

## A Case of Successful Endoscopic Management of Full Thickness Gastric Perforation Secondary to an Ingested Chicken Bone

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### Abstract

Foreign body ingestion is not an unusual phenomenon with most cases resolving spontaneously with few adverse outcomes. Terminal ileal injuries are seen most frequently in such cases while gastric perforations are uncommon. Preoperative diagnosis remains a challenge as the patient's medical history can be misleading and the clinical symptoms are not specific. Advances in endoscopic technique have resulted in less invasive management options replacing emergency laparotomy and the associated morbidity. Herein we describe the successful resolution of a gastric perforation from accidental chicken bone ingestion in a young patient who had previously underwent a Nissen's fundoplication.

**Keywords:** Gastric perforation; Therapeutic endoscopy; Foreign body ingestion; Nissen's fundoplication; Ingested bone

### Introduction

Foreign body ingestion is not a rare occurrence and most pass uninterrupted through the gastro intestinal tract without any adverse consequences [1,2]. Dentures, fish bones, chicken bones, and pins are the most commonly reported ingested cases [1]. Whilst more common lyseen in the pediatric population, accidental ingestions are occasionally encountered in adults particularly in elderly people, alcoholics, patients with learning disabilities, and certain occupations such as carpenters and tailors who tend to hold small sharp objects in their mouth [3]. An obvious history of foreign body ingestion is uncertain in most of the cases [1].

80–90% of ingested foreign bodies pass spontaneously [4] but secondary gastrointestinal perforation is reported in some instances appearing most commonly in the terminal ileum while gastric perforations are not frequently seen due the thickness of the gastric wall [5]. In the past, surgery was the only therapeutic option. However, nowadays, successful endoscopic intervention is described in approximately 10%-20% of cases, whereas, less than 1% requires surgery [4]. We hereby present the endoscopic management of a gastric perforation and the removal of a chicken bone in a patient with a previous Nissen's fundoplication procedure.

### Case Presentation

A previously healthy 31-year-old man with a background history of Nissen's fundoplication for gastroesophageal reflux disease approximately 4.5 years ago presented with a 3-day history of progressive severe epigastric pain. He reported excessive alcohol ingestion prior to the onset of pain. Marked tenderness was elicited in the epigastrium on palpation with localized guarding and rebound. Laboratory investigations revealed a moderate rise in WCC (13.7 X 10<sup>9</sup>/L) and CRP (91mg /L). An electrocardiogram (ECG) and chest radiograph were unremarkable. The patient was admitted with a provisional diagnosis of peptic ulcer perforation or a potential late complication of the fundoplication such as gastric herniation or ischemia. A contrast enhanced computed tomographic scan (CT) of the abdomen and pelvis revealed a foreign body perforating the wall of the gastric antrum with overlying wall thickening and peri mural stranding. A small extraluminal air bubble adjacent to the perforation was also noted with minimal free fluid (Figures 1 and 2).

A gastroscopy (OGD) was performed, with consent to proceed with surgery if deemed necessary. The OGD demonstrated a sharp ended, 4 cm long chicken bone perforating through

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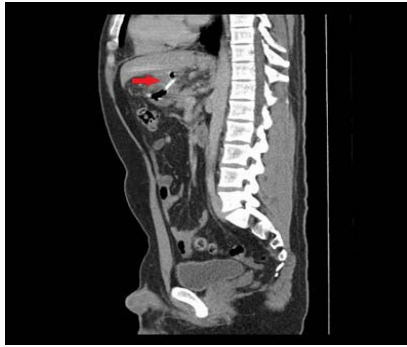
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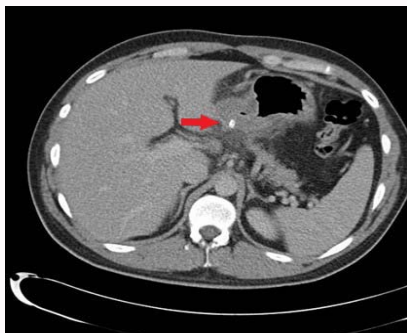
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**Figure 1:** CT scan showing foreign body perforating through the gastric antrum (Red arrow).



**Figure 2:** CT scan showing foreign body perforating through the gastric antrum (Red Arrow).



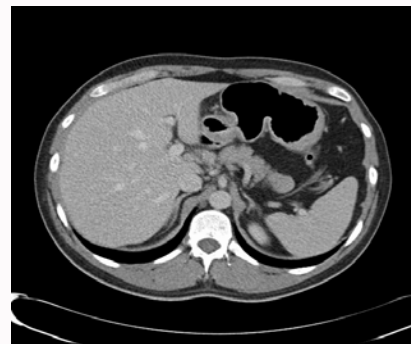
**Figure 3:** Endoscopic removal with biopsy forceps.

the gastric antrum. The perforation was fully sealed by the impacted foreign body. The appearance of the Nissen's wrap and of the rest of the stomach was normal. The chicken bone was smoothly pulled back into the lumen and uneventfully retrieved endoscopically using a biopsy forceps (Figures 3 and 4). There was no hemorrhage or visible perforation needing further management, as the muscular gastric antral wall contracted soon after the removal of bone thus sealing off the perforation. A nasogastric tube was inserted and antibiotics and a proton pump inhibitor infusion were commenced with instructions to keep the patient nil by mouth.

The nasogastric tube output was monitored daily with minimum drainage and the patient showed clinical signs of improvement within 24 hours after the procedure. The inflammatory markers also recovered over the next 72 hours. The nasogastric tube was removed at 48 hours and the patient was observed to tolerate clear oral fluids and a full diet at 72 hours.



**Figure 4:** Retrieved Chicken Bone.



**Figure 5:** Post-procedure CT scan.

A follow up contrast - enhanced - CT scan of the abdomen was performed on the 6<sup>th</sup> post-procedural day, which demonstrated near-complete resolution in the previously described antral wall thickness and size of the extraluminal air bubble (Figure 5). The patient was discharged on day 7. At 6 weeks follow up, he remained symptom free.

## Discussion

Ingested foreign bodies can lead to complications such as impaction, perforation or obstruction at any point throughout the gastrointestinal tract [6]. The most vulnerable sites are acute angulations or physiologic narrowing such as the upper esophageal sphincter, esophageal constrictions at the level of aortic arch and left main stem bronchus, gastroesophageal junction, pylorus, duodenal sweep, ileocecal valve, and anus [7]. The length and the sharpness of the object is directly proportional to the risk of perforation [8], which can result in peritonitis, intraperitoneal abscesses, fistulations, intestinal obstruction, or hemorrhage [1,9].

The most common site of ingested foreign body perforation is the terminal ileum, described in 38.6% of cases respectively [1]. Gastric perforations, as we describe, are not frequently seen. The patient's previous anti-reflux procedure makes the case even more delicate and any disruption in the wrap resulting from a wrap perforation may have added to the complexities of a potential surgical repair. Fundoplication procedures have a reported distal esophageal foreign body obstruction less than 2% [10] with only 0.2% leading to late wall perforations [11].

As the sharp - pointed foreign body is always more difficult to pass spontaneously, such objects in the esophagus; stomach or duodenum; require urgent endoscopic removal. Surgical intervention should be considered when endoscopic treatment fails, and if the sharp body beyond the duodenum ceases to progress

radiographically at 72 hours [12]. Clinical evidence of peritonitis is another reasonable cause for urgent surgical intervention. Lee et al describe the potential risk factors predicting the need to convert to surgery in the failed endoscopic extraction of foreign bodies. After assessing the outcomes of 885 patients, the authors consider age over 70 years, upper esophageal impaction, size greater than 30mm and an impaction time over 40 hours as risk factors likely to result in failed endoscopic outcomes [13]. Our case demonstrates two of these factors; however, the successful endoscopic management of this case avoided the complications of an emergency laparotomy with an associated morbidity of nearly 60% in such cases [3]. Though if managed laparoscopically, the complications are expected to be lower, but morbidity rate for laparoscopic management is not yet reported. The patient was carefully monitored for any signs of peritonitis and the perforation described in the CT scan likely sealed spontaneously with little or no abdominal contamination.

Urgent endoscopic procedures are recommended in cases of ingested sharp foreign objects which are reported to carry a gastric complication rate as high as 35% [12,14]. Guidelines set by the European Society of Gastrointestinal Endoscopy (ESGE) recommend urgent therapeutic OGD within 24 hours [7,9,12,14]. Conscious sedation is adequate for the majority of adult patients for endoscopy but general anesthesia is preferred for pediatric or uncooperative psychotic patients [7]. Endotracheal intubation should also be considered in cases with a high aspiration risk [14]. A grasping forceps, polypectomy snares, dormia-type baskets, retrieval snare net etc. can be used for retrieval via endoscopy [15]. ESGE recommends the use of a protective device, such as an over tube, to avoid oesophago-gastric/pharyngeal damage and aspiration during endoscopic extraction of sharp pointed foreign bodies [14].

## Conclusion

Complications due to ingested bone fragments are not common and preoperative diagnosis remains a clinical challenge. The patient's medical history, as in the reported case, can be misleading and the clinical symptoms are not specific. The key to diagnosis is having a high index of suspicion in the presence of some predisposing factors, such as voracious eating, alcohol and the use of dentures in the elderly. Moreover, in selected cases as ours, endoscopic management alone can be therapeutic even in the presence of a full thickness gastric perforation.

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