

CASE REPORT

A CASE OF GANGRENOUS SMALL BOWEL VOLVULUS FOLLOWING ANTI-HELMINTHIC USE IN A 2-YEAR-OLD FEMALE TODDLER INFESTED WITH ASCARIS LUMBRICOIDES

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ABSTRACT

Ascaris lumbricoides infestation is the most common helminth affectation of humans worldwide. Intestinal obstruction caused by *Ascaris lumbricoides* is very common among young children in developing countries with poor hygienic conditions. While heavy infestation could of its own lead to intestinal obstruction, it has also been reported that use of anti-helminthic drugs can predispose heavily infested children to develop bowel obstruction.

The case of a 2-year-old female toddler who was heavily infested with ascaris and developed symptoms of intestinal obstruction following the use of anti-helminthic drugs was retrospectively reviewed. The diagnostic approach and treatment as well as relevant literature are reviewed.

A diagnosis of acute intestinal obstruction secondary to ascaris infestation was made and she had exploratory laparotomy after necessary resuscitation was done. The finding was small bowel volvulus with gangrenous segment. She had resection of the segment with evacuation of the ascaris worms and bowel anastomosis done. There was postoperative superficial surgical site infection which resolved and she has since maintained a progressive improvement in health.

This case highlights the need to withhold anti-helminthic drugs when heavily ascaris-infested children develop mild symptoms; doing conservative treatment and giving anti-helminthic drugs when symptoms have subsided.

Key words: *Ascaris lumbricoides, Anti-helminthic, Intestinal obstruction, Volvulus.*

INTRODUCTION

Ascaris lumbricoides infestation is the most common helminth affectation of humans worldwide; presenting major health issues especially in developing countries with poor hygienic conditions.¹⁻³ Of the more than 1.4

billion persons said to be affected globally, children aged 2-10 years have the highest prevalence.^{2,4}

The infestation occurs on ingestion of *Ascaris lumbricoides* ova in raw vegetables, other food, water or soil-contaminated hands.

The fertilized eggs hatch in the intestine and the released larvae penetrate the intestinal wall into the bloodstream, where it establishes residency in the lungs.⁵ After a process of maturing, the larvae when expectorated by the host are swallowed back into the intestine to develop into full-grown nematodes in the jejunum which perpetuate the cycle by producing ova which are either excreted through the faeces or hatch in the intestines and travel to the lungs via the bloodstream.⁵⁻⁷

Most patients with intestinal ascariasis present with nausea and intermittent abdominal discomfort while some patients remain asymptomatic, with ova found incidentally in stool samples.⁶ Complicated cases of ascariasis could manifest as pneumonitis, hepatobiliary or pancreatic damage, growth retardation, small bowel obstruction or peritonitis.⁸

The diagnosis of Ascariasis is made when ova are visualized in stool specimen. Treatment is achieved by a variety of anti-helminthic agents including albendazole, mebendazole, piperazine and pyrantel pamoate.⁹ A single albendazole dose of 200mg for children <2years or 400mg for children ≥2years and adults is the preferred treatment favoured by most authorities.^{9,10} While albendazole and mebendazole inhibit microtubule assembly and impair glucose uptake in the organism; piperazine and pyrantel pamoate act by paralysing the worms; which allows the host body to easily expel the parasite.⁹⁻¹¹

These anti-helminthic drugs (particularly pyrantel pamoate) are not recommended for patients with large worm burdens who have acute abdominal pain that may be suggestive of partial bowel obstruction because of the risk of precipitating complete obstruction.⁹ In such cases, conservative treatment is done with the anti-helminthic administered after symptoms subside.⁹

In cases of ascariasis already complicated by complete obstruction, treatment option is laparotomy with manual advancement of the mass of writhing worms toward the colon, enterotomy and milking out of worms, or bowel resection and end-to-end anastomosis for gangrenous loop.^{12,13}

The aim of this report is to present the case of a 2-year-old infested with ascariasis who developed complete bowel obstruction following use of anti-helminthics.

CASE REPORT:

A 2-year-old female toddler, who resided with her parents in rural settings of Irrua, was presented to the children emergency room with complaints of vomiting, inability to pass stool and abdominal distension of 3 days duration. These symptoms had progressed and worsened until presentation. There was associated fever and reduced urine output.

Some days prior to onset of symptoms, she was observed to have passed worms during defaecation, and she was given medication (thought to be levamisole) for this. Symptoms were said to have developed following the administration of the worm expeller as a single dosage.

On examination she was febrile, pale, had abdominal distension, generalized abdominal tenderness, tympanitic percussion notes and hypoactive bowel sounds. Also, a mass (which felt like a fixed bowel loop) was vaguely palpable around the periumbilical region but could not be well characterized because of tenderness.

Nasogastric tube passed drained bilious effluent while urethral catheterisation initially drained inadequate volume of urine (10mls).

Laboratory work-up showed hyponatremia and mild anaemia. Abdominal ultrasound scan done ruled out intussusception, which

was also considered. Plain abdominal radiograph confirmed there were features of bowel obstruction.

She had exploratory laparotomy after resuscitative optimisation. Findings were twisting of small bowel loops about a mesenteric vessel; the small bowel was loaded with many worms. A portion of the twisted bowel was gangrenous necessitating bowel resection and anastomosis (fig 1). Numerous ascaris worms were extracted from the bowel after resection; some active while others inactive (fig2). Intra-operative blood transfusion was done.

The patient had adequate post operative care including intravenous fluids, antibiotics and analgesics. However, she developed superficial surgical site infection necessitating prolonged periods of wound dressing. Also, albendazole brand of anti-helminth was given post-operatively.

Eventually she was discharged on 14th post-operative day. She was followed up in the surgical out-patient clinic and discharged after 4 months following sustained wellness in health.



Fig 1: Gangrenous bowel loops from resultant helminth volvulus



Fig 2: Numerous ascaris worms extracted from resected bowel loop

DISCUSSION:

The index patient hails from a rural setting where sewage control and personal hygiene are poor; conditions which have been established as very favourable for *Ascaris lumbricoides* helminthic infestation.^{1,2} In such environment, children particularly become heavily infested and prone to complications like mechanical intestinal obstruction by ascaris.¹²⁻¹⁶

Intraluminal intestinal obstruction can be caused directly by large numbers of ascaris worms entangled into a bolus.¹⁷ Such accumulated worm bolus could on the other hand result in intramural (intussusception) and extramural (small bowel volvulus) intestinal obstruction.⁸ These varieties of ascaride intestinal obstruction have also been established to develop following attempt at deworming heavily infested children.^{9,18-20}

The index case was passing ascaris worms in stool without any overt symptom of intestinal obstruction until her parents gave drugs (thought to be levamisole) to deworm her; following which the symptoms of bowel obstruction started and progressed till presentation. Bhandari and Garcha reported a similar case in India.¹⁸

The widely recommended practice is to manage heavily ascaris-infested children who develop mild abdominal symptoms conservatively and administer anti-helminthic after symptoms have subsided.⁹ It is established that administration of anti-helminthic drugs at such a time leads to bowel obstruction from paralysis of large number of worms.⁹

Gangrenous small bowel volvulus was the operative finding in the index case; the shear load of ascaris worms in the small bowel segment must have caused the twisting of the loops around the mesenteric vessels at that point. The patient had resection of the gangrenous segment with evacuation of the ascaris worms and bowel anastomosis done.

Laparotomy with manual advancement of the mass of ascaris worms toward the colon is usually the first line of consideration in the surgical management of ascaride intestinal obstruction where the bowel is not gangrenous. When this fails, enterotomy is done for intra-operative evacuation of the ascaris worms. Bowel resection and end-to-end anastomosis is reserved for gangrenous loop as was the case in the index patient.^{12,13} The repair of the enterotomy incision or the end-to-end anastomosis should be done in two-layers to prevent residual worms from migrating through the repair or anastomosis into the peritoneum; this has been reported.⁹

Intestinal obstruction resulting from ascaris infestation is a preventable condition. Early diagnosis of ascariasis and periodic deworming in endemic areas should be encouraged to avoid complications like bowel obstruction. Children presenting with mild gastrointestinal symptoms and mild abdominal signs suggestive of a partial bowel obstruction should be managed conservatively by resting the gut and giving intravenous fluids; nasogastric tube drainage is done when indicated. The use of

anti-helminthic drugs should be withheld in such cases until the symptoms have all subsided.⁹

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