Gastric Perforation due to Fish Bone Ingestion: a Case Report

Yoshiki Wada, MD,1 Wataru Sasao, MD,1 and Tadashi Oku, MD, PhD2

1 Department of Internal Medicine, Hokkaido Prefecture Haboro Hospital, Hokkaido, Japan
2 Department of Surgery, Hokkaido Prefecture Haboro Hospital, Hokkaido, Japan

A 74-year-old man was admitted to our hospital due to low-grade fever and severe epigastric pain. Abdominal computed tomography revealed a linear structure surrounded by a small amount of air that had pierced the angular region of the gastric wall. Esophagogastroduodenoscopy showed that the structure was a fish bone. Gastric perforation due to fish bone ingestion is rare and almost all of the cases need surgical procedures. In this case, we endoscopically removed the foreign body with forceps and clipped the hole. Antimicrobial therapy was performed for one week, and the symptoms were completely improved.

Keywords: foreign-body ingestion, gastric perforation, fish bone, diagnosis by CT, endoscopic therapy, antimicrobial treatment

Introduction
In primary care, foreign body ingestion is a common problem. The majority of ingested foreign bodies pass through the gastrointestinal (GI) tract without any difficulties.1 According to some reports, patients with GI perforation by foreign bodies account for less than 1% of all patients.2–5 In adults, fish bones are the most frequently ingested objects and a common cause of perforation of the GI tract.3 Fish bones may lodge anywhere in the GI tract from the esophagus to the rectum. The perforation is mostly in the lower GI, and rarely in the stomach. Correct preoperative diagnosis is difficult; therefore most of the patients have to undergo abdominal or laparoscopic surgery. Non-metallic foreign bodies such as fish bones and toothpicks are rarely detected on radiography.4 Therefore computed tomography (CT) is useful in the correct diagnosis of foreign body perforation.3 We report a case of gastric perforation due to an ingested fish bone that was diagnosed by CT. In this case, instead of a surgical operation, endoscopic treatment with antimicrobial therapy led to a complete recovery.

Case Presentation
A 74-year-old man, with no previous abdominal complaints, visited our hospital with 18-hour persistent abdominal pain and low-grade fever. He had severe epigastric pain, a poor appetite, and had no food since
the previous day’s lunch. There was mild nausea, but no vomiting or diarrhea. He was alert and had a body temperature of 37.3°C, blood pressure of 116/65 mm Hg, regular pulse rate of 53 beats per minute, respiratory rate of 16 breaths per minute, and oxygen saturation of 98% from ambient air. His past medical history included angina pectoris and diabetes mellitus. He had taken aspirin, lansoprazole, carvedilol, and pioglitazone. The abdominal pain was confined to the epigastric region, and he had rebound tenderness and guarding in the epigastrium suggestive of localized peritonitis. The white blood cell count was 13,600/mm³ with 90% neutrophils and the C-reactive protein level was 15.7 mg/dL. The other test results, including those for hemoglobin, hematocrit, blood urea nitrogen, creatinine, creatine kinase MB, and troponin I, were all within normal limits. Electrocardiography showed no changes compared to the previous one. We suspected gastric or duodenal perforation, and an abdominal CT was performed. The CT showed a linear high-density structure in the angular region of the stomach surrounded by a small amount of air suggestive of perforation (Figure 1a, 1b). There was no ascites or abscess. We concluded that perforation of the angular incisure was caused by fish bone ingestion. The patient had eaten flounder boiled in soy sauce the day before, but he was unaware of ingesting a flounder bone. Esophagogastroduodenoscopy revealed that a flounder bone around 4 cm long had pierced the angulus of the stomach (Figure 2a, 2b). We removed the bone with forceps endoscopically. A small amount of pus exuded from the hole, and we closed the small aperture with one clip. While fasting and medicated with omeprazole, the patient received intravenous antimicrobial therapy (ampicillin and sulbactam 3 g every 8 hours) for one week, and his symptoms were improved. Abdominal CT 7 days after the endoscopic treatment showed that there was neither abscess of the stomach nor intraabdominal gas. (Figure 3) His condition has been fine to date.

Discussion
Unintentional, accidental ingestion of fish bones is a common clinical problem in primary care. Fortunately, most of these fish bones pass through the GI tract without causing any serious complications such as perforation or obstruction.1 Perforation distal to the esophagus by ingested fish bones occurs in less than 1% of all cases.2–5 Although fish bone perforation occurs in all segments of the GI tract, the most common sites of perforation are the ileum, the ileocecal junction and the rectosigmoid colon.6 Areas with sharp angulations, a change in direction and transition from a mobile to an immobile segment of the colon are considered to be the most vulnerable to perforation by an ingested fish bone. Perforation of the stomach by fish bones is rare. In Japan, from November 1981 to January 2010, there were 48 case reports of gastric perforation by an ingested fish bone.7 Of these, 42 cases received surgical operations, with only 6 cases receiving complete conservative therapy with endoscopic treatment and antibiotics.7

Figure 1a and 1b. Abdominal CT showing a linear high-density structure [solid arrows] in the angular region of the stomach surround by a small amount of air [dashed arrows] suggestive of perforation.
The most important risk factor for fish bone ingestion is the use of dentures, although our case’s patient did not use them. Dentures are thought to impede palatal sensory feedback, which provides a protective mechanism for identifying hard and sharp items in food. Other minor risk factors for accidental fish bone ingestion include fast eating, extremes of age (children or elderly), alcohol abuse and mental retardation. Fish bone perforation of the GI tract has several clinical manifestations, such as abdominal pain, vomiting and fever, occasionally including melena and bowel obstruction. In addition, the patients are often unaware of the accidental fish bone ingestion. Therefore, diagnosis of fish bone perforation is clinically challenging. The first clinical impression is frequently appendicitis or diverticulitis, and quite a few patients undergo abdominal or laparoscopic surgery.

In the diagnostic process, plain radiography is generally insufficient to identify the causal fish bone. Although metallic objects and chicken bones are invariably visible on plain radiographs, most fish bones and toothpicks are not sufficiently radiopaque to be indicated on plain radiography. Nor is abdominal ultrasonography always reliable because the examination is likely to be disturbed by obesity and bowel gases. Abdominal CT has the best sensitivity in searching for a fish bone. On a plain CT, a fish bone often appears as a high-density linear structure like calcification within inflammatory tissue. In spite of the superiority of CT over radiography and ultrasonography, even CT has some limitations. On contrast-enhanced CT, a fish bone may be overlooked because it appears to be a small artery. Another conceivable limitation of CT is the thickness of the slices. Fish bones are usually 1 or 2 mm thick, so if one slice thickness is 3 mm or more, the culprit fish bone can be overlooked.

Patients with fish bone perforations in the stomach are significantly more likely to have chronic symptoms, or asymptotically to present with an abdominal abscess compared to those with fish bone perforations in the jejunum or ileum. The patient in our case developed signs of localized peritonitis. If perforating fish bones are identified early, namely in the absence of or with mild of peritonitis and before forming an abscess, endoscopic extraction and clipping may be possible. Retrieval of a fish bone that has lodged in the stomach using a flexible overtube has been reported.
bone perforates the GI tract and migrates into the other solid organs such as the liver and pancreas or completely into the intraperitoneal area forming an abscess, abdominal or laparoscopic surgery should be performed. In our case, intravenous antimicrobial therapy (ampicillin and sulbactam 3 g, every 8 hours) in addition to administration of omeprazole and fasting continued for one week. Antimicrobial therapy for fish bone perforation after endoscopic treatment may be controversial. In this case, one-week antimicrobial therapy was performed because the patient had diabetes mellitus and was assumed to be at risk of poor wound healing. If the endoscopic removal of the fish bone is considered to be a clean-contaminated operation, 3 or 4 days of antimicrobial therapy may be sufficient. Although cautious follow-up and close cooperation with a surgical team are essential, conservative therapy with endoscopic removal of the bone and antibiotics may become the safe alternative to surgery for gastric perforation by a fish bone.

Conflicts of Interest: The authors declare no conflicts of interest.

This Case Report is based on informed consent of the patient.

References