ACG CASE REPORTS JOURNAL

CASE REPORT | SMALL BOWEL

A Second Attack of *Anisakis*: Intestinal Anisakiasis Following Gastric Anisakiasis

Naoto Mizumura, MD, Satoshi Okumura, MD, Hiroshi Tsuchihashi, MD, PhD, Masao Ogawa, MD, PhD, and Masayasu Kawasaki, MD, PhD

Department of Surgery, Bellland General Hospital, Sakai, Japan

ABSTRACT

A 50-year-old man presented with epigastric pain after eating raw mackerel. Abdominal computed tomography revealed submucosal edema of the gastric antrum and pelvic ileum. Gastroscopy revealed an *Anisakis simplex* in the gastric antrum. His epigastric pain resolved after endoscopic removal of the *Anisakis*; however, he developed right lower quadrant pain the following day. Abdominal computed tomography showed submucosal edema of the terminal ileum involving different ileal loops, which was not present on admission. The patient developed delayed intestinal anisakiasis. A serving of raw fish may contain more than one *Anisakis*. After gastric anisakiasis, a second *Anisakis* may cause intestinal anisakiasis.

INTRODUCTION

Anisakiasis is a parasitosis caused by the ingestion of raw fish contaminated with *Anisakis simplex*. More than 90% of cases of anisakiasis are reported in Japan, where raw fish is frequently consumed as sushi and sashimi.[1] Gastrointestinal anisakiasis presents with acute abdominal pain, nausea, and vomiting. Contaminated raw fish may contain numerous *Anisakis* larvae, so they may simultaneously or metachronously attach to multiple sites of the digestive system.

CASE REPORT

A 50-year-old Japanese man presented with a 1-day history of acute epigastric pain with nausea and vomiting. The patient had consumed raw mackerel approximately 3 hours before the epigastric pain developed. His vital signs were normal. Physical examination showed mild tenderness of his epigastrium without guarding or rebound tenderness. Laboratory findings showed a leukocyte count of 15,300 cells/mL (eosinophils 2%) and a C-reactive protein (CRP) level of 12.29 mg/L. Computed tomography (CT) of the abdomen revealed submucosal edema of the gastric antrum and the pelvic ileum, focally dilated small bowel loops in the ileum, and ascites (Figure 1). The diagnosis of gastric and intestinal anisakiasis was suspected based on the patient's clinical course and medical examination. Gastroscopy revealed a tortuous polypide penetrating the mucosa in the gastric antrum (Figure 2). The mobile polypide was removed with the use of endoscopic forceps. The patient's symptoms, including epigastric pain, resolved soon after the procedure. He remained in the hospital for observation.

On day 2 of admission, laboratory tests revealed a leukocyte count of 10,200 cells/mL and a CRP level of 10.29 mg/L. He did not have any abdominal pain or discomfort in the morning, but he developed right lower quadrant pain at night. On day 3, his right lower quadrant pain became persistent. His leukocyte count and CRP level were 10,700 cells/mL and 6.62 mg/L, respectively. Abdominal CT showed the absence of submucosal edema in the gastric antrum (Figure 3). Focal submucosal edema was found in different ileal loops (ie, the pelvic ileum on admission

ACG Case Rep J 2018;5:e65. doi:10.14309/crj.2018.65. Published online: September 12, 2018.

Correspondence: Dr. Naoto Mizumura, Department of Surgery, Bellland General Hospital, 500-3 Higashiyama, Naka-ku, Sakai, Osaka 599-8247, Japan (naotomizumura@gmail.com).

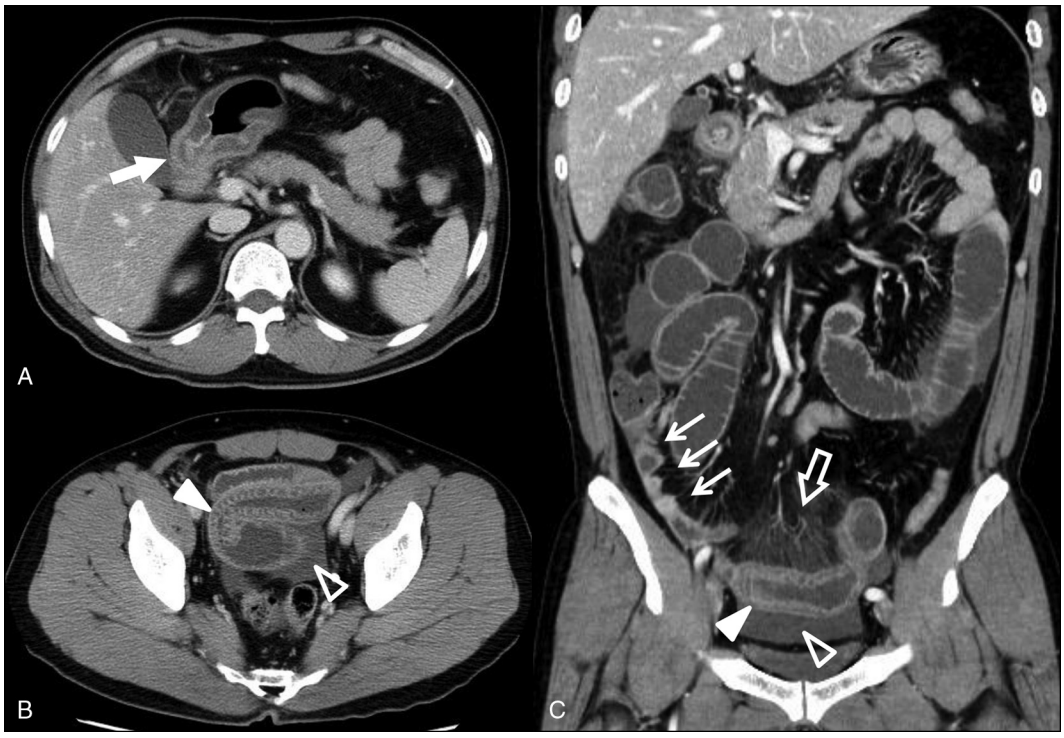

Figure 1. (A and B) Axial and (C) coronal computed tomography scan on admission showing submucosal edema of the gastric antrum (white thick arrow), submucosal edema of the pelvic ileum (white arrow head), ascites (open white arrow head), fat infiltration of the mesentery (open white arrow), and absence of dilated small bowel loops in the terminal ileum (white arrow).

and the terminal ileum on day 3). Submucosal edema was more severe on day 3 than on admission. We suspected that the patient had developed gastric anisakiasis with asymptomatic intestinal anisakiasis on admission, with subsequent symptomatic manifestation of intestinal anisakiasis on day 3 (delayed intestinal anisakiasis). After administration of intravenous 20 mg prednisolone, the patient's symptoms immediately improved. He was treated with fasting and 20 mg prednisolone twice a day for 3 days. He recovered and was discharged on day 8. After discharge, the anti-*Anisakis* IgG/A antibody titer drawn on admission was reported as 1.16 (normal range <1.50). Evaluation of parasites showed *Anisakis simplex*.

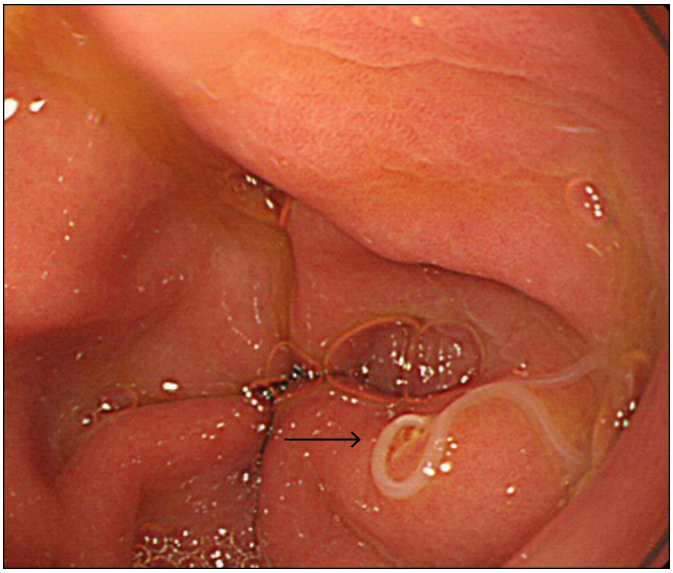

Figure 2. Gastroscopy showing a tortuous polypide penetrating the mucosa in the gastric antrum (arrow).

DISCUSSION

Anisakiasis is divided into 3 categories: gastric, intestinal, and ectopic anisakiasis. Gastric anisakiasis is most common, representing approximately 95% of cases.[2] Along with appropriate consideration of the patient's history, the diagnosis of gastric anisakiasis can easily be confirmed on gastroscopy. However, the diagnosis of intestinal anisakiasis is difficult and is commonly made based on the presence of characteristic CT findings: severe submucosal edema of the involved gastrointestinal area, fat infiltration in the mesentery, and ascites.[1-3] Immunological examinations (eg, *Anisakis*-specific IgA, IgG, and IgE) are often used. However, anti-*Anisakis* antibody titer is not elevated in the early phase (70% sensitivity and 87% specificity), and results take time to be reported.[2]

The key difference between gastric and intestinal anisakiasis is the time interval from raw fish ingestion to clinical symptom

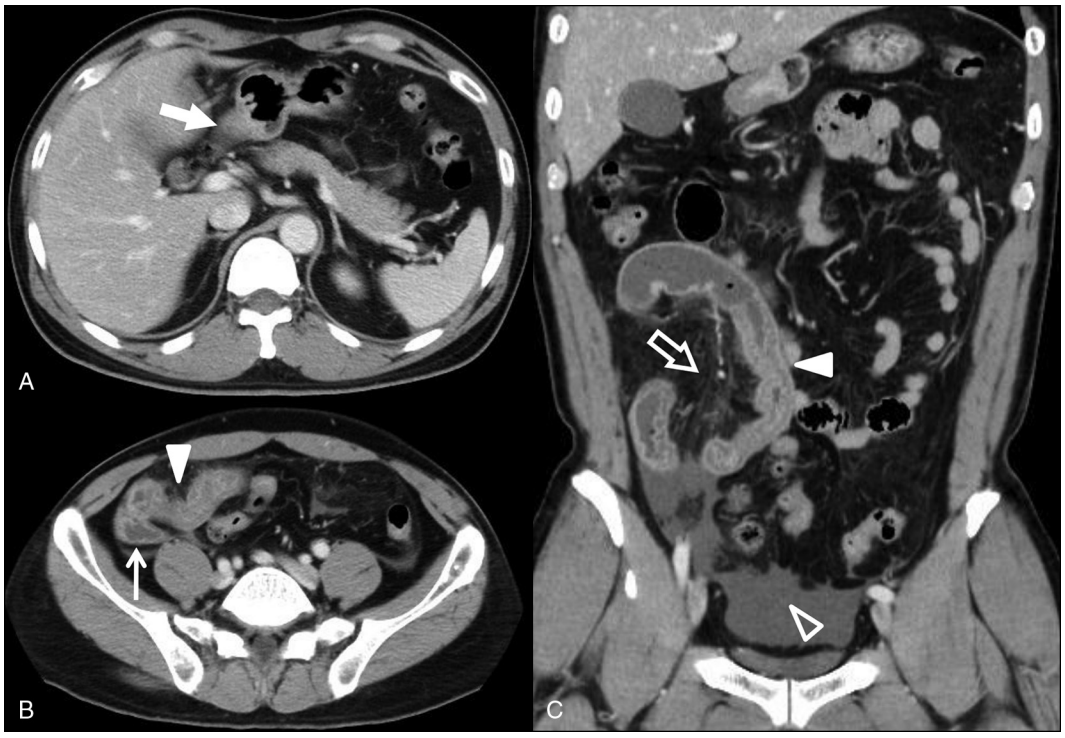

Figure 3. (A and B) Axial and (C) coronal computed tomography scan on day 3 showing submucosal edema of the terminal ileum (white arrow head), fat infiltration of the mesentery (open white arrow), ascites (open white arrow head), and absence of submucosal edema of the gastric antrum (white thick arrow). The white arrow shows the cecum.

onset. Gastric anisakiasis symptoms develop earlier than intestinal anisakiasis (7 hours vs. 36 hours).[1] Our patient did not have any abdominal pain for at least 24 hours after endoscopic removal of the gastric *Anisakis*, but he developed pain in the right lower quadrant at least 36 hours after raw mackerel ingestion. We believe that the patient developed intestinal anisakiasis following gastric anisakiasis.

Contaminated raw fish may contain several *Anisakis* larvae. In patients with gastric anisakiasis diagnosed via gastroscopy, 12.9% of patients were infected with multiple larvae; in one case, a total of 56 larvae were reported.[4,5] In another case, *Anisakis* was reported to simultaneously invade the stomach and the colon.[6] Although *Anisakis* larvae die within 14 days in the human body, they may simultaneously or metachronously attach to multiple sites of the digestive system during their lifespan. Careful gastroscopic observation should be performed to determine whether other *Anisakis* remain. Furthermore, repeat CT is necessary if patients have recurrent symptoms within a few days.

The etiology of anisakiasis is not fully elucidated, but it is considered to involve direct tissue damage and allergic reactions to the *Anisakis* larvae.[1,3] Therefore, removal of the larvae is important for treatment. In our case, gastric anisakiasis and intestinal anisakiasis were treated with gastroscopic removal and administration of 40 mg prednisolone for 3 days. In acute allergic reactions, such as asthma, anaphylaxis, or food allergy, prednisolone 30–60 mg/day (0.5–1 mg/kg) is often prescribed for 3–5 days.[7,8] Although there have been few reports on the efficacy of steroid therapy, this anti-inflammatory treatment could potentially resolve intestinal anisakiasis symptoms and reduce the length of hospital stay.[9-11]

Anisakiasis should be considered in patients with abdominal pain after raw fish ingestion. However, there are differences in the presentation, diagnostic methods, and management between gastric anisakiasis and intestinal anisakiasis. In addition, a serving of raw fish may contain more than one *Anisakis*. After gastric anisakiasis, another *Anisakis* that remains in the gastrointestinal tract may cause intestinal anisakiasis.

DISCLOSURES

Author contributions: All authors wrote the article. S. Okumura, H. Tsuchihashi, and M. Ogawa edited the manuscript. M. Kawasaki is the article guarantor.

Financial disclosure: None to report.

Informed consent was obtained for this case report.

Received November 2, 2017; Accepted June 25, 2018

REFERENCES

1. Takabayashi T, Mochizuki T, Otani N, Nishiyama K, Ishimatsu S. Anisakiasis presenting to the ED: Clinical manifestations, time course, hematologic tests, computed tomographic findings, and treatment. *Am J Emerg Med*. 2014;32(12):1485–9.
2. Shimamura Y, Muwanwella N, Chandran S, Kandel G, Marcon N. Common symptoms from an uncommon infection: Gastrointestinal anisakiasis. *Can J Gastroenterol Hepatol*. 2016;2016:5176502.
3. Shibata E, Ueda T, Akaike G, Saida Y. CT findings of gastric and intestinal anisakiasis. *Abdom Imaging*. 2014;39(2):257–61.
4. Shimamura Y, Ishii N, Ego M, et al. Multiple acute infection by Anisakis: A case series. *Intern Med*. 2016;55(8):907–10.
5. Kagei N, Isogaki H. A case of abdominal syndrome caused by the presence of a large number of Anisakis larvae. *Int J Parasitol*. 1992;22(2):251–3.
6. Kim SH, Park CW, Kim SK, et al. A case of anisakiasis invading the stomach and the colon at the same time after eating anchovies. *Clin Endosc*. 2013;46(3):293–6.
7. Ichinose M, Sugiura H, Nagase H, et al. Japanese guidelines for adult asthma 2017. *Allergol Int*. 2017;66(2):163–89.
8. Ebisawa M, Ito K, Fujisawa T. Japanese guidelines for food allergy 2017. *Allergol Int*. 2017;66(2):248-64.
9. Yamamoto K, Kurihara T, Fukuo Y. A unique and simple treatment method for anisakiasis. *Nihon Ika Daigaku Igakkai Zasshi*. 2012;8 (2):179–80.
10. Ramos L, Alonso C, Guilarte M, Vilaseca J, Santos J, Malagelada JR. Anisakis simplex-induced small bowel obstruction after fish ingestion: Preliminary evidence for response to parenteral corticosteroids. *Clin Gastroenterol Hepatol*. 2005;3(7):667–71.
11. Toyoda H, Tanaka K. Intestinal anisakiasis treated successfully with prednisolone and olopatadine hydrochloride. *Case Rep Gastroenterol*. 2016;10:30–5.