

# An Unexpected Case of Perforated Acalculous Cholecystitis Caused by a Fish Bone

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## ABSTRACT

Gallbladder inflammation is most often determined by the presence of gallstones. Acalculous cholecystitis usually occurs in patients with multiple comorbidities or with an immunosuppressed status, and therefore its evolution is faster and more severe compared to acute calculous cholecystitis. The presence of a fish bone into the peritoneal cavity, through a gastrointestinal fistula is not very rare, but acute cholecystitis caused by a fish bone is unexpected. Here, we present the case of a 75-year old woman who had eaten fish two months before and presented at the Emergency Room with perforated acalculous cholecystitis and a right subphrenic abscess. The laparoscopic approach permitted the evacuation of the subphrenic abscess, bipolar cholecystectomy and removal of a fish bone from nearby the cystic duct. Postoperative evolution was uneventful, with hospital discharge after five days. The patient was in good clinical condition at two months follow-up.

**Key words:** fish bone – foreign body ingestion – acalculous cholecystitis – right subphrenic abscess – laparoscopic cholecystectomy.

**Abbreviations:** ALT: alanine aminotransferase; AST: aspartate aminotransferase; ESR: erythrocyte sedimentation rate; GGT: gamma-glutamyl transpeptidase; NSAIDs: nonsteroidal antiinflammatory drugs; WBCs: white blood cells.

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## INTRODUCTION

Ingestion of foreign bodies is often reported [1, 2]. It can be unintentional ingestion, commonly seen in children and the elderly, or intentional, observed in patients with psychiatric disorders and sometimes in persons serving a prison sentence. In most cases, fish bones seem to occupy a leading position [3]. Usually, the foreign bodies which enter in the digestive tract are spontaneously eliminated through the feces, and rarely determine digestive complications such as perforations, abscesses, generalized peritonitis, or bowel obstruction. Complications can occur as well in the upper respiratory tract. Once ingested, a foreign body may impact the

base of the tongue, the tonsils, the vallecula or the pyriform fossa [4]. In these cases, the otolaryngologist or the endoscopist can easily retrieve it. When the digestive tract is involved, diagnosis is not always easily established, requiring additional procedures. We present a rare and unexpected case of perforated acalculous cholecystitis with a right subphrenic abscess, caused by a fish bone, which passed through the digestive wall, and was successfully treated through laparoscopic approach.

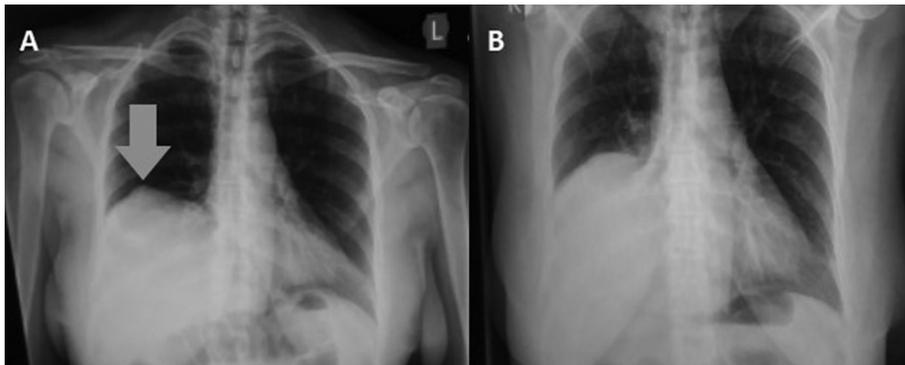
## CASE REPORT

A 75-year old woman was admitted to the emergency department with intense pain in the upper abdomen, associated with nausea and vomiting. Her medical history was positive for arterial hypertension, coxarthrosis treated with nonsteroidal antiinflammatory drugs (NSAIDs) and appendectomy in childhood. She was febrile (38.3°C), her blood pressure was 150/80 mmHg and pulse rate 98 beats/min. Physical examination showed moderate abdominal distension, tenderness in the epigastric area and in the right hypochondrium, with positive Murphy's sign.

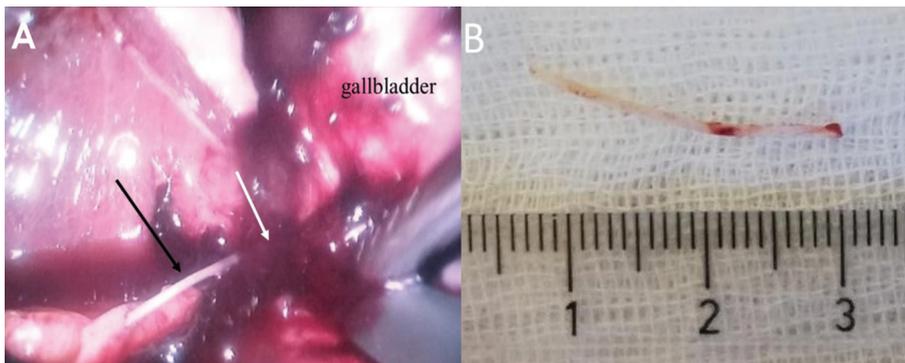
Laboratory values revealed an important inflammatory syndrome (WBCs=24,340 /ml with 84.3% neutrophils; ESR=80 mm/h; fibrinogen=757 mg/dl) associated with elevated

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**Fig. 1.** Chest X-ray. A. preoperative, the ascension of the right hemidiaphragm, with irregular contour (arrow); B. postoperative aspect of the right hemidiaphragm.



**Fig. 2.** The fishbone. A. Intraoperator image with the fish bone (black arrow) in intimate contact with the cystic duct (white arrow); B. Macroscopic aspect of the fish bone.

serum levels of gamma-glutamyl transpeptidase (GGT), 317 U/L, aspartate aminotransferase (AST), 71 U/L, alanine aminotransferase (ALT), 128 U/L, and with normal conjugated bilirubin. The chest and the abdominal X-ray examination showed ascension of the right hemidiaphragm, with irregular contour (Fig. 1A), without any signs of pneumoperitoneum or occlusion. Abdominal ultrasonography revealed a distended gallbladder (9.5 cm longitudinally and 4 cm transversally), with 5-6 mm thickened wall. The diagnosis of acute cholecystitis was established, and wide spectrum antibiotics were administered. During laparoscopy, a large subhepatic adherently process was observed, containing the epiploon, gallbladder, liver, anterolateral abdominal wall and the right hemidiaphragm. After careful dissection, a subphrenic abscess was found, as a consequence of the perforation of the gallbladder. It was resolved through aspiration and lavage. In intimate contact with the cystic duct a fish bone was found (Fig. 2A, 2B). After its removal, bipolar cholecystectomy was performed. The chest

X-ray reevaluation at 48 hours after surgery detected ascension of the right hemidiaphragm, with normal contour (Fig. 1B). The histopathological analysis confirmed a gangrenous acalculous cholecystitis (Fig. 3).

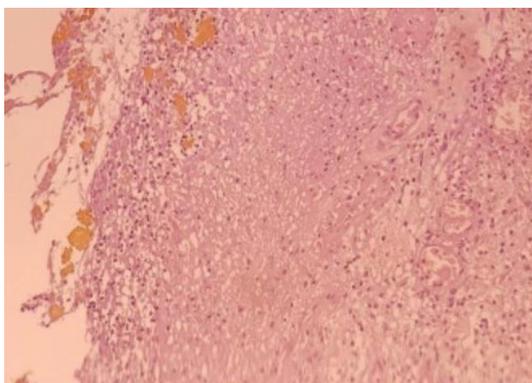
The patient remembered having eaten fish two months before the admittance in the emergency department. She was discharged after 5 days postoperatively, with good overall status and with biological values within normal limits. At two months follow-up, the patient was in good clinical condition.

## DISCUSSION

Acute cholecystitis is rare in the absence of gallbladder lithiasis, accounting for almost 10% of all cases of acute cholecystitis, with increased rates of both morbidity and mortality. In the pathogenesis of acute cholecystitis, stasis and ischemia are the promoting factors, responsible for the gallbladder wall inflammation. In acute calculous cholecystitis, gallstones are the main cause of cholecystitis. Patients with other comorbidities or an abdominal or extra-abdominal infection are predisposed to acalculous cholecystitis [5, 6]. A fish bone responsible for acalculous cholecystitis is really unexpected.

Previously, Patel et al. [7] reported a case of acute cholecystitis caused by a fish bone, embedded in the fibrous tissue at the junction of the cystic and the common bile duct. After initial conservative management, the patient was readmitted for an elective open cholecystectomy. Kunizaki et al. [8] described another case of acute cholecystitis due to a fish bone that penetrated through the stomach wall into the gallbladder without causing peritonitis, treated by laparoscopic cholecystectomy.

Other complications caused by the migration of a fish bone through the stomach or duodenal wall were described: portal



**Fig. 3.** Histopathological examination of the gallbladder: the serous membrane with fibrinopurulent exudate and areas of marked hyperemia (H&E x 20).

vein thrombosis [9], portal and hepatic abscess associated with portal vein thrombosis [10], liver abscess [11, 12], pseudotumoral gastric lesions [13] or liver actinomycosis [14].

Our patient complements the picture of complications caused by ingestion of a fish bone. Once it reaches the digestive tract, a fish bone can be eliminated through the stool or causes intestinal perforation. The patient medical history was not relevant for previous digestive tract perforation. Probably, after ingestion, the fish bone caused a small perforation in the duodenal wall, followed by an inflammatory process. The fish bone caused an extrinsic obstruction of the cystic duct through local inflammation, which led to perforated acalculous cholecystitis with right subphrenic abscess. Chronic NSAIDs used for rheumatologic disease might have explained the attenuated clinical features for two months.

Diagnosis and treatment of the complications following fish bone ingestion are challenging. Usually, patients' history offers no relevant information on fish ingestion, and the fish bone is not detected by conventional imaging explorations [7]. Ultrasonography, although limited in detecting foreign bodies that did perforate the digestive tract, might show signs suggestive for an inflammatory process nearby the perforation site [9, 14, 15]. In our case, ultrasonography led to the diagnosis of acalculous cholecystitis, but did not reveal other inflammatory changes into the duodenal or gastric wall that might have required endoscopic evaluation. However, upper endoscopy may have both a diagnostic and a therapeutic role. When the fish bone does not produce a complete perforation, it can be extracted by endoscopy [16, 17]. If the bone passes the digestive wall, gastroscopy may reveal gastric or duodenal mucosal inflammatory lesions. In these cases, the surgical treatment is indicated, endoscopy being useful in monitoring gastric or duodenal lesions.

Computed tomography is considered the gold standard for diagnosis of the complications induced by an ingested fish bone [9]. Laparoscopy might also diagnose the complications and guide the therapeutic strategy [7, 14].

Compared to the previously reported cases [7, 8], the severity of clinical and biological signs in our patient led us to choose a diagnostic laparoscopy to guide the surgical steps. As an alternative to cholecystectomy, percutaneous cholecystostomy, under radiologic or ultrasound guidance, is indicated in critically ill patients. In addition, the endoscopic gallbladder drainage could be an alternative when percutaneous cholecystostomy is not anatomically feasible or it is contraindicated [18-22]. Unfortunately, these treatment alternatives are only feasible when there is no foreign body that has led to the occurrence of complications.

## CONCLUSION

Acute cholecystitis caused by a fish bone is very rare. The abdominal X-ray and ultrasonography had limited value for diagnosis in our case; the laparoscopy detected the fish bone and guided the surgical strategy. This case highlights an unexpected medical presentation encountered in the case of accidental ingestion of a fish bone.

**Conflicts of interest:** None to declare.

**Authors' contribution:** N.I.B. and M.B. collected the data and wrote the manuscript. N.I.B, L.W. were responsible for patient diagnosis and treatment. L.W., N.I.B., D.A.C., F.A.G. and A.B. revised the manuscript. All authors approved the final version of the manuscript.

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