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SYMPTOMATIC CHRONIC STRONGYLOIDES STERCORALIS INFECTION AFTER ROUX-EN-Y GASTRIC BYPASS IN AN IMMUNOCOMPETENT PATIENT

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ABSTRACT

Introduction: Strongyloides stercoralis is a parasitic nematode with a unique auto infective life cycle, enabling persistent infection. While infection can remain asymptomatic for decades, factors such as malnutrition may facilitate the transition to symptomatic strongyloides infection. Roux-en-Y gastric bypass (RYGB) induce malnutrition due to reduced intake and impaired nutrient absorption.

Case description: A 31-year-old male presented with nausea, diarrhoea, and general malaise following RYGB six months earlier. Jejunal biopsy and faecal polymerase chain reaction (PCR) confirmed chronic *S. stercoralis* infection, likely acquired during travel to Bali in 2016. Treatment with ivermectin led to rapid clinical improvement, normalization of eosinophil counts, and negative faecal PCR within four weeks.

Conclusion: Chronic *S. stercoralis* infection may become symptomatic following RYGB, likely due to postoperative physiological changes, such as malnutrition. Malabsorption, particularly zinc deficiency, may impair mucosal immunity and facilitate parasite persistence. Additionally, reduced colonic motility and gastric acid secretion post-RYGB may compromise host defence mechanisms, increasing the risk of transformation to symptomatic infection. These findings suggest that preoperative screening for *S. stercoralis* might be considered in bariatric candidates with prior exposure to endemic regions. Further research is warranted to clarify the pathophysiological mechanisms linking bariatric surgery to reactivation of chronic strongyloidiasis.

KEYWORDS

Strongyloidiasis, infectious diseases, Roux-en-Y gastric bypass

LEARNING POINTS

- This case suggests that malnutrition, reduced gastric acid, and altered gut motility after Roux-en-Y gastric bypass (RYGB), might impair parasite clearance and immunity, turning an asymptomatic chronic infection into a clinical threat.
- The findings of this case suggest that preoperative screening in bariatric surgery candidates with relevant travel history related to *S. stercoralis* could be useful as RYGB may elevate risk for parasitic flare-ups.

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INTRODUCTION

This case report presents a manifestation of a chronic *Strongyloides stercoralis* infection which became symptomatic after Roux-en-Y gastric bypass (RYGB).

S. stercoralis is a parasitic nematode that can cause strongyloidiasis in humans. It is estimated that approximately 613.9 million people worldwide are infected with *S. stercoralis* each year, with the highest incidence in Southeast Asia, Africa, and the Western Pacific area[1]. Infection with *S.stercoralis* is commonly associated with travel to endemic regions. However, in recent years, the number of diagnosed cases has increased in high-income countries, due to the growing number of immigrants, travellers, and refugees[2].

S. stercoralis has a unique life cycle which allows reproduction both within and outside the host. In the free-living cycle, rhabditiform larvae (L1) are excreted in the faeces of an infected host and can develop into infective filariform larvae (L3) or free-living adults which can produce eggs and also mature from L1 larvae into infective L3 filariform larvae. The filariform larvae can initiate the parasitic cycle due to penetration of the skin of the host when it contacts contaminated soil and will migrate to the small intestine. This migration can be through the lungs where it is coughed up and swallowed causing symptoms like dry cough, wheezing, sore throat and dyspnoea. The alternative route is via abdominal viscera and connective tissue. After entering the gastro-intestinal tract the larvae can induce diarrhoea, constipation, abdominal discomfort, nausea and vomiting. In the small intestine, female adults produce eggs that hatch without fertilization (parthenogenesis). These L1 larvae migrate to the large intestine and are either excreted in the stool or become infective L3 larvae, which can penetrate the colonic mucosa or perianal area. This leads to respectively internal and external auto-infection which can cause chronic infection, distinguishing *S. stercoralis* from other intestinal helminths[3]. In approximately 75% of the cases this is also accompanied with mild peripheral eosinophilia or elevated IgE levels[4].

Infection with *S. stercoralis* can remain latent and asymptomatic for decades following initial exposure[5]. Immunosuppressive therapy, chronic alcohol use, and malnutrition are among the key risk factors that can trigger the transition from asymptomatic to symptomatic chronic *S. stercoralis* infection[1].

Malnutrition occurs in 5% of patients after bariatric surgery[6]. Restricted food intake, malabsorption, appetite suppression, and changes in gastrointestinal hormone levels are known factors contributing to weight loss and consequently, the development of malnutrition following both RYGB and sleeve gastrectomy.

CASE DESCRIPTION

A 31-year-old patient presented himself in December 2024 with complaints of nausea, diarrhoea, and a significant functional decline due to general malaise for the past several months. The medical history mentioned a RYGB six months prior, with the indication for surgery being obesity. According to his travel history, the patient had spent three weeks in Bali, Indonesia in 2016. Physical examination revealed no other abnormalities. Laboratory tests showed a leucocytosis of 21.2 $\times 10^9$/l, an eosinophilia of 5.01 $\times 10^9$/l and a hypoalbuminemia of 22 g/l. A computed tomography (CT) scan was performed and showed enlarged mesenteric lymph nodes. The patient was admitted, and enteral feeding was started because of malnutrition. Due to the gastrointestinal complaints a esophagogastroduodenoscopy was performed and a jejunal biopsy was taken. This showed signs of active chronic inflammation with the presence of larval structures most resembling rhabditiform larvae of *S. stercoralis (Fig. 1)*. Subsequently, *S. stercoralis* IgG1/IgG4 serology was strongly positive with a titre of 1:640 (cut-off: 1:40) and *S. stercoralis* was also confirmed by a positive PCR on faeces. The

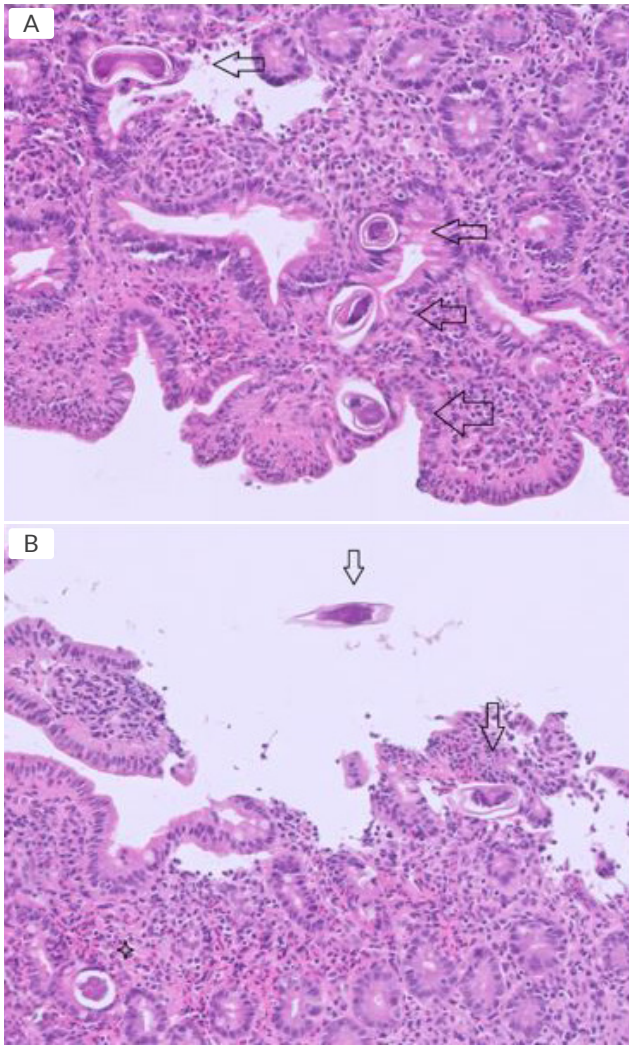


Figure 1. *Hematoxylin and Eosin staining of jejunum biopsy showing multiple rhabditiform (L1) larvae of Strongyloides stercoralis infiltrating the jejunal mucosa and crypts (open arrows) (A, B) and an ovum of the parasite in the jejunal submucosa (star) (B). The parasitic structures in the images have diameters ranging from 30-90 µm. The lamina propria is expanded with increased plasma cells and eosinophils.*

diagnosis was a chronic *S.stercoralis* infection, most likely acquired in Bali. The patient was treated with ivermectin 0.2 mg/kg once daily for 2 days, which was repeated after 2 weeks. The patient showed a quick clinical improvement. After 4 weeks the faeces PCR was negative, and the eosinophil levels returned to normal levels within weeks.

DISCUSSION

A notable characteristic in this patient is that the chronic *S. stercoralis* infection became symptomatic six months after the RYGB. As discussed, malnutrition is a significant factor in the development of symptomatic Strongyloides infection. Following RYGB, zinc is a well-known nutrient that decreases due to malabsorption[7]. Zinc plays an important role in maintaining mucosal barrier integrity and in supporting type 2 immune responses against nematode infections[8]. Therefore, zinc deficiency following RYGB may contribute to impaired immunity, potentially leading to the development of a symptomatic chronic *S. stercoralis* infection in this patient.

Furthermore, a correlation is described between the degree of intestinal muscle hypercontractility and the host's capacity to clear parasites from the gut[9]. Given that a decrease in colonic motility is described as a possible condition following bariatric surgery, it may be a potential risk factor for a symptomatic chronic *S. stercoralis* infection[6].

Additionally, after RYGB, gastric acid production is significantly reduced because a large portion of the stomach, including the acid-producing parietal cells, is bypassed. It has also been hypothesized that reduced gastric acid secretion might favour infection and invasion through the body[10]. Therefore, individuals who underwent RYGB might also have an increased risk of developing a symptomatic chronic *S. stercoralis* infection.

In this case, malnutrition, malabsorption, decreased bowel motility, and reduced gastric acid secretion after RYGB likely contributed to the development of a symptomatic chronic *S. stercoralis* infection.

Therefore, preoperative screening for *S. stercoralis* may be warranted in bariatric surgery candidates originating from or with a history of travel to endemic regions.

Further research is needed to assess the risk and mechanisms of chronic *S. stercoralis* infection following bariatric surgery.

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