

## Appendiceal Endometriosis Causing Acute Appendicitis: A Case Report

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### Abstract

**Background:** Appendiceal endometriosis is a rare disease with a reported incidence of 0.4% in the general population and 2.8% in patients diagnosed with endometriosis

**Case presentation:** Herein, we report a 33-year-old female who appeared in the emergency department with a two-day history of abdominal pain localized in the right iliac fossa, associated with fever (37.7 oC), nausea, and anorexia. The patient was in the middle of her menstrual cycle. Abdominal examination disclosed deep tenderness at Mc Burney point and positive Rovsign's sign. Abdominal ultrasound indicated a diagnosis of acute appendicitis. The patient underwent an open appendectomy. The histological report evinced the diagnosis of appendiceal endometriosis.

**Conclusion:** The clinical findings of appendiceal endometriosis with secondary appendicitis are usually indistinguishable from acute appendicitis. The involvement of menstruation in the presentation of symptoms should raise suspicion about this rare disease. The histological report makes confirmation of the diagnosis.

**Keywords:** Appendicitis; endometriosis; incidence; appendectomy; laparoscopy.

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### I. Introduction

Acute appendicitis is the most typical surgical diagnosis of abdominal pain in the right lower quadrant (1). Acute appendicitis and foci of endometriosis in the appendix are found in 0.4% of the general population and in 2.8% of patients with previously diagnosed endometriosis (8).

Appendiceal endometriosis is usually asymptomatic. Occasionally, it manifests as acute appendicitis, intestinal perforation, intussusception, or acute lower gastrointestinal bleeding (3). It is very challenging to distinguish appendiceal endometriosis from acute appendicitis. A high suspicion index should be raised when menstruation correlates with the symptoms (4). If endometriosis is isolated to the appendix, abdominal computed tomography can't distinguish appendiceal endometriosis from acute appendicitis (5).

Appendiceal endometriosis can be diagnosed histopathologically. It usually involves muscular and seromuscular layers, and less often, the serosa. The mucosa is never engaged (6). The treatment of choice consists of surgery and hormone therapy depending on the severity of symptoms and the patient's age (7). Here we describe the case of a 33-year-old female who was diagnosed with appendiceal endometriosis.

### II. Case Presentation

A 33-year-old female visited the emergency department with a two-day history of abdominal pain localized in the right iliac fossa, associated with fever (37.7 oC), nausea, and anorexia. The patient was in the middle of her menstrual cycle. The patient reported hospitalization in another clinic the previous month with the same symptoms, where she had been treated conservatively with intravenous antibiotics.

Abdominal examination disclosed deep tenderness at Mc Burney point and positive Rovsign's sign, whereas rebound tenderness in the right iliac fossa, psoas sign, and obturator sign were all negative. Laboratory

studies revealed elevated white blood cells (12.7 K/UI), neutrophils (89%), and C – reactive protein (55 mg/L). Abdominal ultrasound was performed in the emergency department and displayed an inflamed appendix with peri-appendicular inflammation.

The patient was admitted to the surgery clinic and underwent an open appendectomy. She recovered uneventfully and was discharged after two days. The histological report evinced the diagnosis of appendiceal endometriosis as it reveals endometriosis of the appendicular muscularis propria and findings compatible with mild acute appendicitis.

### III. Discussion

Acute appendicitis is the commonest cause of acute right lower quadrant pain and a leading cause of surgical emergencies. The estimated incidence varies from 5.7 to 50 patients per 100,000 individuals per year, with a peak incidence between the second and third decade of life. In Western countries, the lifetime risk of acute appendicitis is 8-9%, while in Afrika, the risk is lower (2%). Perforation occurs in 16-40% of cases, with a higher incidence in youths and individuals older than 50 years. The mortality is 0.1%, which rises to 0.6% in gangrenous and 5% in perforated appendicitis (1, 8).

Endometriosis is the presence of endometrial mucosa, both glands and stroma, outside the uterus (9), which is mainly located in the pelvis, while extrapelvic endometriosis is less frequent (10). Its incidence in the general population is 6-10% and usually affects reproductive women (11). Although endometriosis is more common in reproductive-aged women, its sequelae can be seen in the postmenopausal period and manifest with sole gastrointestinal findings (12). Almost 4 per 1000 women are estimated to be admitted to the hospital each year due to this condition (11). However, the exact incidence of endometriosis is difficult to capture as the diagnosis requires biopsy or visual identification of the endometrium during laparoscopy or laparotomy (13). The most typical sites are the ovaries, fallopian tubes, pelvis, cervix, and vagina.

The appendix is a rare site of endometriosis with a reported incidence of 0.4% in the general population and 2.8% in patients diagnosed with endometriosis (2). Appendiceal endometriosis was first described in 1860. Generally, patients with appendiceal endometriosis can be divided into four groups: a) patients who are asymptomatic (more often), b) patients who experience acute appendicitis, c) patients who present with appendiceal invagination, and d) patients who experience atypical symptoms like abdominal colic, nausea, and melena (9). Pain in the right lower quadrant is the most typical symptom of appendiceal endometriosis. Worth noting that one-third of patients with abdominal pain due to endometriosis present with all the symptoms of appendicitis (3, 7).

The clinical findings of appendiceal endometriosis with secondary appendicitis are usually indistinguishable from acute appendicitis. The involvement of menstruation in the presentation of symptoms should raise suspicion about this rare disease (4). Abdominal computed tomography is the gold standard for the evaluation of acute right lower quadrant pain. If endometriosis is isolated to the appendix, the differentiation between appendiceal endometriosis with secondary appendicitis from acute appendicitis is impossible (5). During surgery, especially laparoscopy, hemorrhagic peritoneal fluid and nodularity of the appendix are indicators of appendiceal endometriosis (3, 4).

Appendiceal endometriosis can be diagnosed histopathologically. Mittal et al. found that 56% of endometriosis of the appendix involved the body of the appendix compared to 44% at the tip. The base of the appendix was not involved in any of their cases. Moreover, muscular and seromuscular involvement was noted in 67% of the cases, while serosal involvement in 33% of the cases. The mucosa was not involved in any of their cases (6). In our patient's histological report, the endometrial tissue was found at the end of the appendix in the muscularis propria and not at all in the serosa.

The treatment of choice comprises surgery and hormone therapy and is determined by the severity of symptoms and the patient's age. Hormonal therapy is sometimes effective for relieving chronic pain (7). In recent years, laparoscopic appendectomy has gained popularity and has become the preferred approach for uncomplicated and complicated appendicitis. The whole peritoneal cavity is examined during laparoscopy for a complete assessment for endometriosis and other gynecologic pathology (4).

### IV. Conclusion

Appendiceal endometriosis bringing about acute appendicitis is rare and very difficult to diagnose preoperatively. The histological report makes confirmation of the diagnosis. Appendiceal endometriosis should be included in the differential diagnosis of acute abdominal pain, especially when females of reproductive age are present with clinical symptoms of acute appendicitis. **Acknowledgements:** None.

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**Author contribution:**

1. Stefanou SK: Study conception and design, drafting of manuscript.
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3. Stefanou CK: Literature search and acquisition of data.
4. Kefala MA: Literature search and acquisition of data.
5. Paxinos AK: Analysis and interpretation of data.
6. Tsiantis T: Analysis and interpretation of data.
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