Beyond the Obvious: Appendiceal Endometriosis Presenting as Acute Appendicitis

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Background	A female patient presented signs and symptoms consistent with acute appendicitis. Postoperative pathological examination revealed appendiceal endometriosis.
Summary	We report a case of a young female who presented with acute onset right lower quadrant abdominal pain, nausea and vomiting. She denied symptoms commonly associated with endometriosis, including cyclic pelvic pain or dysmenorrhea. She endorsed amenorrhea secondary to intrauterine device (IUD) placement. Preoperative computerized tomography (CT) scan showed a distended appendix with a fecalith at the ostia, findings consistent with the preoperative diagnosis of acute appendicitis. Laparoscopic appendectomy was performed, during which a grossly hypervascular yet otherwise benign appearing appendix was observed. The right ovary was also found to be enlarged. Postoperative pathological examination revealed appendiceal endometriosis without signs of appendiceal inflammation. A detailed gynecologic history and thorough laparoscopic exam should always be conducted in premenopausal females with a clinical presentation suggestive of acute appendicitis to evaluate for the possibility of endometriosis or other gynecologic disorders as the precipitating etiology.
Conclusion	Appendiceal endometriosis is a rare manifestation of endometriosis that can resemble acute appendicitis in its clinical presentation. The standard of care for this presentation should be appendectomy with a microscopic exam. Further investigations should study the implications of appendiceal endometriosis on future complications from endometriosis.
Key Words	appendiceal; appendicitis; appendix; endometriosis; laparoscopy; surgery

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Case Description

A 21-year-old female with a past medical history of asthma and a current intrauterine device (IUD) presented with sudden onset, diffuse abdominal pain associated with nausea, vomiting, and chills. The abdominal pain started about 12 hours prior and worsened throughout the day. She was afebrile and hemodynamically stable on arrival. Physical exam was significant for severe right lower quadrant tenderness with involuntary guarding. Laboratory testing revealed white blood cell count of 26,000 and lactic acid of 3.2 mmol/L. Serum pregnancy test was negative. Computerized tomography (CT) of the abdomen and pelvis revealed a fluid-filled appendix with a fecalith at the ostia (Figures 1 and Figure 2), findings suggestive of acute appendicitis. The patient received one dose of metronidazole and levofloxacin and was taken directly to the operating room for a laparoscopic appendectomy.

Intraoperative findings revealed a hypervascular appearing appendix without significant surrounding inflammation and an enlarged right ovary that was also hypervascular. There were no signs of frank perforation, intraabdominal fluid, purulence, or adhesions. No areas of ectopic endometrial implantation or other pathologies were observed throughout the abdomen. The patient recovered without complications and was discharged home with a five-day course of oral antibiotics and instructions for outpatient follow-up with a surgeon. The pathology report of the appendix revealed endometrial glands and stroma within the subserosa but no signs of acute inflammation.

Figure 1. Coronal View of Abdominopelvic CT with Arrow Pointing to Fecalith at Ostia of Appendix. Published with Permission

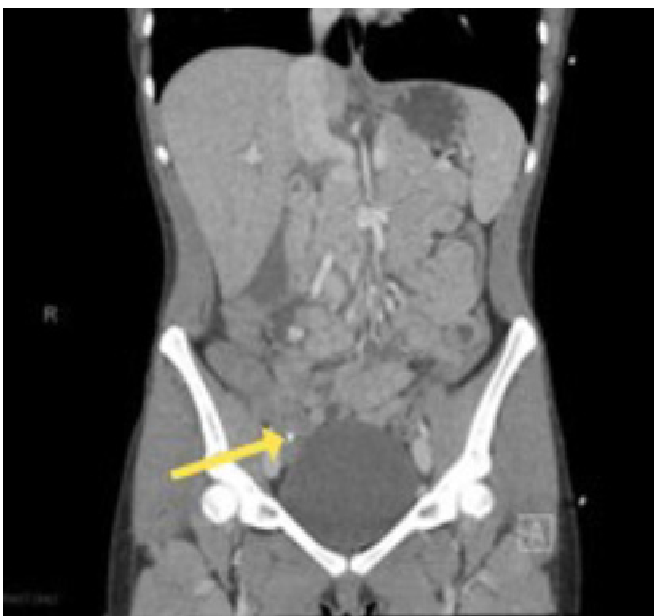
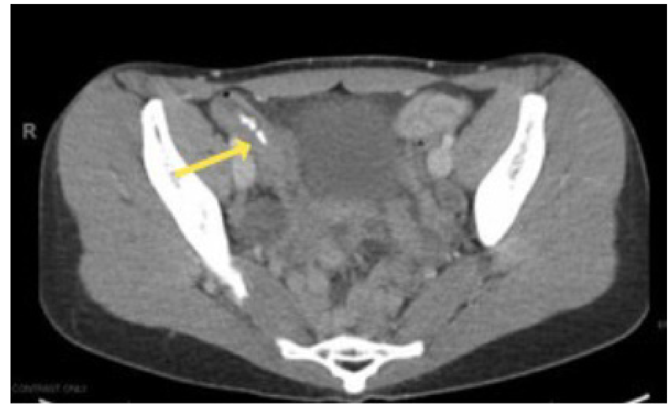


Figure 2. Axial View of Abdominopelvic CT with Visible Fecalith at Ostia of Appendix. Published with Permission



Discussion

Although this patient presented with the classic signs and symptoms of acute appendicitis, the pathology revealed appendiceal endometriosis as the etiology of her symptoms without evidence of acute appendicitis. Appendiceal endometriosis is a purely pathologically derived diagnosis and typically includes the presence of glandular tissue, endometrial stroma and hemorrhage.[1]

A review of the literature shows that appendiceal endometriosis is a rare occurrence, with only a few similar cases reported. One case reported was of a young, previously healthy female who presented with acute appendicitis and no gross evidence of endometriosis outside of the pelvis; she was ultimately diagnosed with appendiceal endometriosis but, unlike our patient, also had acute appendicitis on pathology.[2] Another study of 2,173 appendectomies in South Korea found that 0.23% had appendiceal endometriosis. Of those cases, only two presented with right lower quadrant pain, while the other three had incidental appendectomies during other procedures.[3] The median age was 27 with 80% of the subjects being less than 30 years of age at time of diagnosis. Jeong et al. reported a similar case of appendiceal endometriosis; however the patient experienced cyclical symptoms including abdominal pain, nausea, vomiting, abnormal uterine bleeding, and dizziness with menstruation.[1] Other case reports of appendiceal endometriosis indicate that women were often menstruating during the acute pain and presumed appendicitis.[4] Our patient denied dysmenorrhea, as she had not menstruated in over a year due to her IUD placement, so the acute nature of her abdominal pain in response to the endometriosis is not fully understood.

The mechanism behind the acute presentation of appendiceal endometriosis is controversial. It has been theorized that the shedding of endometrial tissue leads to neural plexus compression, causing pain and presentation similar to acute appendicitis.[4] However, this would not necessarily lead to a heightened inflammatory reaction with markedly elevated leukocytosis, as seen in most patients. Other theories in the literature deliberate whether acute inflammation due to obstruction from an endometrioma or hemorrhage of the endometrial tissue may result in obstruction, edema, and inflammation.[5]

Regardless of etiology, appendectomy is the standard of care for these patients as there is no way to discern appendiceal endometriosis from acute appendicitis on its presentation. An appendectomy also resolves the acute pain even when the pathology later demonstrates appendiceal endometriosis.[1,2,4] The management of our patient would not be changed, except that this patient did not need postoperative antibiotics. There was a normal-appearing appendix, and postoperative antibiotics are not the standard of care. Therefore, our patient had unnecessary antibiotic exposure.[5]

This case highlights the importance of pathology and patient follow-up, even in patients with classic appendicitis symptoms and imaging. An intraoperative examination should always be conducted to evaluate for the gross presence of other abdominal abnormalities during an appendectomy, specifically ectopic endometrial tissue, when operating on premenopausal females.[1,2,4]

Conclusion

Appendiceal endometriosis is a rare diagnosis attributed to females who present with signs and symptoms of acute appendicitis. A comprehensive gynecological history, an intraoperative examination of the abdomen and pelvis for gross pathology, and following up on pathology result follow-ups are paramount for all patients. A detailed history will help to determine signs of a gynecologic cause of the pain such as reports of dysmenorrhea, abnormal uterine bleeding, cyclic abdominal or chronic pelvic pain, or infertility. However, as seen in our case and in a thorough literature review, these symptoms are not always reported in this subset of patients with appendiceal endometriosis. An appendectomy should still be conducted despite a relatively benign intraoperative appearance of the appendix due to the possibility of other pathologic findings such as endometriosis. Future studies should investigate the prognostic implications of endometriosis after a diagnosis of appendiceal endometriosis.

Lessons Learned

Acute appendicitis is an infrequent presentation of endometriosis. We agree that the standard of care should always be appendectomy with a pathological exam when a patient has symptoms of appendicitis. A comprehensive gynecologic history and intraoperative exam should be conducted to evaluate for the presence of other gross pathology, such as ectopic endometrial tissue, especially in women of reproductive age.

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