

Review Article

Surgical complications of round worm infestation

Ketan Vagholkar*, Amish Pawanarkar, Suvarna Vagholkar, Avinash Jawanjaj,
Subashchandra Subudhi, Parthsarathi Chauhan, Purva Agrawal

Department of Surgery, D. Y. Patil University School of Medicine, Navi Mumbai, 400706, India

Received: 10 May 2016

Accepted: 14 May 2016

*Correspondence:

Dr. Ketan Vagholkar,

E-mail: kvagholkar@yahoo.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Round worm infestation is common in the tropical countries. *Ascaris lumbricoides* can cause a variety of complications in the abdomen ranging from colic to perforative peritonitis. As majority of abdominal complications require surgical intervention awareness of the complications is pivotal to the attending surgeon. The surgical complications of roundworm infestation are discussed in this article.

Keywords: *Ascaris lumbricoides*, Complications, Diagnosis, Management

INTRODUCTION

Ascaris lumbricoides is the commonest helminthic infection seen in India, next only to amoebiasis. It is more prevalent in the tropical and sub-tropical countries. Ascariasis can cause serious intra-abdominal complications ranging from abdominal colic to perforative peritonitis.¹

Majority of the complications have a high morbidity and mortality. Awareness of these complications is of utmost importance for surgeons practicing in the tropics to avoid misdiagnosis and mistreatment.

Lifecycle

Infection occurs by ingestion of the embryonated eggs. These release larvae in the intestine from where they get systemically absorbed and enter the pulmonary circulation.

They are excreted into the pulmonary secretions and are either coughed up or swallowed thereby gaining entry back into the gut. In the gut they have predilection for jejunum and the ileum.

Natural history of round worm infection

Round worms are usually free from the intestinal wall. They retain their position in the gut lumen by continuous and powerful muscular movements. They deprive the host of nutrients that are usually absorbed from the intestinal tract. The commonest surgical complication caused by *Ascaris* is intestinal obstruction.²⁻⁵ Various hypotheses have been put forward to explain the high incidence of this complication.

- a) Multiple worms get entangled with each other forming a large bolus. This bolus causes mechanical obstruction of the bowel lumen.
- b) The bolus of worms can also serve as a lead point for intussusception or as a pivot for small bowel volvulus.
- c) Worms can also inhabit the region of the ileocaecal valve. These round worms secrete neurotoxins that induce small bowel contractions. Increased contractions superimposed on a lumen containing a large ball of worms can cause obstruction
- d) The host may induce a strong inflammatory reaction to the toxins secreted by the worms. This inflammatory reaction maybe so strong that it may cause obstruction of the lumen of gut.

Intestinal perforation

Ascaris can induce small bowel perforation by two possible mechanisms:

- a) In an already diseased intestine such as in tuberculosis of the intestine, typhoid and amoebiasis there is ulceration of the intestine. This leads to thinning of the gut wall making it easy for the round worms to perforate an already thinned out intestine.
- b) A very large bolus of worms can cause pressure necrosis, gangrene, eventually leading to perforation.

After the intestine perforates, the worms enter the peritoneal cavity. The host mounts an immune response that results in localized areas of inflammation thereby culminating into the formation of granulomas. These are usually seen within the greater omentum, the surface of the liver, spleen and the peritoneum.³

Acute cholecystitis

Ascaris infection can induce acalculous cholecystitis.³ Ascaris eggs can also serve as a nidus for stone formation. The worms can enter into the biliary tree through the ampulla of Vater causing severe biliary colic, fever, and jaundice.

Cholangitis

Ascariasis can induce severe cholangitis.³ These can be of 2 types:

- a) Acute cholangitis wherein the patient is extremely sick with high fever, jaundice, hepatomegaly and grossly altered liver function tests. If untreated this can lead to endotoxic shock.
- b) The second type is described as recurrent pyogenic cholangitis wherein there is stone formation with superimposed chronic infection. Presence of sludge accompanied with dilatation and stricture formation in the biliary tree is commonly seen.

Hepatic abscesses

Persistent cholangitis can lead to portal pyaemia, predisposing to the formation of hepatic abscesses.³

The abscesses may assume a large size and have a high chance of rupture either into the peritoneal or pleural cavity

Pancreatitis

Review of literature reveals a significant number of case reports documenting pancreatitis as a complication of round worm infestation.³ The parasite may gain entry into the pancreatic ducts causing irritation and precipitating an attack of acute pancreatitis.

Clinical features

Diffuse colicky abdominal pain, fever and vomiting are the common symptoms associated with round worm infestation. Bloody diarrhoea mixed with mucus is a common accompaniment. Patients are often ill with distended abdomen, nausea and anorexia. Physical examination will reveal signs depending upon the organ system affected. Usually obstruction is the commonest surgical presentation accompanying round worm infestation. Patient will usually present with typical features of intestinal obstruction but will also give history of vomiting of worms or passage of worms in stools. The severity of clinical features will determine the nature of the presentation as to whether it is sub-acute or acute. Acute presentations are more prone to perforation and septicemia.

Diagnosis

History taking is an extremely important component of diagnosing round worm infestation. It provides an important lead in ascertaining the etiology of obstruction.

Plain X-ray abdomen will reveal multiple air fluid levels or even worms either in the longitudinal or transverse views. The ball of worms is typically described as the whirlpool pattern. In cases of perforation, free air under the diaphragm maybe seen.⁴⁻⁶

CT scan may also help in confirming the diagnosis. Hematological investigations may reveal eosinophilia, leukocytosis in a few cases. However hematological tests are not diagnostic.⁵

Management

Conservative management is the mainstay treatment. Hypertonic saline enemas prove to be therapeutic in majority of cases. The hypertonic saline concentration causes severe irritation to the bolus of worms. The ball of worms is broken up and a major portion of it enters the large bowel. The environment in the large bowel is not conducive for the growth and survival of Ascaris.

Medical therapy can be administered only after the patient settles from the acute phase of obstruction.⁵⁻⁷ Mebendazole (100 mg) 3 times a day, orally is the drug of choice. Albendazole (400mg) once a day is also therapeutic.

Surgical management is indicated in a select few patients.^{8,9} Indications for surgery are:

1. Failure of response to conservative line of treatment for intestinal obstruction
2. If complications supervene such as perforation, strangulation, or peritonitis
3. Presence of free intraperitoneal gas as detected by plain X-ray abdomen or CT scan.

Choice of surgical procedure is dictated by the intraoperative findings.^{10,11} In patients of obstruction without strangulation or perforation, an attempt is made to push the worms ahead into the large bowel without causing serosal injury to the intestines. In cases where the ball of worms is impacted or strongly adherent, an enterotomy may be required to remove the bolus of worms. However this is associated with high incidence of re-perforation or breakdown of the enterotomy, caused by burrowing of the enterotomy suture line by residual worms. Therefore it is preferable to avoid enterotomy as far as possible.

In case of perforation, removal of the worms or preferably resection anastomosis may be required. This carries a calculated risk of anastomotic leakage. However as this is an inevitable situation there are limited options.¹¹ In cases presenting as intussusception or volvulus, if strangulation is absent reduction is attempted. However if strangulation is present, resection anastomosis is necessary. The morbidity associated with surgical intervention for round worm complications is extremely high. The mortality is also high as the chances of leakage of suture lines or sutured enterotomies is extremely high.¹² Majority of patients are in severe septicemia thereby increasing the morbidity and mortality in such patients.

CONCLUSION

Ascaris infestation can cause a multitude of surgical complications. Intestinal obstruction is the commonest. A trial of conservative treatment is the best option. However if complications develop, surgical intervention is indicated. The morbidity and mortality associated with surgical intervention continues to be extremely high.

ACKNOWLEDGEMENTS

Authors would like to thank Mr. Parth K. Vagholkar for his help in typesetting the manuscripts.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not Required

REFERENCES

1. Villamizar E, Mendez M, Bonilla E, Varon U, Onatara S. Ascaris lumbricoides infestation as a cause of intestinal obstruction in children. Experience with 87 cases. J Pediatr Surg. 1996;31(1):201-4; discussion 204-5.
2. Akgun Y. Intestinal obstruction caused by Ascaris lumbricoides. Dis Colon Rectum. 1996;39(10):1159-63.
3. Louw JH. Abdominal complications of Ascaris lumbricoides infestation in children. Br J Surg. 1966;53(6):510-21.
4. Yetim I. Intestinal obstruction caused by Ascaris lumbricoides. Dis Colon Rectum. 1996;39(10):1159-63.
5. Bhagabati JN, Zaman N. Intestinal obstruction - a clinical study of 235 cases. Clinician 1972;36:41-9.
6. Agugua NEN. Intestinal ascariasis in Nigerian children. J Trop Pediatr. 1983;29(4):237-9.
7. Comoro MA, Kantar J. Non-operative management of intestinal obstruction due to ascaris lumbricoides. J Coll Physicians Surg Pak. 2003;13(2):86-9.
8. Rode H, Cullis S, Millar A, Cremin B, Cywes S. Abdominal complications of Ascaris lumbricoides in children. Pediatr Surg Int. 1990;5:397-401.
9. Wasadikar PP, Kulkarni AB. Intestinal obstruction due to ascariasis. British J Surg. 1997;84:410-2.
10. Surendran N, Paulose MO. Intestinal complications of round worms in children. J Pediatr Surg. 1988;23:931-5.
11. Rahman H, Pandey S, Mishra PC, Sharan R, Srivastava AK, Agarwal VK. Surgical manifestations of ascariasis in childhood. J Indian Med Assoc. 1992; 90:37-9.
12. Vagholkar KR. Healing of anastomosis in the gastrointestinal tract (Prospective study of 35 cases). Bombay Hospital J. 2001;43(2):269-79.

Cite this article as: Vagholkar K, Pawanarkar A, Vagholkar S, Jawanjali A, Subudhi S, Chauhan P, et al. Surgical complications of round worm infestation. Int J Res Med Sci 2016;4:1838-40.