Annals of Medicine and Surgery 78 (2022) 103808

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.elsevier.com/locate/amsu

Case Report

Intestinal obstruction in a child with massive ascariasis and associated acute appendicitis: A case report

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ARTICLE INFO

Keywords:
Intestinal obstruction (IO)
Soil transmitted helminths
Ascaris lumbricoides (A. Lumbricoides)
Computed tomography (CT)
Ultrasonography

ABSTRACT

Introduction and importance: Ascaris lumbricoides is a parasitic roundworm that spread through feces-oral routes and is endemic in many nations with poor sanitation.
Case presentation: We present a case of a 6-year-old boy who arrived in the emergency room with abdominal pain, constipation, and vomiting. Physical examination revealed abdominal distension, absence of bowel sounds, and abdominal tenderness. Abdominal radiographs, ultrasonography, and computed tomography established the diagnosis of intestinal obstruction by A. lumbricoides with associated acute appendicitis and surgical approach scheduled. A massive intraluminal nematode from the jejunum to the ileocecal valve was observed during an exploratory laparotomy. An ileal enterotomy was performed and the worms were removed. The patient was discharged without incident on the 12th day.
Clinical discussion: Ascariasis is the most common helminthic infection worldwide; reaching peak prevalence in children aged 2 to 10. The disease is prevalent in children with environmental and socioeconomic risk factors, causing serious problems such as intestinal obstruction (IO), volvulus, intussusception, and intestinal necrosis.
Conclusion: Ascaris lumbricoid is very prevalent in developing countries and should be kept in mind in preschool children with symptoms of sudden acute intestinal obstruction. The diagnosis of intestinal ascariasis can usually be made with plain radiography, barium examinations, and ultrasonography of the abdomen. Other modalities, such as CT, can also be used. Medical treatment of Ascaris infestation is usually successful; however, bowel obstruction may require surgery.

1. Background

Ascarislumbricoides infects 1.5 billion people worldwide, primarily in tropical and subtropical areas, and is a major cause of morbidity and mortality in Sub-Saharan Africa, America, China, and East Asia [1]. Although ascaris is mainly asymptomatic, symptomatic ascariasis presents with pneumonitis, hepatobiliary or pancreatic damage, growth retardation, intestinal obstruction (IO), or peritonitis. Ascariasis is a frequent cause of IO in children with an acute presentation that has been reported in a number of cases where an increased worm infestation partially or fully obstructs the intestinal lumen [2]. Early detection of intestinal obstruction caused by A. lumbricoides is very useful to avoid its serious and lethal complications. Here, we report ultrasound (USG), X-ray, and computed tomography (CT) findings in a 6-year-old boy with mechanical IO due to Ascaris lumbricoides (A. lumbricoides).

2. Case report

A 6-year-old child, a son of parents with low educational and socio-economic levels and no sewer service at home in remote rural areas, was brought to the emergency department with abdominal pain, constipation, and several episodes of bilious vomiting associated with the presence of worms in his mouth and anus during the past 24 hours, as reported by his parents. According to the patient's family history, his eldest brother died a year ago with the same symptoms and signs. The assessments of other systems were unremarkable. On examination, the child was thin, irritable, and moderately dehydrated, with signs and symptoms of malnutrition. Except for a temperature of 37 °C, his fatal signs were normal. Tenderness and rigidity in the mid-abdomen were observed during an abdominal examination. Laboratory tests were done at the time of admission. The haemoglobin level was 10.3 g/100 mL, and

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https://doi.org/10.1016/j.amsu.2022.103808
Received 23 February 2022; Received in revised form 14 May 2022; Accepted 14 May 2022
Available online 18 May 2022

the red blood cell count was 4.14 106/L. The total leukocyte count was increased to 20 103/L, and the number of eosinophils was increased (20%). Multiple pairs of curvilinear echogenic lines were seen on abdominal ultrasonography (USG) within an adynamic, fluid-filled small intestine (Fig. 1). During real-time observation, these structures seemed to move freely. Multiple loops of dilated bowel can be seen throughout the abdomen on abdominal radiography. Multiple air-filled tubular structures, mainly in the right lower quadrant, are also noticeable on abdominal radiography (Fig. 2). Computed tomography (CT) also demonstrated multiple massively dilated loops of small bowel. Multiple elongated, tubelike structures, some of which were air filled, were seen within most of the small bowel loops. Moreover, appendix diameter measures 8mm with diffuse wall thickness increase. (Fig. 3). These findings represent mechanical small bowel obstruction by ascariasis with associated acute appendicitis. The patient underwent emergent surgery. It was observed that the small bowel predominantly ileocecal region completely filled with parasites with inflamed appendix and the diagnosis was confirmed (Fig. 4). The patient was discharged without incident on the 12th day.

3. Discusion

Approximately 2 billion people are infected with at least one species of Soil Transmitted Helminths (STH), with one billion being infected with A. lumbricoides and another 4 billion at risk. Infection with Ascaris lumbricoides affects approximately 1.5 billion people worldwide. Children are prone to infection with environmental and socioeconomic risk factors that have an impact on child health [3]. The Ascaris life cycle begins with ova in human feces, which is then swallowed via the fecal-oral pathway. The larvae hatch in the intestine and then penetrate through the mucosa, gaining access to the portal circulation. The larvae then migrate to the lungs, where they mature for about two weeks, make their way to the bronchi and reach the oropharynx, where they are swallowed once again. The worms ultimately settle in the small intestine, where they stay and lay eggs that are expelled in the feces [4]. The majority of Ascaris lumbricoides infestations are asymptomatic. However, due to the high prevalence of disease, the global burden of symptomatic disease remains relatively high. Individuals with a high worm load are more likely to develop symptomatic disease. Heavy infestations with Ascaris are frequently believed to result in abdominal discomfort, anorexia, nausea, and diarrhea. In a severe Ascaris infestation, a mass of worms can restrict the intestine lumen, leading to acute intestinal obstruction. The ileocecal valve is the most common site of heavy infestation and obstruction. Symptoms include colicky abdominal pain, vomiting, and constipation. Worms may be detected in the vomitus. Volvulus, ileocecal intussusception, gangrene, and intestinal perforation are all possible complications [5]. Acute appendicitis may occur due to the occlusion of the appendiceal lumen by adult Ascaris worms or may result from the secondary infection of Ascaris eggs [6]. Plain radiography, barium examinations, ultrasonography (USG), and CT scan radiological appearances of intestinal A. lumbricoides infestation and associated complications have been characterized. When the Ascaris are few in number, plain radiography of the abdomen may be normal. In severe infestations, the aggregated Ascaris may appear as a tangled group of thick cords contrasted against the bowel gas. The Ascaris appear as elongated, smooth, cylindrical, and frequently coiled radiolucent filling defects within the barium-filled intestinal lumen on barium imaging. Worms mostly found in the jejunum and ileum. Real-time The US is also an excellent method to evaluate intestinal worms. The orientation of the worm relative to the probe, transducer resolution, the presence or absence of fluid around the worm, the segment of the worm examined (head or body), and whether the worm is dead or alive all influence sonographic findings. In the USG examination, the adult worm will be depicted as a hypoechoic tubular structure with well-defined echogenic walls. During real-time evaluation, the worms can be seen making real movements. Although CT is not the preferred approach for diagnosing ascariasis, the worms may frequently be seen within the intestinal lumen through soft-tissue windowing [7].

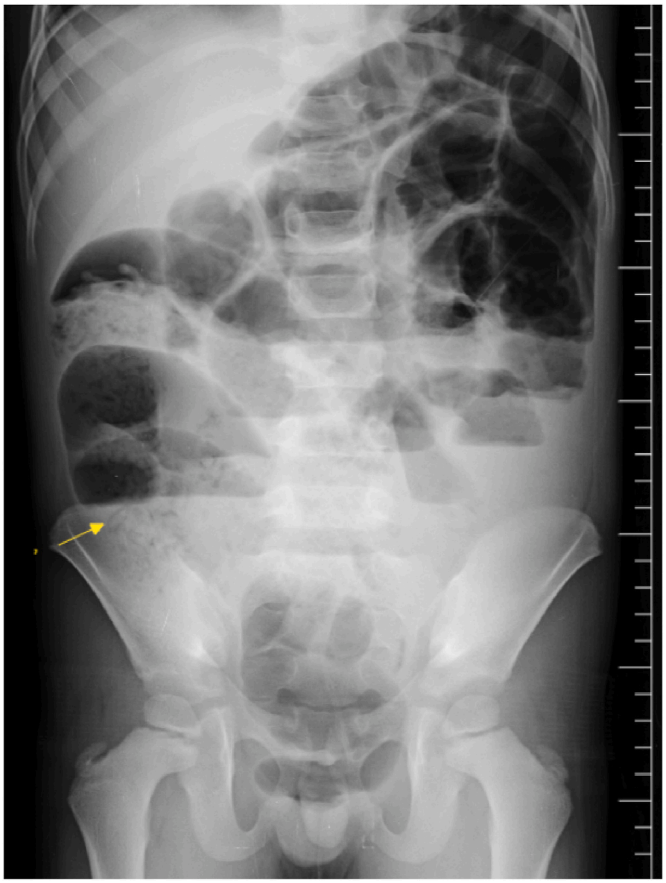

Fig. 1. Multiple loops of dilated bowel can be seen throughout the abdomen on abdominal radiography. Multiple air-filled tubular structures, mainly in the right lower quadrant, are also noticeable on abdominal radiography (Fig. 1).

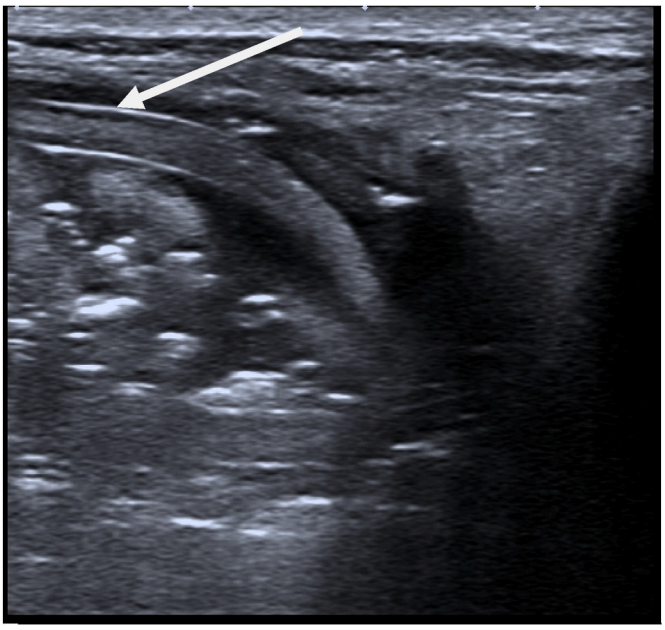

Fig. 2. Multiple pairs of curvilinear echogenic lines were seen on abdominal ultrasonography (USG) within an adynamic, fluid-filled small intestine (Fig. 2).

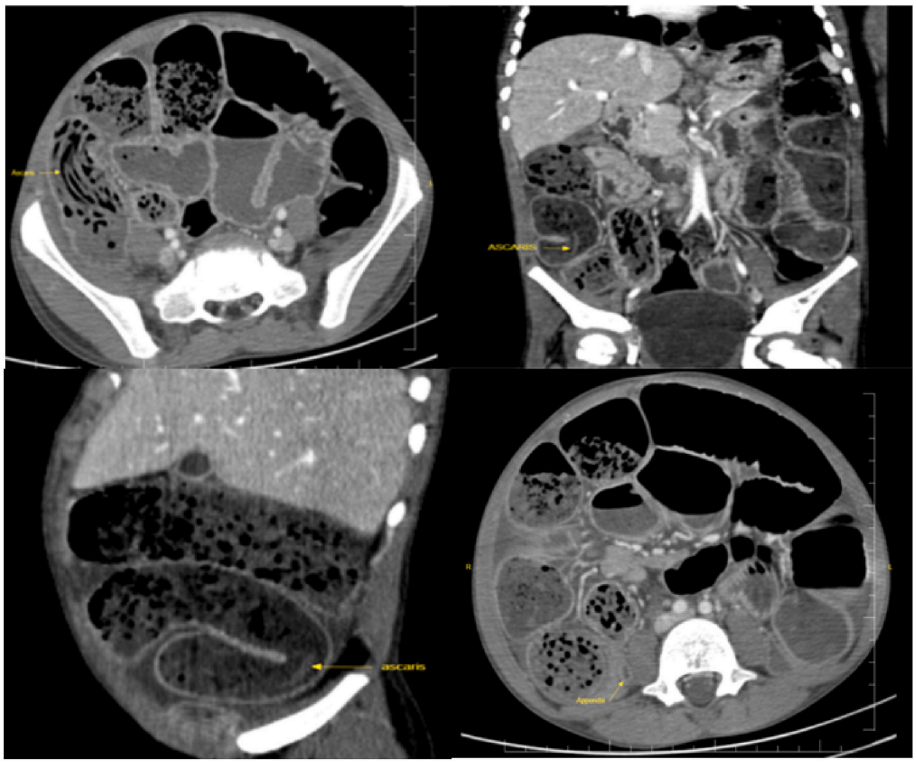

Fig. 3. Massively dilated loops of small bowel with multiple elongated, tubelike structures, some of which were air filled, were seen within most of the small bowel loops. Moreover, appendix diameter measures 8mm with diffuse wall thickness increase and no features suggesting its perforation.

Fig. 4. Physical appearance of Ascaris Lumbricoides extracts during exploratory laparotomy.

Treatment with a single 400-mg dosage of albendazole administered orally is usually successful. Surgery, on the other hand, is frequently suggested in the case of bowel obstruction. In this case, the patient underwent emergency surgery for high-grade small bowel obstruction, and an enterotomy was performed to remove the worms after careful milking of the worms, as multiple abnormal contents in the small intestine had been found at the laparotomy, and recovery was complete. The work has been reported in line with the SCARE 2020 criteria [8].

4. Conclusion

Ascaris lumbricoid is very prevalent in developing countries and should be kept in mind in preschool children with symptoms of sudden acute intestinal obstruction. The diagnosis of intestinal ascariasis can usually be made with plain radiography, barium examinations, and ultrasonography of the abdomen. Other modalities, such as CT, can also be used. Medical treatment of Ascaris infestation is usually successful; however, bowel obstruction may require surgery. To avoid serious life-threatening sequelae from A. lumbricoides infestation, improvements in sanitation, health education, and anthelmintic treatment must be implemented in endemic zones. Infestation, as some of them requires urgent surgery.

Ethical approval

Ethical approval for this study was waived by ethical committee of Mogadishu Somali Turkey, Recep Tayyip Erdogan Training and Research Hospital.

Source of funding

No funding was received.

Author contribution

*AME wrote the case report and discussion and **writing**- Reviewing and Editing.* CÇ examined the radiological films and wrote the radiology report**.** SMAJ Wrote abstract and introduction. AMD and İCİ approval of

the final version.

Trial registry number

1. Name of the registry:
2. Unique Identifying number or registration ID:
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

Guarantor

Abdinasir Mohamed Elmi.

Consent for publication

Written informed consent was obtained from the patient's parents 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.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Declaration of competing interest

The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2022.103808.

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