CASE REPORT

Anisakidosis: a fortuitous mimicker of gastrointestinal malignancy

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SUMMARY

A 51-year-old woman presented with epigastric pain, vomiting and diarrhoea. Her sister was recently diagnosed with duodenal adenocarcinoma, manifesting similar symptoms. Imaging revealed thickened gastric antrum with enlarged local lymph nodes. Endoscopy illustrated 3 worms embedded in the antral wall, identified as *Anisakis simplex* larvae. Larvae removal and a 2-week albendazole regimen treated the symptoms. With globalisation of cultural culinary practices, physicians must be vigilant of anisakidosis. Its ability to mimic peptic ulcer disease, chronic gastritis and malignancy necessitates broader differential diagnoses and lower thresholds for endoscopy.

BACKGROUND

Anisakidosis is a rare, fish-borne parasitic disease that has the ability to mimic various gastrointestinal illnesses. Over 90% of cases have been reported in Japan, with only 60 cases reported in the USA. Our case presents anisakidosis in a middle-aged, Caucasian woman in the USA, with no history of raw seafood consumption. Furthermore, our case reinforces the ability of anisakidosis to mimic other gastrointestinal diseases, with a presentation concerning for malignancy in a patient whose first-degree relative was recently diagnosed with duodenal carcinoma.

CASE PRESENTATION

A 51-year-old Caucasian woman presented with symptoms of epigastric pain for 9 days. Pain was gradual in onset, intermittent, sharp in quality, lasting numerous hours daily. Pain was partially relieved with daily omeprazole and exacerbated by the ingestion of food. Three days earlier, the patient noticed increased severity of pain and development of nausea, two episodes of vomiting and one episode of diarrhoea.

The patient reported experiencing similar pain 6 months ago, successfully treated with the use of omeprazole. She denied recent ill contacts, travel, indulgence in exotic foods or use of non-steroidal anti-inflammatory agents. She admitted to drinking alcohol socially but denied tobacco use. Of note, her sister was recently diagnosed with duodenal adenocarcinoma, presenting with similar symptoms.

Physical examination was notable for epigastric tenderness, without rebound or guarding.

INVESTIGATIONS

Initial laboratory data revealed mild leucocytosis (12 000 cells/mL—72.6% neutrophils, 14.1%

eosinophils) and anaemia (haemoglobin of 11.0 g/dL). Abdominal CT imaging performed in the emergency room showed a diffusely thick-walled gastric antrum with enlarged perigastric and retroperitoneal lymph nodes.

In light of the patient's presentation and significant family history of gastrointestinal malignancy, the patient was admitted to the medicine service and an oesophagogastroduodenoscopy was performed. This revealed congestion of the gastric antrum mucosa as well as three, thin, 1 cm long, live white worms embedded in its wall in a pinpoint fashion (figures 1 and 2). No other worms were identified in any other endoscopically visualised portion of the upper gastrointestinal tract, including the body and fornix of the stomach. Biopsies of the stomach were taken and the worms were removed via forceps. Histological analysis of the biopsied specimens illustrated mild, chronic, active gastritis with eosinophilia and intramucosal lymphoid aggregates. No evidence of ova, parasites, metaplasia, dysplasia or neoplasia was found on microscopic examination. The worms were later identified via morphological analysis as larvae of the *Anisakis simplex* species.

TREATMENT

The patient's symptoms improved shortly after the removal of the worms and she was prescribed albendazole, 400 mg daily for 2 weeks.

OUTCOME AND FOLLOW-UP

At the 2-week follow-up, she reported complete alleviation of symptoms, with improvement of white cell count and haemoglobin levels.

DISCUSSION

Anisakidosis is a parasitic infection caused by the accidental ingestion of third-stage larvae from the Anisakidae family, found in raw or undercooked seafood.¹ Infections in humans are typically caused by *A. simplex* (anisakiasis) or *Pseudoterranova decipiens* (pseudoterranovosis).² The disease was first described in the Netherlands in 1960.³ Since then, 90% of all cases have been reported in Japan, with only 60 cases being described in the USA.² The incidence of anisakidosis has been often attributed to the popular consumption of sushi and sashimi, although the consumption of less-expensive marine fish as cod and herring at home or in restaurants may portend higher risks of infection, given the greater abilities of sushi chefs to identify larval infestations.⁴

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Figure 1 Endoscopic view of the gastric antrum showing thin white worms embedded in the mucosa.

The typical anisakis life cycle involves numerous hosts. Adult forms are embedded in the gastric mucosa of marine mammals. Adult females produce unembryonated eggs that are excreted through the faeces of these mammals, to become embryonated in seawater. First stage larvae develop within these eggs and moult to become free-swimming second-stage larvae. Crustaceans consume second-stage larvae, which mature to form third-stage larvae, infective to fish and squid. Once consumed, these larvae migrate to the viscera and musculature of these second intermediate hosts. The cycle is complete when third-stage larvae are consumed by primary hosts and undergo moulting, forming adult worms. Humans are accidentally infected when they consume undercooked seafood parasitised by third-stage larvae.⁵

The pathophysiology of anisakidosis is attributed to direct tissue damage via proteases released by larvae or allergic reactions.⁶ The disease can thus be clinically classified into four clinical syndromes: gastric, intestinal, ectopic and allergic.¹ More than 90% of the cases of anisakidosis involve the stomach, presenting typically with acute, severe epigastric pain, nausea and vomiting hours after ingestion of contaminated food.³ Other features include mild fever, diarrhoea and rash.² Although the acute phase subsides within a few days, symptoms may be present for weeks to months, simulating those of peptic ulcer disease or chronic gastritis.⁵

Figure 2 Endoscopic view of thin white worm being retrieved from gastric antrum via forceps.

The typical workup of gastric anisakidosis includes laboratory tests, imaging studies and endoscopic or surgical evaluation. Blood work generally reveals leucocytosis with eosinophilia.⁶ CT scan findings include submucosal oedema, fat infiltration around the stomach, lymphadenopathy, focal masses and/or ascites.^{7 8} However, the definitive diagnosis of anisakidosis is made via endoscopic or surgical removal and examination of the larvae, generally visible up to at least 6 days after consumption of the parasitised seafood.^{1 2} Endoscopy may also reveal erythema, oedema, erosions, ulcerations or even tumour-like nodules.¹ These are matched with biopsy findings of eosinophilic and lymphocytic infiltration of mucosa and submucosa as well as phlegmon formation.¹ Delays in endoscopy may result in degeneration, elimination or penetration of the larvae through the mucosa.

Management involves early endoscopic removal of live larvae, which naturally die after 3 weeks in the human body.^{1 3} Although the role of antihelminthic agents is yet to be established, few observational studies have shown albendazole, 400–800 mg daily for 6–21 days, to be effective.⁴

As a preventable illness, the best protection against anisakidosis is avoidance of inadequately prepared marine fish and squid. If fish is to be consumed raw, freezing at –4°F for 7 days or –31°F for at least 15 hours prior to consumption is recommended.²

With globalisation of cultural culinary practices as well as the increasing incidence of fish-borne parasitic disease, it is imperative for clinicians to be vigilant of presentations of anisakidosis. This may be impeded by the ability of the disease to mimic common ailments as peptic ulcer disease, chronic gastritis as well as gastrointestinal cancers. Thus, it is crucial to employ endoscopy to confirm diagnoses, particularly in individuals at risk for malignancy.

Learning points

- ▶ With globalisation of ethnic cuisine and the rising incidence of foodborne parasitic diseases, physicians must keep broad differential diagnoses in the workup of gastrointestinal disease.
- ▶ Anisakidosis carries the ability to mimic common gastrointestinal diseases, including malignancy. Thus, in patients with upper gastrointestinal symptoms who are at high risk for malignancy, endoscopic investigation should be employed.
- ▶ In addition to endoscopic removal of larvae, albendazole, 400 mg daily for 2 weeks, may be considered as adjunctive therapy for the treatment of anisakidosis.

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