Round Worm Intestinal Obstruction: A Single Center Study

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Citation

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Abstract

Introduction: Ascariasis is one of the most cosmopolitan intestinal parasite infections and can be found in inhospitable regions inhabited by human beings, but its highest prevalence is observed in the tropical and subtropical areas. In contrast to silent forms of this illness or chronic symptomatology, massive infestation in children can lead to serious complications requiring urgent surgical attention by experts. Intestinal obstruction has been estimated to occur in 2 per 1000 Ascaris-infected children per year. We are presenting a study emphasizing initial conservative treatment for round worm obstruction, whether partial or complete.

Material and Methods: Patients with partial or complete round worm obstruction without signs and symptoms of peritonitis admitted to the Department of Pediatric Surgery IMS, BHU, Varanasi, India, were included in this study. They were given nil by mouth, intravenous fluids, antibiotics, piperazine salt through nasogastric tube and glycerine plus liquid paraffin emulsion enemas and were evaluated for duration of hospital stay, rate of conversion to surgical treatment and complications.

Results: One hundred and seventy-five patients (92%) were treated successfully with conservative management. Only 14 patients (8%) required surgical intervention. In one case (0.52%) there was post-operative mortality, in two cases (1.1%) resection and anastomosis was required. Mean hospital stay was 4.3 days for the patients responding to conservative management.

Conclusion: Round worm intestinal obstruction can be effectively treated by conservative management.

INTRODUCTION

Ascariasis is most common in the tropical and subtropical areas. Estimations yield nearly 1 000 000 new annual cases and 60 000 fatalities per year[1,2,3]. Ascariasis can occur at all ages, but it is most common in children between 2 to 10 years of age, and prevalence decreases above the age of 15 years. In contrast to silent forms of this illness or chronic symptomatology, massive infestation in children can lead to serious complications, which include obstruction of small intestine, appendiceal lumen, bile duct, and pancreatic duct; intestinal volvulus; intussusception; peritonitis due to perforation of a viscus; and liver and lung abscess[4,5,6]. In addition to these largely mechanical complications, secretions from the worms as well as toxic decomposition products of disintegrating worms appear to be capable of provoking a severe and sometimes necrotizing inflammatory reaction in the bowel or bile ducts[7] as well as systemic and pulmonary hypersensitive reactions. Intestinal obstruction has been estimated to occur in 2 per 1000 Ascaris-infected children per year. In Indian school children the incidence is more than 11%[8] and Ascariasis causes about 15% of all intestinal obstructions[9]. Many studies advocate conservative treatment for partial intestinal obstruction due to round worms but we are presenting a study emphasizing initial conservative treatment for round worm intestinal obstruction, either partial or complete.

MATERIAL AND METHODS

All patients with suspected round worm intestinal obstruction admitted to the Pediatric Surgery Department of the Institute of Medical Sciences B.H.U., Varanasi, India, between January 2002 and January 2007 were included in this study. The study was passed by the ethical committee of our university. A total of 189 patients with partial or complete intestinal obstruction due to round worms without signs and symptoms of peritonitis were admitted during this study. Patients who presented with signs and symptoms of peritonitis and pneumoperitoneum were excluded from this study. All patients were initially subjected to conservative treatment (nil by mouth, intravenous fluids, nasogastric tube aspiration, rectal enemas (glycerine plus liquid paraffin enema) and piperazine salt through nasogastric tube for 3 consecutive days) after getting their informed consent. They were closely monitored with assessment of vital parameters, abdominal girth measurement and serial abdominal X-ray.

The abdominal radiograph at admission was evaluated for the number of air-fluid levels and the diameter of the dilated loops was recorded. Serial follow-up X-rays were taken at 8, 24, and 48 hours. Clinical improvement was defined as a decrease in abdominal pain and distension, decrease in abdominal girth and associated passage of flatus or stool. Radiological improvement was defined as a decrease in number of dilated bowel loops or in the diameter of dilated small bowel. If the condition of patients did not improve or deteriorated according to clinical and/or radiological parameters, they were considered for surgical treatment. The treatment protocol followed at our center is conservative with appropriate intravenous fluids, nasogastric suction, antispasmodic, antibiotic and anthelmintic therapy (piperazine salt 75mg/kg) followed by rectal enemas (glycerine plus liquid paraffin enema) for three consecutive days.

RESULTS

All the cases were from low socioeconomic groups. The sex distribution was 112 males and 77 females. The most common age of presentation was 4-8 years (table – 1).

Figure 1

Table 1: Patient profile: n=189

Sex distribution	
Male	112 (59.2%)
Female	77 (39.8%)
Age distribution	
< 2 yrs	16 (8.5%)
>2 yrs but < 6 yrs	117 (61.9%)
> 6yrs – 12 years	56 (29.6%)

Almost all patients presented with abdominal pain (96.8%) and distension (94%). Ninety-three patients (49.2%) passed worms in vomitus and 112 patients (59.3%) passed worms rectally (table – 2).

Figure 2

Table 2:Presenting symptoms (n=189)

Abdominal Pain	183 (96.8%)
Abdominal distension	178 (94%)
Failure to thrive	42 (22.2)
Anemia	163
History of worm passage	
History of worm passed through mouth	93 (49.2%)
History of worm passed through rectum	112 (59.3%)
No history of worm passage	14(7.4%)
Type of obstruction	
Partial obstruction.	122 (64.5%)
Complete obstruction.	67 (35.5%)

History of anthelminthic treatment in recent past was present in 121 cases (64%). X-ray was suggestive for round worm obstruction in 50.7% of cases whereas ultrasonographic findings were positive in 76%. Partial bowel obstruction was observed in 64.5% and complete bowel obstruction in 35.5%. Out of 189 patients only 14 (8%) required surgical treatment and the rest responded well to conservative management. Operative procedures done were: (1) milking of worms to colon in 10 cases (71%); (2) enterotomy and removal of worms in two cases (14.5%) and (3) resection of ischemic bowel and anastomosis in 2 cases (14.5%). Mean hospital stay for conservative treatment was 4.3 days for patients responding to conservative management while for patients who required surgical intervention it was 12.4 days (table – 3).

Figure 3

Table 3: Clinical course of patients

Hospital stay (conservative treatment)	4.3 day (range 4-6days)
Hospital stay for patients treated surgically	12.4 days (range 9-16 days)
Cost for conservative treatment	approximately Rs 3000
Cost for surgical treatment	approximately Rs 9000
Patients who required surgical intervention	14 (7.5%)
Complications (Ischemic bowel)	2 (1.05%)
Mortality	1 (0.53%)

There was post-operative mortality in a single patient in the present series and in two cases ischemic changes of the bowel were observed requiring resection and anastomosis.

DISCUSSION

Ascariasis is one of the more common intestinal parasite infections of the human being and it is calculated that the world population's fourth part is infected. Over 1.4 billion people are infected throughout the world. Fortunately, Ascaris-related severe clinical disease is restricted to heavy worm overload in approximately only 2 million people, leading to 20,000 deaths per year in endemic areas[10]. In contrast to silent forms of this illness or chronic symptomatology, massive infestation in children can lead to serious complications requiring urgency surgical attention by experts. The prevalence of ascariasis is highest in children aged 2-10 years, with the highest intensity of infection occurring in children aged 5-15 years[11]. In our series, most of the patients were in the age group of 2-6 years (71%) and this is similar to the results of N. E. Agugua et al.[11] who reported the highest incidence in children aged between 3-7 years (74%) (table – 1).

The clinical illness depends on parasite load.[2,12] Infested patients may not have any symptoms or can present with malnutrition, chronic abdominal colic pain, nausea, vomiting and the elimination of parasites in stools or rectum and sometimes through the mouth. Most of our patients presented with abdominal pain and distension (96.8% and 94%, respectively) and this is similar to other reported series[7,13,14] (table – 2). Many patients have a history of expulsion of Ascaris by rectum or mouth which helps in making a right diagnosis.[11,15,16] Ninety-three patients (49.2%) of the present series had a history of passing worms through the mouth and 112 (59.3%) patients passed worms in stool, Villamizar et al.[4] reported that 50% of their patients had passed worms by stool or anus (table – 2). In cases of massive infestation, patients can present with acute intestinal obstruction either because of a bolus of worms obstructing the intestinal lumen or due to volvulus needing emergency surgery.[17,18] In the present series, 67 cases (35.4%) presented with acute intestinal obstruction. Besides direct obstruction of the bowel lumen, toxins released by live or degenerating worms may result in bowel inflammation, ischemia, and fibrosis leading to intestinal obstruction.

Diagnosis of round worm obstruction is usually suspected on history and clinical symptoms and is supported by radiological studies. The abdominal X-ray shows air-fluid levels and multiple lineal images of Ascaris lumbricoides in the dilated intestinal loops.[19] Whirlpool sign[4] was suggestive in 50.7% of cases in the present study. Most of the patients presented late, had grossly dilated bowel loops and were constipated; this may be the main reason for the smaller number of patients diagnosed on plain X-ray of the abdomen. Abdominal ultrasonography could demonstrate a dilated intestinal loop, with thicker wall and a mass of worms that cause the obstruction.[19] Characteristic sonographic features of round worm obstruction are 'railway track' sign and 'bull's eye'.[20] A group of parasites is described like an echogenic complex mass[21] of intestinal air, parasites and fecal matter, with the morphology of a jellyfish head in the longitudinal axis and roselike in the transaxial cut. Ultrasonography diagnosed 76% of cases in the present study.

Few studies highlight that administration of anthelmintic drugs in children with abdominal pain and subacute obstruction worsens the clinical picture[16] and leads to serious complications like intussusceptions, volvulus, hemorrhagic or necrotic bowel or even perforation[16,19,22]. This medication leads to complete paralysis of an important number of parasites and accumulates them at the level of the distal small bowel blocking the lumen. History of recent anithelmintic treatment was observed in 64% cases in our series which may add an important contributory factor for precipitation of intestinal obstruction.

Conservative management for partial worm obstruction is advocated in many studies[19,21,23,24,25,26] and can be done with intravenous fluid administration, nasogastric suction, instillation of oral piperazine salt[4], normal saline enema[27] and hypertonic saline enemas[26]. A recent controlled trial from Pakistan[26] indicated that in patients without peritonitis, hypertonic saline enemas were quicker in relieving obstruction and resulted in shorter hospital stays than intravenous fluids alone. Malde et al.[21] reported that almost all patients responded to hypertonic saline enemas. Few studies advocated use of gastrografin[16,25,28] for evacuation of worms with variable results. Mukhopadhyaya et al.[27] used anthelmintic drugs and normal saline enema with 50% success for conservative treatment in their series. All these studies advocated conservative management in cases of partial worm obstruction only, but in the present study we have used conservative treatment in partial as well as complete intestinal obstruction without signs and symptoms of perforation and peritonitis. All the patients with partial intestinal obstruction responded to conservative treatment. Out of 67 patients with complete intestinal obstruction, 53 (79.2%) responded well to conservative management while 14 patients (19.8%) required surgical intervention with only one mortality in the post-operative period.

Mean duration of hospital stay for the patients who responded to conservative management was 4.3 days (range 4-6 days) which is comparable to 3 days in the gastrografin group of Bar-Moar et al.[25], 3.5 days in the hypertonic saline group and 4 +/- 1.69 days reported by Soomro MA et al.[26]. For surgical intervention it was 12.4 days (range 9-16 days). With the modality of treatment proposed in our series (anthelmintics through nasogastric tube and rectal enema) most patients respond well to conservative therapy (worms are expelled out of rectum with stool, abdominal distension and pain decreases). If patients did not pass worms after 3 days of anthelmintic treatment or there was deterioration of clinical or radiological parameters, they were considered for surgical intervention (14 patients in our series). In all patients who required surgical intervention, a bolus of worms was observed in the distal ileum, in two cases ischemic changes of the bowel were observed (requiring resection and anastomosis). In most cases the worm bolus was pushed into the colon by milking the intestine (10 cases) and later the worms were expelled out of the rectum. In two cases it was not possible to milk the worms into the large intestine and enterotomy was required. All patients were doing well on follow-up.

In our earlier series[29] of conservative management of round worm intestinal obstruction, we used intravenous fluids, nasogastric tube aspiration and glycerine plus liquid paraffin emulsion retention enema. Seventy-five percent of patients responded to conservative treatment with an average hospital stay of 4 days. In the present series, we used instillation of piperazine salt through nasogastric tube in addition to intravenous fluids, nasogastric tube aspiration and glycerine plus liquid paraffin emulsion retention enema with 92% success by conservative management.

CONCLUSION

Partial as well as complete roundworm intestinal obstruction (without signs of peritonitis) can effectively be managed conservatively by using nasogastric piperazine salt and gylcerine plus liquid paraffin enemas. This modality of treatment is quite safe, required less hospital stay and is cost effective. Only in exceptional cases surgical intervention is required.

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