International Journal of Surgery Case Reports 109 (2023) 108486

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

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

Case report

Ascariasis causing small bowel obstruction in an adult female: A case report

Anteneh Messele Birhanu [a,*], Suleman Hassen Mohammed [b], Bizuayehu Tassew Gossaye [b], Molla Asnake Kebede [a]

[a] Department of Medicine, School of Medicine, College of Medicine and Health Sciences, Mizan-Tepi University, Mizan Teferi, Ethiopia
[b] Department of Surgery, School of Medicine, College of Medicine and Health Sciences, Mizan-Tepi University, Mizan Teferi, Ethiopia

ARTICLE INFO

Keywords:
Case report
Ascariasis
Small bowel obstruction
Adult
Intestinal obstruction

ABSTRACT

Introduction and importance: Ascariasis is a helminthic infection of humans caused by *Ascaris lumbricoides*. Intestinal obstruction from ascariasis can result in a rare but severe and often fatal surgical emergency of intestinal perforation and peritonitis in endemic areas. There have been reports of ascariasis causing Small Bowel Obstruction (SBO) in children in endemic areas but this phenomenon has not been studied in adults. The objective of this study was to describe the case of ascariasis causing SBO in a 25-year-old female.

Case presentation: A 25-year-old female from southwest Ethiopia presented with a complaint of intermittent crampy abdominal pain of 02 days duration associated with vomiting of ingested matter of 02 to 03 episodes, progressive abdominal distension and failure to pass feces and flatus. On examination, she was acutely sick looking. She has mild abdominal distention and a hyperactive bowel sound. Subsequently, she was resuscitated, broad spectrum antibiotic started, consent taken & operated. Patient discharged on the 7th postoperative day.

Clinical discussion: There have been reports of Ascariasis causing SBO in endemic areas of the tropics and subtropics. SBO secondary to the ascaris ball in an adult is very rare and is relevant to present as it adds key clinical lessons in the consideration as a differential diagnosis, investigation clues and patient management.

Conclusion: In a patient presented with symptoms and signs suggestive of bowel obstruction, Ascariasis should be considered as a differential diagnosis for those from endemic areas. The treating physician should have a high index of suspicion.

1. Introduction

Ascariasis is a helminthic infection of humans caused by *Ascaris lumbricoides (AL),* the nematode. *AL* is the most prevalent and largest of the human helminths. The normal habitat of the adult worm is the jejunum. The infection is acquired by the ingestion of the embryonated eggs, and the larvae pass through a pulmonary migration phase for maturation [1].

Ascariasis infects 25 % of the world's population [1,2]. It remains highly endemic throughout much of the tropics and sub-tropics [2]. The global pooled prevalence of tested positive for Ascaris infection was 11.01 % with variation across regions with the highest found in Central & Southern Asia, 13 %, Latin America & the Caribbean 12.75 % and sub-Saharan Africa, 11.66 %. [3] There is also variation in prevalence among countries; Chad (48.19 %), Liberia (42.45 %), Ecuador (39.58 %), Madagascar (37.16 %), the Philippines (34.69 %), Solomon Islands (33.96 %), Indonesia (32.02 %), Rwanda (31.22 %) and Sri Lanka (30.81 %) [3]

The prevalence is highest globally in children, rural residents and low and middle income levels [1,3–5]. Ascariasis has the highest prevalence noted among children with peak age between 2 and 10 years [2,3].

In endemic areas, the majority of A. lumbricoides infections cause mild or no symptoms. Clinical disease is restricted to a small percentage of individuals with a high parasite burden, as most individuals harbour only a few worms [1,6].

AL is a rare cause of bowel obstruction in children [4,5] including endemic areas and very rare to cause problems in adults.

The objective of this study was to describe the case of ascariasis causing small bowel obstruction (SBO) in 25- year-old adult female from South West Ethiopia who was managed surgically and discharge on the 7th postoperative day. This case report has been reported in line with the SCARE 2020 Criteria [7].

* Corresponding author.
E-mail address: antenehmessele@mtu.edu.et (A.M. Birhanu).

https://doi.org/10.1016/j.ijscr.2023.108486
Received 5 June 2023; Received in revised form 26 June 2023; Accepted 28 June 2023
Available online 8 July 2023
2210-2612/© 2023 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

2. Case presentation

Twenty-five (25) year old adult female from southwest Ethiopia presented with a complaint of intermittent crampy peri-umbilical abdominal pain of two (02) days duration associated with vomiting of ingested matter of two to three episodes, progressive abdominal distension and failure to pass feces and flatus. The patient had a history of passage of adult ascaris worm in the stool, a month back but did not seek care.

On examination, the patient was acutely sick looking, alert, not in cardiorespiratory distress, and has a lean body mass. The vital signs were; blood pressure of 120/70 mmHg, pulse rate of 104 beats per min, respiratory rate was 14 breaths/min and a temperature of 36.9 °C. She has pink conjunctiva and non-icteric sclera and wet lip and oral mucosa. Abdominal examination revealed that it moves with respiration, peri-umbilical distention but no visible bowel loops, hyperactive bowel sound, soft and non-tender, there was 6 cm by 5 cm soft mobile non-tender mass on right lower quadrant and there was a formed stool on examining fingers on digital rectal examination. The palms were warm and no palmar pallor.

The complete blood count was all in the normal range. A plain erect abdominal x-ray revealed that there were peripherally located dilated multiple air-fluid levels with regularly spaced valvulae conniventes and paucity of air in the rectum. (Fig. 1).

The initial differential diagnosis considered was SBO secondary to volvulus and intussusception Bilateral Intravenous (IV) line was secured and resuscitated with two liters of normal saline then on maintenance fluid, catheterized with a urine output of 0.8 ml/kg/h. A nasogastric tube was inserted with a greenish fluid output of 300 ml over 36 h and kept in situ. The patient was on conservative management for about 36 h. But she had no significant improvement. At the time of decision, the patient had still abdominal pain and distension, NGT output decreased over the past 12 h; the vital signs were; blood pressure of 100/60 mmHg and pulse rate of 108 beats per minute.

Exploratory laparotomy was decided, and the patient was taken to the operation room (OR) after written informed consent was taken. A broad spectrum antibiotic was given (Ceftriaxone 1 g Intravenously (IV) twice a day and Metronidazole 500 mg IV three times a day).

Under general anesthesia and patient in supine exploratory laparotomy was done by a senior general surgeon with the assistance of a general practitioner through a midline incision surgical approach at a general hospital. Intra-operatively, the ileum rotated 360^{o} clockwise on its mesentery using the ascaris ball as an axis. (Fig. 2). An enterotomy of about 3 cm was done on the ileum where the mass of ascaris was located. Extraction of the ascaris ball manually and with non-toothed pick-up and milking through the stoma done. (Fig. 3). The Heineke-Mikulicz enterotomy of longitudinal incision and transverse closure applied.

Postoperatively, the patient was kept nothing per os (NPO), maintenance fluid alternatively of normal saline, ringers lactate and 5 % dextrose in normal saline for 24 h, ceftriaxone 1 g IV two times a day, metronidazole 500mg IV three times a day and tramadol 50 mg IV three times a day until the 3rd postoperative day given. Started sips on the 3rd postoperative day when an integrated bowel movement started. The NGT was kept in situ and removed after 24 h when no output. The patient was discharged on the 7th postoperative day. Postoperative condition was uneventful. Upon discharge, she was dewormed with a single dose of Albendazole 400 mg orally with all her family members. She was on a follow-up to the surgical referral clinic.

3. Discussions

A case of ascariasis causing SBO in the 25-year-old adult female is presented in this report. Ascariasis infections remain highly endemic throughout much of the tropics and sub-tropics. Although substantial declines in some regions were recorded, it remained unacceptably high in these regions [2].

The normal habitat of the adult worm is the jejunum [1]. Adult

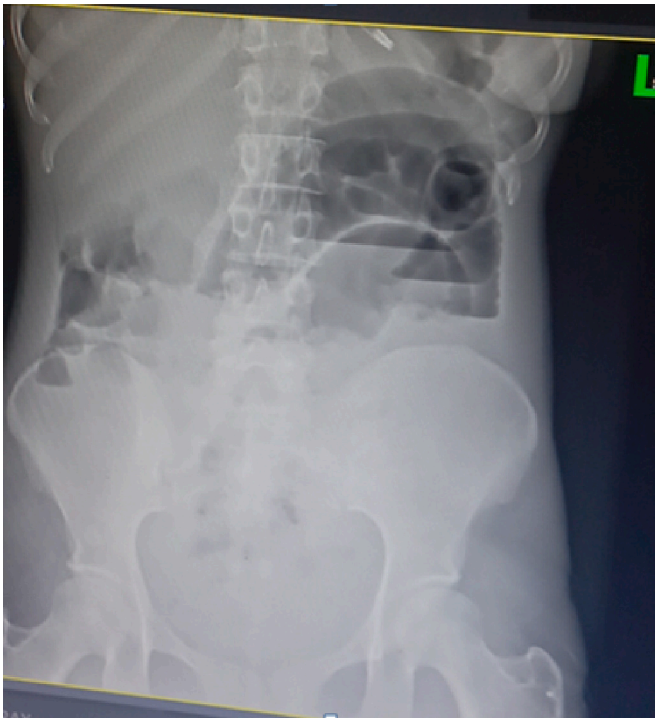


Fig. 1. Plain Abdominal radiograph demonstrating peripherally located multiple-air-fluid levels.

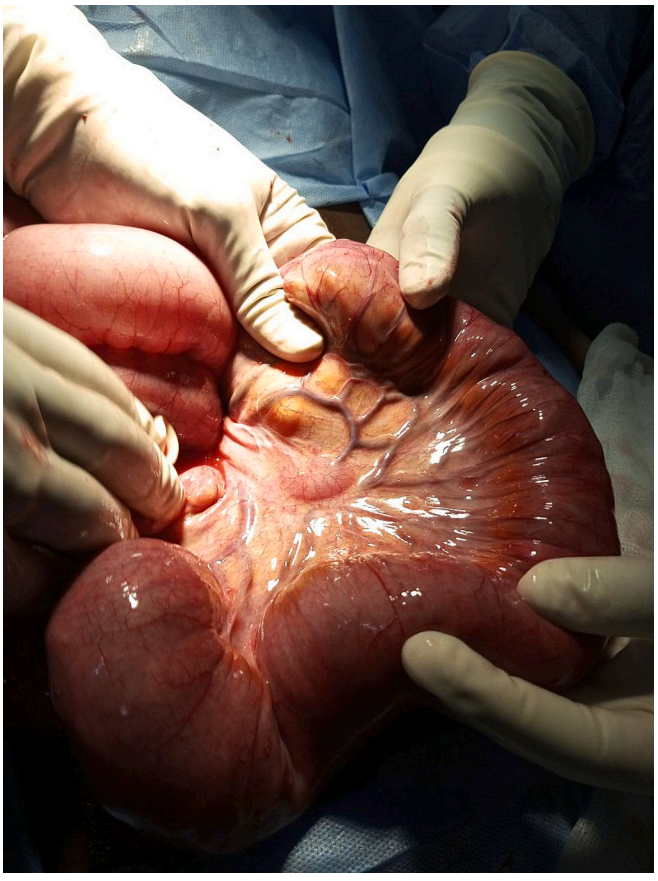


Fig. 2. 360^{0} clockwise rotated ilium on its mesentery using the ascaris ball as an axis and proximally dilated loop when the abdomen is opened.



Fig. 3. The image shows mass/bundles of A. lumbricoides worms extracted from a section of obstructed small intestine following enterotomy in a 25 -year-old Woman.

parasites dwelling in the small intestine can induce, depending on their numbers, various gastrointestinal and hepatobiliary complications [6] including ileal perforation [8], intussusception [9], intestinal obstruction [10–13], upper gastrointestinal bleeding, volvulus, peritonitis, biliary colic, acute cholecystitis, acute pancreatitis, acute cholangitis and hepatic abscess [6].

Intestinal obstruction from ascariasis can result in a rare but severe and often fatal surgical emergency of intestinal perforation and peritonitis in endemic areas [8,14]. It is important to consider AL in the differential diagnosis of patients presenting with bowel obstruction especially those living in endemic areas or immigrants from temperate and tropical countries.

Intestinal Ascaris lumbricoides infestation and associated complications can be investigated with the use of plain radiography, barium examinations, ultrasonography (USG), and CT scan. In severe infestations, the aggregated Ascaris may appear as a tangled group of thick cords contrasted against the bowel gas in plain abdominal x-ray but may be normal when the ascaris is few in number. The Ascaris appear as elongated, smooth, cylindrical, and frequently coiled radiolucent filling defects within the barium-filled intestinal lumen on barium imaging. Abdominal ultrasound (US) used to detect 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. With all these advantages, the abdominal US is considered an excellent method to evaluate intestinal worms. Abdominal computed tomography (CT) is not the preferred approach for diagnosing ascariasis. However, the worms may frequently be seen within the intestinal lumen through soft-tissue windowing [10,15].

The World Health Organization (WHO) recommended deworming with albendazole (400 mg) and mebendazole (500 mg) of children, women of reproductive age including pregnant mothers (Pyrantel pamoate in the first trimester) [1] in all endemic countries periodically as these drugs are effective, inexpensive and easy to administer so as to reduce morbidity by reducing the worm burden [16–18].

There have been reports of Ascariasis causing SBO in endemic areas of the tropics and sub-tropics and immigrants of these areas [5,10–13]. However, there is no single report of the case in adult as to the best of the author's knowledge. SBO secondary to the ascaris ball in an adult is very rare and relevant to present as it adds key clinical lessons in the consideration as a differential diagnosis, investigation clues and patient management.

4. Conclusion

In a patient presented with symptoms suggestive of intestinal obstruction, ascariasis should be considered as a differential diagnosis for those from endemic areas or immigrants from temperate and tropical countries.

It is important to note the passage of the ascaris worm in the vomitus and stool including digital rectal examinations. The treating physician should have a high index of suspicion for Ascariasis From history, physical examination and investigation clues of AL, timely surgical treatment should be undertaken. Medical treatment with Albendazole, Mebendazole or Pyrantel pamoate (pregnancy) should be provided to the index case as well as the family members upon discharge. Deworming for children and pregnant mothers in endemic areas is a recommendation.

Abbreviations

AL	Ascaris Lumbricoides
IV	Intravenous
NGT	Naso Gastric Tube
NPO	Nothing per os
OR	Operation Room
SBO	Small Bowel Obstruction
US	Ultrasound
WHO	World Health Organization

CRediT authorship contribution statement

Anteneh Messele, MD: Involved in the conception and design of the study, drafting and revising of the article and final approval of the version to be submitted and also involved in direct management of the patient.

Suleman Hassen, MD: Involved in the conception and design of the study, drafting and revising of the article and final approval of the version to be submitted and also involved in direct management of the patient.

Bizuayehu Tassew, MD: Involved in the design of the study, drafting and revising of the article and final approval of the version to be submitted.

Molla Asnake, MD: Involved in the design of the study, drafting and revising of the article and final approval of the version to be submitted.

All authors agreed to be accountable for all aspects of the manuscript.

Informed consent

Written informed consent was obtained from the patient 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.

Ethical approval

The case report has been submitted for Ethical Review Committee and approved as ethically sound.

Funding

No funding.

Registration of research studies

Not applicable.

Guarantor

Anteneh Messele Birhanu.

Declaration of competing interest

No potential conflict of interest relevant to this article was reported.

Data availability

The authors of this manuscript are willing to provide any additional information regarding the case report upon official request.

Acknowledgments

We would like to thank our patient and patient family for willingness to let use the images for publication.

References

[1] M.S. Khuroo, Ascariasis, Gastroenterol. Clin. N. Am. 25 (3) (1996) 553–577.
[2] R.L. Pullan, J.L. Smith, R. Jasrasaria, S.J. Brooker, Global numbers of infection and disease burden of soil transmitted helminth infections in 2010, Parasit. Vectors 7 (1) (2014) 37.
[3] C. Holland, M. Sepidarkish, G. Deslyper, A. Abdollahi, S. Valizadeh, A. Mollalo, et al., Global prevalence of Ascaris infection in humans (2010−2021): a systematic review and meta-analysis, Infect Dis Poverty. 11 (1) (2022) 113.
[4] R. Steinberg, J. Davies, A.J. Millar, R.A. Brown, H. Rode, Unusual intestinal sequelae after operations for Ascaris lumbricoides infestation, Pediatr. Surg. Int. 19 (1–2) (2003) 85–87.
[5] I. Yetim, O.V. Ozkan, E. Semerci, R. Abanoz, Rare cause of intestinal obstruction, Ascaris lumbricoides infestation: two case reports, Cases J. 2 (2009) 7970.
[6] K.J. Else, J. Keiser, C.V. Holland, R.K. Grencis, D.B. Sattelle, R.T. Fujiwara, et al., Whipworm and roundworm infections, Nature Reviews Disease Primers. 6 (1) (2020) 44.
[7] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.
[8] Y.D. Molla, A.D. Beza, A.K. Tadesse, I.O. Answar, Ascaris lumbricoides a rare cause ileal perforation, a case report, Int. J. Surg. Case Rep. 105 (2023), 108097.
[9] H. Nikolić, G. Palčevski, G. Saina, M. Peršić, Chronic intussusception in children caused by Ascaris lumbricoides, Wien. Klin. Wochenschr. 123 (9–10) (2011) 294–296.
[10] A.Y. Ali, A. Mohamed Abdi, E. Mambet, Small bowel obstruction caused by massive ascariasis: two case reports, Annals of Medicine and Surgery. 85 (3) (2023).
[11] A.M. Elmi, C. Çelik, S.M. Alı Jama, A.M. Dirie, Gedi ibrahim I., Intestinal obstruction in a child with massive ascariasis and associated acute appendicitis: a case report, Annals of Medicine and Surgery. 78 (2022), 103808.
[12] C. Fata, F. Naeem, E.R. Barthel, Small bowel obstruction secondary to Ascaris lumbricoides in the setting of prior exploratory laparotomy, J Pediatr Surg Case Rep 47 (2019), 101254.
[13] C.M. Mbanga, K.S. Ombaku, K.N. Fai, V.N. Agbor, Small bowel obstruction complicating an Ascaris lumbricoides infestation in a 4-year-old male: a case report, J. Med. Case Rep. 13 (1) (2019) 155.
[14] S.E. Efem, Ascaris lumbricoides and intestinal perforation, Br. J. Surg. 74 (7) (1987) 643–644.
[15] C.J. Das, J. Kumar, J. Debnath, A. Chaudhry, Imaging of ascariasis, Australas. Radiol. 51 (6) (2007) 500–506.
[16] 2030 Targets for Soil-transmitted Helminthiases Control Programmes. Geneva: World Health Organization.
[17] Standard Treatment Guideline for general hospitals in Ethiopia, Ethiopian Federal Ministry of Health 2020.
[18] Guideline: preventive chemotherapy to control soil-transmitted helminth infections in at-risk population groups. Geneva: World Health Organization; 2017.

Anteneh Messele Birhanu is an Assistant Professor, Department of Medicine, School of Medicine, College of Medicine and Health Sciences at Mizan – Tepi University, Ethiopia. **Anteneh Messele Birhanu** is a Medical Doctor and has MPH

Suleman Hassen Mohammed and **Bizuayehu Tassew Gosaye** are Assistant Professors of General Surgery, Department of Surgery, School of Medicine, College of Medicine and Health Sciences at Mizan – Tepi University, Ethiopia. **Suleman Hassen Mohammed** and **Bizuayehu Tassew Gosaye** are Medical Doctors and has Specialty Certificate in General Surgery

Molla Asnake Kebede is an Assistant Professor in General Medicine, Department of Medicine, School of Medicine, College of Medicine and Health Sciences at Mizan – Tepi University, Ethiopia. **Molla Asnake Kebede** is a Medical Doctor and has been certified on ICU Care and currently working in ICU.