

CASE REPORT

ACUTE APPENDICITIS SECONDARY TO ENTEROBIUS VERMICULARIS INFESTATION IN A YOUNG FEMALE: A CASE REPORT

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ABSTRACT: Gastrointestinal infection due to enterobius vermicularis occurs worldwide and is considered to be the most common helminth infection. The simple presence of enterobius vermicularis in the appendix usually produces symptoms of acute appendicitis. Acute appendicitis due to enterobius vermicularis is very rare, affecting mostly children. The association of this parasitic infestation with acute appendicitis varies from 0.2%–41.8% worldwide. Whether pinworms cause inflammation of the appendix or just appendiceal colic has been a matter of controversy. We present a case of an 18 year old female with enterobiasis of appendix presented with clinical features of acute appendicitis. The appendix was surgically removed and the specimen was pathologically diagnosed to contain of enterobius vermicularis in non-inflamed and histologically mild mononuclear cell infiltrated appendix. One should keep in mind that the clinical signs of intestinal parasite infection may mimic acute appendicitis, although rare. A careful evaluation of symptoms such as pruritus ani, or eosinophilia on laboratory examination, could prevent unnecessary appendectomies.

KEYWORDS: Enterobius vermicularis; Appendicitis; Pinworm infestation, Appendiceal syndrome, Appendiceal colic, Parasitic appendicitis, Laparoscopic appendectomy.

INTRODUCTION: Acute appendicitis is considered as the most common cause of emergency surgery.¹ The etiology of acute appendicitis rarely involves parasitic and protozoal infections of the gastrointestinal tract in the developed countries.² Inversely, many parasitic infections frequently lead to the symptomatology of acute appendicitis. It is exactly this ambiguous relation between parasitic infections and acute appendicitis that still induces a controversy as to whether or not these parasites may cause appendicitis, despite the fact that many parasites have been found in the lumen of the appendix.³

Enterobius vermicularis, also known as pinworm or thread worm, is a widespread parasite estimated to affect up to 209 million people worldwide; it occurs most frequently in children aged 5 to 10 years and is relatively uncommon in those under the age of two years.⁴ The association of pinworm infestation with acute appendicitis varies from 0.2 to 41.8%.⁵ Infection via the fecal-oral route is the most common route of human transfer, the mature worm lives and reproduces in the proximal part of the ascending colon, caecum and the terminal ileum. After fertilization, the male worm dies while the female migrates to the anal canal where the laying of eggs takes place.⁶

Sometimes, however, ova can be found in ectopic sites in the peritoneal cavity and the appendix.⁷ E. vermicularis infection is usually asymptomatic. The most common symptom is pruritus in the perianal region, but infestation may also present with ileocolitis, enterocutaneous fistula, urinary tract infection, mesenteric abscesses, salpingitis and appendicitis.

The role of E. vermicularis in clinical appendicitis has been disputed since its discovery in the appendiceal lumen in 1898.⁸ However, reviews of the literature do agree that E. vermicularis

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infestation of the appendix can produce clinical features mimicking acute appendicitis referred to as appendiceal colic⁸ but frequently without any histological evidence of acute inflammation.⁹

We present the case of an 18 years female with right iliac fossa pain, who underwent appendectomy and the pathology revealed *E. vermicularis*.

CASE REPORT: An 18 year old female presented to the emergency department with acute abdominal pain in her right lower quadrant associated with fever and vomiting. The physical and laboratory examination revealed right iliac fossa tenderness and leukocytosis with neutrophilia. Abdominal ultrasonography was suggestive of acute appendicitis. An open appendectomy was performed. The pathological examination showed the congested external surface [Fig. 1] and the numerous area of lumen containing pinworms and mononuclear cell infiltration [Fig. 2]. Two oral doses of mebendazole were administered postoperatively. The follow-up to date was without incident and she was free of symptoms one year after the operation.

DISCUSSION: The various worms that have been reported to be associated with clinical appendicitis include: *Ascaris lumbricoides* (round worm), *Trichuris trichuria* (whip worm), *Entamoeba histolytica* and *Enterobius vermicularis*.⁶ Intraluminal parasites within resected appendix specimens are generally an incidental finding. Gastrointestinal infection due to *Enterobius vermicularis* occurs worldwide and is considered to be the most common helminthic infection.¹⁰

Enterobius ova have been found in human coprolites from 7800 BC.¹¹ Fabricius Hildanus was the first to describe appendiceal pinworms in 1634.¹² Since 1899, when the association of *Enterobius* infestation was first described,¹³ there have been several case reports and retrospective studies on this subject.

Despite the fact that the relationship of *E. vermicularis* to the pathogenesis of appendicitis has been investigated for many years, the influence of the parasite on the individual forms of inflammation is still unclear⁶. More recently, a study reviewing 2267 cases of appendicitis showed that there was a highly significant difference in the incidence of *E. vermicularis* in normal and in inflamed appendices, which may indicate that the presence of *E. vermicularis* in the appendix can cause symptoms of acute appendicitis.⁸

Although *E. vermicularis* may have a causal role in appendiceal pain and chronic inflammation due to obstructive phenomena, the overwhelming majority of cases are not associated with acute inflammation. Interestingly, the presence of pinworms in the appendix may cause a clinical "appendiceal syndrome" even without eliciting acute inflammation.¹⁴

This "syndrome", also mentioned as appendiceal colic, consists of chronic right lower quadrant and pelvic pain, intermittent in nature, and can be explained by the hypothesis of appendiceal lumen obstruction. The situation in acute appendicitis is less clear.

With regards to histopathology, *E. vermicularis* is rarely associated with the histological changes of acute appendicitis. *E. vermicularis* infestation of the appendix may cause a spectrum of pathologic changes in the appendix that range from lymphoid hyperplasia to life-threatening complications such as gangrenous appendicitis and perforation with peritonitis. Lymphoid hyperplasia in response to the presence of the parasite may be the first tissue reaction leading to clinical signs of appendiceal colic. On the other hand, the obstructive effect because of the prominent lymphoid tissue may be the initiating event for the inflammatory process.²

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Sterba and Vlcek found that the number of granulomas in appendices infested with *E. vermicularis* far exceeded the number of granulomas in a control group of noninfested appendices.¹² Morgensen et al. have shown that, apart from simply causing granuloma formation, *E. vermicularis* can also invade the wall of the appendix leading to inflammation.

A literature search showed a single case of mucosal invasion and intramural location of *E. vermicularis* in a patient with symptoms of acute appendicitis. Sah and Bhadani described in their study two cases of acute appendicitis, in which eggs of the parasite were attached to mucosa in one case and in another *E. vermicularis* had invaded the mucosa and was lying intramurally. However, presumably the worms had just been caught by the severe inflammation in these two cases of acute appendicitis.⁶

Appendectomy should be done with caution if the appendix is not acutely inflamed; surgeon must bear in mind the possibility of resident worms in the vermiform appendix.¹⁴ Saxena et al. reported three cases in which pinworms were released into the abdominal cavity during laparoscopic appendectomy¹⁵.

CONCLUSION: Correct diagnosis can be achieved after co-assessment of the patient's history, physical examination and laboratory findings, as well as radiological imaging and unnecessary appendectomy should be avoided. Patients not undergoing appendectomy can benefit from fecal sampling and night-time application of cellophane tape in the perianal area as a means of detecting the parasite as well as empirical antihelminthic therapy. Appendectomy treats the consequence and not the root cause. Family members and persons with close contact should also be treated once the diagnosis of *Enterobius* infestation has been confirmed.

In equivocal cases, patients should be clinically observed and re-evaluated before being subjected to an emergency appendectomy. Appendectomy should be done with caution if the appendix is not acutely inflamed; worms in the vermiform appendix could be resident. Pharmacological eradication with antihelminthics (e.g. Mebendazole) and meticulous extraction of released worms are important to avoid chronic complications.¹⁵

It is important that surgeons should exercise maximum caution during laparoscopic appendectomy, especially when the endoloop is in use, to avoid the release of pinworms into the peritoneum upon amputation of the appendix, thereby re-infecting the patients.

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Fig. 1: Specimen of resected appendix showing congested external surface

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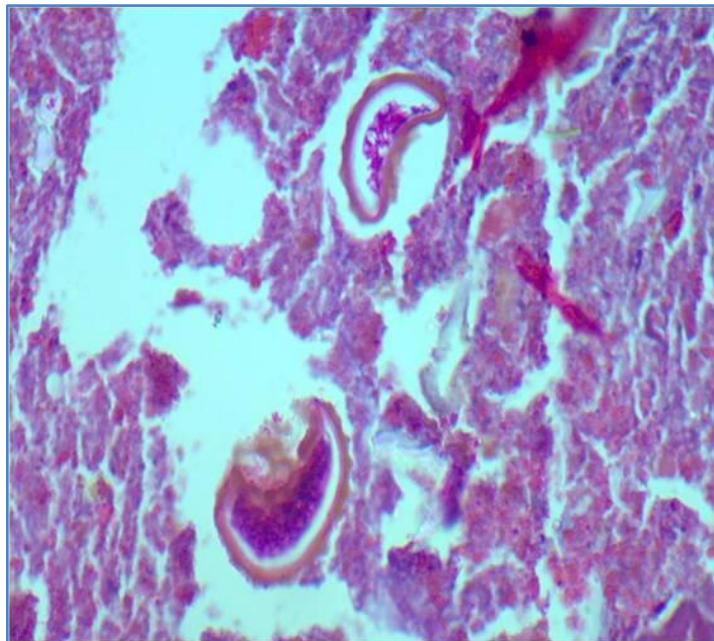


Fig. 2: Histopathology showing mild mononuclear cell infiltration and lumen with numerous areas of Pinworm

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