriosis have a 7-fold greater chance of having ureteral endometriosis, whereas patients with rectum-sigmoid endometriosis have a 22-fold greater chance.[17] Most patients may not have physical findings, however large endometriotic nodules may be palpated in the rectovaginal septum and their presence is highly related to ureteral endometriosis.[16]

Renal function should be assessed in all patients and urine should be examined for presence of blood, and cytology to rule out urinary tract malignancies. Imaging techniques are of limited value in providing an accurate depiction of the extent of the disease and the infiltration of the ureteral wall. Abdominal ultrasonography is routinely used as a screening tool to rule out urinary tract obstruction, because of the high rate of asymptomatic presentations.[18] Periodic renal ultrasonography is generally suggested in the follow-up of these patients.[15,18] Intravenous pyelography has been traditionally used to assess renal function in women suspected of having obstruction or urinary tract endometriosis. Radiological findings include hydroureteronephrosis, narrowing of the pelvic ureter and, rarely, an intraluminal ureteral mass which are considered to be nonspecific for the condition. However, intravenous pyelography demonstrates the precise location, extent and degree of ureteral narrowing. Transitional cell carcinoma can be radiologically indistinguishable from ureteral endometriosis. Computed tomography provides the same information in identifying endometriosis, however the high radiation dose associated with it, has limited its use especially in fertile women.

Magnetic resonance imaging (MRI) may reveal direct signs such as a nodule or a mass invading the ureter along its course or at the ureterovesical junction.[19] Magnetic resonance imaging allows evaluation of all locations and can potentially distinguish intrinsic from extrinsic form of ureteral endometriosis and also help to make decision regarding the surgical approach.[20] Magnetic resonance imaging is more sensitive (91% vs. 82%) but less specific (59% vs. 67%) than surgery for the diagnosis of intrinsic ureteral endometriosis.[21] Ureteroscopy can help to diagnose intrinsic endometriosis, although absence of findings does not exclude the presence of ureteral endometriosis. Apart from the macroscopic recognition of endometriotic lesions, which may appear as oedematous and irregular with different shapes and colors, ureteroscopy allows biopsy, histological confirmation and ablation.[22,23]

The treatment of ureteral endometriosis is controversial, however the aims of treatment include the relief of urinary obstruction, preservation of renal function and prevention of relapse of the disease. Hormonal therapy (HT) alone has been associated with variable results. Hormone manipulation helps shrink the tissues affected by endometriosis, but obstruction usually does not resolve. HT is usually considered as an option for patients of childbearing age who desire to have children in future, with close follow-up with ultrasound at 6-monthly intervals to rule out an obstruction.[23] The commonly used therapies include: gonadotropin-releasing hormone agonists and antagonists, progestins and combined oral contraceptives. All these drugs help in to alleviate the severity of pelvic pain, dysmenorrhea and dyspareunia, however the symptoms often recur when therapy is discontinued[23,24] and these drugs are frequently associated with suboptimal safety and tolerability and they do not improve fertility.

The main indications for surgical treatment of UE are the presence of symptoms and/or the hydroureteronephrosis.[23,25] Open surgery was the preferred treatment in cases of extensive disease prior to the laparo-robotic era.[24] The success of surgery has been correlated with the extent of excision because of a high risk of recurrence, estimated to be around 30%. It corresponds to the actual persistence of deep infiltrating endometriosis left in place as the result of an incomplete initial surgical removal. Presently, laparoscopic interventions such as ureterolysis, ureterostomy and ureteral reimplantation for ureteral stricture disease secondary to endometriosis is being performed by embracing the same principles of traditional urologic surgery, with a magnified view, superior exposure and a greater ability to identify the disease in the pelvis and retroperitoneal space as well as in the lower urinary tract.[5,26]

Giannini et al[27] reported on their study to assess the feasibility and to describe the perioperative outcomes of minimally invasive treatment of deep ureteral endometriosis using robotic assistance, highlighting the technical benefits and the limits of this approach. Their case-series included 31 consecutive patients affected by high-stage endometriosis including ureteral endometriosis using robotic assistance between November 2011 and September 2017. All procedures were successfully completed by robotic technique, resulting in full excision of the parametrial nodules involving the ureter. Mean operating time was 184.8 $\pm$ 81 min. Mean hospital stay was 4.02 $\pm$ 3 days. Perioperative complications occurred in five patients and 4 out of 5 involved the urinary tract.

The involvement of the ureter in deep pelvic endometriosis is asymptomatic in a large percentage of women, however it may lead to the silent loss of renal function. Ureteral endometriosis is usually diagnosed incidentally during gynaecological/urological examination or on investigation for lower abdominal pain. The treatment is usually surgical, with the technique chosen according to the type of ureteral involvement, the site of lesion and the distance to the ureteral orifice. In specialist centres the urologists and gynaecologists need to work together to treat such patients. The surgical urological treatment can have good results in terms of both patient compliance and prognosis.

5. Conclusions

Ureteric endometriosis is rare but a cause of severe morbidity in those that have deep infiltrating endometriosis. Can lead to ureteric obstruction and at times loss of function. An index of suspicion in women in child bearing age is important. Hormonal manipulation along with surgical intervention is beneficial in most patients.

6. Source of Funding

None.

7. Conflict of Interest

None.

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Cite this article: Nerli RB, Nutalapati S, Patel P, Bellad MB, Ghagane SC. Ureteral endometriosis – Our experience. *Indian J Obstet Gynecol Res* 2020;7(3):374-378.