CASE PRESENTATION

A 50-year-old man presented to the emergency department (ED) with vomiting and epigastric pain 1 h after eating raw, wild salmon, which he had purchased from a major chain grocery store. He experienced immediate onset of profuse emesis and upper abdominal pain with no diarrhea. The epigastric pain was severe (described as 8 of 10) and persisted for 2 h.

On presentation to the ED 6 h after eating the fish, he had a fever of 39°C and continued to experience severe abdominal pain, which localized to the left upper quadrant. On examination, the patient had abdominal tenderness, which was worse over the left upper quadrant and epigastrium. Hematological tests revealed a hemoglobin level of 167 g/L, a platelet count of 96×10^9/L, and an elevated white blood cell count of 11.4×10^9/L, with predominant neutrophilia but no eosinophilia. His chest x-ray was unremarkable, and stool culture for ova and parasites was negative. An abdominal x-ray revealed an abnormal contour of air surrounding the gastric mucosa, suggesting extensive lobular thickening. A subsequent computed tomography scan revealed uniform thickening of the rugae in the fundus and body of the stomach, suggestive of acute gastritis or neoplasia. He underwent esophagogastroduodenoscopy (EGD), at which time a diagnosis was made.

DIAGNOSIS

Gastric anisakiasis

At endoscopy, punctate ulcerations were observed throughout the stomach and, on closer inspection, a 1 cm to 2 cm worm at the centre of each ulcer (Figure 1). Two of the worms were removed and sent to the microbiology laboratory for identification.

Gross initial examination of the worms under a stereomicroscope revealed small, white larval nematodes 20 mm × 0.5 mm. Some key morphological features of anisakid worms were identified, including: fine striations of the cuticle; the presence of a boring tooth ventral to the mouth; and the presence of an excretory pore between the ventrolateral lips (1,2). Histopathological examination of transverse sections revealed the absence of lateral alae and distinctive Y-shaped lateral chords, confirming the identification of an anisakid worm (2,3). The narrow base of these chords, as well as the shape and colour of the worm, suggested the specimen was Anisakis.

Anisakiasis is caused by the accidental ingestion of larval nematodes belonging to the family Anisakidae. Humans become infected by eating raw seafood in dishes such as sushi, sashimi, ceviche, lomi-lomi, or other undercooked fish and squid dishes. Although a skilled sushi chef will recognize the distinctive ‘watch coil’ appearance of the larval worms (approximately 1 cm to 2 cm) in raw fish, individuals preparing their own sushi may not, and may, inadvertently, become infected after ingestion of the larval nematodes.

Anisakiasis is caused by members of the genera Anisakis and Pseudoterranova. Anisakis can be distinguished from Pseudoterranova by the presence of butterfly shaped lateral chords, >100 intestinal cells and an intestinal cecum (4). Anisakis simplex causes most human infecions, but other Anisakidae can rarely be involved (2,5). Anisakiasis is a rare condition in North America, with approximately 60 cases reported in the United States, and an even lower incidence in Canada (6-9).

There are several reasons for the increasing incidence of anisakiasis worldwide. All major oceans and seas contain marine life that is infected with anisakids (1). More regulatory control over marine fishing and marine mammals has increased the available host populations for anisakid worms; while at the same time, individuals worldwide are consuming more raw or lightly-cooked fish and squid. Pseudoterranova occurs more frequently in the United States and Canada because Pseudoterranova decipiens is mainly found in Atlantic or Pacific cod, Pacific halibut and red snapper (5).

To our knowledge, this is the first case of anisakiasis acquired from raw ‘wild salmon’ purchased from a Canadian supermarket. Our patient had a classic presentation for this condition. After eating infected fish, patients typically present within 6 h with severe vomiting and occasionally diarrhea, followed by profuse abdominal pain, as occurred in the present case. EGD and surgical removal of the Anisakis worms is the treatment of choice (1). Endoscopic extraction should be urgently performed when gastric anisakiasis is suspected because delayed worm removal may result in the larvae embedding into the submucosa. Although only a small number of worms were surgically removed, the patient experienced significant improvement of his symptoms, and no additional larvae were identified on repeat EGD.

Patients should be warned to not eat raw fish prepared at home because it can contain not only Anisakis, but also Gnathostoma spinigerum, Gnathostoma hispidum, Diphyllobothrium pacificum and Diphyllobothrium latum (1). Enteric bacterial infections that may also occur after eating raw fish include cholera (Vibrio cholerae) or Escherichia coli. However, if patients persist in eating raw fish and preparing their
own sushi, they should be instructed to freeze the fish for seven days at
–20°C or at a lower temperature for a shorter period of time (<–20°C for
four days). Sushi that is prepared in Canadian restaurants and supermar-
kets is very unlikely to contain any parasitic infections because it is
likely either flash frozen to –35°C for 15 h or frozen for a prolonged
period of time, as outlined above. Provincial legislation across Canada
varies; however, in Alberta, regulations require mandatory freezing
unless raw fish is either farm fed or tuna (10).

Increasing reports of acute anisakiasis will likely occur in the next few
decades given the growing consumption of sushi and sashimi worldwide.

A detailed recent food and beverage history should be recorded for
patients presenting to the ED with rapid onset of acute abdominal pain
to diagnose this condition. Endoscopy and worm removal is urgently
required to treat this condition, and to prevent long-term complica-
tions. Prevention relies on the adequate cooking of fish and seafood,
or the proper storage of these foods by freezing.

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