



Obstruction from endometriosis causing hydronephrosis and complex renal pelvis rupture: A case report

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ABSTRACT

Endometriosis presents a diagnostic conundrum due to its diverse clinical manifestations, ranging from asymptomatic to acute obstructive uropathy. This is a case of a 30-year-old woman with a history of endometriosis and rapidly progressing left flank pain culminating in rupture of the renal pelvis in her left kidney. Initial investigations revealed left-sided hydronephrosis without evidence of nephrolithiasis. Subsequent imaging showed active extravasation indicative of urinary obstruction attributable to endometriosis. Placement of a left nephrostomy tube alleviated her symptoms, and follow-up imaging revealed a distal ureteral stricture. A stent was subsequently placed, which resolved the obstruction and obviated the need for extensive surgical intervention. In this case, the patient's history of endometriosis prompted consideration of its role in urinary obstruction, despite the absence of typical symptoms, and underscores the importance of considering endometriosis as a potential cause of acute urinary obstruction, particularly in patients with a history of the disease. Physicians in the emergency department should maintain a high index of suspicion for endometriosis-related complications to facilitate timely intervention and prevent adverse outcomes. Awareness of the variable presentations of endometriosis is paramount for ensuring comprehensive patient care and optimal outcomes.

1. Introduction

Endometriosis is a common, chronic inflammatory disease in which ectopic endometrial tissue exists outside the uterus. It affects up to 10% of women during their reproductive years [1]. Although the exact cause is unknown, endometriosis can occur throughout abdominopelvic organs. Common symptoms include dysmenorrhea, chronic pelvic pain, and fatigue. Endometriosis presents in a wide variety of ways, with some patients being asymptomatic and others being severely disabled from the associated pain. Given that it can be asymptomatic, endometriosis can remain unnoticed until it obstructs crucial structures and leads to adverse outcomes. In a Medicaid insurance study of women with and without endometriosis, those with endometriosis had 30% more visits to the emergency department (ED), revealing that endometriosis is a commonly seen entity in the ED [2].

This article reports the case of a woman with rapidly progressive left

flank pain and eventual rupture of the renal pelvis in her left kidney while she was in the ED. Subsequent intervention and evaluation showed an area of stricture thought to be caused by endometriosis. Thus, although endometriosis can be clinically silent, it can also obstruct crucial structures, making it a possible diagnosis for a myriad of symptoms and worth considering in numerous clinical situations.

2. Case Presentation

A 30-year-old woman came to the ED with severe left-sided flank pain. She had a history of excision of endometriotic lesions, left ureterolysis, and ovarian cystectomy (10 months prior). She said that her pain had been gradually increasing, ultimately becoming severe and radiating to her left inguinal area. She had associated nausea and vomiting. She also said that the pain was different from past episodes of abdominal pain caused by her endometriosis. She had no infectious or

Abbreviations: CT, computed tomography; ED, emergency department.

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urinary symptoms. She reported taking no medications.

The patient had normal vital signs, and the only notable findings were tenderness in the left costovertebral angle and flank. The initial laboratory evaluation showed no signs of leukocytosis, urinary tract infection, or frank hematuria. The urinalysis showed trace protein but no elevated levels of white blood cells or bilirubin and no casts. Given her level of pain, a kidney stone was suspected, so abdominal computed tomography (CT) with contrast was ordered, which showed moderate to mild dilatation of the left renal collecting system, with the left ureter extending to the left ovary. Signs of urinary obstruction with hydronephrosis were seen on the left side (Fig. 1) without any clear sign of renal pelvis rupture, but findings were suspicious for fluid accumulation in the retroperitoneum medial to the kidney, with subtle focal fluid in the perinephric fat (Fig. 2).

A urologist was consulted, who recommended another CT scan of the abdomen and pelvis with a delayed phase to assess for flow in the urinary collecting system. Subsequent CT imaging showed active signs of extravasation and non-opacification of the ureter due to obstruction from endometriosis (Fig. 3), although the exact location of the obstruction was unclear. The patient was admitted, and a left-sided nephrostomy tube was placed to depressurize the system and to allow for appropriate urinary drainage. She improved and was discharged the next day, with plans to return for follow-up testing.

Approximately 4 weeks later, a follow-up anterograde left-sided pyelogram showed signs of a distal ureteral stricture (Fig. 4), and a retrograde pyelogram showed a distal stricture too tight to allow contrast flow (Fig. 5) that had caused the renal pelvis rupture. Although there was clearly flow throughout the ureter on antegrade imaging, an attempt at placing a stent failed because the stricture could not be passed despite the use of multiple sizes of wires. Approximately 1 week later, the patient had renal scintigraphy that showed delayed excretion from the left kidney into the slightly dilated collecting system, which improved substantially after she was given 20 mg of intravenous furosemide. However, no scintigraphic evidence was seen of a urodynamically significant obstruction, suggesting spontaneous resolution of the ureteral obstruction. After this, capping trials were done, during which her pain level did not increase. Ultrasonography confirmed continued urinary drainage without hydronephrosis.

In additional conversations with the patient and the urology team, it was decided not to pursue complex ureteral reconstructive surgery



Fig. 1. Coronal CT image obtained in the portal venous phase showing left hydronephrosis. This image also shows a delayed enhancement pattern in the left kidney, as evidenced by hypoenhancement of the renal medulla relative to the right kidney.



Fig. 2. Axial CT image obtained in the portal venous phase. The image shows perinephric fluid anteromedially to the left kidney (arrowhead).



Fig. 3. Coronal maximum-intensity projection CT image obtained 2 h after the initial CT examination. The point of obstruction can be seen in the distal ureter (arrowhead), although no obvious source of obstruction is visible on the CT scan.

because her pain and urinary flow had spontaneously improved substantially, allowing for removal of nephrostomy tubes. She chose to restart her previously prescribed oral contraceptive medication. Close



Fig. 4. Antegrade pyelogram at 1-month follow-up showing focal narrowing in the distal ureter. The narrowing was the source of obstruction (arrowhead).

follow-up was recommended, including office visits with the urology team at 6 weeks, 12 weeks, and 6 months, as well as repeat basic metabolic panels and ultrasonography of the kidney. Ultimately, within the 6-month follow-up period the patient did not require any further intervention.

3. Discussion

Endometriosis can present with a wide variety of symptoms. ED physicians should consider this diagnosis as a cause of acute flank pain, especially for patients with known endometriosis. In this case, the patient reported severe, left-sided flank pain and was found to have left-sided costovertebral angle tenderness. Because she was afebrile and did not have urinary symptoms it was unlikely that she had an infection. However, tenderness at the costovertebral angle in an afebrile patient is highly specific for obstructive uropathy [3], with her presentation of radiating pain from the left flank down to the groin raising a high suspicion for renal colic. Though classic teaching suggests ordering CT without contrast for renal colic, the choice was made to use IV contrast due to the patient's history of endometriosis, concern for possible infection, and her lack of having kidney stones. Ultrasonography imaging was considered; however, kidney stones are best diagnosed on CT with or without contrast. Ultrasonography can be used effectively to screen for obstruction, particularly for those with a benign presentation and recurrent history, which can decrease CT in the ED up to 50% [4]. This patient did not have kidney stones on imaging; however, she did



Fig. 5. Retrograde pyelogram at 1-month follow-up showing focal narrowing in the distal ureter. The narrowing was the source of obstruction (arrowhead).

mild hydronephrosis of the left kidney, indicating stricture and/or obstruction. Her history of endometriosis made it the most probable cause of the obstruction and the subsequent rupture.

Although endometriosis was the probable cause of her obstruction, the definitive diagnosis could have been made only with surgery. Urethral endometriosis has been reported in only 1% of patients with endometriosis [5], with the left distal ureter being the most common site of ureteral endometriosis. Treatment may include placing a stent or other surgical procedures, such as complex ureteral reconstruction if the area is fibrosed and/or too stenotic for stent placement. Thus, it is important for ED physicians to recognize that endometriosis and complications from endometriotic tissue excision carry a wide range of symptoms, making it a diagnosis to consider for female patients with acute flank pain.

4. Conclusion

Awareness of the various and complex presentations of endometriosis, especially for those with a history of the disease, is important for ensuring optimal outcomes for patients with acute urinary obstruction due to endometriosis. Physicians in the ED should maintain a high index of suspicion for endometriosis-related complications to facilitate timely intervention and prevent adverse outcomes for women with acute flank pain. This case showed that complications can quickly arise in otherwise

healthy women and emphasized the crucial role of a patient's history in diagnosis and treatment.

Contributors

Matthew J. Van Ligten contributed to the literature review and drafting the manuscript, and revised the article critically for important intellectual content.

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Andrej Urumov contributed to editing, review of images, and the literature review.

Cameron R. Adler contributed to patient care and revised the article critically for important intellectual content.

Wayne A. Martini Jr. contributed to the conception of the case report and patient care, drafted the manuscript, undertook the literature review, and revised the article critically for important intellectual content.

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