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Megaduodenum associated with gastric strongyloidiasis

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ABSTRACT

Gastric strongyloidiasis and megaduodenum are rare diseases. Gastrointestinal (GI) strongyloidiasis has many clinical features. One of them is megaduodenum. We describe a case of a 32-years-old man who has come to us from an endemic area for *Strongyloides stercoralis.* He had had megaduodenum diagnosed in his childhood. We submitted him to two surgeries. He has recovered just after the second surgery, a Roux-en-Y partial gastrectomy. After that, his follow-up was uneventful and the patient has gained 10 kg in weight. Histopathology confirmed gastric strongyloidiasis. In conclusion, if patients arrive from an endemic area of *S. stercoralis* and if they present GI symptoms or a previous diagnosis of megaduodenum, they must be considered for a histological evaluation for gastric strongyloidiasis.

1. Introduction

Dilatation of the duodenum, called megaduodenum, is a rare condition. Its clinical appearance is characterized by chronic duodenal stasis, dilatation, hypertrophy, and elongation of the duodenum.[1] Thompson et al.[2] described megaduodenum as an endoscopic finding linked to strongyloidiasis. This disease is caused by the nematode (roundworm) *Strongyloides stercoralis* (*S. stercoralis*). It is most common in the tropical, subtropical, and in warm temperate regions of the world.

This paper aims to report a clinical case of a patient with megaduodenum associated with gastric strongyloidiasis. He has been submitted two surgeries by the authors. We have not found a similar case in the medical literature.

2. Case report

B.G., 32-years-old black man, has born in Haiti. He has lived there until he was grown-up. Then, he has come to Brazil to study and he was enrolled in September 2010 at The State University of Campinas (UNICAMP) as a postgraduate student. At the very beginning, he has had complaints of lower limbs weakness and impaired walking. Moreover, he has complained about difficulties in stool and gas elimination, and vomiting. Also, he has mentioned previous episodes of melena and hematemesis. As personal background, the patient had had a prior abdominal surgery that was performed in his childhood due to gastroduodenal ulcer disease. This first surgery had been performed in Haiti and we have never had access to his medical records from there. We have to address that he was treated initially by the Neurology Specialty, not by the authors' staff. This initial work-up has included blood tests (human immunodeficiency virus (HIV) serology, Chagas' disease serology, B and C hepatitis serologies, syphilis serology, cytomegalovirus (CMV) serology, iron dosage, and B12 vitamin dosage). All these tests have resulted negative or within the normal limits. Besides, an upper GI endoscopy was performed as well. It has shown a jejunal ulcer in the side-to-side gastroenteroanastomosis, a megaduodenum, and a duodenal stenosis located at thirty centimeters downstream the pylorus (third portion of the duodenum). Although there was a jejunal ulcer in the side-to-side gastroenteroanastomosis in this first exam, this bypass has been without signs of obstruction at that moment. Moreover, in this upper GI endoscopy, biopsies were performed at the anterior wall of the pyloric antrum. Histopathology has diagnosed chronic gastritis in this first examination and *Helicobacter pylori* (*H. pylori*) infection has resulted negative. According to the medical records, the Neurology Specialty diagnosed him with a sensory and motor diffuse polyradiculitis. Surprisingly, there was not further investigation concerning his GI symptoms at this first evaluation.

After that, he has been followed in an outpatient ambulatory in a clinic specialized in esophageal, gastric, and duodenal diseases.

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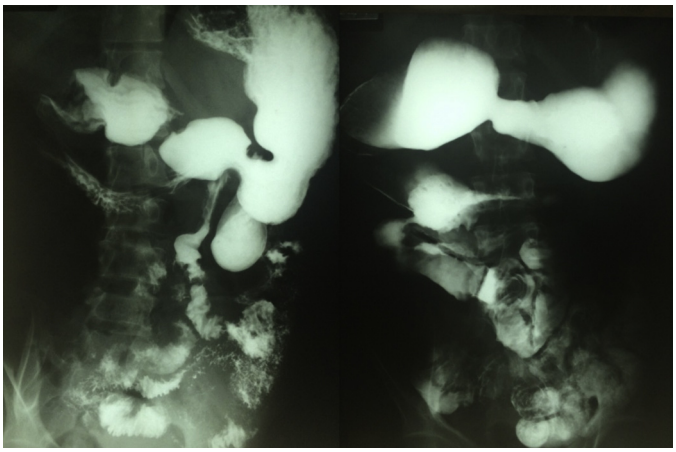

Fig. 1. Contrast radiographic study showing a duodenal stenosis in the third portion of the duodenum and the megaduodenum.

Initially, he was treated with proton pump inhibitors therapy (PPI). But unfortunately, he has lost follow-up at that moment.

After a gap of two years, the patient has returned with an episode of upper GI bleeding. Promptly, a new upper GI endoscopy has been made. It has shown gastric stasis, a diminished diameter in the side-to-side gastroenteroanastomosis, mucosal erosions in the jejunal of this side-to-side gastroenteroanastomosis, megaduodenum, and mucosal erosions in the duodenum. Besides, in this exam it was apparently observed also a side-to-side jejunal–duodenum anastomosis with some stenosis (this anastomosis would be located between the second and third portions of the duodenum). Still, a naso-enteral tube was inserted at this GI endoscopy, bypassing this duodenal stenosis. However, he has got worse, with persistent vomiting without improvement with medical treatment. Meanwhile, preoperative contrast radiographic studies have shown that, in fact, the patient had undergone a gastroenteroanastomosis procedure in his infancy and there was not a side-to-side jejunal–duodenum anastomosis. Actually, there was a duodenal stenosis in the third portion of the duodenum (Fig. 1) – as it has been seen in the first GI endoscopy two years ago. Therefore, the authors have scheduled a surgery. He has undergone a conversion of this gastroenteroanastomosis procedure to a Roux-en-Y gastroenteroanastomosis operation without any resection of the stomach (Fig. 2). Still, we have repaired its prior anastomosis between stomach and efferent jejunal limb, increasing its diameter. Lastly, we have made a side-to-side anastomosis between the third portion of the megaduodenum and a jejunal loop, thus making a bypass of the narrowed area of the duodenum. The patient has resumed, leaving the hospital seven days after this first surgery.

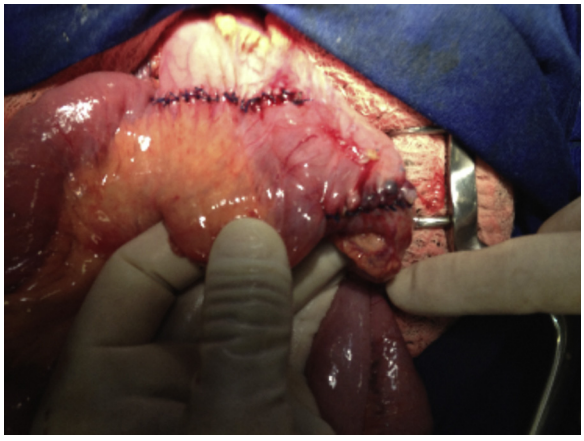

Fig. 2. Roux-en-Y gastroenteroanastomosis – first surgery.

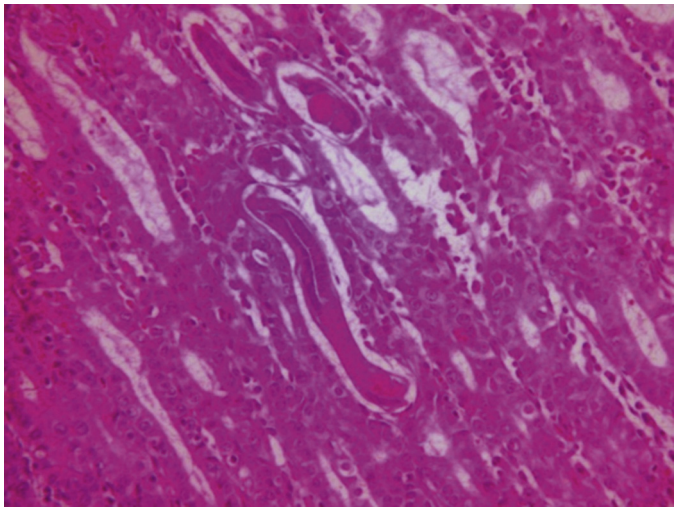

Fig. 3. Histopathological studies showing *Strongyloides stercoralis*'s larvae on the gastric mucosa.

However, one month afterward, he has returned with abdominal pain, difficulty stool and gas elimination, vomiting, and severe weight loss. Again, a new work-up was done. The upper GI endoscopy has shown a wide and previous gastroenteroanastomosis. A new contrast radiographic study has demonstrated a wide and permeable gastroenteroanastomosis. Nonetheless, there was a slowed small bowel transit as well. Throughout this in-hospital period, the patient has suffered persistent fever, with several infectious outbreaks. He, initially, was treated as a framework of bronchopneumonia. Finally, he was admitted in the intensive care unit, requiring parenteral nutritional support, and intravenous antibiotics.

Because of the maintenance of vomiting, anorexia, and malnutrition, another surgery was scheduled after controlling infection. On this occasion, we have chosen to perform a partial gastrectomy. We have used a Roux-en-Y reconstruction, aiming to exclude the duodenum from alimentary tract. Definitely, after this last surgical procedure, the patient has resumed well, accepting oral nutrition and recovering weight. Lastly, he has left hospital one week after this surgery. Histopathology of the surgical specimen resulted in gastric (Figs. 3 and 4), duodenal (Fig. 5), and jejunal strongyloidiasis.

In conclusion, after this diagnosis has been reached, he was treated with ivermectin, a broad-spectrum antiparasitic drug. He has overcome, gaining almost 10 kilogram in weight after six-months follow-up.

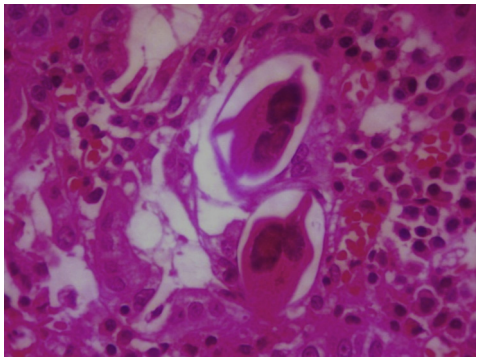

Fig. 4. Histopathological studies showing *S. stercoralis's* larvae on the gastric mucosa.

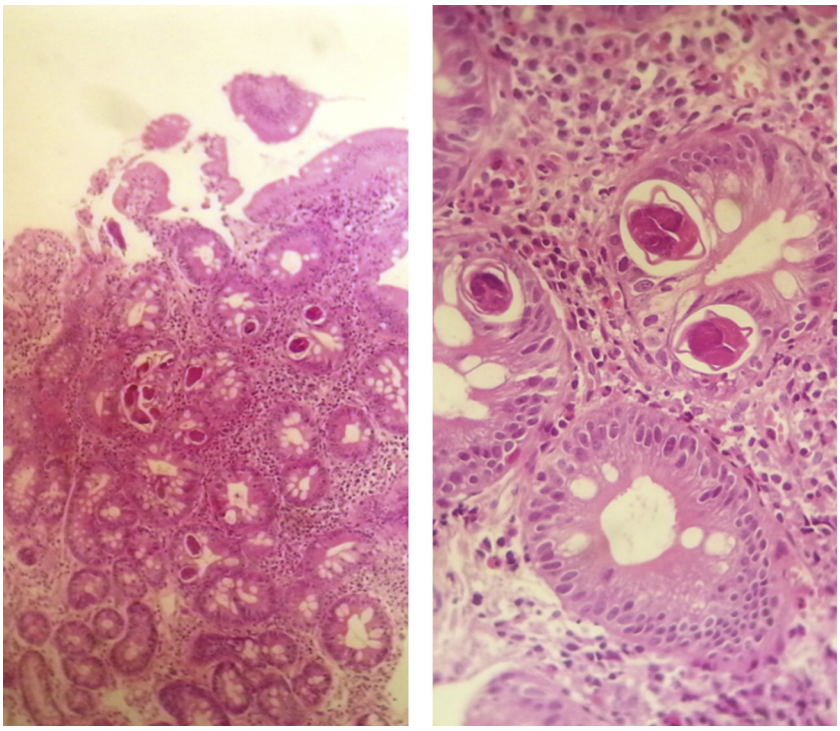

Fig. 5. Histopathological studies showing *S. stercoralis*'s larvae on the duodenal mucosa.

3. Discussion

There are two main forms of megaduodenum: congenital and acquired. In congenital form, the main issue is the nervous damage that occurs within the bowel's intramural nervous system. On the other hand, the acquired form of megaduodenum has been linked to some illnesses. One of that is Chagas' disease.[3] It is caused by the protozoon *Trypanossoma cruzi* and it could be associated with megaduodenum, megacolon, and megaesophagus.[4] Another acquired condition for megaduodenum could be systemic sclerosis. Patients with megaduodenum typically present themselves with upper GI symptoms like sensation of ever-increasing fullness of the stomach interrupted by periods of relief. Some patients have pain in the epigastrium, two or three hours after a meal. Vomiting occurs sometimes spontaneously. Abundant salivation may be present as well as loss of weight, the latter varying according to the duration of the disease.[5]

S. stercoralis is often considered a tropical and subtropical disease, although endemic sites are also seen in temperate regions.[6,7] Humans usually become infected through skin. However, the disease has also been experimentally induced by oral administration of contaminated water with filariform larvae.[8] Strongyloidiasis is mainly a dermatologic and GI disease but it has been reported to involve virtually in every human organ.[6] It may occur in both immunocompromised and immunocompetent individuals.[9] The diagnosis of strongyloidiasis is often difficult since stool examination is negative in up to 50–70% of the cases.[10] Histopathology of surgical and/or cytological specimens is of utmost importance in the diagnosis. Also, it can exclude a wide range of infectious diseases. GI symptoms (diarrhea, constipation, anorexia, abdominal pain) usually begin about two weeks after infection, with larvae being detectable in stool after three–four weeks.

Chronic infection with *S. stercoralis* is most often asymptomatic. Complications such as intestinal obstruction, ileus, copious GI bleeding, and acute worsening of chronic intestinal manifestations have occurred in the context of an increased larval burden.[9] Initial diagnosis attempt of a strongyloidiasis infection is usually through stool examination, but the yield is not higher than 46%, even after three stool examinations.[2] Diagnostic sensitivity of an enzyme-linked immunosorbent assay for strongyloidiasis ranges from 68% to 95%. A duodenal or a jejunal biopsy specimen yields the diagnosis in approximately 90% of cases.

There are many endoscopic findings described in strongyloidiasis but, unfortunately, most of them lacking photographic documentation. In the duodenum, the most important findings comprise edema, brown discoloration of the mucosa, erythematous spots, bleeding under the epithelium, and megaduodenum.[2]

In our case, the patient was born in an endemic region for strongyloidiasis, having a long history of GI symptoms. He experienced a long gap without symptoms that were relieved following the surgery performed in his infancy. Interestingly, all upper GI endoscopies have seen a megaduodenum of this patient. Nonetheless, no biopsy examination from the duodenum has been done preoperatively. It could explain the delay in reaching the definitive diagnosis.

Megaduodenum symptoms are similar in a great extent to chronic duodenal obstruction. Basically, surgical treatment for megaduodenum is based on two surgical procedures. The first one is Finney's duodenojejunostomy, when the process is localized in the duodenum. The second one is a partial enterectomy with reestablishment of the intestinal tract by an end-to-end anastomosis when, in addition to megaduodenum, there is megajejunum.[1]

Megaduodenum diagnosis through upper GI endoscopy was recorded in this case, but without histopathological studies. Moreover, we could not confirm whether it had been congenital or acquired. In fact, this patient went through two surgeries because of obstructive symptoms. Finally, after histopathological diagnosis was achieved, he received the correct medical treatment for strongyloidiasis. Fortunately, he has overtaken all hazards and, until now, he has not had any more GI derangement.

4. Conclusion

Every patient that comes from an endemic area for *S. stercoralis* and has GI symptoms or a diagnosis of megaduodenum should be

considered for a strongyloidiasis investigation. In this regard, biopsies on stomach and duodenum should be made routinely. Finally, megaduodenum associated with gastric strongyloidiasis is a very rare manifestation of *S. stercoralis* infection.

Conflict of interest

I state that we do not have a direct financial relation with any commercial identity.

Funding

I do not have any source of funding for this research.

Ethical approval

This study has the ethics committee approval.

Author contributions

Terciotti, Valdir- study design.
Loes, Luiz Roberto- study design.
Coelho, João- data analysis.
Andreollo, Nelson Adami- writing.
Silva. Amanda Pinter Carvalheiro- data collection and writing.

Consent

This study has the patient consent.

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