Case Report

Appendiceal Enterobiasis Mimicking Acute Appendicitis: A Case Report

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Abstract

Background: *Enterobius vermicularis* (pinworm) is the most common intestinal helminth, particularly prevalent among children. Although often asymptomatic, it may rarely involve the appendix, either as an incidental finding or as a potential cause of appendiceal inflammation.
Case Presentation: We present the case of a 25-year-old male who presented with acute right iliac fossa pain, nausea, and localized tenderness. Laboratory investigations revealed leukocytosis. A provisional diagnosis of acute appendicitis was made, and the patient underwent appendectomy. Gross examination showed a mildly inflamed appendix. Histopathology revealed the presence of *Enterobius vermicularis* within the appendiceal lumen, associated with mucosal inflammation.
Discussion: Appendiceal enterobiasis may clinically mimic acute appendicitis, but the parasite is often identified only upon histopathological examination. The pathogenic role of *E. vermicularis* in appendicitis is debated, with some authors suggesting it as an incidental finding, while others implicate it as a cause of luminal obstruction and irritation. Detection of the parasite is clinically relevant as it necessitates anti-helminthic treatment to prevent recurrence and community spread.
Conclusion: This case emphasizes the importance of routine histopathological evaluation of appendectomy specimens, as rare etiologies such as *Enterobius vermicularis* may mimic acute appendicitis and alter postoperative management.

Keywords: appendicitis; *Enterobius vermicularis*; appendiceal enterobiasis; histopathology

Introduction

Acute appendicitis is one of the most common surgical emergencies worldwide. AA is a serious medical condition that occurs when the appendix becomes inflamed due to a blockage inside it. This condition causes severe abdominal pain and requires immediate medical attention. The diagnosis of AA relies on the patient's medical history, physical examination, laboratory analysis, and abdominal imaging [1]. The most accepted etiological mechanism involves luminal obstruction by fecoliths, lymphoid hyperplasia, or rarely, parasitic infestation [2]. Among parasites, *Enterobius vermicularis* is frequently reported. It is a ubiquitous intestinal nematode, mainly affecting children, with global prevalence estimated at 4–28% depending on socioeconomic status and hygiene [3, 4]. Although perianal pruritus is the most common manifestation of *Enterobius vermicularis* (pinworms), pinworms have been reported to be found in different multiple locations, including the vermiform appendix [5].

The incidence of appendiceal enterobiasis in appendectomy specimens ranges from 0.2% to 4.8% in endemic areas [2]. However, whether *E. vermicularis* truly causes appendicitis or is merely an incidental finding is still debated. Herein, we report a case of appendiceal enterobiasis presenting as acute appendicitis.

Case Report

A 25-year-old male presented to the outpatient surgical department with a history of right lower abdominal pain for 10 days, associated with nausea and anorexia. On examination, the patient was febrile with localized tenderness at McBurney's point and rebound tenderness. The patient denied any changes in the bowel habit. Laboratory investigations showed leukocytosis with neutrophilia.

Generalized abdominal ultrasonography was done which showed thick-walled inflamed appendix. A clinical diagnosis with radiological correlation of acute appendicitis was made, and the patient underwent open appendectomy. Intraoperatively, the appendix appeared mildly inflamed without perforation. The specimen was sent for histopathological examination. Microscopy revealed wall of appendix with ulceration covered by acute inflammatory exudate. Lumen showed fecal matter within which multiple cross-sections of *Enterobius vermicularis* adult worms show an eosinophilic cuticle with lateral alae, worm gut and uterus filled with eggs inside. The inflammation extended transmurally into subserosa. No eosinophilic infiltration or granuloma seen. A final diagnosis of Acute Appendicitis with helminthic infestation resembling *Enterobius vermicularis* was rendered. The postoperative course was uneventful. Patient was discharged home after 48 h with 400 mg of cefixime daily for 1 week and 500 mg of metronidazole once weekly for 3 weeks. A follow-up visit was scheduled for 8 days later, at which time he was healthy, and the stitches were removed.

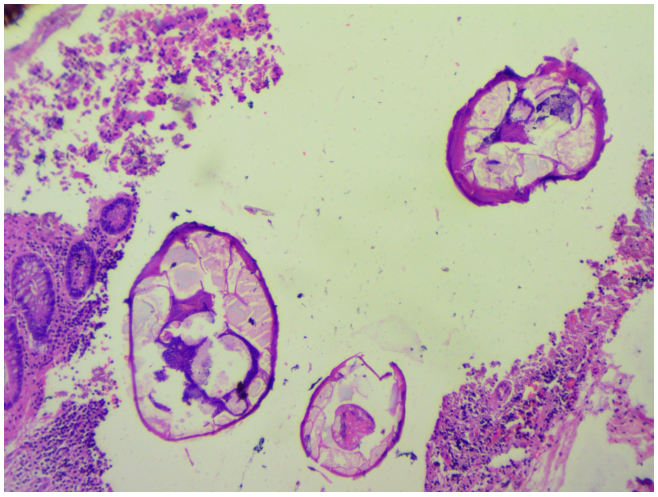

Figure 1: Hematoxylin and eosin (H&E) stain showing the appendix mucosa on a 10× view showing intraluminal adult *Enterobius vermicularis*.

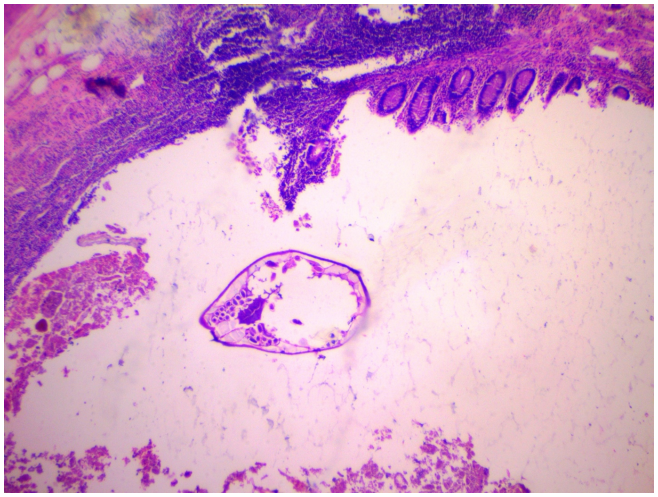

Figure 2: Hematoxylin and eosin (H&E) stain showing the appendix mucosa on a 4× view showing mucosal erosion and intraluminal *Enterobius vermicularis* gravid uterus with eggs.

Discussion

Threadworm or pinworm, also known as *E. vermicularis*, continues to be one of the most prevalent parasitic infestations globally. It is estimated that around 209 million people are affected by this condition, and it is somewhat more common in developing countries [6, 7]. Humans become infected through the fecal–oral route by ingesting the parasite's eggs from contaminated food or water. This disease is often asymptomatic but can sometimes manifest classically as nocturnal anal pruritus, especially in children. Approximately 20% of children worldwide have *E. vermicularis* infections [1].

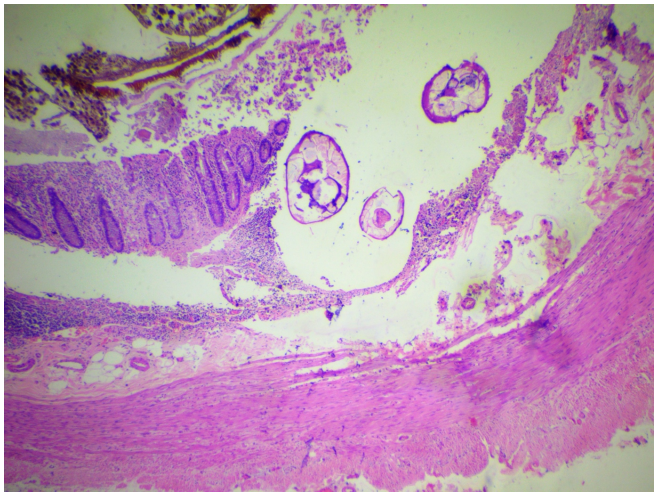

Figure 3: Hematoxylin and eosin (H&E) stain showing the appendix mucosa on a 4× view showing intraluminal adult *Enterobius vermicularis*.

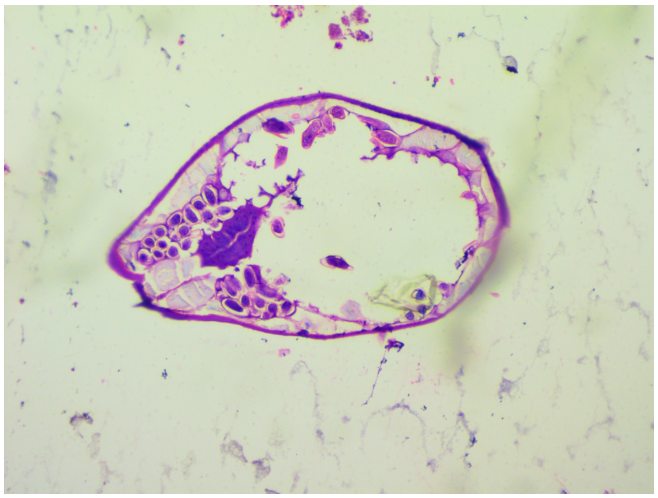

Figure 4: Hematoxylin and eosin (H&E) stain 10× view showing intraluminal *Enterobius* gravid uterus with eggs.

E. vermicularis typically resides in the ileum and cecum. Once the eggs of *E. vermicularis* are ingested, they develop into adult worms in the small intestine within 1–2 months. When confined to the ileocecal area, the infection typically does not cause any symptoms. During the night, female adult worms and their eggs migrate to the anal area and deposit thousands of eggs in the perianal region, which causes pruritus. Perianal pruritus is caused by eggs hatching near the anal area, leading to contamination of the fingers and ingestion of the eggs (autoinfection), which restarts the life cycle of the worm. Occasionally, the larvae migrate back to the rectum and the small intestine, beginning the life cycle again (retro infection) [7, 8].

Perianal itching is the most frequent manifestation of *E. vermicularis* infection, often occurring at night due to inflammation caused by adult worms and eggs on the perianal skin. Abdominal discomfort, nausea, and vomiting are other presentations that usually indicate a high worm burden [7]. Typically, the pathogenicity of *E. vermicularis* is mild, ranging from asymptomatic cases to nocturnal anal pruritus [9]. In our case, no such symptoms of pinworm infestation were reported by patient, thus it was an incidental finding. Thus, the histopathological examination of appendix serves two purposes, first it helps in the confirmation of acute appendicitis and secondly it discloses any additional pathological information that is not evident grossly or intraoperatively [10].

E. vermicularis infection can cause diseases, such as acute appendicitis, chronic appendicitis, ruptured appendicitis, gangrenous appendicitis, and perforation, resulting in peritonitis [5]. The histological findings commonly observed in resected appendiceal specimens vary from normal to inflammatory patterns, including lymphoid hyperplasia, eosinophilic infiltration, or neutrophilic infiltration. Macroscopically, helminths may be seen in the lumen of the appendix [9].

There are two hypotheses regarding the possible mechanism of acute appendicitis in individuals with parasitic infections. The first hypothesis suggests that the clinical signs of acute appendicitis are caused by obstruction of the duct by adult parasites rather than true inflammation of the appendiceal wall [9]. The second hypothesis proposes that irregular migration of eggs and larvae can lead to the formation of granulomas in different parts of the body, such as the appendix, kidney, peritoneal cavity, male urinary tract, and female genital tract [1].

Although the gold standard treatment for acute appendicitis is appendectomy, this procedure merely addresses a complication

while the root cause remains. Therefore, drug treatment should be administered to eradicate *E. vermicularis* [5]. In our case, *E. vermicularis* in appendix was an incidental finding in histopathology, therefore routine postoperative treatment regimen with cefixime and metronidazole was given to the patient. The preferred drugs for treating *E. vermicularis* are mebendazole, pyrantel pamoate, and albendazole. Mebendazole is taken as a single 100 mg dose, with a repeat dose in 2 weeks. Pyrantel pamoate is given at a dose of 11 mg/kg, up to a maximum of 1 g, with doses administered 2 weeks apart. Albendazole is taken as a single 400 mg dose, with a repeat dose given in 2 weeks. Treatment for *E. vermicularis* infection should be prescribed for both the patient and his/her family members. Additionally, patients must be educated on the importance of maintaining good hygiene practices and washing their hands regularly to prevent the spread of infection and reinfection [1].

Conclusion

The prevalence of pinworm infestation is estimated of up to 50% in children and 20% in adults [11]. Appendiceal enterobiasis, although rare, should be considered in patients presenting with features of appendicitis, in children and in adults. So, routine histopathological evaluation of appendectomy specimens ensures detection of such cases and guides appropriate anti-parasitic treatment.

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