

Enterobius granuloma: an unusual cause of omental mass in an 11-year-old girl

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Enterobius vermicularis (pinworm) is the only nematode that infects humans. It is one of the most common intestinal parasites. Pinworm commonly infests the terminal ileum and colon, and does not cause severe morbidity unless ectopic infection occurs. However, granulomatous lesions caused by ectopic *Enterobius vermicularis* infection may lead to unusual clinical symptoms and may be misinterpreted as malignant lesions. Herein, the authors present an 11-year-old girl with pinworm infection who presented with abdominal pain and an omental mass, with special emphasis on the diagnosis and treatment.

Key words: enterobius, granulomas, girl, children.

Enterobius vermicularis is a small nematode, which is an obligate parasite of human beings. Prevalence of *E. vermicularis* infection, known as oxyuriasis, is 5-15% in the general population. Children with low socioeconomic status are affected most¹. The transmission route is oral-fecal contamination and direct contact with contaminated clothes, toys, toilets, towels, or other objects. After ingestion, eggs hatch in the duodenum, and adult worms inhabit the terminal ileum, appendix vermiform and colon. The female worms migrate to the anus after copulation and release their eggs to the perineum. When the female worm inserts her tail pin to the anal mucosa, pruritus and a prickling sensation occur. Scratching the itchy area may cause dermatitis and secondary bacterial infection. In female patients, parasites may move through the vagina to the uterus, fallopian tubes, and peritoneal cavity, leading to ectopic oxyuriasis²⁻⁴. Ectopic localizations such as the female genital tract, male genitourinary tract, peritoneum, omentum, liver, kidneys, lungs, and conjunctiva are reported⁴⁻⁹. Clinical presentation of ectopic oxyuriasis depends on the site of infection and presence of immune response and may lead to a diagnostic challenge because of the unusual symptoms.

Case Report

An 11-year-old girl was admitted to the Emergency Department because of abdominal pain. She was born to a family with a low socioeconomic status. Her medical history was unremarkable. She had an abdominal pain of acute onset lasting for one day. She did not have any other accompanying gastrointestinal or genitourinary symptoms. She was not sexually active and had not yet reached menarche. On admission, her height and weight were at the 50th percentile, axillary temperature was 37°C, pulse was 80 beats per minute, and blood pressure was 105/70 mmHg. The physical examination revealed mild tenderness at the right lower quadrant and pelvis. Laboratory data including complete blood count, renal and liver function tests and urine analysis were normal. Ultrasonography and magnetic resonance imaging studies demonstrated a right pelvic solid mass of 3x2 cm (Fig. 1). The patient underwent surgery, and a solid mass originating from the omentum was excised. The pathological examination revealed necrotizing granulomatous lesion with eggs of *E. vermicularis* and surrounding eosinophilic leukocytes (Figs. 2, 3). The postoperative course was uneventful. The patient is on mebendazole treatment and doing well.

Discussion

Enterobius vermicularis is the only nematode that infects humans and is the most common human helminth worldwide. It most commonly infects young children 5-10 years of age. More than 30% of children worldwide are infected

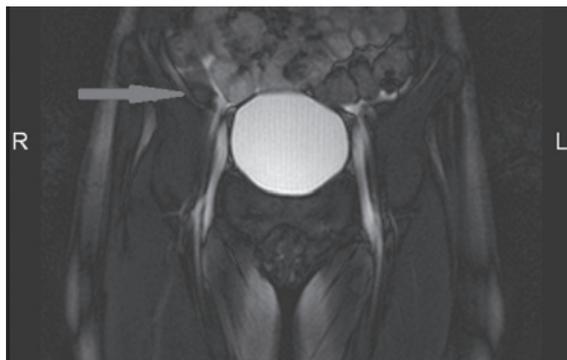


Fig 1. Appearance of the solid mass on MRI.



Fig. 2. Inflammation rich in eosinophil leukocytes surrounding the granuloma (hematoxylin & eosin [HE], original magnification X100).

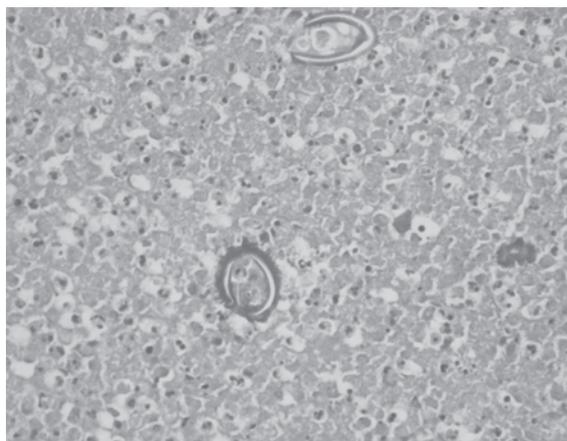


Fig. 3. Flattened refractile eggs of *E. vermicularis* (HE, original magnification X400).

with the organism¹. Infection generally affects family clusters, and overcrowding and low socioeconomic status with poor sanitation increase the risk.

The pathogenicity of *E. vermicularis* is low; thus, infections are generally innocent and asymptomatic. Worms may be incidentally noticed in the perianal region. The most common symptom is perianal pruritus caused by ova deposition. Restlessness during sleep may be encountered due to the prickling sensation caused by insertion of the tail pin of the female worm into the anal mucosa or movement of the worms. Children with *E. vermicularis* infection may present with enuresis nocturna. Morbidity of *E. vermicularis* infection is low, so despite its high prevalence, it is not considered to be a serious disease. On the other hand, ectopic *E. vermicularis* infection may cause severe symptoms and may necessitate surgical treatment. Although a rare phenomenon, various sites of ectopic *E. vermicularis* infection, such as the vulva, vagina, endometrium, salpinx, male genital tract, peritoneum, liver, kidney, ocular region, and even lungs have been well reported in the literature⁴⁻¹⁰. These parasites may cause appendicitis, intestinal obstruction, intestinal perforation, enterocolitis, eosinophilic ileocolitis, hepatic infection, urinary tract infection, pelvic or peritoneal granulomas, epididymitis, sialadenitis, and salpingitis. *E. vermicularis* have been demonstrated even in a macerated human embryo and cerebrospinal fluid.

It is thought that intraabdominal extraintestinal infection may occur when the worm penetrates the bowel wall in the presence of a disease that violates the integrity of the bowel wall, such as inflammatory bowel disease, malignancy or immune compromised state. However, ascendant migration of worms through the female genital tract is the most accepted pathway. In reported cases of peritoneal granulomas outside the gastrointestinal tract, only female worms are found. This finding supports the ascendant route since male worms die in the bowel wall after copulation. Thus, *E. vermicularis* infections of the peritoneal cavity are more common in female patients.

In the case presented, intraperitoneal infection caused a granulomatous mass in the omentum, leading to acute abdominal pain. *E. vermicularis*

granulomas are generally asymptomatic and rarely cause clinical symptoms. A granuloma may mimic any benign or malignant mass lesion depending on the involved site, leading to a diagnostic challenge. It may coincidentally accompany a benign ovarian solid or cystic mass, leading to a misdiagnosis of malignancy. Moreover, granulomas accompanying malignant tumors may lead to misinterpretation of the stage, leading to a more aggressive surgery¹¹⁻¹³. To avoid unnecessary wide excisions, any infectious cause of granulomas, including *E. vermicularis*, should be considered, especially in patients with poor socioeconomic status, and should be confirmed by frozen biopsy.

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