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Chronic anisakidosis presenting with intestinal intussusception

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Abstract. – OBJECTIVE: Anisakidosis is a parasitic infection caused by the ingestion of row or uncooked fish, containing larval nematodes from the Anisakidae family. Intestinal anisakidosis represents about 4% of all cases, the majority being localized in the small bowel, with rare colonic involvement. Here we present an infrequent case of chronic anisakidosis, presenting with intestinal intussusception.

CASE REPORT: A 52 years old woman, chronically treated with immunosuppressants, presented to our Institution with acute abdominal pain and vomiting, due to colocolic intussusception. Colonoscopy successfully reduced the intussusception and revealed the presence of a voluminous colonic submucosal mass, near the hepatic flexure. Therefore, the patient underwent laparoscopic right hemicolectomy. The diagnosis of anisakidosis was made when the histological examination of the surgical specimen revealed the infestation of the intestinal wall by a nematode of the Anisakidae family, with an intense erosive-inflammatory adjacent reaction.

Key Words:
Anisakidosis, Colocolic intussusception, Colonoscopy, Endoscopy.

Introduction

Anisakidosis is a parasitic infection caused by the ingestion of row or uncooked fish, containing larval nematodes from the *Anisakidae* family of roundworms, usually *Anisakis simplex* and, less commonly, *Pseudoterranova decipiens*[1]. The increasing incidence of anisakidosis can be attributed to the gaining popularity of dishes that include raw or undercooked fish, and to improved diagnostic methods. The first report was described from Van Thiel in 1960, and, since then, many cases have been described, especially in Japan, where consumption of raw fish is common and over 2000 cases are reported annually[1]. The *Anisakis* life cycle involves marine mammals (whales, dolphins, and seals) as final hosts, and small crustaceans and marine fish or squid, as primary and secondary intermediate hosts, respectively[1].

Humans act as accidental hosts when infected marine fish or squid are consumed. Anisakidosis is classified as luminal or invasive form, according to the presence of bowel wall invasion by *Anisakid* larvae. The invasive form is further divided into gastric and intestinal, depending upon the penetration site. Gastric anisakidosis is much more common (> 90%) than the enteric form.

The pathogenicity of *Anisakis* is due to allergic reactions and direct tissue damage[2,3]. Usually the infection events begin 1 hour after ingestion and the larval death happens around 14 days later. This pathophysiologic cycle can be modified by poor immune response, with consistently low specific and total immunoglobulin IgE levels[4]. Allergic manifestations range from urticaria to anaphylaxis[2,3]. Tissue damage is due to the attachment of ingested larvae onto the gastrointestinal mucosa (acute form of the disease), or to the penetration and migration into the wall of the gastrointestinal tract (chronic infection), where abscesses or eosinophilic granuloma, can form, producing a variety of symptoms[5].

The clinical manifestations of anisakidosis vary according to the site within the gastrointestinal tract, where the larvae invade the wall and elicit an inflammatory response. Acute gastric anisakidosis generally presents with epigastric pain, nausea, and vomiting, 2-5 hours following the ingestion of raw fish. In contrast, chronic gas-

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tric infection can simulate peptic ulcers and chronic gastritis. Early endoscopy is highly recommended for patients in whom acute gastric anisakidosis is suspected; indeed, endoscopy is a useful diagnostic and therapeutic tool, since the anisakid larvae can be identified on the surface of the gastric mucosa and removed with the use of biopsy forceps[5]. Intestinal anisakidosis represents about 4% of all cases, the majority being localized in the small bowel (especially the terminal ileum), with only rare colonic involvement. Patients usually present with non-specific signs and symptoms, such as lower abdominal pain, fever, nausea, vomiting, and diarrhoea[6]. Clinically, intestinal anisakidosis may mimic appendicitis, Crohn's disease, or eosinophilic gastroenteritis and it is a commonly misdiagnosed and underestimated cause of acute abdomen. Cases presenting as bowel obstruction, strangulation, intussusception, and even pneumoperitoneum have also been described, where surgical resection of the inflamed portion of bowel may be the only definitive treatment[7]. Chronic intestinal anisakidosis might present with vague abdominal pain, nausea, weight loss, presence of mesenteric masses[1].

Herein, we discuss the case of a woman who presented to our Institution with acute abdominal pain and vomiting, due to colocolic intussusception, caused by chronic intestinal anisakidosis.

Case Report

A 52 years old woman, suffering from ankylosing spondylitis HLA B27+ and sacred ileitis, chronically treated with immunosuppressant drugs (Adalimumab, 40 mg every 2 weeks), presented to the Emergency Room of our Hospital with acute abdominal pain and vomiting. The abdomen was treatable, but painful to touch; Blumberg was negative; the right iliac fossa was moderately tympanic; bowel sounds were accentuated. Vital signs were normal and laboratory tests were normal, except for the presence of a slight leukocytosis with relative eosinophylia (10.950/mm^3, eosinophils 3.5%). Abdominal ultrasound (US) and computed tomography (CT) showed the presence of a 5 cm-sized mass, with multiple concentric ring signs and hay-fork signs, associated with air-fluid levels and small bowel dilatation (Figure 1A-B). Thus, she was diagnosed as having a colocolic intussusception.

A colonoscopy was performed, in the attempt to reduce the intussusception with gas insufflation. Endoscopy successfully reduced the intussusception and revealed the presence of a voluminous colonic submucosal mass, near the hepatic flexure; the ascending colon and caecum were filled with stool (Figure 1C-D). The patient was then taken to the operating room and underwent laparoscopic right hemicolectomy. Formalin-fixed and paraffin-embedded tissue sections obtained from the surgical specimen were stained by Hematoxylin and Eosin (H&E) method. Histological examination revealed an intense submucosal inflammatory process, formed by lymphomonocytes, sometimes in follicular aggregations, and abundant eosinophils. Within this inflammatory reaction, it was possible to notice multiple sections of a pluricellular parasite, with a single internal chamber, surrounded by an intensely eosinophil external covering. The regressive aspects of the parasite structures did not allow a precise evaluation of the covering epithelium of the chambers. The thickness of the orthogonal sections of the parasite was 0.5 mm; the side border of some sections of the parasite showed side excrescences like "beaks" (Figure 2). These features are typical of *Anisakis* or *Pseudoterranova*.

In a retrospective anamnestic clinical interview, the patient reported frequent consumption of marinated pilchards in the last 12 months. Moreover, she had been suffering, from about 6 months, of nausea and rarely vomiting, bad breath, worsening fatigue, weight loss (5 kg in total), vague abdominal pain, nightlife chills, with absence of fever. No consumption of marinated or raw fish was reported in the week before the admission.

The postoperative course and clinical follow-up performed at 3 and 6 months after surgery were uneventful.

Discussion

Colonic anisakidosis is a rare condition[7,8]. In Japan, where more than 90% of worldwide cases occur, only 75 anisakidosis have been reported in the large intestine. Among these, the majority (63%) were located in the right colon (caecum and ascending colon) with only 11% in the sigmoid colon and rectum. In all cases, the consumption of raw fish within two days before the onset of symptoms was confirmed. Adult intussusceptions comprise 5%-10% of all reported cases[9].

Colonic intussusception is rare in adults, and it is primarily caused by tumors, approximately 70% of which are malignant neoplasms. US and

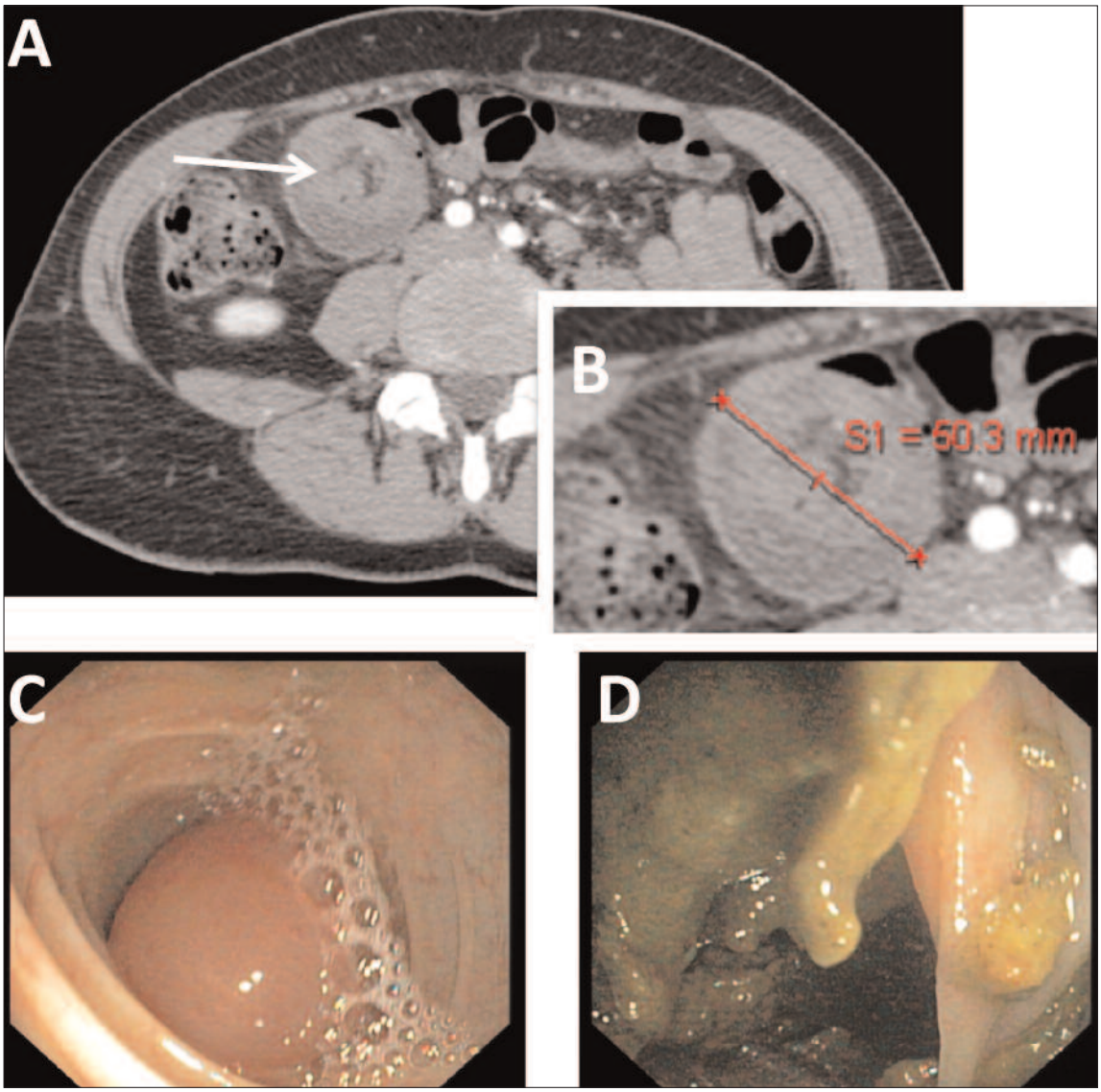

Figure 1. Abdominal CT scan documented the presence of a 5 cm-sized mass, showing multiple concentric ring signs and hay-fork signs (white arrows in panel ***A,*** shown at larger magnification in panel ***B***), with air-fluid levels and small bowel dilatation, due to colocolic intussusceptions. Endoscopy revealed the presence of a colonic submucosal mass occupying almost all the lumen of the colon, near the hepatic flexure (panel ***C***); the ascending colon was filled with stool (panel ***D***).

CT are very useful for the diagnosis of intussusceptions, when specific findings (multi concentric ring sign, target ring sign, or hay-fork sign) can be documented[6,7]. Adult intussusception caused by intestinal anisakidosis is an extremely rare occurrence. So far, there have been only 13 published reports[6,7]; in all cases, patients ate raw or marinated fish within 7 days from the symptom onset. Endoscopy may be useful for the diagnosis of anisakidosis, and also for the pneumodynamic resolution of the intussusception. Indeed, colonoscopy was successful and emergency operation could be avoided in 3 of the 13 aforementioned cases. However, if raw fish intake is not discovered at interview, or incidental detection of anisakis body fails, it is hard to determine what caused intussusception; that is the reason why surgery was performed in most of the cases[6].

Our patient suffered from a chronic intestinal anisakidosis, given that abdominal symptoms (nausea and rarely vomiting, bad breath, worsening fatigue, weight loss, nightlife chills with absence of fever) had been present from months

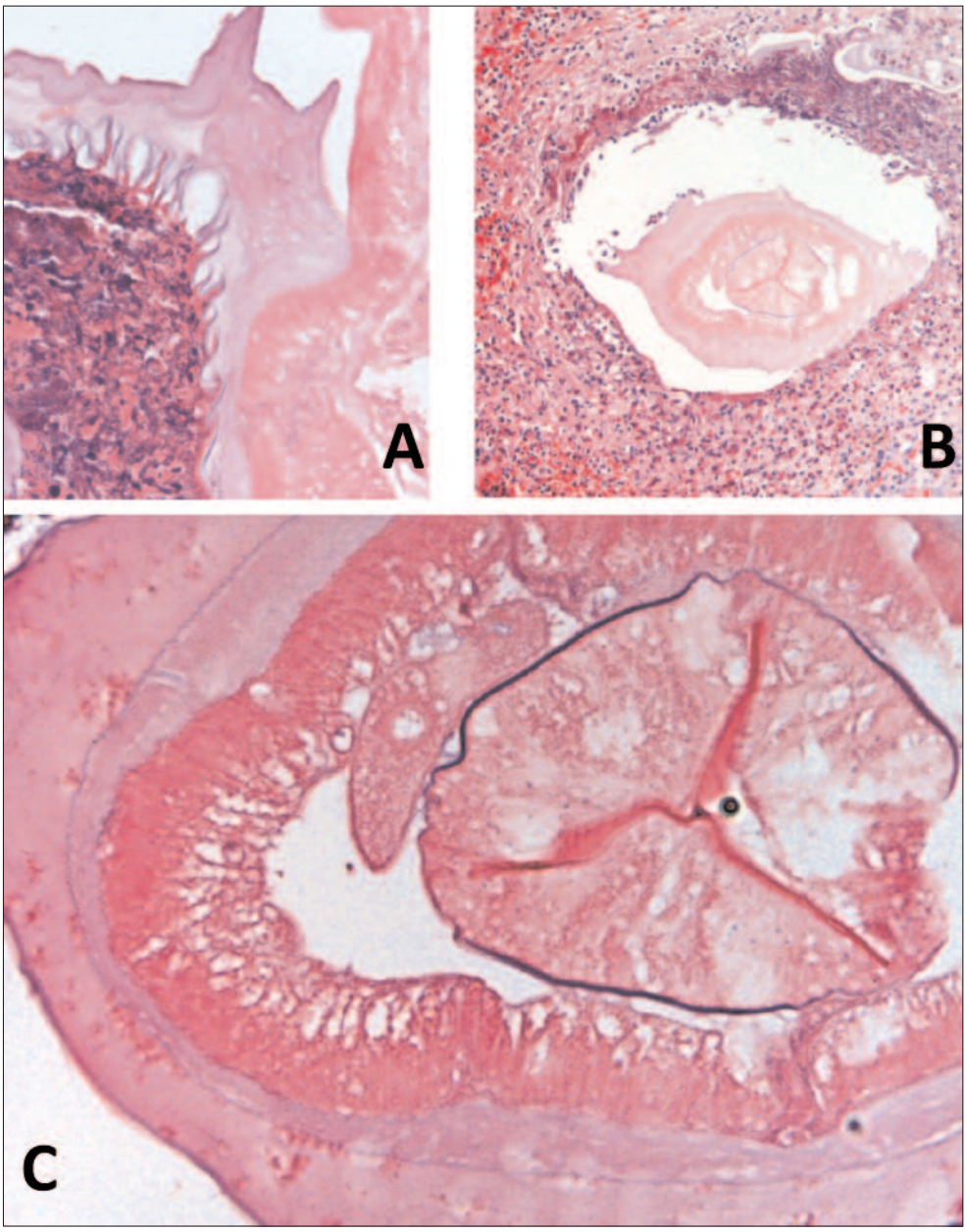

Figure 2. Histological examination of the surgical specimen revealed an inflammatory transmural process, formed by lympho-monocytes, sometimes in follicular aggregations, and abundant eosinophils ***(A)***. Within this inflammatory reaction, at the level of the submucosa, it was possible to notice multiple sections of a pluricellular parasite, with a single internal chamber, surrounded by an intensely eosinophil external covering, with typical features of Anisakis or Pseudoterranova ***(B, C)***.

and given the lack of raw fish consumption in the week before the admission; the colocolic intussusception was responsible for the rapid worsening of the clinical conditions, that finally led the patient to the Emergency Room. It is possible that the immunosuppressant drugs taken for the ankylosing spondylitis contributed to the chronicization of the infection.

In the case presented here, although colonoscopy was able to reduce the intussusception, the presence of a submucosal mass occupying almost completely the colonic lumen led to the surgical resection of the right colon. The diagnosis of previously unsuspected anisakidosis was made when the histological examination of the surgical specimen revealed the infestation of

the intestinal wall by a nematode of the *Anisakidae* family, with an intense erosive-inflammatory adjacent reaction. The histological diagnosis of anisakidosis relies on the identification of the nematode surrounded by an eosinophilic infiltrate. Unfortunately, identification becomes difficult when the worm degenerates, as it often happens in the setting of exhuberant inflammation in the intestinal wall. As a consequence, successful diagnosis requires an awareness of the disease entity and due diligence during sectioning by an expert pathologist[10].

Conclusions

The case presented here emphasizes the importance of taking into account the anisakidosis as a possible cause of acute abdominal pain, that might be due to a chronic intestinal infection complicated by the late-onset of intussusception. In order to recognize cases of chronic anisakidosis presenting with acute abdomen, in the context of persistent intestinal symptoms such as nausea, weight loss, and abdominal pain, it is essential to investigate the onset of symptoms and the correlation with the ingestion of raw/marinated or undercooked fish. Colonoscopy may be helpful to diagnose the cause and to reduce the size of intussusceptions caused by *Anisakis*. However, surgery becomes mandatory in chronic anisakidosis of the gastrointestinal tract with mass formation.

Conflict of Interest

The Authors declare that there are no conflicts of interest.

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