The Fish Bone that went too Far: A Geriatric Case of Fish Bone-Induced Colonic Perforation and Abdominal Wall Abscess

Nurul Izniza*, Shi haiyuan

Department of Radiology, Changi General Hospital, Singapore

***Correspondence:** Nurul Izniza, Department of Radiology Changi General Hospital, Singapore

nurul_izniza_yamin@cgh.com.sg

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HUMAN AND ANIMAL RIGHTS
Not applicable

ABSTRACT

Accidental ingestion of fish bone is a frequent occurrence, with most of cases going unnoticed as they pass through the gastrointestinal tract. Complications related to it such as perforation is rare. Diagnosis is challenging due to nonspecific symptoms, and timely surgical intervention is critical to preventing severe complications. We present the case of a 78-year-old male with nonspecific symptoms. Despite treatment for a suspected upper respiratory infection with intravenous antibiotics, his inflammatory markers remained elevated, prompting further investigation. Contrast-enhanced CT revealed a right lower abdominal wall collection with a linear calcified density, raising suspicion of a fish bone.

CASE REPORT

BACKGROUND

The Fish Bone That Went Too Far: A Geriatric Case of Fish Bone-Induced Colonic Perforation and Abdominal Wall Abscess, offers a significant contribution to the current literature by highlighting a rare but serious complication of foreign body ingestion, specifically fish bone-induced colonic perforation and subsequent abdominal wall abscess. The accidental ingestion of fish bones is a frequent occurrence, yet it is typically asymptomatic as the body naturally expels the foreign object without incident. However, in a minority of cases, such as the one presented here, complications arise, leading to potentially severe and life-threatening conditions.

The importance of this case lies in its ability to emphasize the clinical challenge of diagnosing fish bone-induced perforations, particularly in geriatric patients. The nonspecific nature of symptoms often complicates diagnosis. In this instance, the patient's continued elevation in inflammatory markers despite treatment for a suspected upper respiratory infection prompted further investigation, ultimately leading to the identification of a fish bone-induced colonic perforation via contrast-enhanced CT imaging. This highlights the critical role of advanced imaging techniques, such as CT scans, in diagnosing uncommon yet clinically significant conditions that might otherwise go unnoticed.

CASE REPORT

History & Clinical Data

A 78-year-old Chinese male with good premorbid status presented to the emergency department with productive cough, fever, generalized body weakness and loss of appetite. On clinical examination, his was febrile with low-grade fever. He was normotensive and not tachycardic. He was admitted and treated with intravenous Augmentin for an upper respiratory infection. However, his inflammatory markers remained significantly elevated, with hyperleukocytosis at 16.0 × 10^9/L

and C-reactive protein at 349 mg/L. His chest X-ray and urine analysis were unremarkable.

Imaging Findings

A contrast-enhanced CT scan of the thorax, abdomen, and pelvis was performed to locate the source of infection. It demonstrated a right lower anterior abdominal wall rim-enhancing collection. There is adjacent fat stranding extending from the collection to the adjacent right proximal transverse colon, possibly representing a fistula. A linear calcified density was observed within the abdominal wall collection, highly suggestive of a fish bone. No additional significant findings were noted in the thorax.

Management & Follow-up

A percutaneous drainage catheter was inserted into the right abdominal wall collection under ultrasound guidance. Administration of contrast via the drain showed no fistulous connection to the adjacent bowel. Bacteriological culture of the abdominal wall collection yielded *Citrobacter koseri*, which was sensitive to Augmentin. Follow-up CT abdomen demonstrated a smaller collection with a predominantly superficial residual component. The inflammatory markers normalized, and the drain was subsequently removed. The patient was discharged with outpatient follow-up.

DISCUSSION

Etiology & Demographics

Types of foreign bodies often differ among countries based on eating habits, culinary culture, and socio-cultural characteristics [1]. According to the Food and Agriculture Organization (FAO), Asian consumers enjoy high consumption levels of aquatic food (24.6 kg/capita/year), and in 2019, Asian consumers consumed over 70% of total global aquatic food [2]. Accidental ingestion of foreign bodies, particularly fish bones, accounts for approximately 84% of accidental ingestions [3]. Most cases resolve without symptoms as the foreign body is naturally expelled from the gastrointestinal (GI) tract within a week [2]. However, fish bone ingestion remains a significant clinical concern, with 10–20% of patients requiring endoscopic removal and around 1% developing GI perforations. These may necessitate prompt surgical intervention to prevent further complications [3,4]. Fish bones are particularly prone to causing GI perforation due to their sharp tips and elongated shape [2,4,5].

Risk factors for accidental fish bone ingestion include the use of dentures, which impair sensory feedback, extremes of age (children and the elderly), alcoholism, drug abuse, mental disabilities, rapid eating, and talking while eating [6]. Lim et al.'s 1994 study showed the incidence of fish bone ingestion was notably higher among Chinese patients compared to their Malay or Indian counterparts, leading to the hypothesis that the use of chopsticks, along with the traditional Chinese practice of deboning fish in the mouth (utilizing the teeth, lips, and tongue), may contribute to an increased risk of fish bone ingestion.

Despite the potential severity, fish bone-related GI perforations are often difficult to diagnose preoperatively due to nonspecific symptoms. Perforations frequently occur at areas of sharp angulation or at transitions between mobile and immobile bowel segments [4,7]. Occasionally, fish bones may perforate into less common sites, such as hernia sacs, Meckel's diverticulum, or the appendix.

Clinical & Imaging Findings

Fish bone-induced GI perforations are rarely diagnosed preoperatively and present with a broad spectrum of symptoms, depending on the perforation site. Clinical manifestations may include abdominal pain, vomiting, fever, melena, and bowel obstruction [4]. Other reported complications include localized abdominal abscesses, fistulas (colorectal, colovesical, enterovesical), inflammatory masses, omental pseudotumors, bleeding, and renal or ureteral colic. Compared to small bowel perforations, those occurring in the stomach, duodenum, and colon tend to present later [7,8].

Plain radiography has a limited role in detecting fish bones, with a sensitivity as low as 32% and false negatives occurring in up to 47% of cases. Pneumoperitoneum, a typical sign of perforation, is often absent in fish bone-related cases due to gradual bowel wall erosion, which is subsequently covered by fibrin, omentum, and adjacent bowel loops. Radiographic evidence of free intestinal gas is found in only 20% of patients.

With recent advancements in imaging, multi-detector CT scans have become the preferred diagnostic method for foreign body-related perforations. CT findings suggestive of perforation include thickened intestinal segments, localized pneumoperitoneum, regional fat stranding, intestinal obstruction, and occasionally, abscess formation. However, these findings are nonspecific. The definitive diagnosis is confirmed when a fish bone is identified as a linear calcified lesion surrounded by inflammation.

Potential pitfalls in CT interpretation include false positives due to bowel contrast, faecal artifacts, and contrast-opacified small blood vessels that may mimic a fish bone.

Treatment & Prognosis

The management of ingested foreign bodies depends on the patient's symptoms, the type of foreign body, and its location [4,7]. Surgical or radiological intervention may be required in patients who develop perforations, abscesses, fistulas, or ileus. In cases of small bowel perforation, treatment may involve repair or segmental resection. Early intervention is crucial to minimizing morbidity and preventing further complications. The timing and extent of surgery depend on factors such as the size of the perforation, the degree of contamination, bowel viability, and the surgeon's clinical judgment.

DIFFERENTIAL DIAGNOSIS

Fish bone perforations may occasionally mimic malignancy and other acute or chronic inflammatory conditions [8]. This is often attributed to considerable inflammatory thickening or a mass-like appearance of the affected structures, the absence of a relevant history of fish bone ingestion, and a lack of familiarity with the diverse imaging characteristics associated with fish bones.

TEACHING POINTS

Accidental ingestion of fish bones is common and usually asymptomatic, but in 1% of cases, it can lead to serious complications such as gastrointestinal perforation or abscess formation, where symptoms can be non-specific. CT scanning would identify a linear calcified lesion which is suggestive of a fish-bone and for detecting fish bone-induced perforations.

QUESTIONS

1. What percentage of accidental ingestions of foreign bodies are attributed to fish bones?
A) 10–20%
B) 30–40%
C) 50–60%
D) 70–80%
E) 84% (applies)

Explanation: Fish bones account for about 84% of accidental foreign body ingestions. Despite their high prevalence, fish bone-related perforations remain rare[Accidental ingestion of foreign bodies, particularly fish bones, accounts for approximately 84% of accidental ingestions].

2. Which of the following is NOT a risk factor for accidental fish bone ingestion?
A) Use of dentures
B) Extreme age (children and elderly)
C) High alcohol consumption
D) Eating slowly (applies)
E) habit of eating unfilleted fish with chopsticks

Explanation: Eating quickly, rather than slowly, increases the risk of fish bone ingestion[Risk factors for accidental fish bone ingestion include the use of dentures, which impair sensory feedback, extremes of age (children and the elderly), alcoholism, drug abuse, mental disabilities, rapid eating, and talking while eating]

3. Which diagnostic imaging method is preferred for detecting foreign body-related perforation?
A) Plain radiography
B) Upper GI endoscopy
C) Multi-detector CT scan (applies)
D) Barium swallow
E) MRI

Explanation: Recent advancements in imaging technology have made the multi-detector CT scan the preferred method for diagnosing foreign body-related perforation, including those caused by fish bones. This imaging technique is more sensitive than plain radiography, as it can detect signs like thickened intestinal segments, localized pneumoperitoneum, regional fat stranding, and occasionally, abscess formation, even in the absence of pneumoperitoneum (free gas).

4. What is the main challenge in diagnosing fish bone-related GI perforations?
A) The fish bone is not easily visible on radiography(applies).
B) The symptoms are typically not specific to fish bone ingestion(applies).
C) The perforations can occur in atypical locations such as hernia sacs and Meckel's diverticulum (applies).
D) Faecal material and oral contrast can mimic fish bones(applies).
E) Fish bone perforations are not always accompanied by pneumoperitoneum(applies).

Explanation: all of the above are known challenges in diagnosing fish-bone related GI perforations. Fish bones are non-metallic, making it difficult to identify on plain radiographs. Thus, multi-detector CT is the preferred mode of investigation. They can occur in atypical locations, like hernia sacs, Meckel's diverticulum, or the appendix. These uncommon sites make it harder to identify and diagnose the perforation preoperatively because the symptoms may be vague or nonspecific, and they do not always align with more typical gastrointestinal perforations. Usually the site of fish-bone related perforations, is concealed by omentum, fibrin and surrounding bowel loops with absence of pneumoperitoneum in most cases.

Which imaging finding is NOT typically associated with fish bone-induced gastrointestinal perforations on CT scan?

A) Thickened intestinal segments
B) Localized pneumoperitoneum
C) Regional fat stranding
D) Pancreatic malignancy(applies)
E) Abdominal collection

Explanation: CT scans may show thickened intestinal segments, localized pneumoperitoneum, regional fat stranding, and intestinal obstruction. It can also mimic intestinal malignancy due to inflammatory mural thickening of the bowel loops. "pancreatic malignancy" is not a typical imaging finding associated with fish bone-induced perforations.

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FIGURES

Figure 1: A 78-years old male with fish-bone related anterior abdominal wall collection.

FINDINGS: Axial contrast-enhanced CT of the abdomen and pelvis in the portal venous phase demonstrates a rim-enhancing collection seen within the right lower abdominal wall involving the muscle layers and extending into the deep subcutaneous tissues, suggestive of an abscess. A linear calcific density (yellow arrow) is seen within the deeper portion of the abscess, suspicious for a fish bone.
TECHNIQUE: Axial contrast-enhanced CT abdomen in portal venous phase, 141mAs, 120kV, 3.00mm slice thickness, 70mls Iopamiro 370

Figure 2: A 78-years old male with fish-bone related anterior abdominal wall collection.

FINDINGS: Coronal contrast-enhanced CT of the abdomen and pelvis in the portal venous phase demonstrates adjacent fat stranding extending from the collection to the adjacent right proximal transverse colon(yellow arrow), possibly representing a fistula. Linear density, suspicious for a fish bone(green arrow) is noted.
TECHNIQUE: Coronal contrast-enhanced CT abdomen in portal venous phase, 141mAs, 120kV, 3.00mm slice thickness, 70mls Iopamiro 370._

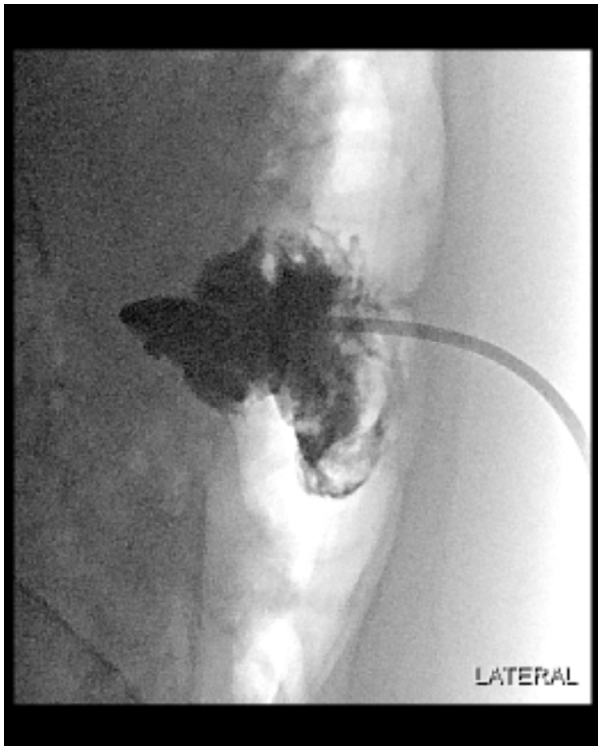

Figure 3: A 78-years old male with fish-bone related anterior abdominal wall collection.

FINDINGS: Administration of contrast via the percutaneous drainage catheter showed no fistula between the anterior abdominal wall collection and the adjacent bowel. **TECHNIQUE:** lateral view fluoroscopic images of the right lumbar region.

Figure 4: A 78-years old male with fish-bone related anterior abdominal wall collection.

FINDINGS: A follow up axial contrast-enhanced CT of the abdomen and pelvis in the portal venous phase demonstrates a smaller right lower anterior abdominal wall collection with residual superficial component. The tip of the percutaneous drainage(yellow arrow) catheter is seen within the deeper aspect of the collection.
TECHNIQUE: Axial contrast-enhanced CT abdomen in portal venous phase, 40mAs, 120kV, 3.00mm slice thickness, 75mls Omnipaque 350.

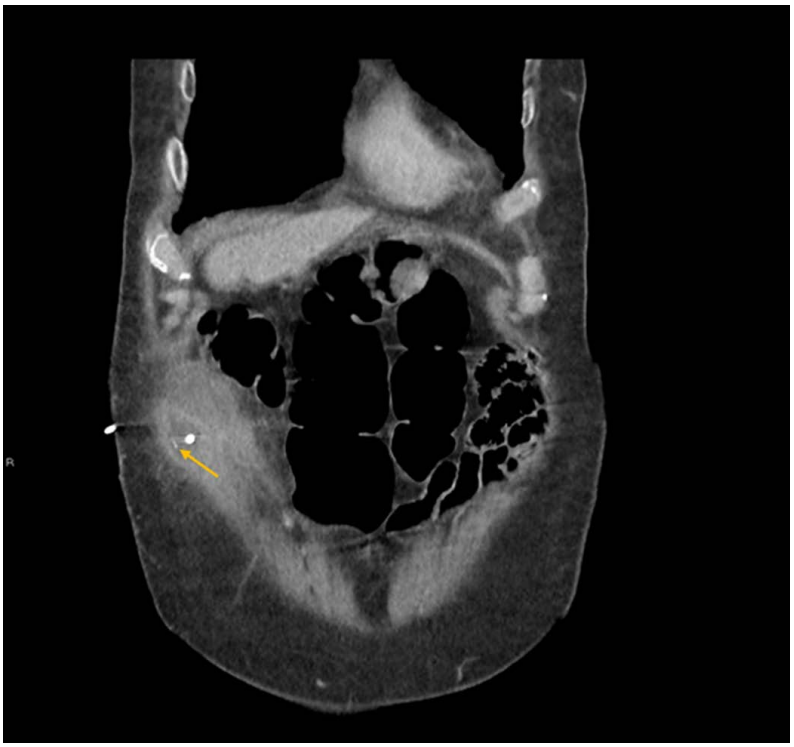

Figure 5: A 78-years old male with fish-bone related anterior abdominal wall collection.

FINDINGS: A follow up coronal contrast-enhanced CT of the abdomen and pelvis in the portal venous phase demonstrates Linear calcific density(yellow arrow) is again seen within the deeper part of the collection, suspicious for a fish bone.
TECHNIQUE: Coronal contrast-enhanced CT abdomen in portal venous phase, 40mAs, 120kV, 3.00mm slice thickness, 75mls Omnipaque 350.

TABLE

Parameter	Details
Incidence	Rare, about 1% develop perforations
Gender ratio	No clear gender predilection[8]
Age predilection	Extreme of ages(children and elderly)
Risk Factors	Use of dentures, alcoholism, mental and psychological disorders, eating habits such as using chopsticks
Treatment	cases with complications will need surgical or radiological interventions, depending on the severity of the cases.
Diagnostic techniques	Plain radiography has a limited role in detecting fish bones. Hence, multi-detector CT scans have become the preferred diagnostic method for detection of a fish bone which would appear as a linear calcific density as well as its associated complications.

KEYWORDS

Abdominal wall abscess; Perforation; Foreign body; Fish bone; Rare; Computed Tomography

ABBREVIATIONS

CT = Computed Tomography