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# When Diagnosis Curls a Little: Partial Bowel Obstruction Due to *Ascaris. L* in a Young Man

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## Abstract

*Ascaris lumbricoides* is a helminth commonly infecting humans, particularly in developing countries. It causes a range of clinical symptoms; However, many patients are asymptomatic. This article presents a case study of a young man who experienced diffuse abdominal pain and constipation, eventually being diagnosed with partial bowel obstruction due to *Ascaris lumbricoides* infection. The article emphasizes the importance of considering helminthic infections like ascariasis as a potential cause of intestinal obstruction, especially in endemic areas. Early diagnosis and intervention, including conservative management and anthelmintic drugs, can lead to a full recovery and avoid unnecessary surgery.

**Keywords:** *Ascaris lumbricoides*, Parasite, Abdominal pain, Roundworms

## 1. Introduction

*Ascaris lumbricoides* is a common helminth infection in developing countries, particularly in Southeast Asia.<sup>1,2</sup> However, due to climate change, increased transport convenience, and immigration from low-income countries, these infections can now occur in countries where they were previously rare.<sup>3</sup> *Ascaris* infection primarily affects children and can cause malnourishment and growth failure.<sup>4</sup> *Ascaris* affects different organs, such as the intestine or lung. Patients with intestinal *ascaris* are mostly asymptomatic or show only mild abdominal discomfort and bloating.<sup>5</sup> However, severe complications like appendicitis, cholangitis, and intestinal obstruction have also been reported.<sup>5,6</sup> Intestinal obstruction caused by *Ascaris* should be considered a potential diagnosis for patients with potential risk factors, such as poor hygiene or a history of travel to endemic places.<sup>1</sup>

## 2. Case presentation

A 19-year-old man presented to the ER with abdominal pain and constipation for three weeks.

The pain was gradual and progressive, scoring six out of 10. Nausea and vomiting (which happened only once and was not bilious) developed 48 h before his ER visit. Previously, he was in good health and had no relevant medical history like abdominal surgery. He had a heart rate of 87 beats per minute, blood pressure of 110/70 mm Hg, and normal respiratory rate. Upon examination, the abdomen was without distention and surgical scar. It was also soft without tenderness. No mass was palpable in superficial or deep palpation. The rectal exam was empty. Lab studies showed a hemoglobin level of 14 g per deciliter (reference range, 12–15 g/dl) and a white blood cell level of 7600 per cubic millimeter (reference range, 4000 to 11,000 WBC/ $\mu$ L). On detailed history, he remembered that he had passed some worms on his last defecation.

A stool exam for eggs and parasites revealed fertilized eggs from roundworms of the species *Ascaris lumbricoides*, and a diagnosis of ascariasis was established. Abdominopelvic CT with oral contrast was performed, and it (Figs. 1 and 2) revealed worm-like masses as longitudinal filling defects in the ileum. Partial bowel obstruction was treated with conservative management, and then the

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Fig. 1. Axial section of contrast CT-scan of the abdomen showing tubular in the ileum lumen.

patient was treated with mebendazole and was referred to an infectious disease specialist for further treatment.

The patient was an Afghan immigrant to Iran who immigrated over a year ago and worked as a construction worker. Because of the low socioeconomic level, he does not have environmental sanitation and personal hygiene. In extended history, the patient recalled drinking from a water source with inadequate hygiene, which can be the source of *Ascaris* transmission. It was recommended that the patient be more cautious about the sanitaryness of food and water. He lives alone, but prophylaxis treatment is crucial if infected patients live with roommates.



Fig. 2. Coronal section of contrast CT of the abdomen showing tubular in the ileum and jejunal lumen.

### 3. Discussion

Based on history and physical exam, three important clinical features – progressive abdominal pain, constipation, and nausea with vomiting with the normal physical examination – should be approached in our patient. The most critical diagnosis for these features is bowel obstruction.<sup>7</sup> Most of the obstructions occur in small bowels.<sup>7</sup> Important obstruction causes in the small bowel are adhesion bonds, hernias, malignancies, foreign bodies, and bezoars.<sup>8</sup> In extrinsic causes of bowel obstruction, adhesion bonds due to previous abdominal surgery are the leading cause. Most of the obstructions in the large bowel are caused by cancer, volvulus, and diverticulitis.<sup>9</sup>

Parasite infections like ascariasis are another cause of bowel obstruction, especially in developing countries with poor access to sanitary water and poor personal hygiene.<sup>10</sup> In an observational study of 3-5-year-old children in Kashmir who had a bowel obstruction, nearly 60 % of the cases had ascariasis.<sup>11</sup> The causes of obstruction included ascariasis 131 (63.2 %), adhesion 23 (11.1 %), intussusception 21 (10.1 %), obstructed hernia 17 (8.2 %), and volvulus 11 (5.3 %). One hundred twenty-six patients needed an operative intervention, and 81 were treated conservatively. The operative procedures performed included enterotomy in 37 (29.3 %), milking of worms in 18 (14.2 %), resection anastomosis in 31 (24.6 %), and adhesiolysis in 13 (10.3 %). Appendicular perforation was seen in 4 (1.9 %), and worms in the gallbladder were seen in 1 (0.5 %) patient.<sup>11</sup> However, because of its rare presentation in the adult groups, its prevalence is not mentioned in the literature.

Closeness to sewage is another risk factor for acquiring helminth infections like ascariasis. The incidence of ascariasis among those living near wastewater was 18 % in comparison to 1 % in the controlled group in a study in Morocco.<sup>12</sup>

More than 700 million individuals around the world are infected with *Ascaris*. The tropical and subtropical areas are endemic. *Ascaris* is more prevalent in rural communities and impoverished countries due to inadequate hygiene.<sup>4</sup> The highest prevalence of this helminth is in East and Southeast Asia. Over half of the population in Myanmar and the Philippines is infected with this helminth.<sup>13</sup>

The prevalence of *Ascaris* in Iran is lower than in Southeast Asian countries. According to a recent meta-analysis, the prevalence of *Ascaris* in Iran is 0.22 % compared to 20 % in Afghanistan.<sup>4</sup>

In another study, Afghanistan has a considerable amount of infestations as far as one out of every five

children is infected with ascariasis in the province of Kandahar.<sup>14</sup>

However, massive immigration and refuting, especially in recent years, might modify the previous epidemiology of infections.<sup>15</sup>

Most patients with ascariasis are asymptomatic. Gastrointestinal symptoms like abdominal pain, anorexia, and diarrhea are the most common features. The patient can experience a broad spectrum of symptoms based on the parasite life cycle stage.<sup>16</sup>

After ingesting embryonated eggs through contaminated water or food, the matured eggs will become larvae in the duodenum. The hatched larvae migrate to the jejunum and might invade the intestinal wall and the portal system.<sup>17</sup> This causes complications in the hepatobiliary tract, like hepatic abscess, biliary colic, acute cholangitis, and pancreatitis.<sup>18</sup>

The larva can even invade the inferior vena cava, right heart, pulmonary arteries, and lungs and lodges in the alveoli and bronchial tree (Loeffler syndrome). Our patient did not show any signs (e.g., eosinophilia, coughing) of this syndrome.<sup>19</sup>

The entangled worms in the small intestine can cause partial or complete obstruction, which is the typical manifestation of GI tract ascariasis in highly infected patients, especially in children who have smaller intestines. Complete obstruction may need immediate surgical attention to prevent complications such as perforation and gangrene of the bowel.<sup>20</sup> Helminth toxins like anaphylatoxin can also cause local inflammation and ileus.<sup>20</sup>

Worms might cause intussusceptions with classic features, including abdominal pain, palpable mass (especially in the right lower quadrant), and currant stool. However, most intussusceptions are idiopathic and are more prevalent in children younger than three.<sup>21</sup>

In ultrasonography of the abdomen, triple line signs can be detected.<sup>22</sup>

The “Triple line” refers to two hyperechoic longitudinal tubes (discriminating outline of *Ascaris* body), which surround an anechoic one (gut of parasite). This sign can also be seen in the hepatobiliary type.<sup>23</sup> In the plain radiologic film in heavily infested patients, tangled worms can be detected as soft tissue densities in dilated intestine loops.<sup>23</sup>

On x-ray with contrast (barium swallow or barium enema), two different signs can be detected. A typical filling linear defect or signs of parallel lines (if the worm ingests contrast). Longitudinal filling defects can be seen in CT scans with contrast. In the transverse cut, a targetoid appearance (also bull's eye) comprising two enucleated circles is seen.<sup>24</sup>

In obstruction with a low risk of progression to ischemia, conservative management like a

nasogastric tube, fluid resuscitation, and gram-negative supporting antibiotics should be considered.<sup>24</sup>

Single-dose therapy with anti-helminth drugs like Albendazole and Mebendazole is used to eradicate worms in the setting of infection in adults and children.<sup>25</sup> The mechanism of action of these drugs is binding to beta-tubulin, a microtubule for supporting cell structure, causing immobilization and eventually death.<sup>25</sup>

The second dose should be given in six weeks to eradicate residual worms. In complicated cases such as hepatobiliary ascariasis, volvulus, and bowel ischemia, surgery is needed.<sup>26</sup>

#### 4. Conclusion

This case presented partial bowel obstruction as the first sign of ascariasis in a young immigrant man who recovered after bowel rest and mebendazole administration. Physicians should consider bowel obstruction due to parasites, especially in endemic places, in a person with a recent travel history and poor socioeconomic status. Most cases can be treated conservatively and with additional anthelmintic therapy. In severe complications like complete obstruction with gangrene, surgical intervention is needed.

#### Statement of ethics

This study was approved by the research and ethics committee of Tehran University of Medical Sciences. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

#### Data availability statement

The data used to support the findings of this study are included within the article.

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The authors received no financial support for the research, authorship, and/or publication of this article.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

#### Author contribution

HR and BSA participated in handling the patient, designing the study concept, and revising the

manuscript; MO and SP participated in manuscript writing. All authors read and approved the final manuscript.

### Guarantor

Bahareh Shateri Amiri is the guarantor of this article.

### Conflicts of interest

The authors declare no conflicts of interest.

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