

Small bowel volvulus due to helminthic infestation in a child

D. I. Samarweera¹, A. U. Wijmanne²

¹ National Hospital of Sri Lanka.

² Teaching hospital, Kurunegala, Sri Lanka.

Key words: *Ascaris lumbricoides*; intestinal obstruction; volvulus; surgery for complications

Introduction

Ascaris lumbricoides is the largest and the commonest intestinal nematode infesting the humans and is estimated to infect 1.5 billion people worldwide. Asia (73%), sub Saharan Africa (12%) and South America (8%) share most of the global disease burden because the tropical climate and low socioeconomic status prevalent in these regions favouring worm transmission. *Ascaris* is transmitted by ingestion of infective egg contaminated food or water. The larva hatches out and pierces the small intestine wall on the fourth day to enter the blood stream. Once trapped in pulmonary circulation, it pierces the alveolar membrane and migrates upstream in the airways towards the pharynx and re enter the digestive tract. After further maturation male and female worms occupy the jejunum and reach sexual maturity by 9-11 weeks. Adult worms grow up to 15-30cm in size and live for 10-24 months while the female lays 200,000 eggs per day. Fertilized eggs are excreted in faeces and mature in favourable soil to become infective over several weeks. They can remain viable up to 10 years until such conditions ensue [1]. The worm load of an individual is a result of cumulative exposure over time as adults do not multiply within the gut.

Case presentation

A three year and 10 months old boy complaining of abdominal pain, abdominal distension and progressive food intolerance for two days was transferred from a rural hospital to Rathnapura hospital. He was the youngest of four children from a plantation worker's family who shared latrine facilities with the community. The child weighed 14kg (compatible with 15th percentile weight for his age) but was free of significant pathologies. He had received anthelmintic drugs as part of a mass treatment programme a day prior to the onset of symptoms. He was admitted with above symptoms to the

rural hospital next day and was transferred for further care to Rathnapura hospital as the child became progressively ill despite conservative management.

Upon reception, the child was restless, moderately dehydrated and pale. He was tachycardic but not febrile and did not comply with abdominal examination. A supine abdominal x ray revealed distended bowel loops with "whirlpool" appearance (Figure 1). Initial blood investigations revealed WBC $11000 \times 10^3/L$ with 5% eosinophils, Hb 10.5g/dL, serum Na⁺ 135 mmol/L, K⁺ 4.5 mmol/L and CRP of 10mg/L. After resuscitation he was taken to theatre for urgent surgical exploration. Findings during laparotomy included multiple distended small bowel loops filled with dead worms. The terminal ileum was in volvulus with gangrene and



Figure 1. Abdominal radiography of the patient showing whirlpool image


spontaneously perforated when detorsion was attempted. A total of 162 worms were removed from the bowel (Figure 2) until obstruction was relieved by milking them out through the perforation.

Gangrenous ileum was resected and a primary ileocolic anastomosis between jejunum and ascending colon was

Correspondence: D. I. Samarweera

E-mail: disamaraweera@gmail.com

Received: 06-09-2017 Accepted: 01-10-2017

 <http://orcid.org/0000-0001-8334-8157>

DOI: <http://doi.org/10.4038/sljs.v35i3.8413>





Figure 2. Worms removed during surgery

constructed. The child received post operative critical care observation for two days and subsequently made a complete recovery within a week. His discharge plan included administration of Anthelmintic Treatment (AT) in six weeks, nutritional therapy and instructions on hygienic practices for the whole family to prevent reinfection.

Discussion and conclusion

Ascaris infestation is a global epidemic with prevalence as high as 95% in some populations [2]. In Sri Lanka the vulnerable communities include plantation workers with 77% of children having evidence of infection, mostly acquired due to poor hygienic practices [3]. Many infected individuals remain asymptomatic but children between 2-10 years of age develop symptoms due to small calibre of intestine and of the ileocecal valve. Symptoms of Ascariasis are often nonspecific and include abdominal discomfort, anorexia, nausea and sometimes passage of adult worms with stools or vomitus. Complications include malnutrition with growth retardation due to high worm burden, and obstruction of the intestinal lumen or the biliary tree by migrating worms. Such episodes may be triggered by stressors such as AT, fever, fasting or anaesthesia.

Intestinal obstruction (IO) is the commonest complication of Ascariasis and considered the commonest cause of abdominal surgical emergency in children in susceptible communities [1]. Other complications include volvulus, ileocecal intussusception, gangrene, perforation and acute appendicitis. The usual site of blockage is the ileocecal valve and patients present with features of IO together with a shifting mass in right lower quadrant. Laboratory findings may demonstrate a peripheral eosinophilia. Stool microscopy only demonstrates ova if symptoms develop after 40 days of infestation, therefore is not useful for diagnosis in the acute setting.

Useful imaging in arriving at a diagnosis includes plain X ray abdomen demonstrating collections of worms contrasting against bowel gas which is known as the “whirlpool effect”. Ultrasound scan can demonstrate the “railway tract sign”; multiple curvilinear echogenic strips without acoustic shadowing within bowel lumen. Contrast studies, CT and MRI scans are useful but not mandatory in straightforward cases. Patients with intestinal obstruction are initially managed conservatively but surgery is indicated when there is complete obstruction, lack of clinical response within 24-48 hours or volvulus, intussusception, appendicitis or when perforation is imminent.

A single heavy dose of AT, specially paralytic agents should not be used in this setting as it can convert a partial obstruction to a complete obstruction [4]. Surgical management includes worm extraction by enterotomy together with resection and anastomosis in the presence of gangrene or perforation. Attempting to evacuate all the worms can result in bowel injury due to excessive handling so only the obstructing mass is removed. The rest is managed with AT administered once the intestinal transit is restored and repeated around six weeks of discharge. AT is highly effective in elimination of worms (95-100% success rate) but does not confer protection against reinfection. Up to 80% of individuals will acquire a worm load similar to pre-treatment value within six months of therapy [5] unless transmission of infection is controlled by improving sanitary and sewage facilities, public education and periodic mass antihelminthic treatment. Co-infection with other parasitic diseases and nutritional deficiencies are common therefore should be considered in all cases.

References

1. Khuroo, M.S., Ascariasis. *Gastroenterol Clin North Am*, 1996. 25(3): p. 553-77.
DOI: [https://doi.org/10.1016/s0889-8553\(05\)70263-6](https://doi.org/10.1016/s0889-8553(05)70263-6)
2. Pullan, R.L., et al., Global numbers of infection and disease burden of soil transmitted helminth infections in 2010. *Parasit Vectors*, 2014. 7: p. 37.
DOI: <https://doi.org/10.1186/1756-3305-7-37>
3. Sorensen, E., et al., The effect of the availability of latrines on soil-transmitted nematode infections in the plantation sector in Sri Lanka. *Am J Trop Med Hyg*, 1994. 51(1): p. 36-9.
DOI: <https://doi.org/10.4269/ajtmh.1994.51.36>
4. Salman, A.B., Management of intestinal obstruction caused by ascariasis. *J Pediatr Surg*, 1997. 32(4): p. 585-7.
DOI: [https://doi.org/10.1016/s0022-3468\(97\)90712-0](https://doi.org/10.1016/s0022-3468(97)90712-0)
5. Hall, A., K.S. Anwar, and A.M. Tomkins, Intensity of reinfection with *Ascaris lumbricoides* and its implications for parasite control. *Lancet*, 1992. 339(8804): p. 1253-7.
DOI: [https://doi.org/10.1016/0140-6736\(92\)91593-w](https://doi.org/10.1016/0140-6736(92)91593-w)

Learning Points:

- Symptoms and complications of Ascaris infection is still prevalent among children living in Sri Lanka.
- Significant morbidity in form of bowel gangrene, perforation and peritonitis is inevitable if prompt diagnosis and management is delayed.