

CASE REPORT

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Endoscopic management of fish bone perforation of the 3rd portion of the duodenum leading to retroperitoneal abscess: A case report and literature review

Kah Ann Ho, Kabytto Chen, Rajkumar Srinivasan

ABSTRACT

Introduction: Most fish bones ingested pass through the gastrointestinal tract without complications. Perforation occurs in less than 1% of cases but this rate increases up to 35% with ingestion of sharp pointed objects. There are only 14 cases of duodenal perforation from fish bone described in the literature thus far. In most of these cases there was no history of ingestion reported which makes diagnosis challenging. Complications from such perforation include hepatic abscess, pancreatic abscess, renal vein thrombus, duodenocaval fistula, and lodgement in common bile duct. 25% of these cases were managed with endoscopy alone without need for surgery.

Case Report: We describe a case of a 70-year-old male with perforation involving the third part of the duodenum from a fish bone complicated by retroperitoneal collection. He presented with right-sided abdominal pain and raised inflammatory markers. Initial imaging revealed a foreign body lodged in the third portion of the duodenum with adjacent retroperitoneal fluid. Progress imaging showed new extraluminal gas and inflammation prompting urgent intervention. Endoscopic removal of the fish bone was successful with subsequent resolution of the abscess.

Conclusion: In this case, endoscopic removal of the fish bone was successful resulting in early recovery. However, management of duodenal perforation by foreign body

can be challenging due to its rarity and myriad of possible management options including conservative, percutaneous, endoscopic, and surgical approaches.

Keywords: Duodenal perforation, Endoscopy, Fish bone perforation, Foreign body, Retroperitoneal abscess

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INTRODUCTION

Fish bone is a commonly ingested foreign body with reported cases of gastrointestinal perforation from it [1, 2]. Perforation of duodenum from fish bone is a rare occurrence with only a few cases described in the literature [3–8]. We present a case of a retroperitoneal collection from a fish bone perforation involving the third portion of duodenum (D3). Despite the distally located perforation, the fish bone was removed endoscopically and did not require surgical intervention.

CASE REPORT

A 70-year-old male presented to his district hospital with sudden onset severe right-sided abdominal pain. He described the pain to be stabbing in nature which radiated to his back and lower extremities. He denied other symptoms including nausea, vomiting, fevers, or bloody bowel movements. His past medical history included

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type 2 diabetes, hypertension, myasthenia gravis, hemochromatosis, hyperthyroidism, and osteoarthritis. His only abdominal surgical history was an open appendectomy as a child. He was allergic to diclofenac and never had similar presentations in the past. He was a non-smoker and did not consume alcohol. His abdomen was soft to examine with rebound tenderness in the right upper and lower quadrants and suprapubic region. He was kept nil by mouth and transferred to our facility via road ambulance for further management.

His blood investigations revealed elevated white cell counts at $19.4 \times 10^9/L$ (normal range 3.9–11.1) and C-reactive protein (CRP) 31 mg/L (normal ≤ 4). Rest of his routine blood investigations were within normal limits [lipase 15; liver function tests (LFTs): gamma-glutamyl transferase (GGT) 43, alkaline phosphatase (ALP) 83, alanine aminotransferase (ALT) 22, aspartate aminotransferase (AST) 21]. His erect abdominal X-ray did not identify free air under the diaphragm or concurrent cardiopulmonary pathologies (Figure 1). Computed tomography (CT) of his abdomen and pelvis revealed a foreign body lodged in the third portion of his duodenum along with retroperitoneal fluid adjacent to the perforation site. The foreign body within the duodenal lumen was in a horizontal lie, radiologically measured an approximate length of 3.0 cm and was partly intraluminal and had pierced through and through the duodenal wall and protruded into the retroperitoneal part of the duodenum. No intraperitoneal free gas or fluid was identified (Figure 2). On questioning the patient following the CT scan, he was unable to recall ingesting any sharp foreign body but admitted to eating fish two days prior to symptom onset which raised the suspicion for a fish bone perforation. Given the clinical picture and CT findings, he was managed conservatively with intravenous isotonic fluids and broad-spectrum antibiotics with proton pump inhibitor and was kept nil by mouth at admission.

His inflammatory marker (CRP) rose to 283 mg/L (normal ≤ 4) on day 2 of his admission and a progress CT scan was done. The repeat CT demonstrated the foreign body in the same lie and location but new retroperitoneal gas and fat stranding adjacent at the site of perforation was identified. No drainable retroperitoneal fluid was noted. There was also progressive serositis in the D3 and D4 segments (Figure 3).

We performed an emergency gastroscopy the same day which identified the embedded fish bone in the third portion of the duodenum (D3). The fish bone was successfully removed with an endoscopic snare (Figure 4) without any complications and a nasogastric tube was inserted post procedure. The fish bone was 8 cm long which was longer than the length predicted by CT which emphasizes the limits of imaging for foreign bodies involving the gastrointestinal tract due to poor visualization from surrounding intra and extraluminal gas in case of perforation, and due to congenital anchoring and angulation of the gastrointestinal tract particularly in the duodenum (Figure 5).

The nasogastric tube was removed on day 2 and he was started on clear oral fluids. By day 5 following the procedure, he was on a normal diet and his abdominal pain had resolved completely. His white cell counts normalized ($8.2 \times 10^9/L$) and CRP had reduced to 36. He was discharged home on a course of oral antibiotics. He remained well at six-week post-procedure outpatient follow-up.

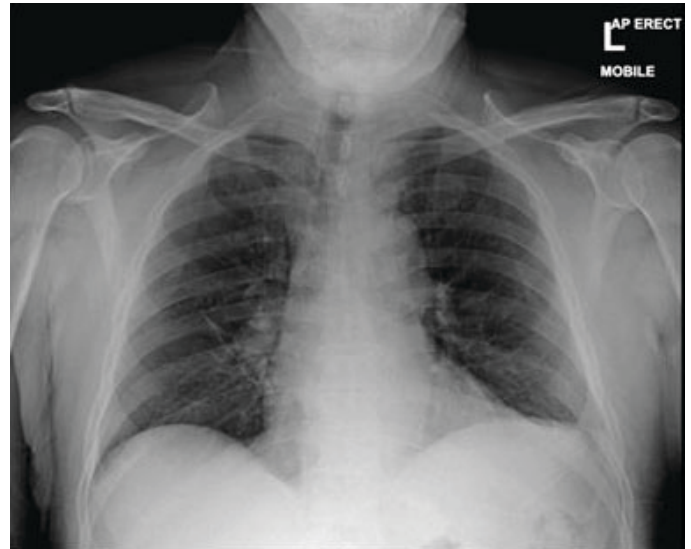


Figure 1: Chest X-ray on day of presentation.

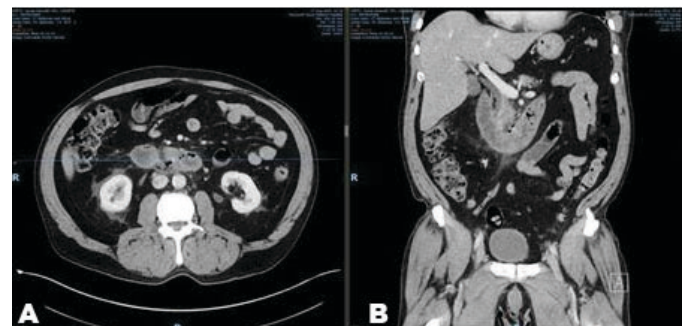


Figure 2: CT abdomen pelvis on day 1 of admission.

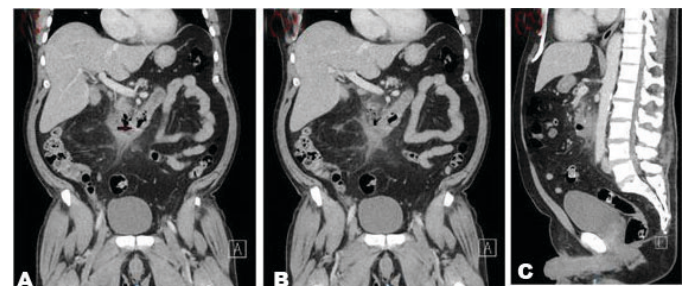


Figure 3: CT abdomen pelvis on day 2 of admission. (A) Axial view with red arrow showing radio-opaque one in duodenum. (B) Extraluminal gas and periduodenal fluid around site of duodenal perforation. (C) Sagittal view showing aorta not involved in perforation.

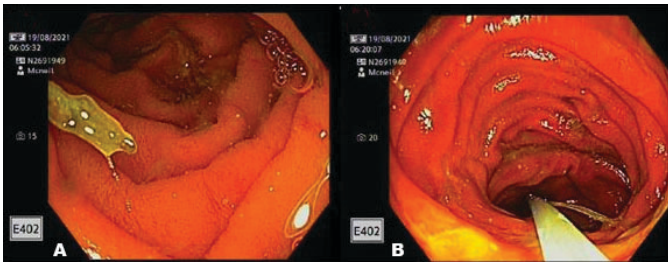


Figure 4: (A) Endoscopic images showing fish bone in D3 and (B) snare used to retrieve fish bone.



Figure 5: 8 cm long fish bone.

DISCUSSION

Majority of fish bone ingestion pass the gastrointestinal (GI) tract uninterrupted without complications. Gastrointestinal perforation from foreign body ingestion occurs in less than 1% of cases [3]. The rate of perforation from ingestion of sharp pointed objects can go up to 35% [9]. Foreign body perforation can be difficult to diagnose as patients usually present with nonspecific symptoms or are unaware of a history of ingesting a foreign body. The most common clinical presentation includes abdominal pain, with or without associated sepsis and bowel obstruction depending on the location of foreign body in the gastrointestinal tract [1]. Predisposing factors to foreign body ingestion include geriatric population with poor/absent dentition, patients with psychiatric disorders or developmental delay, alcohol intoxication, and prisoners seeking secondary gain [9].

Clinical guidelines written by the European Society of Gastrointestinal Endoscopy (ESGE) recommends urgent (within 24 hours) endoscopic removal of sharp pointed foreign objects, magnets, batteries, and large/long objects from the stomach or proximal duodenum [9]. A recent case series of 586 patients with ingested foreign bodies in the upper GI tract aimed to validate the ESGE guidelines. In this series, only 20 patients ingested fish bones and only 16 cases were found in the duodenum. It is not known how many cases of duodenal lodgment sites were due to fish bone. This study reported a 99.5%

success rate for endoscopic removal of foreign bodies with a 17.9% rate of overall complications and 7.7% rate of major complications including laceration, deep ulceration, and perforation. This study also showed that endoscopy within 6 hours reduced rate for overall complications [10].

There are no specific guidelines pertaining to fish bone ingestion. In the largest case series of fish bone ingestion by Ngan et al., 358 patients were prospectively recruited if they had a history of fish bone ingestion. This study showed 87.2% had endoscopic removal with immediate relief of symptoms [2]. This case series, however, only included fish bones down to the esophagus and not distally.

Perforation of duodenum from fish bone is rare. There have been 14 cases of duodenal perforation from fish bone in the English literature [3, 8]. Among these cases, 60% of cases reported no history of ingestion. The second part of the duodenum (D2) was the most common site of perforation [3]. Complications are three times higher in duodenal perforation from foreign body compared to other GI tract locations. They are also more likely to be asymptomatic and present a longer course [1]. Reported complications of fish bone perforation to the duodenum in literature include hepatic and pancreatic abscesses, renal vein thrombus, duodenocaval fistula and lodgment in the common bile duct [3–5, 7].

Fish bones are not always radio-opaque on X-ray as it depends on the species of fish. X-ray has only 32% sensitivity for detecting fish bones [2, 11]. Fish bone perforation is suggested on CT scan by thickened intestinal segment, localized free gas, regional fatty infiltration, or associated intestinal obstruction but definitive diagnosis can only be made by identifying a linear calcified foreign body [11]. Computed tomography has been shown to be 90–100% sensitive for detection of fish bone and has a specificity of 100% [12]. However, there are some caveats to using CT to detect fish bone as it can be limited by lack of observer awareness, thickness of the CT slices, orientation of fish bone with respect to axial CT scan, and contrast material obscuring fish bones [11].

Management of duodenal perforation can be conservative, percutaneous, endoscopic, or surgical depending on the location and lie of the foreign body within the duodenum, secondary organ involvement, and available expertise. In the literature, 25% of cases of duodenal perforation from fish bone were managed with endoscopy alone while 75% required surgery alone or in combination with endoscopy. The patients who were successfully managed with endoscopy alone did not have any associated secondary organ involvement similar to our case [3]. Surgical approach for the third portion of the duodenum (D3) is limited by insufficient view as it is fixed to the retroperitoneum [6]. In the case we describe, the fish bone had perforated D3 and caused a retroperitoneal collection which resolved after endoscopic removal of the fish bone without any complications.

CONCLUSION

Fish bone perforation of retroperitoneal duodenum is rare. Clinical diagnosis is difficult due to nonspecific symptoms and often a lack of history of fish bone ingestion. Imaging cannot always reliably predict dimensions of foreign bodies as this is limited by surrounding gas in perforation as well as angulation of the duodenum. This case illustrated successful endoscopic removal of a fish bone causing perforation in the third part of the duodenum. Prompt removal of ingested fish bone can result in early recovery.

REFERENCES

1. Paixão TSA, Leão RV, de Souza Maciel Rocha Horvat N, et al. Abdominal manifestations of fishbone perforation: A pictorial essay. *Abdom Radiol (NY)* 2017;42(4):1087–95.
2. Ngan JH, Fok PJ, Lai EC, Branicki FJ, Wong J. A prospective study on fish bone ingestion. Experience of 358 patients. *Ann Surg* 1990;211(4):459–62.
3. Cheung KT, Goonawardena J, Luck T, Sayed-Hassen A, Wong E. Endoscopic and surgical management of duodenal perforation by a fish bone. *Surgical Practice* 2021;25(4):227–31.
4. Brandão D, Canedo A, Maia M, Ferreira J, Vaz G. Duodenocaval fistula as a result of a fish bone perforation. *J Vasc Surg* 2010;51(5):1276–8.
5. Yi L, Cheng Z, Zhou Y, et al. Fishbone foreign body ingestion in duodenal papilla: A cause of abdominal pain resembling gastric ulcer. *BMC Gastroenterol* 2020;20(1):323.
6. Murakami D, Harada H, Amano Y. Fish bone perforation of the duodenum. *Ann Gastroenterol* 2020;33(3):322.
7. Iwai T, Yoshida H, Yokoyama T, et al. Migration of a fish bone into the right renal vein. *J Nippon Med Sch* 2011;78(3):189–93.
8. Liao H, Wijesurendere C, Barramundi – A local favourite as cause of fishbone perforation of the pylorus – 2 case reports and a review of literature.. *J Surg Res* 2023;6(3):153–5.
9. Birk M, Bauerfeind P, Deprez PH, et al. Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy* 2016;48(5):489–96.
10. Liu Q, Liu F, Xie H, Dong J, Chen H, Yao L. Emergency removal of ingested foreign bodies in 586 adults at a single hospital in China according to the European Society of Gastrointestinal Endoscopy (ESGE) recommendations: A 10-year retrospective study. *Med Sci Monit* 2022;28:e936463.
11. Goh BKP, Tan YM, Lin SE, et al. CT in the preoperative diagnosis of fish bone perforation of the gastrointestinal tract. *AJR Am J Roentgenol* 2006;187(3):710–4.
12. Akazawa Y, Watanabe S, Nobukiyo S, et al. The management of possible fishbone ingestion. *Auris Nasus Larynx* 2004;31(4):413–6.

Author Contributions

Kah Ann Ho – Conception of the work, Analysis of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Kabytto Chen – Acquisition of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Rajkumar Srinivasan – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

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Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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