



Case report

Acute intestinal obstruction due to ascariasis in a child: A case report

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ABSTRACT

Introduction and importance: Ascariasis is one of the most common parasitic infections worldwide, especially in tropical and subtropical developing countries with poor personal hygiene and sanitation. This condition is a staggering worldwide public health problem with high morbidity and mortality. Intestinal obstruction is an acute presentation that occurs in cases where clumps of worms form, causing partial or complete obstruction of the intestinal lumen.

Case presentation: We report a case of a 5-year-old boy with total intestinal obstruction due to *Ascaris lumbricoides*, who underwent exploratory laparotomy and enterotomy to remove the worm masses.

Clinical discussion: Infestation with roundworms is widespread in developing countries. While the majority of the intestinal obstruction they cause may be treated conservatively, in some circumstances, surgery may be required.

Conclusion: Infestation with roundworms is widespread in developing countries, and although the majority of the intestinal obstruction they cause may be treated conservatively, in some circumstances, surgery may be required.

1. Introduction

Ascariasis is one of the worm infestations often found in the human body, located around 25 % of the world's human population and reaching at least 807 million to 1121 billion cases [1]. It has a mortality rate of 60,000 per year, mainly among cases that cause intestinal obstruction [2,3].

Worms that cause intestinal disorders in children are common at 1–14 years of age [1,4]. This occurs mainly in developing tropical and subtropical countries where personal hygiene and sanitation are poor [1]. We report this case according to the Updating Consensus Surgical Case Report (SCARE) 2020 guidelines [5].

2. Presentation of case

A 5-year-old boy was admitted to the emergency department with complaints of worsening abdominal pain over the previous 2 days. He had not passed urine or flatus for 3 days, accompanied by complaints of vomiting. For two weeks previously, he had abdominal pain, and the patient had a history of diarrhea. On examination, the child was thin, with symptoms and signs of malnutrition. The WHO performance status

was 2, accompanied by moderate dehydration with a heart rate of 96 beats/min, respiration 22 times/min, and a temperature of 37.9 °C. On physical examination, the abdomen appeared to have a dark contour, which was painful when pressed, especially at the right hypochondrium, and a palpable mass was visible at the right hypochondrium. Other head-to-toe assessments were within normal limits. Laboratory examinations were within normal limits. An abdominal X-ray examination showed intestinal obstruction and the lower right area showed a view of a mass “whirlpool image,” with air-fluid level and no free air under the right hemidiaphragm (Fig. 1). Based on these examinations, the patient was diagnosed with total intestinal obstruction as high as the ileum due to suspected periappendicular infiltrates.

An exploratory laparotomy was performed, and intraoperatively it transpired that the appendix was only slightly hyperemic. Further identified in the terminal ileum to 20 cm distal to the cecum was an intraluminal mass as a bolus of ascariasis, and no other intra-abdominal organ abnormalities were found. Enterotomy was made 30 cm distal cecum (colon ascendens), milking from the ileum to the distal cecum to remove 540 g of the ascaric mass (Fig. 2). Postoperatively, the patient was given intravenous antibiotics for 7 days and a single dose of an anthelmintic drug by a pediatric doctor based on the results of a stool

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Fig. 1. Abdominal X-ray examination showed dilated loops of the small intestine, with air-fluid levels, no free air under the right hemidiaphragm, and the right hypochondrium region showing a mass “whirlpool image” (arrow).



Fig. 2. Extraction of the worms during an enterotomy.

analysis. The patient went home on the 12th day.

3. Discussion

In developing countries in Asia, Latin America, and Africa with poor sanitation, low educational standards, and personal hygiene, ascariasis is still a common parasite infection [6]. In south Asia and southeast Asia, the most prevalent soil-transmitted helminth discovered was *Ascaris*, with a prevalence of 18 %, followed by *Trichuris* 14 %, and hookworm 12 %. Cambodia, Vietnam, and Laos had the highest hookworm prevalence [7].

The infection caused by *A. lumbricoides* is frequently asymptomatic or produces mild, nonspecific symptoms. The phase of the parasite's life cycle and the severity of the infection influence symptoms in those seeking medical attention. At 10–14 days after infection, eosinophilic pneumonia (Loeffler syndrome) may develop as a result of a normally

self-limiting inflammatory response to larvae migrating through pulmonary tissue [8]. In addition to coughing, urticaria, hemoptysis, and dyspnea, patients may also present with abnormal auscultatory breath sounds [8,9]. Adult ascariasis can cause acute abdomens, such as small bowel obstruction, upper gastrointestinal bleeding, intussusception and volvulus, peritonitis, and even gastric ascariasis with perforation. Acute cholecystitis, acute cholangitis, biliary colic, hepatic abscess, and acute pancreatitis are the five major clinical syndromes caused by hepatobiliary and pancreatic ascariasis. Intestinal ascariasis is frequently accompanied by diarrhea, loss of appetite, asthenia or stomach pain, other changes in bowel habits, and weight loss. Increased bowel sounds, abdominal discomfort, and distension are signs of intestinal obstruction, as is occult or fresh fecal blood, and anemia is typical with mucosal bleeding [9]. Many patients have a history of ascari extrusion through the mouth or rectum [6].

The physical examination may reveal bloating, abdominal mass,

abdominal tenderness, or abdominal pain [6]. Massive worm populations, coiled-up and interlaced behavior, neurotoxic release, and peristaltic contraction are the causes of intestinal blockages [10]. In the digestive tract, worms may produce an obstructive bolus when the load is massive. Though they can also be seen in large numbers in the jejunum, worms typically congregate in the terminal ileum [6,11,12].

The main causes of ascariis-related intestinal obstruction are that worms can form a large bolus that causes mechanical obstruction of the bowel lumen; the worm bolus may serve as a lead point in intussusception or a pivot in small-bowel volvulus; ascariis worms may be localized on the ileocecal valve, where their release of neurotoxins causes the contraction of the small intestine and can obstruct the intestine; and the inflammatory response brought on by the worms' anaphylatoxins, hemolysins, and endocrinolysins can result in obstruction of the intestinal lumen [6].

An abdominal x-ray that shows the levels and multiple linear images of *Ascaris lumbricoides* in dilated intestinal loops [10], with a "whirlpool" image in some cases, supports the diagnosis of roundworm obstruction, which is suspected based on the patient's medical history and symptoms of intestinal obstruction [10,13]. The ultrasound examination will help detect thick echogenic strips with a central anechoic tube, several linear or curved echogenic strips without acoustic shadowing, "three-line" or "four-line" signs, and "bull's eye" appearances or "railway track" signs on transverse scans [13].

If the patient presents with intestinal subocclusion, medical procedures such as nasogastric drainage, broad-spectrum antibiotics, and intravenous fluids and electrolytes must be used. However, patients with total obstruction are candidates for surgical intervention after initial resuscitation and antimicrobial therapy. One strong dose of an anthelmintic may cause a fully developed intestinal blockage and be indicated to prevent the spontaneous resolution of the entangled bolus [13].

Surgical treatment includes performing milking of the worms distantly in the intestine, an enterotomy to remove the worms from the colon, or an intestinal resection with an entero-entero anastomosis in cases of necrosis [13]. If the obstruction is at the ileal level, the worms may be delicately milked to the cecum without damaging the bowel wall. Enterotomy must be performed if the obstruction is at the jejunum level since milking the bolus to the ileocecal valve could injure the bowel wall [6,12].

An ileum enterotomy was performed in our case because the extent of the infestation prevented milking all *Ascaris lumbricoides* to the large bowel and could have damaged the intestinal wall. This allowed the majority of the roundworms to be removed, with the remainder requiring medical treatment with albendazole once intestinal transit had resumed. After taking the history of the present illness, the patient's parents did not know that their child previously had intestinal worms, except for a history of diarrhea and vomiting several times.

Due to the possibility of residual worms developing a worm bolus and spastic paralysis, anthelmintic therapy should be started 3 to 5 days following surgery, after the first bowel movement [6]. To eliminate any worms, mebendazole or albendazole 100 mg twice daily for 3 days must be started following resolution and repeated 6 weeks later [13]. Resolution is defined as the occurrence of any two of the following criteria: beginning of defecation, removal of colicky discomfort, and disappearance of air-fluid levels [13].

A delay in therapy can cause intestinal perforation, intestinal gangrene, and worm spillover into the abdominal cavity [14,15]. In children aged under 10 years, the mortality rate from ascariis intestinal blockage is 5.7 % [16].

4. Conclusion

Infestation with roundworms is widespread in developing countries, and although the majority of the intestinal obstruction they cause may be treated conservatively, in some circumstances, surgery may be required. The author would like to make some key recommendations to

highlight the importance of population sanitary hygienic education (especially for risk groups), implementation of anti-helminthic medication programs, and educating authorities and leaders about intestinal parasitism because prevention is the most crucial aspect of this disease.

Patient consent

Written informed consent was obtained from the child's parents or guardians for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Conflicts of interest

N/A.

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