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Case Report

Vanishing pelvic mass: Decidualized endometriosis during pregnancy^{☆,☆☆}

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ABSTRACT

A 40-year-old woman without history of endometriosis was found to have 10 cm pelvic mass on the routine first trimester ultrasound. Magnetic resonance imaging (MRI) of the pelvis demonstrated a large solid mass abutting the rectum which raised the concern for malignancy. Transrectal biopsy of the mass was performed with histopathology result of decidualized endometriosis. Patient continued her pregnancy and had cesarean section at 39 weeks. Interestingly, no mass was found when obstetrician performed pelvic examination after delivery in the operative room. This case is a unique presentation of endometriosis during pregnancy in a patient with no prior history of endometriosis. Large size and abutment of the rectum by the decidualized endometriosis on MRI led to misinterpretation as malignancy. Our case highlights complexity of the deep infiltrative endometriosis (DIE) during pregnancy which can misguide the providers, lead to unnecessary procedures and unwanted complications.

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Introduction

Endometriosis affects 10% of women of reproductive age [1]. It has significant social, public health, and economic implications [1]. Endometriosis tissues are affected by hormones the same way as uterine endometrium, therefore hormonal changes during pregnancy can affect endometriosis cells and implants. Decidualization is a process that results in changes

to cells of the endometrium in preparation for, and during, pregnancy. Decidualization occurs in response to elevated levels of the ovarian steroid hormones, estradiol, and progesterone. Hormonal changes are required in order to support the differentiation that is necessary for implantation during the menstrual cycle [2]. Initially pregnancy was thought to have beneficial effects on endometriosis, however more recent data on the development of endometriosis during and after pregnancy show fewer beneficial effects than previously

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reported [3]. Some data has been published on dynamic changes of endometriosis during pregnancy, however this is mostly limited to endometrioma which is endometriosis confined to the ovary [4]. Nevertheless, decidualization of deep invasive or infiltrative endometriosis which involves tissues beyond the uterus and ovary has not been well studied. Ultrasound and magnetic resonance imaging (MRI) are the modalities of choice for endometriosis diagnosis and follow-up. From the imaging standpoint, most available data is ultrasound based and limited MRI data has been published to date [5]. A few articles with only limited MRI images have been published on this topic but none had a large peri-rectal mass appearance and presentation [6]. We found case reports of radiology-pathology correlation of decidualized endometrioma [7,8], however to our best knowledge no radiology-pathology report has been published on decidualized deep infiltrative endometriosis during pregnancy.

We report a case of a pregnant patient who was found to have 10 cm pelvic mass on her first trimester ultrasound.

Case

A 40-year-old pregnant (G1P0) patient had history of intermittent left hip and abdominal pain which was attributed to left hip labral tear. Her menstruations were regular. The whole-body CT scan 3 years prior to her current presentation was negative. Pelvic ultrasound at the same time showed only subserosal fibroid. Repeated ultrasound a year later for continuous left lower abdominal pain did not show any change from her prior exam. Colonoscopy was normal at the same time.

During pregnancy, patient was found to have 10 cm pelvic mass in the cul-de-sac when she was evaluated with ultrasound at 9 weeks gestation. This mass was new since her prior ultrasound performed 2 years earlier. Pelvic MRI followed and it showed a 10 cm solid mass in the deep pelvis involving the rectosigmoid with loss of fat plane between the rectal wall and mass (Fig. 1). The ovaries appeared normal. Differential diagnosis included primary colorectal neoplasm, gastrointestinal stromal tumor (GIST), and cervical tumor.

Flexible sigmoidoscopy with multiple biopsies showed benign colonic mucosa with decidualized stromal cells in the lamina propria, staining was positive for hCG and estrogen receptors. Patient's beta-HCG was 99,000 mIU/mL, CEA 1.2 ng/mL, and CA 19-9 19.5 U/mL. Staging with an abdominal MRI and chest CT without contrast were both negative. Interventional radiology was consulted for biopsy but were unable to do an ultrasound guided biopsy of this deep pelvic mass. Subsequently, colorectal surgeon performed a transrectal biopsy which showed decidualized endometrial stromal proliferation involving benign ulcerated colonic mucosa consistent with "deciduosis" (Fig. 2).

Because of the uncertainty and potential bleeding into the lesion, the decision was made to operate before fetal via-

bility, and patient underwent a laparotomy at 19 + 5 weeks gestation. Surgical plan was to perform an anterior resection of the mass. However, upon entry into the abdominal cavity, the uterus was too large to be able to clearly visualize the cul-de-sac and operate effectively, and there was also concern that patient would require a colostomy. The mass was attached to the pelvic floor, around the rectum and was obliterating the cul-de-sac. It felt hard and woody like fibrosing endometriosis. Abdomen was closed without any resection.

For the remainder of her pregnancy, patient did not have any new complaints. She underwent a C-section at 39+5 weeks gestation. Once the uterus had been closed, a combined rectal, and intra-abdominal exam of the pelvic floor was performed with a plan to biopsy tissue in the cul-de-sac. However, there were no masses found as the fibrotic tissue previously documented during her laparotomy had disappeared.

Discussion

Endometriosis is a mysterious disease with different range and stage of presentation. Particularly, the deep infiltrative endometriosis during pregnancy can pose a significant diagnostic dilemma as in this case. Our patient had no prior history of endometriosis and no evidence of endometriosis on any imaging before her pregnancy. Detection of 10 cm pelvic mass during the first trimester of pregnancy was not only distressing for the patient but also challenging for the clinical care team. With ultrasound's limitations in characterizing the pelvic mass, follow-up MRI without contrast was performed. Given the large size of the mass, solid appearance, and abutment of the rectal wall concerns were raised for possibility of colorectal malignancy. This prompted a discussion about necessity of biopsy to obtain tissue for histopathology analysis which added to complexity of the decision making. Most notably, biopsy procedure was challenging given the fact that patient was 9 weeks pregnant. The postpartum disappearance of the mass is an interesting finding of our case. This phenomenon has been reported in literature but more often attributed to endometrioma rather than deep infiltrative endometriosis [9]. Reasons to explain this postpartum vanishing effect remain unknown [10]. Our case underscores the diagnostic challenges associated with endometriosis during pregnancy. To the best of our knowledge, correlation between MRI imaging findings and histopathology in decidualization of deep infiltrative endometriosis in the cul-de-sac during pregnancy has not been reported. Awareness of the imaging appearance of this entity, namely presence of T1 hyperintense foci indicating endometriotic implants and/or blood products on MRI within the mass, can help both clinicians and radiologists guide patient's management and minimize uncertainty and unwanted complications.

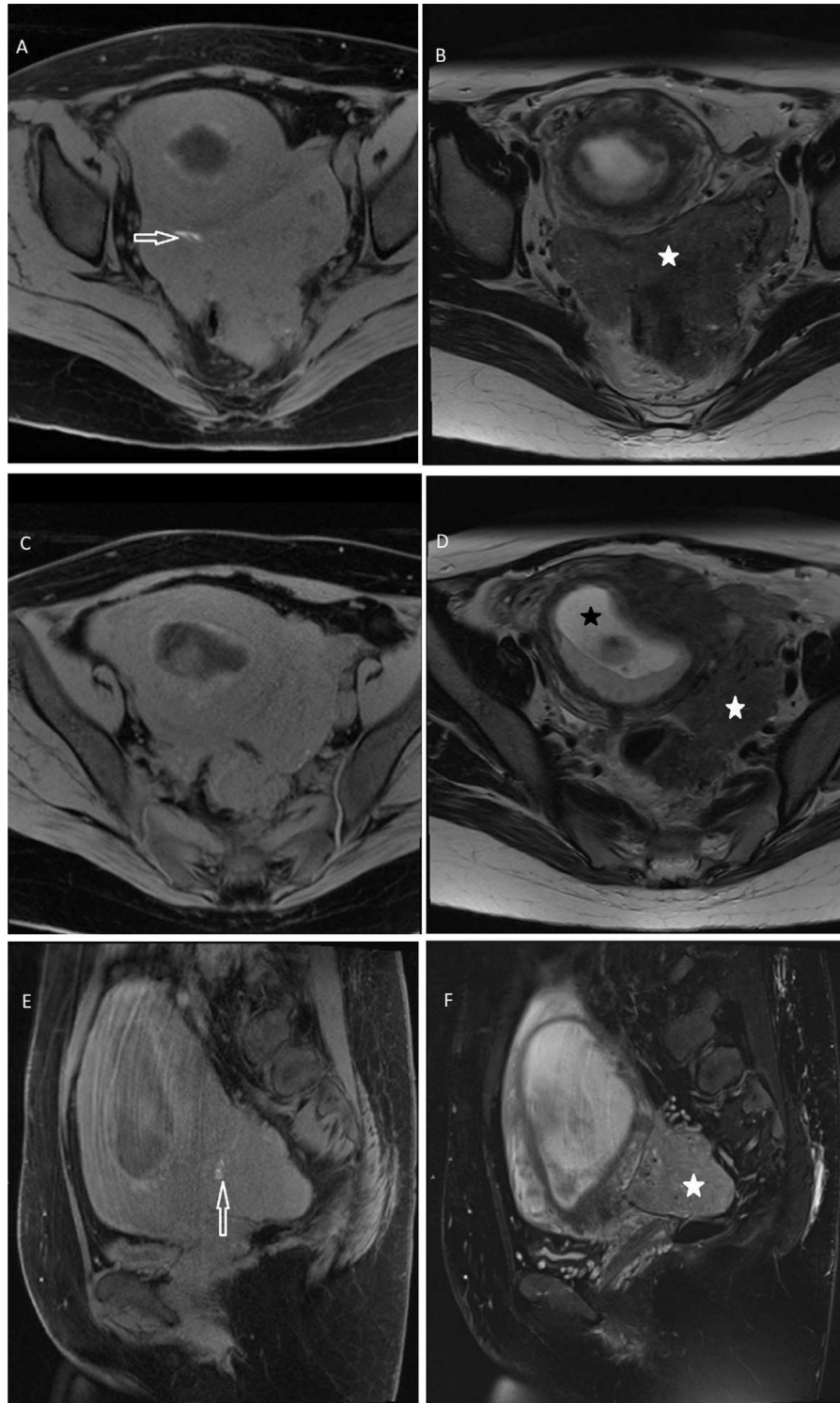


Fig. 1 – Pelvic MRI without contrast. (A and C) are axial T1 fat saturated images which are demonstrating large solid mass in the cul-de-sac with a few foci of T1 hyperintensity (white arrow) suggestive of active endometriosis disease. (E) is sagittal T1 fat saturated image showing another view of the large pelvic mass abutting the posterior wall of the lower uterus and containing foci of T1 hyperintensity (white arrow) within the mass. (B and D) are axial T2 images anatomically corresponding to T1-weighted images and showing a solid mass (white star) abutting the uterus as well as the rectum with loss of fat planes between the mass and the rectum. The mass demonstrates T2 intermediate signal. Gestational sac (black star) visualized in the uterine cavity. (F) is sagittal T2 image showing mass in the cul-de-sac with T2 intermediate signal and well-circumscribed margins.

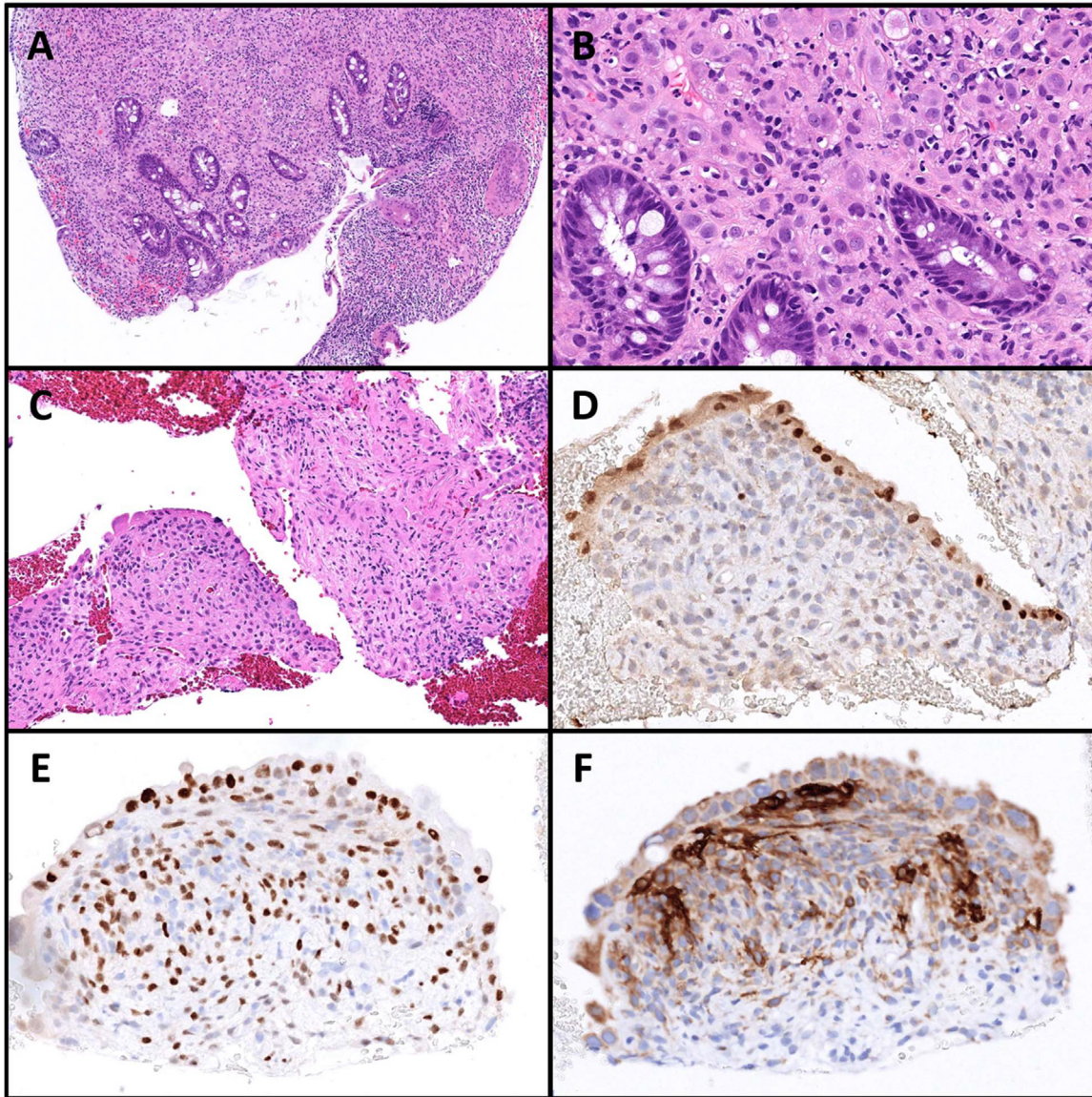


Fig. 2 – Decidualized endometriosis involving colonic mucosa. Biopsy sections from colonoscopy show ulceration of the overlying colonic mucosa and expansion of the lamina propria by a population of cells with abundant eosinophilic cytoplasm and distinct cell borders (A) H&E 10x; (B): H&E 40x. Cell block preparation from fine needle aspiration of the mass shows the same population of decidualized cells with associated fibrosis, chronic inflammation, and müllerian-type epithelium, consistent with decidualized endometriosis (C) H&E 20x. Immunohistochemical stains show labeling of the epithelium for PAX8 (D) PAX8 40x and estrogen receptor (E): ER 40x and patchy labeling of the stroma with estrogen receptor (E): ER 40x and CD10 (F): CD10 40x, confirming a diagnosis of decidualized endometriosis. Due to lesional heterogeneity, the presence of an unsampled neoplasm arising in association with endometriosis could not be excluded.

Patient consent

Signed consent has been obtained from the patient.

REFERENCES

- [1] World Health Organization. *Endometriosis*. <https://www.who.int/news-room/fact-sheets/detail/endometriosis>.
- [2] Okada H, Tsuzuki T, Murata H. Decidualization of the human endometrium. *Reprod Med Biol* 2018;17(3):220–7. doi:10.1002/rmb2.12088.
- [3] Leeners B, Damaso F, Ochsenein-Kölble N, Farquhar C. The effect of pregnancy on endometriosis—facts or fiction? *Hum Reprod Update* 2018;24(3):290–9. doi:10.1093/humupd/dmy004.
- [4] Izza Rozalli F, Rahmat K, Fadzli F, Boylan C, Deb P. Decidualized ovarian endometrioma in a pregnant woman mimicking ovarian malignancy: magnetic resonance imaging and ultrasonographic findings. *Iran J Radiol Q J Publ Iran Radiol Soc* 2015;12(4):e21260. doi:10.5812/iranjradiol.21260.

- [5] Coccia ME, Rizzello F, Palagiano A, Scarselli G. The effect of the hormonal milieu of pregnancy on deep infiltrating endometriosis: serial ultrasound assessment of changes in size and pattern of deep endometriotic lesions. *Eur J Obstet Gynecol Reprod Biol* 2012;160(1):35–9. doi:[10.1016/j.ejogrb.2011.10.004](https://doi.org/10.1016/j.ejogrb.2011.10.004).
- [6] Navarro R, Poder L, Sun D, Jha P. Endometriosis in pregnancy. *Abdom Radiol N Y* 2020;45(6):1741–53. doi:[10.1007/s00261-020-02486-7](https://doi.org/10.1007/s00261-020-02486-7).
- [7] Wong L, Botolahy V, Carteret T, Marty M, Brun JL. Decidualized ovarian mass mimicking malignancy. *Case Rep Obstet Gynecol* 2015;2015:217367. doi:[10.1155/2015/217367](https://doi.org/10.1155/2015/217367).
- [8] Nakai G, Kitano R, Yoshimizu N, Yamamoto K, Higashiyama A, Juri H, et al. A case of bilateral decidualized endometriomas during pregnancy: radiologic-pathologic correlation. *Kobe J Med Sci* 2015;61(2):E40–6.
- [9] Filippi F, Benaglia L, Alagna F, La Vecchia I, Biancardi R, Reschini M, et al. Decidualization of endometriosis in a cohort of IVF-mediated pregnancies. *Sci Rep* 2022;12(1):1524. doi:[10.1038/s41598-022-05635-8](https://doi.org/10.1038/s41598-022-05635-8).
- [10] Benaglia L, Somigliana E, Calzolari L, Busnelli A, Cardellicchio L, Ragni G, et al. The vanishing endometrioma: the intriguing impact of pregnancy on small endometriotic ovarian cysts. *Gynecol Endocrinol Off J Int Soc Gynecol Endocrinol* 2013;29(9):863–6. doi:[10.3109/09513590.2013.813476](https://doi.org/10.3109/09513590.2013.813476).