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## Case report

# Infiltrative endometriosis without endometrioma: A case report and imaging findings mimicking a bladder malignancy <sup>☆☆</sup>

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## ARTICLE INFO

## Article history:

Received 11 September 2021

Revised 22 September 2021

Accepted 28 September 2021

## Keywords:

Endometriosis

Endometrioma

Chronic pelvic pain

Magnetic resonance imaging

## ABSTRACT

Endometriosis affects 10%–15% of women of childbearing age, but the incidence can be as high as 90% in those with chronic pelvic pain. Endometriosis is categorized into ovarian endometriomas, superficial peritoneal implants, and deep infiltrating endometriosis. In this case report a 40-year-old woman gravida 1, para 1 with a history of hysterectomy in Mexico presented with chronic abdominal pain and severe hematuria. Magnetic resonance imaging revealed an infiltrative pelvic mass involving the bladder concerning for a neoplasm that demonstrated subtle hyperintense components on T1-weighted images. The diagnosis of infiltrative endometriosis was established following cystoscopy and tissue sampling. This case highlights the importance of considering endometriosis in the differential for patients with pelvic masses, and recognizing potential features that could suggest the diagnosis.

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## Introduction

Endometriosis can be found in 10%–15% of women of childbearing age, but it can be as high as 90% in those with chronic pelvic pain [1]. Endometriosis occurs when endometrial gland

and stromal tissue are found outside the uterus [1]. The exact mechanism regarding the origin of the tissue presence outside the uterus has not been determined [2]. Some theories include the metastatic spread of endometrial tissue, metaplastic change of tissue, and a combination of the metastatic spread with metaplastic change [2]. Endometriosis can be categorized into ovarian endometriomas, superficial peritoneal implants, and deep infiltrating endometriosis [1]. The clinical presenta-

<sup>☆</sup> Funding statement: No funding sources were utilized.

<sup>☆☆</sup> Competing Interests: The authors have declared that no competing interests exist.

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<https://doi.org/10.1016/j.radcr.2021.09.059>

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tion generally includes chronic pelvic pain (may be severe), dyspareunia, dysmenorrhea, infertility, and gross hematuria [2]. Additional signs and symptoms can occur, depending on tissue implant location.

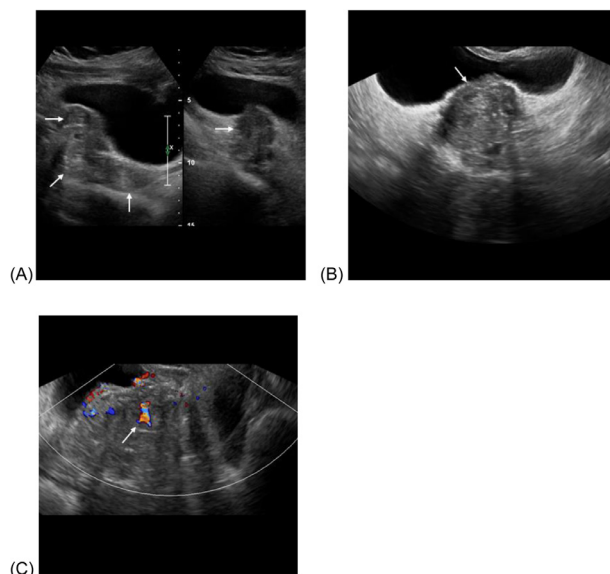
### Case report

A 40-year-old gravida 1, para 1 female with a history of hysterectomy for intractable bleeding and pain presented with chronic abdominal pain and elevated CA125. She had a 1-2-year history of painful hematuria and intermittently passes large clots. The pain was worse at night and induced nausea/vomiting with intermittent constipation. She reported severe dyspareunia, but no constitutional symptoms (weight loss, fever, etc.). Menarche began at age 12 and was painful throughout her reproductive life. Her single pregnancy was complicated by pre-eclampsia. Her hysterectomy was performed 10 years prior in Mexico and records are not available for review. Current medical history includes morbid obesity.

On physical examination, the patient's abdomen was tender to deep palpation in the lower quadrants. There were normal external female genitalia with an intact urethra and Skene ducts. Speculum placement in the vagina produced significant pain. Cervix was visualized and rectovaginal examination was attempted, but manipulation of the area produced severe pain. There was an overall suboptimal pelvic examination secondary to guarding, discomfort, and patient's body habitus. Laboratory results reveal an elevated CA125 at 93.9 IU/mL.

Further evaluation was performed with a pelvic ultrasound, which revealed a large mass along the bladder dome (Fig. 1). Given the history of hematuria, a computed tomography urogram was obtained, which confirmed that the mass was infiltrating into the bladder (Fig. 2). Subsequently, a pelvic magnetic resonance imaging (MRI) with contrast was obtained to better characterize the mass, which demonstrated a 5.2 × 4.6 × 3.9 cm heterogeneous, solid, mass abutting the remnant cervix with distortion of the bladder dome (Fig. 3). Small, soft tissue projections contacting the adjacent sigmoid colon were also seen. Small T1 hyperintensities were identified at the posterior and superior aspects of the mass/cervix were noted on pre-contrast images (Fig. 4), suggesting presence of blood products, as well as heterogenous enhancement on T1-weighted post-contrast images (Fig. 5). Lastly, the mass demonstrated hyperintense signal on diffusion-weighted image with corresponding hypointense signal on the apparent-diffusion coefficient map (Fig. 6), consistent with restricted diffusion. When considering both the history of cyclic hematuria and the radiological features, a favored diagnosis of infiltrative endometriosis was made. The managing clinical team obtained a gynecological and urology consultation. The decision was made to perform cystoscopy for direct visualization of the infiltrative mass, as well as obtain tissue sampling. The diagnosis of endometriosis was subsequently confirmed on pathology.

The patient was subsequently initiated on hormonal therapy. Over the subsequent 3 years the patient's symptoms of pelvic pain and hematuria reduced in frequency and severity,

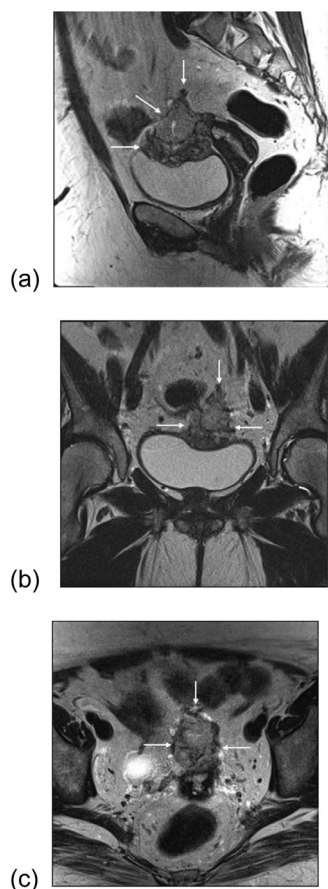


**Fig. 1 – Transabdominal and transvaginal pelvic ultrasound. (A) Transabdominal gray scale sonographic images in long axis (left) and short axis (right) at the level of the bladder dome demonstrate a mass along the bladder dome (arrows). (B) Transvaginal gray scale sonographic image of the mass is transverse orientation (arrow). (C) Color Doppler interrogation of the mass demonstrated internal vascularity.**



**Fig. 2 – Computed tomography urogram. Computed tomography urogram coronal multiplanar reformat demonstrate an infiltrative mass along the bladder dome.**

and quality of life was improved. However, the patient more recently presented to the emergency department with large volume hematuria and is currently being evaluated by the gynecological oncology and urology services for possible mass resection and bladder reconstruction.

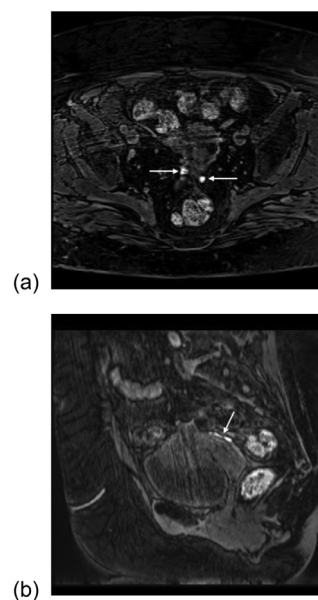


**Fig. 3 – Magnetic resonance imaging of the pelvis. Sagittal (A), coronal (B), and axial (C) T2-weighted images of the pelvis demonstrate a 5.2 × 4.6 × 3.9 cm heterogeneous, solid mass abutting the remnant cervix with invasion of the bladder dome (arrows).**

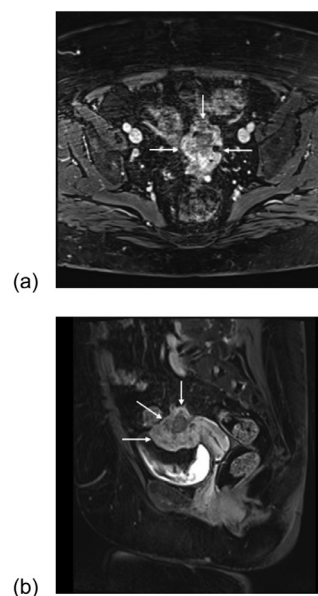
## Discussion

The radiologic work-up for endometriosis typically begins with a transvaginal ultrasound due to its accessibility, lack of ionizing radiation, and to determine whether further assessment with MRI is required [1]. On ultrasound, endometriosis depositions are often hypoechoic and may be nodular in shape [1]. MRI often demonstrates the presence of blood products that are hyperintense on T1-weighted sequences [2]. The endometrial implants may also demonstrate hypointense signal on T2-weighted sequences, which can be due to blood products with characteristic “T2 shading” as well as marked T2 hypointense signal related to formation of fibrosis [1]. Computed tomography imaging is not commonly used for the investigation of endometriosis because it may be difficult to distinguish from surrounding tissue or neoplasm [1].

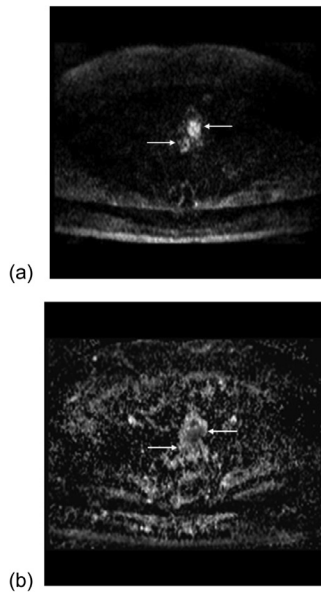
Deep infiltrative endometriosis describes lesions > 5mm in depth [2]. Due to the invasive nature of these lesions, they often involve smooth muscle proliferation, fibrosis, and pain-associated neuroangiogenesis [1]. Tissue implants involving the bladder, as seen in this case, can present with suprapubic



**Fig. 4 – Magnetic resonance imaging of the pelvis. Axial (A) and sagittal (B) T1-weighted images with fat saturation of the pelvis prior to contrast administration demonstrate small T1-hyperintensities at the posterior and superior aspects of the mass/cervix (arrows), which are suggestive of blood products.**



**Fig. 5 – Magnetic resonance imaging of the pelvis. Axial (A) and sagittal (B) T1-weighted images with fat saturation of the pelvic following intravenous contrast administration demonstrate heterogeneous enhancement of the infiltrative mass (arrows).**



**Fig. 6 – Magnetic resonance imaging of the pelvis. The infiltrative pelvic mass demonstrates hyperintense signal on long B-value diffusion-weighted image (DWI) (arrows, A), which has matched hypointense signal on apparent-diffusion coefficient (ADC) map (arrows, B). These findings are consistent with restricted diffusion.**

pressure and cyclic hematuria [2], especially when combined with a prior history of pelvic surgery, such as the hysterectomy that this patient had [2]. Prior surgery is thought to play a role in spreading endometrial tissue to other locations in the pelvis [1]. Other signs and symptoms of tissue implants affecting the urinary tract can include flank pain, obstruction, and impaired renal function [2]. Rectal involvement can present with constipation, hematochezia, or painful defecation [2].

Superficial peritoneal implants include tissue implants on the peritoneum or ovaries [1]. These lesions are usually small (<1 cm) and can often only be diagnosed with laparoscopy [1]. The most common location for endometriosis to manifest is the ovary, which is termed an endometrioma when there is the formation of endometriotic cysts due to episodic hemorrhage [2]. On imaging, endometriomas have a characteristic “T2 shading” appearance that refers to hypointense T2 shading due to blood of different ages, in lesions which are T1 hyperintense [1]. Atypical findings of endometriosis can occur when endometrial tissue implants in an unusual location. Lung involvement can lead to pneumothorax while sciatic nerve involvement can lead to sciatica [2].

Increasing CA-125 levels can be used to monitor progression/recurrence, but it is not a serologic marker that should be considered pathognomonic for endometriosis or reliable before surgical resection. CA-125 measurements of at least 30 units/milliliter raise suspicion for recurrence of endometriosis in symptomatic patients, but are not diagnostic [3]. The patient, in this case, had an elevated CA-125 (93.9 IU/mL).

A differential diagnosis that could be considered for this case includes recurrence or metastasis from a primary gynecological tumor, metastasis from gastrointestinal tumor,

urachal adenocarcinoma, as well as pseudosarcomatous fibromyxoid tumors.

A primary gynecological tumor recurrence is a high consideration given the history of prior surgery and unknown final pathology due to the patient’s care being provided in another country.

Symptomatic treatment of endometriosis may involve modulating hormone levels with medications, such as estrogen/ progesterone oral contraceptives or gonadotropin-releasing hormone agonists [3]. Modulating hormone levels often target the different types of pain associated with endometriosis [3]. Definitive treatment, however, often involves surgical removal of the mass(es) [2]. These surgeries can be complicated and require surgeons from multiple specialties (ex. gastrointestinal for colon involvement) for the greatest success [3].

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## Conclusion

Endometriosis commonly presents as an endometrioma, but endometrial tissue may be found in other structures of the pelvis, abdomen, lungs, etc. Its high incidence in women of childbearing age with chronic pelvic pain should keep it on the differential. This case report highlights the importance of conducting pelvic examinations imaging to begin exploring the etiology of chronic pelvic pain, even after a total hysterectomy. Definitive management of endometriosis involves surgical removal of the endometrial tissue. Radiologists maintain a suspicion for the diagnosis in the case of infiltrative pelvic masses given the overlapping features with malignancies.

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## Author contributions

Neither this work— which has been approved by all co-authors – nor any part of its essential substance, or figures have been published or submitted to another scientific journal during the submission and review process. According to *Authorship and Co-authorship Requirements for Manuscripts Submitted to Biomedical Journals* of International Committee of Medical Journal Editors (ICMJE), all the authors have made substantial contributions to: conception and design, drafting the article or revising it critically for important intellectual content, and final approval of the version submitted to the Journal.

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## Patient consent

All patient identifying information has been stripped from the images and movie files. Additionally, no patient identifying information is used in the case report.

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## IRB statement

No IRB approval was required for this manuscript.

## REFERENCES

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- [1] Agely A, Bolan C, Metcalfe A, VanBuren W, Menias C. Genitourinary manifestations of endometriosis with emphasis on the urinary tract. *Abdom Radiol (NY)* 2020;45(6):1711–22. doi:[10.1007/s00261-019-02383-8](https://doi.org/10.1007/s00261-019-02383-8).
- [2] Coutinho A, Bittencourt LK, Pires CE, Junqueira F, de Oliveira Lima CMA, Coutinho E, et al. MR imaging in deep pelvic endometriosis: a pictorial essay. *Radiographics* 2011;31(2):549–67. doi:[10.1148/rg.312105144](https://doi.org/10.1148/rg.312105144).
- [3] Rolla E. Endometriosis: advances and controversies in classification, pathogenesis, diagnosis, and treatment [version 1; peer review: 4 approved]. *F1000Res* 2019;8(529). doi:[10.12688/f1000research.14817.1](https://doi.org/10.12688/f1000research.14817.1).