

## Case Report

# Jejunal Perforation after Chicken Bone Ingestion: A Case Report

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## Abstract

Small bowel perforation is a rare consequence of Foreign Body Ingestion (FBI) and can be prevented with early identification of the object even in the presence of non-specific abdominal symptoms. There are various causes of perforated viscus. While a comprehensive history usually guides a majority of the diagnosis, it may be unobtainable due to age, disease process, or in the setting of conditions associated with altered mental status. In this case report, we present a 63-year-old female with an acute abdomen found to have pneumoperitoneum and a foreign object in her small bowel with local enteric contrast extravasation on imaging. She was urgently brought to the operating room, where she underwent exploratory laparotomy, revealing perforated jejunum secondary to a chicken bone. The purpose of this report is not only to discuss a rare case of perforation in the setting of FBI but to emphasize the importance of prompt diagnosis of FBI as it can lead to perforation and other life-threatening complications.

**Keywords:** Foreign body ingestion; Chicken bone; Jejunal perforation; Altered mental status; Case report

## Introduction

More than 100,000 cases of FBI are reported annually in the United States and occur mostly in children between the ages of six months and three years [1]. FBI in adults is less common, with a majority of cases due to fish bones, chicken bones, or toothpicks [2]. Although the incidence of FBI is highest among prison inmates for the trafficking of narcotics, it is also encountered in individuals who have psychiatric disorders, mastication and swallowing difficulties, dementia, conditions associated with altered mental status, and those who are intoxicated [3]. In these high-risk populations, it is important to maintain a high index of suspicion for FBI, especially in the setting of vague abdominal pain. While most foreign bodies pass through the GI tract unnoticed, structural abnormalities like strictures and tumors can lead to impaction, thus complicating removal [4,5].

Additionally, FBI can have serious and sometimes fatal consequences, including abscess and stricture formation, bowel obstruction, and perforation, with less than 1% of all FBI cases due to the latter [6,7]. Because nonspecific abdominal complaints are often described, plain radiographs and Computed Tomography (CT) scans can be helpful in diagnosing and localizing ingested foreign objects. Here, we discuss a 63-year-old female with dementia found to have small bowel perforation secondary to an ingested chicken bone.

## Case Presentation

A 63-year-old female presented to the emergency room with

altered mental status and acute abdominal pain. Past medical history was significant for chronic obstructive pulmonary disease, hypertension, bipolar disorder, and dementia. Past surgical history included sigmoidectomy with primary anastomosis for perforated diverticulitis in 2016. She presented to the emergency room with altered mental status and acute abdominal pain. At the bedside, her significant other stated that the patient had been experiencing increased urinary frequency, abdominal pain, and diarrhea for the past few days; however, that morning, her pain had acutely worsened. Due to her altered mental status, she was only able to provide a limited history of severe abdominal pain associated with mild nausea.

The patient was hemodynamically stable on physical examination, and her abdomen was diffusely tender with involuntary guarding. CT with intravenous contrast was performed and revealed pneumoperitoneum with a foreign body in the small bowel accompanied by foci of extraluminal air compatible with small bowel perforation likely secondary to a chicken or fishbone (Figure 1). Upon further questioning, the patient was unable to characterize if and when she swallowed a foreign object, but throughout her limited consciousness, she did admit to swallowing a bone at some point in the last few weeks. At this point, the patient was stable enough to undergo a CT scan with oral contrast, which demonstrated extravasation of oral contrast at the level of the foreign body (Figure 2). After the second scan, the patient was started on Vasopressor support, and shortly afterward, her abdominal examination worsened.

The patient was taken to the operating room for exploratory laparotomy. Dense adhesions were lysed upon entry, revealing a moderate amount of succus and interloop abscess. All four quadrants were copiously irrigated with warm saline mixed with antibiotics. The small bowel was run from the ligament of Treitz to the terminal ileum. A perforation was noted in the distal jejunum where a foreign body was palpated inside the lumen just proximal to the area of perforation. This area was resected to healthy tissue margins, followed by a side-to-side functional anastomosis using a stapling device. A foreign body was removed from the resected bowel on the back table and resembled a bone (Figure 3).

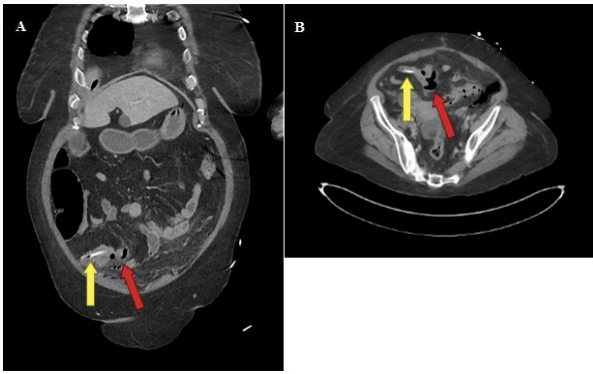
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**Figure 1:** CT with intravenous contrast, coronal view (A), and axial view (B), showing a linear hyper-density in the distal small bowel, likely foreign body such as a chicken or fishbone (yellow arrow), with pockets of extraluminal air seen medially in the right lower quadrant (red arrow) suggesting perforation secondary to foreign body.



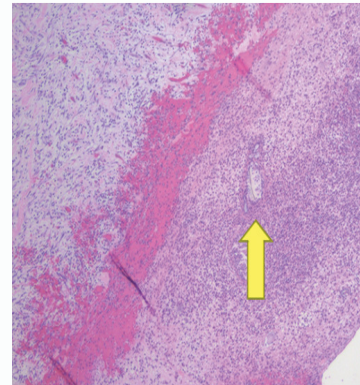
**Figure 2:** Coronal CT with oral contrast exhibiting extraluminal extravasation of oral contrast in the right lower quadrant into a fluid collection adjacent to the small bowel (yellow arrow) compatible with small bowel perforation where foreign body was visualized.



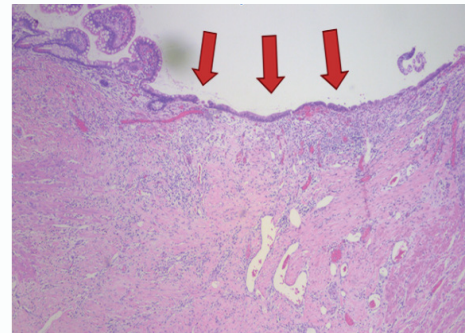
**Figure 3:** Chicken bone (blue arrow) extracted from the area of perforation in the distal jejunum.

In the postoperative period, the patient’s mental status improved, and she was able to report that she had accidentally swallowed a chicken bone ten days prior to her current hospital presentation. The patient was eventually discharged to a nursing home after meeting appropriate inpatient clinical milestones to recovery. Final pathology revealed perforated small bowel with surrounding severe acute

inflammation and food particles consistent with a perforated viscus (Figure 4 and 5). Grossly, there was evidence of fibrinous exudate and stricture within the lumen of the resected specimen. The foreign body measured 5.5 cm × 0.2 cm × 0.2 cm and was suggestive of an animal bone.



**Figure 4:** Cross section of jejunum with inflammatory cells and food particle (yellow arrow) (H&E).



**Figure 5:** Mucosal erosion at the site of perforation of the jejunal specimen (red arrows) (H&E).

### Discussion

Around 80% to 90% of ingested foreign objects are eliminated without complication, but less than 1% necessitate surgical intervention [8,9]. Misdiagnosis is a possibility and usually occurs when a comprehensive history is unobtainable. Our patient was altered at baseline, which was worsened by her septic state. This made her diagnosis challenging through history alone. While the patient exhibited signs of peritoneal irritation on physical examination, she was hemodynamically stable and able to undergo imaging which demonstrated a foreign object in the small bowel. The differential diagnosis of acute abdominal pain is vast, and to include foreign body ingestion as a cause is often hindered without sufficient history. Imaging is almost always helpful in making the diagnosis; however, there may be instances when imaging does not reveal an object [10]. Thereby, FBI might only be discovered at the time of exploratory laparotomy for perforated viscus. Suspicion of FBI should be based on populations posing the highest risk in addition to clinical signs, especially when patients are unable to provide a reliable story. Clinicians can also relay to caregivers of high-risk patients at routine office visits some of the common signs and symptoms to consider, including but not limited to irritability, decreased urinary frequency, nausea/vomiting, worsening mental status, fever, nonspecific abdominal pain, and bloody stool. If FBI is suspected, clinicians can

use imaging to their benefit [10].

Gastrointestinal perforation in the setting of FBI is uncommon; however, when it does occur, it is life-threatening [6]. Perforation can even mimic other disease processes: In a report from 2019, two cases of small bowel perforation secondary to foreign body ingestion resembled acute appendicitis [11]. The risk of perforation increases for sharper objects such as fish bones, needles, straight pins, and paper clips, which account for 10%-15% of swallowed objects [12]. The most common reported sites of perforation are the duodenum, gastric antrum, and ileocecal junction, respectively [13]. Perforation of the stomach, duodenum, and colon present at a slower, more innocuous rate than that of the jejunum or ileum, and jejunal perforation is less common overall [14,15]. Our patient experienced a rare jejunal perforation in the setting of a semi-sharp foreign object. Surgery may be the only option in some cases to remove an impacted object, especially one not amenable to an endoscopic approach due to an underlying condition such as Crohn's disease, which harbors stricture formation. However, imaging to localize the object can assist in elective removal before a patient becomes septic from an acute perforation, thus decreasing mortality.

Pathologic analysis revealed a stricture in the lumen of our jejunal specimen. The etiology of small bowel stricture includes but is not limited to Crohn's disease, non-steroidal anti-inflammatory drugs, surgical anastomosis, neoplasm, and autoimmune inflammatory diseases [16]. The question remains whether this stricture was already present or formed secondary to foreign body irritation. A review of current literature does not reveal a fixed time period for the development of stricture. Timing may differ depending on the nature of the stricture, namely inflammatory, fibrotic, or mixed; the disease process causing the stricture; and the stricture's location in the GI tract [17]. The development of fibrostenotic disease is complex and involves many different cell types including immune regulators, fibroblasts, and smooth muscle cells [18]. A combination of mesenchymal cell activation from bowel injury and chronic inflammation, unregulated extracellular matrix deposition, and tissue remodeling results in fibrosis with subsequent narrowing of the bowel lumen [19]. This is a slow process-it has been reported that 70% of patients with Crohn's disease will develop fibrotic strictures 10 years after diagnosis [18,20]. Based on this data, it is reasonable to infer that strictures take time to form, and therefore, it is doubtful that a stricture formed in the 10 days between FBI and perforation in our patient. If we accept this hypothesis, the stricture most likely caused foreign body impaction and ultimately led to bowel wall erosion and perforation.

## Conclusion

While rare, small bowel perforation is a devastating outcome in cases of FBI. In an attempt to determine the cause of jejunal perforation in this case, it seems that stricture may have played a role in impaction of the foreign body. If this is true, the patient would benefit from further workup to rule out other inflammatory bowel diseases. Close monitoring of patients with conditions that alter cognition and memory is vital to prevent unintended ingestion. If ingestion does occur, however, timely diagnosis can help prevent life-threatening consequences.

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