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Preoperative Diagnostic Imaging for Fish Bone Penetration : A Case Report

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Abstract A 61-year-old man presented with right lower quadrant abdominal pain. A foreign body 19mm in length was seen on plain abdominal radiograph and abdominal computed tomography. Although he denied any fish bone ingestion, the preoperative suspicion of fish bone penetration of the intestinal tract was high. At laparotomy, a fish bone which had penetrated out of the cecum was seen. Ileo-cecal resection and peritoneal drainage were performed. The patient was well after surgery.

Key words : Fish bone penetration, Plain abdominal radiograph, Abdominal computed radiography, Preoperative diagnostic imaging

Introduction

Fish bone penetration or perforation of the intestinal tract is extremely rare. We report a patient in whom the preoperative diagnosis of fish bone penetration was suggested by plain abdominal radiograph and computed tomography.

Case report

A 61-year-old man presented to our department with a three-day history of increasing right lower quadrant abdominal pain, without nausea nor vomiting. Physical examination revealed a tender right lower quadrant mass. He was afebrile, 37.1°C. His white blood cell count and C-reactive protein were 12,100 cell/ μ l and 6.09mg/dl, respectively. Erect chest radiograph revealed absence of free air under the diaphragm. Plain abdominal radiograph revealed a radiopaque linear shadow, 19mm in length in the right lower abdominal quadrant (Fig.1). Abdominal computed tomography revealed linear high density within the colon and surrounding hypodense lesions (Fig.2). He denied any previous ingestion of fish bones. A presumptive diagnosis of abscess formation secondary to foreign body (presumably fish bone) penetration or perforation of the intestine was made.

Laparotomy was done through a right lower para-median incision. There was no ascites. The appendix was normal. A fish bone, 19mm in length (Fig.3), had penetrated out of the cecum with surrounding abscess formation. Ileo-cecal resection and peritoneal drainage were performed and bowel continuity was re-established by side-to-side anastomosis. He developed wound infection postoperatively which responded to antibiotics. The patient was discharged

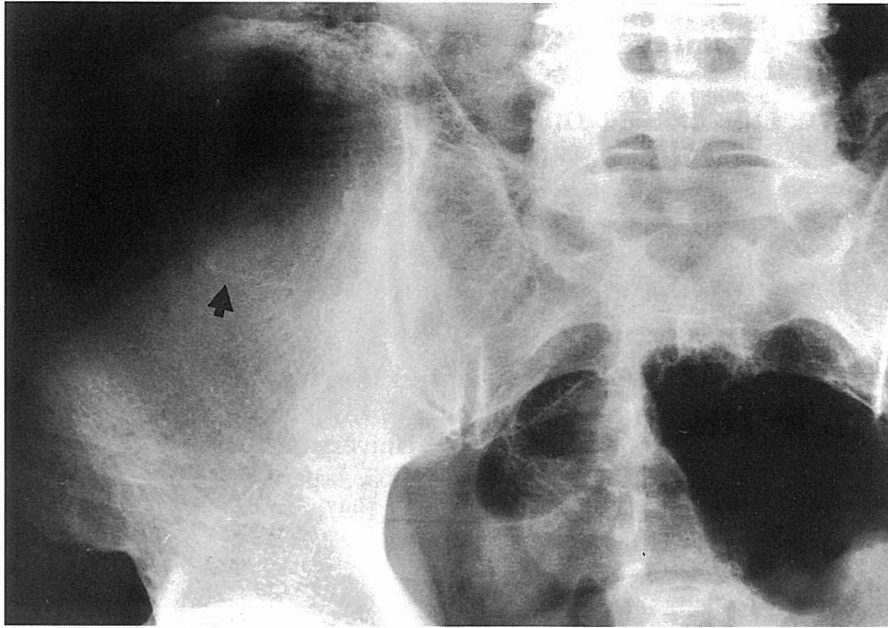


Fig. 1 Abdominal plain radiograph reveals radiopaque linear shadow (arrow) on the right lower quadrant.



Fig. 2 Abdominal computed tomography reveals linear high density inside the colon and pericecal hypodense lesions.

well on the 25th day after operation.

Discussion

Ingestion of foreign bodies is not uncommon, but most of them pass through the gastrointestinal tract within a period of seven days¹. Although 10 to 20% of ingested foreign bodies would fail to pass through the entire gastrointestinal tract, less than 1% cause perforation or penetration². In McManus's series involving 95 cases of perforation or penetration of the gastrointestinal tract by ingested foreign bodies, 26 cases (27%) involved fish bones³. As

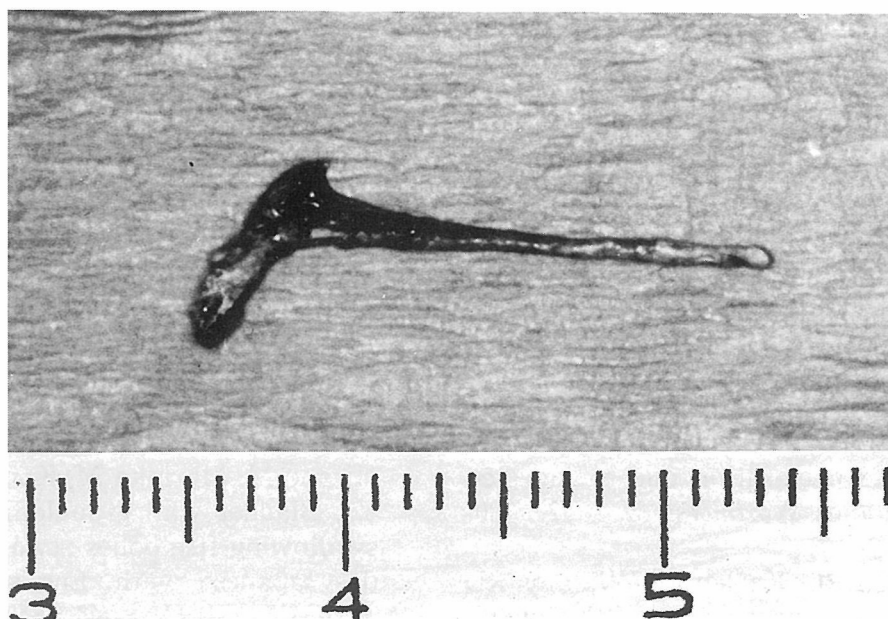


Fig. 3 Picture showing the ingested fish bone measuring 19mm in length.

Japanese frequently consume fish, the incidence of fish bone ingestion is high⁴. In Japan, Matsuzaki⁵ recently reported that there were 384 cases of gastrointestinal perforation or penetration due to fish bone. Ando⁶ reported that the sites of perforation or penetration, in descending order of frequency, were (1) anus (31.3%), (2) ileum (9.6%), (3) transverse colon (8.8%), (4) sigmoid colon (6.3%), (5) esophagus (5.8%), (6) rectum (3.3%), (7) cecum (2.5%) and (8) descending colon (2.1%)⁶. The clinical presentations were (1) intraabdominal abscess or granuloma (30.4%), (2) perineal or peri-proctal abscess (16.7%), (3) periproctitis (13.8%), (4) peritonitis (9.2%), (5) penetration to other organ (6.3%), (6) abdominal wall abscess or granuloma (5.8%)⁶. Approximately 99.1% of all patients⁶ were operated upon. Accurate preoperative diagnosis of fish bone ingestion was difficult. They were often mistakenly diagnosed as (1) malignant tumors (15.9%), (2) inflammatory tumors (13.2%) and (3) appendicitis (11.9%)⁶. Some difficulties were caused by failure to recognize the foreign bodies, including fish bone. Carelessness is the most frequent reason cited for fish bone ingestion, particularly in children. Other causes included poor vision, mental infirmity, rapid eating, drug addiction, absent-mindedness and use of dentures². The wearing of dentures may cause a lack of normal palatal and gingival sensation, permitting accidental bone ingestion⁷. In our case, the patient wore dentures. Preoperative diagnosis of fish bone penetration or perforation was made by diagnostic imaging in 18 previously reported cases^{6,8-22}. Our case is 19th report. Of these reports, radiopaque linear shadows were detected by plain abdominal radiography in 5^{9,15,18,20} (one case⁹ was during endoscopic retrograde cholangiopancreatography, ERCP) and linear high density was detected by abdominal ultrasonography (US) and computed tomography (CT) in 2¹⁴ and 17^{6,8-19,21,22}, respectively (5 cases^{9,14,15,18} were overlapped). A high index of suspicion is needed to diagnose penetration or perforation. Of these 19 cases, although 6^{6,12,15,17,21} had a history of eating fish, definite history of fish bone ingestion was obtained in only one case¹². In such cases, it is essential to take a detailed history, especially with respect to meal. Presence of the above-mentioned typical findings on plain abdominal radiograph, or abdominal US or CT would suggest the diagnosis of fish bone penetration or perforation. Takemura²² reported a case in which he successfully performed a less invasive surgical procedure with elective operation as a result of accurate diagnosis of gastro-intestinal perforation by a fish bone.

Plain abdominal radiography is often ordered for patients who complained of abdominal discomfort. Fish bone is essentially radiopaque, however, it may be hardly visible due to its position, size, angle etc. We had a previous experience of a case in which a fish bone had penetrated through the ileum²³⁾, but the fish bone was not visible on the plain abdominal radiograph. It does not mean that plain abdominal radiograph has no role in the diagnosis of fish bone penetration. Radiopaque material was discovered on plain abdominal radiographs in 5 cases^{9,15,18,20)} (one case⁹⁾ at ERCP). On the other hand, the frequency of detection of linear high density by abdominal CT was higher, so it is worthwhile considering abdominal CT in patients with unexplained peritonitis and intra-abdominal abscesses.

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