

Small bowel obstruction and volvulus secondary to strongyloidiasis

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CASE STUDY

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ABSTRACT

We report the case of a 27-year-old Sudanese man with episodes of small bowel obstruction and volvulus, and significant malnutrition with severe hypoalbuminaemia due to strongyloidiasis. Interestingly, he did not have the common associated eosinophilia or any of the known risk factors of strongyloidiasis. His symptoms improved after treatment with ivermectin and albendazole. Health care providers should be aware of the possible absence of the well-described risk factors and the potential atypical presentation of this disease due to the growing population of migrants from the endemic areas in Australia.

Key Words

Strongyloidiasis, population health, small bowel obstruction and volvulus, malabsorption

Implications for Practice:

1. What is known about this subject?

Strongyloidiasis is endemic in tropical and subtropical regions and the manifestation of clinical disease is usually due to presence of immunosuppression.

2. What new information is offered in this case study?

Strongyloidiasis is an unusual cause of bowel obstruction

and severe malabsorption. The absence of eosinophilia and immunodeficiency does not exclude the diagnosis.

3. What are the implications for research, policy, or practice?

Due to the rapid growing population of migrants from endemic regions in Australia, healthcare providers should have a high index of suspicion for this disease.

Background

Strongyloidiasis is due to infection with the parasitic roundworm *Strongyloides stercoralis* and it is endemic in tropical and subtropical regions.^{1,2} Infection starts with direct penetration of the skin by the filariform larvae living in soil. They undergo haematogenous spread to the respiratory tract, where they are coughed up and swallowed into the gastrointestinal tract before migrating to the small intestine mucosa and maturing to adulthood.³ Compared to other helminthic parasites, *Strongyloides* is capable of autoinfection - it is able to complete its entire life cycle within one human host. As a low level of autoinfection allows the parasite to persist for decades, clinical manifestations can occur long after the initial infection.⁴ Disseminated disease can occur when the filariform larvae from autoinfection migrate to other organs.⁷

Case details

A 27-year-old man, who had migrated to Australia from Sudan 13 years previously, presented with progressive bilateral ankle swelling and pain, as well as three months of significant constipation and anorexia with 30kg of weight loss. During this time he presented to several hospitals with gastrointestinal symptoms. Two months prior to presentation he underwent laparotomy for abdominal pain and a small bowel volvulus was corrected. A computed tomography of his abdomen one month prior to admission showed a small bowel obstruction which resolved following nasogastric decompression. Persisting abdominal pain led to endoscopy which was macroscopically normal. His other past medical history includes mild intellectual impairment and stable epilepsy on sodium valproate and carbamazepine.

On examination, the only abnormal findings were mild abdominal discomfort and pitting oedema to his knees.

Initial investigations demonstrated white cell count of $12.7 \times 10^9/L$ with monocytosis but no eosinophilia, serum sodium of 128mmol/L, serum albumin of less than 10g/L, international normalised ratio (INR) of 1.4, alanine aminotransferase level of 157U/L, aspartate aminotransferase level of 70U/L, alkaline phosphatase level of 158U/L, and gamma-glutamyl transpeptidase level of 93U/L. There was no proteinuria. His vitamin A level was 0.5umol/L and vitamin D level was $<10\text{nmol/L}$. A faecal alpha-1 antitrypsin level was not able to be obtained due to constipation. A liver ultrasound performed during one of his previous admissions to another hospital demonstrated changes suggestive of fatty liver with no other significant abnormality.

Following admission, and after considerable time was taken to contact the various hospitals, his story evolved. Review of his gastroscopy biopsy specimen demonstrated widespread strongyloidiasis in his stomach and duodenum, with chronic gastritis (Figure A) and duodenitis (Figure B). A diagnosis of protein-losing enteropathy secondary to strongyloidiasis was made. It appeared in retrospect that his episodes of obstruction and possibly his small bowel volvulus were related to strongyloidiasis and perhaps mediated by paralytic ileus. After consultation with the Infectious Disease team, the patient was treated with a single dose of oral ivermectin 0.2mg/kg and five days of oral albendazole 400mg/day concurrently, with repeated doses one week later. The patient had a dramatic improvement in symptoms and was discharged after the first week of treatment.

Following the diagnosis of strongyloidiasis, further investigations were requested to look for possible causes of immunosuppression. The patient had never received immunosuppressive therapy such as corticosteroid. He tested negative for human T cell lymphotropic virus (HTLV) types 1 and 2, and human immunodeficiency virus (HIV).

Discussion

The association between immunosuppression and strongyloidiasis, especially disseminated disease, is well documented, particularly related to corticosteroid use and HTLV infection.^{7,8} It is hypothesized that these two risk factors respectively impair the functions of T helper 2 and T regulatory cells, which in turn predispose to Strongyloides infection.^{8,11} Other risk factors include underlying malignancy, alcoholism, haematopoietic stem cell transplantation, and HIV.⁷

Clinical manifestations of strongyloidiasis can range from asymptomatic eosinophilia to fatal disseminated disease with septic shock. Although a lack of eosinophilia is possible and is not required for diagnosis, this usually occurs in situations of disseminated disease with concurrent pyogenic infection or steroid administration⁹, which was not the case in our patient. Medical practitioners, therefore, should be mindful that an absence of eosinophilia does not exclude the diagnosis of strongyloidiasis. Other common clinical features include cutaneous reactions such as pruritus and urticarial tracts, nausea and vomiting, diarrhoea, abdominal pain, anorexia, dyspnoea, and cough.⁵ Uncommon presentations include paralytic ileus and malabsorption, which have only been reported in case reports.⁶ We suspected paralytic ileus in our patient in view of the recurrent small bowel obstructions and significant constipation. Due to the wide spectrum of clinical symptoms, including atypical manifestations, it is crucial to consider this diagnosis in patients with exposure to endemic regions.

Despite concerns that malabsorption and hypoalbuminaemia may respectively lessen oral bioavailability and serum concentration of the highly protein-bound drug ivermectin¹⁰, it did not seem to be the case in our patient. This is possibly because his disease was limited to the gastrointestinal tract, and he therefore received adequate delivery of drugs to the affected site. However, extra caution would be required if medical practitioners encounter patients with disseminated strongyloidiasis and co-existing malabsorption and hypoalbuminaemia.

Conclusion

Strongyloidiasis is endemic in tropical and subtropical areas but is less common in temperate regions. However, due to the rapidly growing population of migrants from Africa and Southeast Asia in Australia, medical practitioners need to maintain a high level of suspicion for this disease in patients from the endemic regions including travellers with brief distant exposure. This is of particular importance as Strongyloidiasis can occasionally result in volvulus and bowel obstruction as in our case, and if the diagnosis can be promptly made, invasive intervention such as major surgery can potentially be avoided.

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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PATIENT CONSENT

The authors, *Sung J, MacLeish M, Meagher D*, declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient(s) in this report.
2. All possible steps have been taken to safeguard the identity of the patient(s).
3. This submission is compliant with the requirements of local research ethics committees.

Figure A: Biopsy of the stomach showing antral type gastric mucosa. Numerous parasites are seen on the surface and within the foveolae. The lamina propria is infiltrated by moderate numbers of plasma cells

Figure B: Biopsy of the duodenal mucosa with eroded surface. Crypts are hyperplastic and contain parasitic worms

