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# Extra luminal migration of ingested fish bone to the spleen as an unusual cause of splenic rupture: Case report and literature review



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## ABSTRACT

**INTRODUCTION:** The ingestion of foreign bodies (FB) is a common problem worldwide and affects all ages; it is, however, particularly important in the pediatric population and in mentally impaired adults. The typical outcome of FB ingestion is good, since the majority of ingested material is passed spontaneously through the gastrointestinal tract. Serious complications can occur, however, including bowel perforation or obstruction and gastrointestinal bleeding, amongst others. Extraluminal migration of ingested foreign bodies is very rare and reported cases so far have shown, more commonly, migration to neck structures, with very few reported cases of migration to the abdomen. To date, there is no reported case of extraluminal migration of ingested FB to the spleen.

**CASE PRESENTATION:** A 59-year-old man presented with acute abdominal pain and dyspnea. A CT scan revealed a FB within the spleen, with a ruptured capsule and perisplenic collection. Surgery was performed and a 3cm-long fishbone was extracted, with hemoperitoneum secondary to spleen rupture. The patient was discharged on the third postoperative day with good recovery and without any complications; pneumococcal polysaccharide vaccination was provided.

**CONCLUSION:** FB ingestion is a relatively benign condition; however, some serious complications can arise infrequently. The patient reported herein is the first in the literature to present a splenic rupture due to extra luminal migration of an ingested fish bone.

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## 1. Introduction

The ingestion of foreign bodies (FB) is a common problem worldwide and affects all ages, however it is particularly important in the pediatric population and in mentally impaired adults [1,2]. Commonly ingested FB include medication packaging, dentures, coins and fish and chicken bones, amongst others [3]. The typical outcome of FB ingestion is good, with approximately 80% of ingested material passed spontaneously through the gastrointestinal tract without requiring any invasive medical intervention, 20% of patients requiring an endoscopic removal, and just 1% of ingested material will cause perforation requiring surgical treatment [2,4,5]. It is important to mention that serious complications can occur due to ingested FB, such as; obstruction, ulcer formation, gastrointestinal (GI) bleeding, GI perforation, tracheoesophageal

fistula formation and bacteremia, amongst others [4,6–10]. Fish bones are the most common objects that can cause GI perforations [1]. When this FB become impacted, they often do so at sites of physiologic narrowing, such as the pharynx, upper and lower esophageal sphincter, stomach, duodenum and ileum [11]. The most usual site is the ileum and the most common complication is an intra-abdominal abscess [12]. Extraluminal migration of ingested FB is extremely rare. We present a case of extraluminal migration to the spleen generating splenic rupture and hemoperitoneum which presented as acute abdominal pain.

## 2. Case presentation

A 59-year-old man was admitted to the emergency room (ER) with a severe sharp abdominal pain of 8 h of duration. The pain had an insidious onset, was localized on the left upper and lower quadrant, was exacerbated with breathing movements and was associated with dyspnea.

Vital signs were: temperature 37.4°C; blood pressure 84/53 mmHg; heart rate 108 beats/min; and respiratory rate 25 breaths/min. The initial physical examination revealed normal

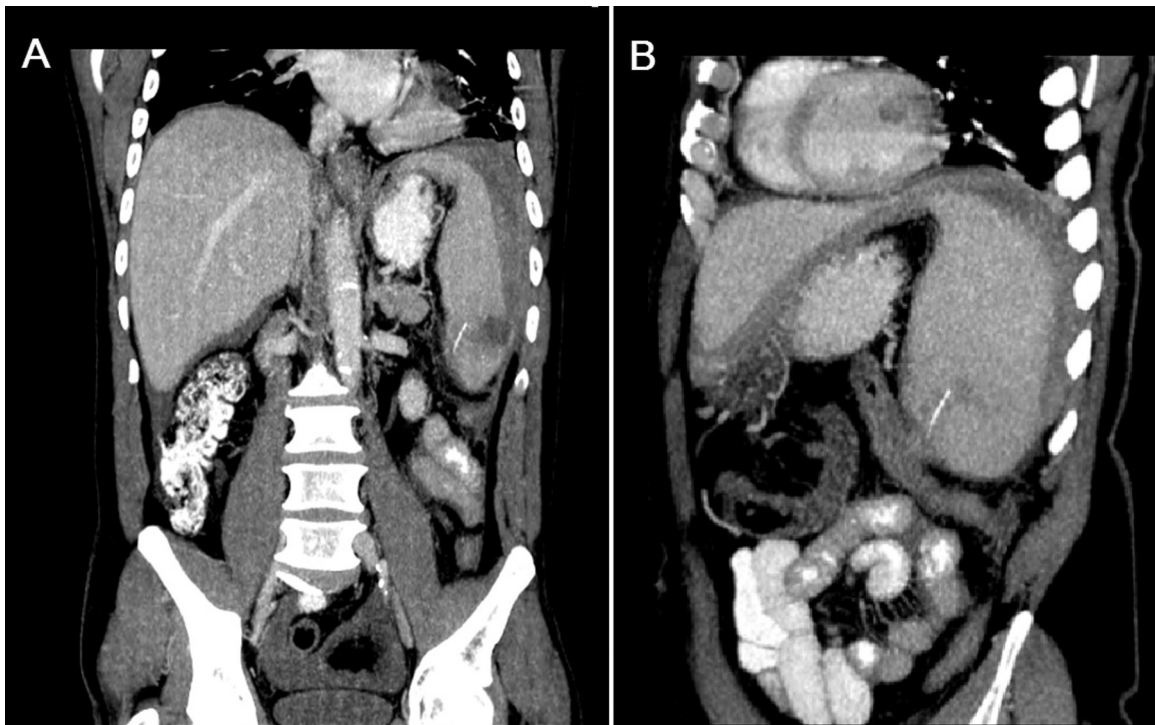
Abbreviations: FB, foreign bodies; GI, gastrointestinal; ER, emergency room.

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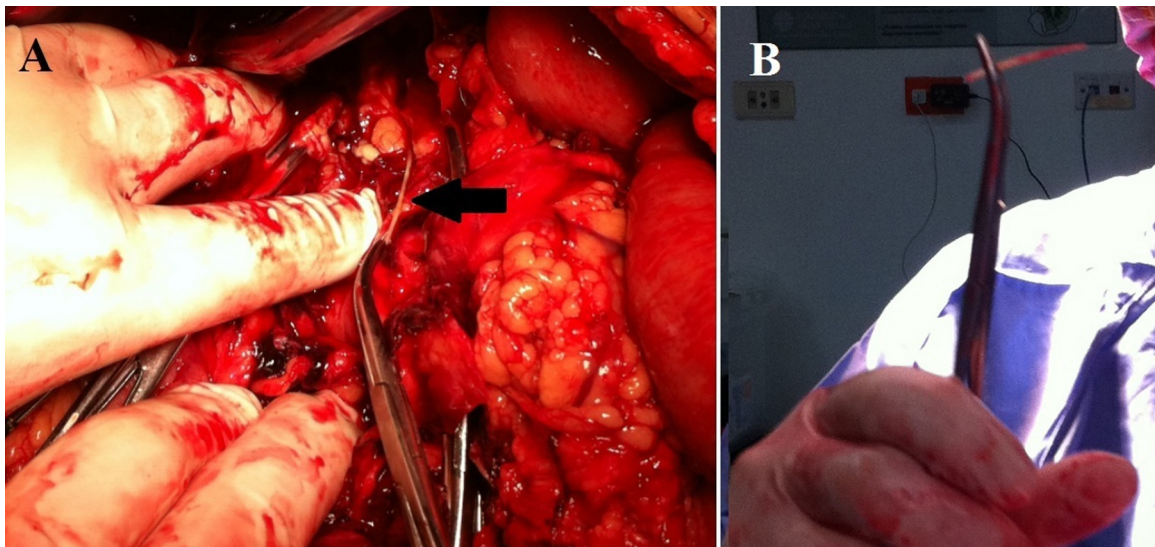
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**Fig. 1.** Abdominal CT scan. (A) Coronal plane (B) Sagittal Plane. Shows splenic rupture associated with a subcapsular hematoma and the presence of a linear hyperdense foreign body in the spleen, of 3.0 cm, close to the splenic flexure of the colon.



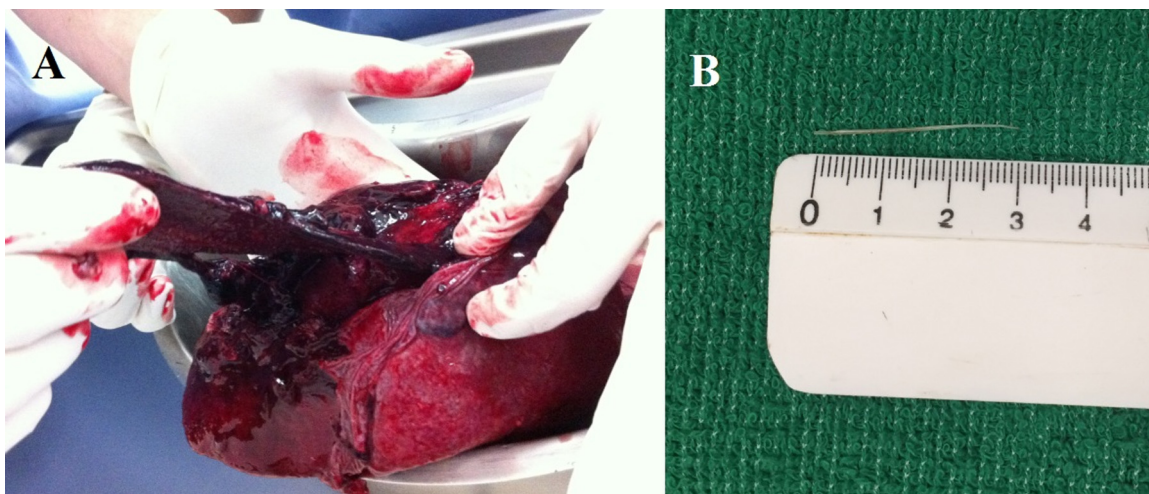
**Fig. 2.** Laparotomy and splenectomy images. (A) Surgical field during splenectomy and surgical drainage of hemoperitoneum that shows the presence of a large fishbone (Black arrow); (B) Fishbone recovered during surgery.

breathing sounds and regular heart beat without any murmur. He had normal bowel sounds, tenderness on the upper and lower left quadrant and muscle guarding without rebound pain.

Serum laboratory examinations showed: a white blood cell count of  $10,760 \text{ mm}^3$ , neutrophils of 79%, lymphocytes of 10.2%, hemoglobin 11.5 g/dL and a platelet count of  $259,000/\mu\text{L}$ . Serum biochemistry tests revealed BUN of 12 mg/dL, creatinine 1.12 mg/dL, C-reactive protein of 8.8 mg/dL, and lactate of 1.8 mmol/L. Arterial blood gases showed pH: 7.4,  $\text{PCO}_2$ : 27.6 mmHg,  $\text{PO}_2$ : 99.7 mmHg,  $\text{HCO}_3^-$ : 19.7, BE:  $-3.3$ , which were compatible with acute respiratory alkalosis.

After primary ER medical treatment he was evaluated by general surgery and an abdominal and chest contrasted CT scan was ordered, which reported a splenic rupture associated with the presence of a linear FB of 3.0 cm, focal inflammatory changes and intrasplenic collection (Fig. 1). Written and informed consent was obtained and, an exploratory laparotomy was therefore performed to resolve his acute abdominal pain due to the high risk of peritonitis (Fig. 2).

An enlarged spleen was found during the surgery, with a traumatic rupture of 80% of its capsule in the posterior area due to a fishbone of  $3 \times 0.1 \times 0.1 \text{ cm}$ . The patient had a 500cc



**Fig. 3.** Gross examination of specimens obtained during surgery. (A) An Enlarged spleen (13.5 × 10 × 5 cm) that weighted 342.1 g, with a subcapsular hematoma of 9 × 7 cm and a traumatic rupture of 80% of the posterior aspect; (B) Sharp large fishbone of 3 × 0.1 × 0.1 cm.

hemoperitoneum and a left subphrenic hematoma. Splenectomy was performed, the hemoperitoneum was drained and the fishbone was recovered (Fig. 3). The patient presented remission of the abdominal pain and was discharged 3 days later without any complications. Follow-up at 18 days later was unremarkable, during which a pneumococcal polysaccharide vaccine was administered.

### 3. Discussion

Most FB pass through the GI spontaneously over a period of 7 days. Perforations of GI secondary to the ingestion of a FB can occur, however, and those requiring surgery correspond to less than 1% of cases [4,13,14]. As the reported case notes, perforation of the GI by a fishbone and its extraluminal migration is an unusual abdominal condition [13].

Sharp FB, such as fish bones, chicken bones and needles [15], are more prone to migrate outside the lumen if they are not removed early [16], causing perforation of the gastrointestinal tract and dangerous complications.

Patients usually do not remember the time of ingestion of the FB, which is compatible with our reported case. A diagnosis of acute abdominal pain is challenging and requires diagnostic images to help elucidate the source of the pain. One of these diagnostic images is an abdominal radiograph which has low sensibility (32%): even if fish bones have enough calcium to be radiopaque, they can be overshadowed by soft tissues [17,18]. The first diagnostic method that should be used, therefore, is a CT scan, because it has a sensitivity of 71.4% and was useful as shown in this case report [18,19].

We found, in the literature, that the usual presentation of FB perforation in the GI tract appears with symptoms of peritonitis, thickened GI, free intraperitoneal air that appears in the CT, and adhesions found via a laparotomy or laparoscopy [2]. The most common migratory destination for fish bones is to neck structures [11,20], and very few of them migrate to the abdomen (such as the peritoneal cavity, liver or bladder) [2,5].

Nevertheless, this patient had a rare case of fishbone migration that probably perforated the colon through the splenic flexure and then migrated to the spleen, causing an encapsulated splenic hematoma, which subsequently led to a rupture of the splenic capsule, causing the acute abdominal pain that the patient presented.

This acute abdominal pain, caused by a fishbone, is an unusual case, which, at the time of the diagnosis, required diagnostic images, such as a CT scan, and an experienced radiologist to interpret the results of the CT scan. The learning point is that FB that are

suspected to have migrated extraluminally should be considered for removal by surgical procedure, without delay, in order to prevent traumatic complications such as the one described. This article adds to the literature that FB ingestion and extraluminal migration can be associated with splenic rupture, a previously unknown complication.

### 4. Conclusion

FB ingestion is a relatively benign condition, however some serious complications can arise, albeit infrequently. The patient reported here is the first one in the literature to present a splenic rupture due to the extraluminal migration of an ingested fish bone through the splenic flexure of the colon. FB that are suspected to migrate extraluminally should be considered for promptly removal by surgical procedure in order to prevent traumatic complications.

### Conflicts of interests

The authors declare no conflicts of interest.

### Funding

No funding was secured for this study.

### Ethical approval

Ethics approval was not required as patient consent was obtained.

### Consent

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

### Author contribution

This work was carried out in collaboration between all authors. Author MS and JS wrote the first draft of the manuscript. Authors AE and CO managed the literature searches and revised the manuscript. All authors read and approved the final manuscript.



## Guarantor

Carlos A. Ordoñez.

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