Anisakiasis in Hawaii: A radiological diagnosis

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Human anisakiasis, an increasing medical problem in Japan, was recently identified in 7 people in Hawaii[1]. We report an 8th case occurring in an individual who had consumed a large amount of raw squid sushi at a restaurant. The diagnosis of anisakiasis in this patient was made after the parasite was identified by X-ray. To our knowledge, radiographic demonstration of the anisakiasis parasite has not been reported in Hawaii previously.

Introduction

Infection by the nematode anisakis in humans was first reported in 1960 by Thiel[2]. Since that time the incidence of anisakiasis has increased, especially in Japan, where numerous new cases are reported each year. In Hawaii, 7 cases have been reported, the diagnosis made by the endoscopy and the radioallergosorbent test (RAST). The lifecycle, diagnosis, treatment, and overall management of infection with anisakis was extensively reviewed by Deardorff, Kayes and Fukumura[1].

In brief, Anisakis is a nematode that commonly infects the gastro-intestinal tract of marine mammals, after these mammals have ingested the infected flesh of fishes or crustaceans[1,3,4]. Humans can also become infected after eating the raw flesh of infected fishes such as salmon, mackerel and rockfish (red snapper). Infections have also occurred after eating raw squid[1,4,5,6].

Typically, a patient may present with severe, intermittent epigastric pain 1 to 12 hours after eating such food. Nausea, vomiting, diarrhea and urticaria may or may not ensue. Fever, leukocytosis with or without eosinophilia, and occult blood in the stool may also be present in some cases[1]. Symptoms may mimic acute gastroenteritis, food poisoning[5], appendicitis, cancer, ileitis, TB peritonitis, cholecystitis[8] and Crohn's Disease[9].

Diagnosis can be made radiographically by actually seeing the parasite on film. The presence of broad gastric folds, bowel edema[10,11], or widening of the gastric angle, in symptomatic patients with a history of consuming seafood can also suggest anisakiasis[4,5,6,11]. However, the diagnosis is usually made by endoscopy and/or RAST[1,12,13].

Treatment consists of endoscopic removal of the worm, in addition to symptomatic management[1,4,5,6].

Complications of severe anisakiasis include intussuception with intestinal obstruction[7], severe ascites, penetration of the bowel wall by the juvenile form[9] or ileus[8]. Anisakiasis has also been linked to the formation of an eosinophilic, granulomatous, gastric tumor[14]; the worm has also been reported to have migrated into the mesentery, the pancreas[8] and the liver[9].

Infections by anisakis can be prevented if raw items are cooked or blast-frozen prior to consumption[1,3].

Case report

A 33-year-old physician was seen in the office with a chief complaint of intermittent, sharp, non-radiating epigastric pain 3 hours following consumption of a large amount of raw squid at a sushi bar. The pain was accompanied by diaphoresis and nausea, but no fever or vomiting.

Past medical history and family history were not remarkable, and the patient denied being on any medications. Social history was significant only in that alcohol was imbibed infrequently. Review of symptoms was non-contributory.

On physical examination, the vital signs were: BP 130/88 P 84/min, T 99°F. Examination of the abdomen revealed mild tenderness to deep palpation in the epigastric region. Guarding, rigidity, and rebound were not present; bowel sounds were normal. Rectal examination was unremarkable; the stool was brown and guiac negative. The rest of the examination was not remarkable.

Laboratory data revealed a WBC of 11.1 with a normal differential.Eosinophilia was not present. The Hgb was 16.1, Hct 46.6, platelets 189,000, BUN 15, Creat 1.0, SGOT 25, SGPT 41, GGT 54 and total Bilirubin 0.8. An upper GI series was obtained. The initial reading reported no abnormalities. The patient was treated symptomatically and left Hawaii the same day. He later reported spontaneous resolution of the symptoms within 24 hours. No further followup seemed necessary, therefore.

The patient, being a physician, reviewed the upper GI films and found a 0.5 mm x 2 cm thread-like, radiolucent, filling-defect partially surrounded by a pool of barium in the body of

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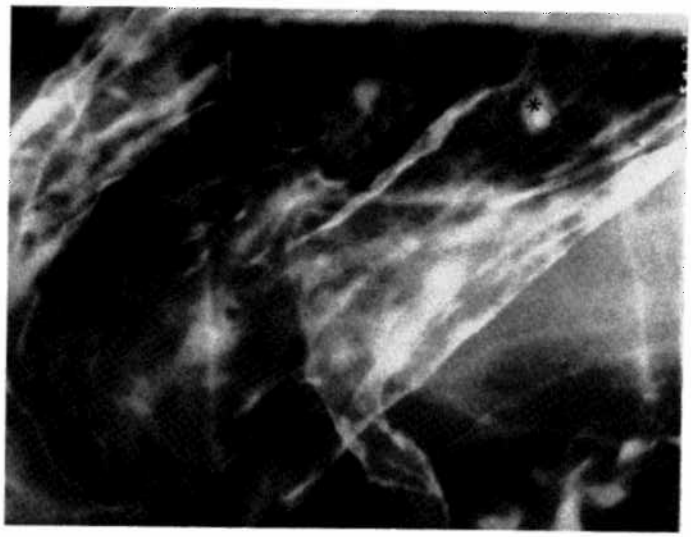

FIG. 1 — X-ray photograph of the nematode Anisakis in the wall of the stomach. The parasite appears beside the asterisk as a serpiginous 0.5 mm x 2 cm filling-defect. Note the small pool of barium, representing the site of attachment, partially surrounding the worm.

the stomach (Fig. 1). A surgeon by profession, the patient immediately made a diagnosis of anisakiasis based on his clinical experience with similar infections in his own patients. He returned to Hawaii approximately 2 months later and brought up his case for discussion by his peers. Consequently, a corrected diagnosis of anisakiasis was made.

Discussion

This case, in which the patient made the diagnosis, emphasizes the need for greater awareness by physicians concerning anisakiasis. No further workup, such as endoscopy or RAST, was necessary on this patient because his symptoms resolved within 24 hours; the upper GI X-ray was read as "normal" and anisakiasis was simply not suspected.

Since then, we have discussed this case with several local radiologists. They also read the X-rays as normal and were surprised that the nematode could be seen on film. However, the thread-like filling-defect, surrounded by a small pool of barium (the site of attachment by the worm), that can be seen in this patient's films is what is frequently demonstrated in Japan. In one Japanese study of 130 patients, thread-like filling-defects in circular or ring-like shapes were seen in 47.7% of patients with gastric anisakiasis[6]. Sugimachi et al[6] also interpreted the small, round collection of barium associated with the thread-like filling-defect as the parasite's site of attachment to the mucosa. Nakata et al[5] reported the same kind of serpiginous, thread-like filling-defect in 31 of 41 patients (76%) studied. Other workers have also been able to demonstrate this in the small bowel[11] and in the large bowel[10].

Residents living in Hawaii have many opportunities to sample new seafood dishes in the home or at local restaurants. Although relatively few cases have been reported locally, it is quite likely that such infestations have gone undiagnosed[1]. The radiographic evidence of the presence of anisakis, for example, is subtle and easily overlooked, and the edema in the stomach or bowel which may occur could also be caused by other gastrointestinal diseases. As a result, endoscopy with or without RAST would be more useful than X-ray to confirm the presence of the anisakis. However, if the parasite is apparent radiographically, this finding may obviate invasive procedures (eg exploratory laparotomy for a diagnosis of acute appendicitis) and aid in the overall management of the patient's illness.

REFERENCES

1. Deardorff TL, Kayes SG, Fukumura T: Human anisakiasis transmitted by marine food products. *Hawaii Med J*, Vol 50, 1:9-16, 1991.
2. Van Thiel PH: A nematode parasitic to herring causing acute abdominal syndromes in man. *Trop Geogr Med*, 2:97-113, 1960.
3. Brown HW, Neva F: Basic Clinical Parasitology 5th Ed. 1983. Appleton-Century-Crofts. 339 pp.
4. Ikeda K, Kumashiro R, Kifune T: Nine cases of acute gastric anisakiasis. *Gastrointest Endosc*, Vol 35; 4:304-308, 1989.
5. Nakata H, Takeda K, Nakayama T: Radiological Diagnosis of Acute Gastric Anisakiasis. *Diagnostic Radiology*, 135:49-53, 1980.
6. Sugimachi K, Inokuchi K, Ooiwa T et al: Acute gastric anisakiasis-analysis of 178 cases. *JAMA*, Vol 253, 7:1012-1013, 1985.
7. Hayashi N, Furukawa M, Nakata T et al: A case of intestinal anisakiasis associated with intussusceptions of the small intestine. Iryo, Vol 43, 7:753-756, 1989.
8. Yokogawa M, Yoshimura H: Clinicopathologic studies on larval anisakiasis in Japan. *Am J Trop Med Hyg*, 16:723-728, 1967.
9. Hayasaka H, Ishikura H, Takayama T: Acute regional ileitis due to Anisakis larvae. *Int Surg*, 55:8-14, 1971.
10. Higashi M, Tanaka K, Kitada T et al: Anisakiasis confirmed by radiography of the large intestine. *Gastrointest Radiol*, 13:85-86, 1988.
11. Matsui T, Iida M, Murakami M et al: Intestinal anisakiasis: clinical and radiologic features. *Radiology*, 157:299-302, 1985.
12. Deardorff TL, Fukumura T, Raybourne RB: Invasive anisakiasis. A case report from Hawaii. *Gastroenterol*, 90:1047-1050, 1986.
13. Sakanari JA, Loinaz M, Deardorff TL et al: Intestinal anisakiasis. A case diagnosed by morphologic and immunologic methods. *Am J Clin Pathol*, 90:107-113, 1988.
14. Kitsukawa K, Tanouchi M, Tanakami A et al: Parasitic eosinophilic granuloma of stomach resembling a submucosal tumor. *Am J Gastroenterol* (Letter to editor), Vol 85, 2:217-218, 1990.

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