Case Report

Enterobius vermicularis infection associated with appendicitis, Meckel's diverticulitis, and peritonitis

Spasimir Todorov Shopov[1,2]

From [1]Pathologist, Department of Pathology, MBAL Uni Hospital Ltd., Panagyurishte, [2]Assistant Professor, Department of General and Clinical Pathology, Medical University - Plovdiv, Plovdiv, Bulgaria

ABSTRACT

Enterobius vermicularis (EV) is a tiny helminth that lives in the human cecum. Its prevalence varies widely by region and social setting. It is diagnosed easily with perianal sticky tape test and microscope visualization for eggs or worms. The treatment is mebendazole or albendazole drugs. Serious sequelae are not thought to be common, but they can include peritonitis, mesenteric abscess, intestinal perforation, enteric ulceration, enteritis, Meckel's diverticulitis, and intussusception from ectopic worm movement. More controversial is the association of EV with appendicitis. Here, I am reporting the case of a 9-year-old child with clinical symptoms of acute appendicitis and peritonitis. A Meckel's diverticulitis is also operatively established. Histological examination revealed EV in the lumen of the appendix and Meckel's diverticulum. Pediatricians encounter EV in varying frequencies, but this helminth must be considered on a daily basis from doctors from all specialties in connection with a wide variety of potential, sometimes severe complications.

Key words: Appendicitis, *Enterobius vermicularis*, Meckel's diverticulitis

Enterobius vermicularis (EV) is the most common helminthic infection in humans. It is more commonly seen in young children [1]. During the cycle of the parasite, the fertilized female descends into the rectum from its habitual location, the cecum, and colon and lays its eggs in the anal folds and the surrounding areas. The deposited eggs mature in a few hours and contain fully developed larvae. The movements of the females and the laying of the eggs cause itching, predisposing the passage of the infection to the same patient, or other patients through hands which have been contaminated hands. Self-infection is common and can cause long-term infections [2]. The worms typically reside in the cecum, appendix, and distal ileum, where they adhere to the mucosa.

The female EV sometimes can be found in different places: Female genitals, fallopian tubes, ovaries, and perineum. Other times, both in female and male patients, the parasite can be found in rare locations; the prostate, the urinary bladder, the ureter, the spleen, the peritoneum, the mucosa, the appendicular lumen, the intestinal wall, the liver, the lungs, the epididymis, and the conjunctival sac [2]. Meckel's diverticulum is the most common congenital abnormality of the small intestine, presenting in 1%–4% of the general population [3]. Often, the diagnosis is histologically established as a surprise to the pathologist and shocks the treating team of clinicians.

The reason for presenting this report is not only the presentation of EV associated with appendicitis, Meckel's diverticulitis complicated by peritonitis but also the frequency of these complications associated with EV, which our practice has recently encountered.

Access this article online	
Received - 03 July2020 Initial Review - 19 July 2020 Accepted - 23 July 2020	Quick Response code
DOI: 10.32677/IJCR.2020.v06.i08.002	

CASE REPORT

A 9-year-old boy was admitted to the emergency department of our hospital due to nausea, frequent vomiting, lack of bowel movement, and flatulence. For 3 days, the patient was having persistent abdominal pain mainly in the lower half of the abdomen, loss of appetite, and fever, without diarrhea. At first, the pain was dull, colic-like, but the day before the reception, it became stabbing.

During the clinical examination of the respiratory system, the patient was having accelerated breathing superficially and on auscultation, vesicular breathing with prolonged exhalation was noticed. The cardiovascular system revealed tachycardia, AH interval of 95/50 with no additional pathological finding. Abdomen examination showed pronounced muscular defense

Correspondence to: Spasimir Todorov Shopov, Department of Pathology, MBAL Uni Hospital Ltd., str. "GeorgiBenkovski" 100, 4500 Panagyurishte, Bulgaria. E-mail: sshopov1@abv.bg

mainly in the lower abdomen and missing peristalsis. Bloomberg's symptom was positive. No other abnormalities were found in vital organs and systems.

Roentgenography of the abdomen showed hydroaeric shadows. On laboratory examination, increased leukocytes were found. Biochemistry was within normal limits. Clinical and laboratory studies are compatible with acute appendicitis and peritonitis. Indicators of vital organs and systems showed no deviations.

A surgical approach was performed with a Lenander incision, in which 80 ml of pus was evacuated around the appendix. During the revision of the abdominal cavity, slightly inflamed Meckel's diverticulum was found measuring 3 cm in, 4–5 cm from the ileocecal region. Appendectomy along with Meckel's diverticulectomy was done. The appendix and Meckel's diverticulum sent for histology. No postsurgical complications were registered.

The macroscopic examination showed an appendix of 6 cm with hyperemic, whitish patches on the serosa, and the lumen was filled with fecal material. A resect Meckel's diverticulum showed hyperemic of the serosa. Lumen filled with intestinal contents. Histopathological examination of the appendix showed a transverse and longitudinal section of female and male worms in a lumen with clearly visible alae (Fig. 1a). The appendicular mucosa preserved. Submucosa showed reactive lymphoid follicles with germination centers. Inflammation in the appendicular wall consisting of leukocytes and scarce eosinophils. A histological examination of Meckel's diverticulum showed parasites in the lumen, marked hyperemia with inflammation in the lamina propria, and lymph follicles (Fig. 1b and c). In another part of the Meckel's diverticulum, parasites, and eggs with degenerative changes and an abundance of eosinophilic leukocytes around them (Fig. 1d).

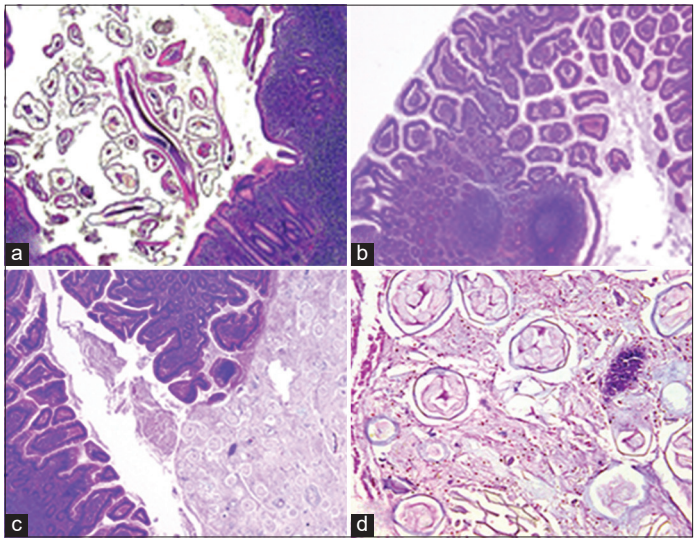

Figure 1: Histological view showing (a) the inflammation in the mucosa of the appendix with longitudinally and transversely cut male and female parasites in the lumen with visible alae (enlargement ×50); (b) Meckel's diverticulum with reactive inflammation and lymphatic follicle formation in lamina propria (enlargement ×50); (c) Meckel's diverticulum with eggs and parasites in his lumen (enlargement ×50); (d) Eggs and parasites with degenerative changes and an abundance of eosinophilic leukocytes around them in the lumen of a Meckel's diverticulum (enlargement ×200)

Postoperatively, no worms and eggs were identified in stool examination and in the application of transparent adhesive tape to the perianal area. It was held treated with mebendazole 100 mg by a schema. All the family members were also given treatment for the infection. The patient is on regular tracked. Repeat stool examination was normal.

DISCUSSION

EV is the most common infection-causing helminth. It colonizes predominantly the intestinal tract, and its discovery elsewhere is very rare. It is more common in temperate climates and in school-age girls [1]. Despite the Moosazadeh *et al*. report, the majority of cases reported and verified by us are men. EV can cause the appendix to obstruct with appendix colic, as the direct connection with appendicitis remains controversial [4]; however, in our case, it clearly led to appendicitis and local peritonitis, while in the Meckel's diverticulum, there was mild inflammation. EV can cause severe morbidity and can even be fatal when outside the gut [5].

Meckel's diverticulum is usually asymptomatic and detected incidentally during laparotomy, as in our case. Usually, it rarely manifests with intestinal obstruction, bleeding, diverticulitis, and perforation. The Meckel's diverticulitis associated with EV infection is extremely rare. From the reference in the Medline database through PubMed using the terms: "EV," "appendicitis," "peritonitis," and "Meckel's diverticulitis," there were two reported case reports with EV infestation of the Meckel's diverticulum [6], but this is the first case where we have appendicitis with local peritonitis and Meckel's diverticulitis.

In the reported case, infection with EV was successfully managed with subsequent antihelminthic therapy with VERMOX (mebendazole). One month after the treatment in the study control sample, EV was not detected. Despite the presence of inflammation in the appendix wall, in the present case, its mucosa, for the most part, remains intact, as does the mild inflammation of the Meckel's diverticulum, which supports the view that the EV most likely to irritate and gradually suppress the immunity of the macroorganism and in the certain moment creates the background for the subsequent complication. Our case is in support of the fact that EV can provoke inflammation in the appendical mucosa and the wall, in this case causing acute inflammation with subsequent local peritonitis.

This case highlights the usefulness of histological examination of all specimens in search of EV, especially in endemic areas, during appendicectomy, to minimize the risk of contamination and to initiate early treatment for both the patient and the people who have been in contact with him.

CONCLUSION

We report a rare manifestation of appendicitis with local peritonitis and Meckel's diverticulitis associated with EV.

Therefore, identification of intestinal parasitosis, especially in young patients, should always be considered as a possible cause of acute abdomen.

REFERENCES

1. Moosazadeh M, Abedi G, Afshari M, Mahdavi SA, Farshidi F, Kheradmand E. Prevalence of *Enterobius vermicularis* among children in Iran: A systematic review and meta-analysis. Osong Public Health Res Perspect 2017;8:108-15.
2. Pampiglione S, Rivasi F. Enterobiasis in ectopic locations mimicking tumor-like lesions. Int J Microbiol 2009;2009:642481.
3. Park JJ, Wolff BG, Tollefson MK, Walsh EE, Larson DR. Meckel diverticulum: The Mayo Clinic experience with 1476 patients (1950-2002). Ann Surg 2005;241:529-33.
4. Шопов С, Апендикална Колика, Причинена от Enterobius Vermicularis. Клиничен Случай. Списание МД; 2019.
5. Ariyarathenam AV, Nachimuthu S, Tang TY, Courtney ED, Harris SA, Harris AM. Enterobius vermicularis infestation of the appendix and management at the time of laparoscopic appendectomy: Case series and literature review. Int J Surg 2010;8:466-9.
6. Sharma M, Kaul R, Chander B. *Enterobius vermicularis* infestation leading to Meckel's diverticulitis in an adolescent boy: An extremely rare presentation. J Lab Physicians 2018;10:106-8.

Funding: None; Conflicts of Interest: None Stated.

How to cite this article: Shopov ST. *Enterobius vermicularis* infection associated with appendicitis, Meckel's diverticulitis, and peritonitis. Indian J Case Reports. 2020;6(8):423-425.