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Case report on a rare cause of silent duodenal perforation

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ABSTRACT

INTRODUCTION: Foreign body ingestion is a common clinical scenario encountered in clinical practice. Perforations related to foreign bodies are rare (<1%) but can present as a serious element in Emergency surgery. The most common site of perforations are angulated areas like ileocecal valve, sigmoid colon and duodeno-jejunal flexure and small bowel. We describe a rare case of duodenal perforation related to foreign body ingestion which has rarely been reported in the literature.

CASE PRESENTATION AND MANAGEMENT: This case report describes the presentation and management of a 65 year old male who presented with septic shock without symptoms and signs of an acute abdomen. Imaging revealed a sealed foreign body perforation in the first part of duodenum with a localized abscess. The abscess cavity was drained and the foreign body (fish bone) was removed laparoscopically.

CONCLUSION: Foreign body perforations were often missed in view of its atypical and latent presentation with the history of foreign body ingestion is rare. Early multiplanar reformatting CT images help in identifying the cause and also to locate the foreign body in most of the patients, thus making it an important tool for preoperative diagnosis which assists in surgical planning. Though the majority of patients will require an exploratory laparotomy, minimally invasive procedures can be attempted in stable patients similar to this case.

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1. Introduction

Foreign body ingestion is a common clinical scenario encountered in clinical practice. Around 80% to 90% of the ingested foreign bodies will be excreted without causing any major complications [1]. Perforations related to foreign bodies are rare but can present as a serious element in Emergency surgery. This condition is often missed in view of its atypical presentation and the history of foreign body ingestion is seldom present. Foreign body ingestion is usually involuntary or accidental and involves patients of extreme ages with mental or swallowing disorders. There will be a latent period between the time of ingestion and the time of clinical presentation. The most common site of perforations are angulated areas like ileocecal valve, sigmoid colon and duodeno-jejunal flexure and small bowel. Duodenal perforations related to foreign body ingestion is very rarely seen in clinical practice; we encountered such a case in our academic institution and it demands reporting.

This case report has been reported in accordance with the SCARE Criteria [1].

2. Presentation of case

A 65-year-old male patient presented himself to our Emergency Department with a high grade fever, chills, and rigor which had persisted for two weeks. He denied any history of diarrhoea, vomiting, or abdominal distension. His past medical history included hypertension and he has been on medications for more than 20 years. On examination, he was lethargic, toxic looking, and clinically dehydrated. Initial vital signs showed that he was septic with temperature (40.2 °C), hypotensive (80/40 mmHg), with tachycardia (112/minute), and tachypnea (30/minute). Cardiovascular and respiratory examinations were insignificant. His abdomen was completely soft with active bowel sounds.

Blood investigation revealed haemoglobin (15.5 gm/dL), leukocytosis (19,000 cells/mm³), neutrophils $17 \times 10^9/L$, lymphocytes $25 \times 10^9/L$ and C-reactive protein (CRP) 426 mg/dL. A renal panel showed signs of mild acute kidney injury: creatinine 180 μmol/L and estimated glomerular filtration rate (eGFR) 53 mL/min/1.73 m² from his previous baseline value of 90 mL/min/1.73 m². His total bilirubin was 1.1 mg/dl and his albumin was normal (38 mg/dl). No significant pathology was found on an X-ray of his chest and abdomen. Blood gas analysis showed metabolic acidosis with lactate 2.4 mmol/l.

The patient was transferred to our High Dependency (HD) unit for resuscitation and active monitoring. Broad spectrum antibiotics (ceftriaxone and metronidazole) were started along with

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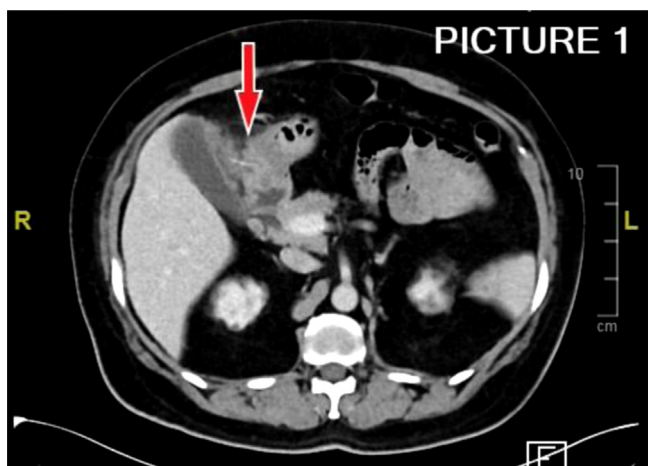


Fig. 1. Arrow pointing extra luminal foreign body through first part of duodenum.

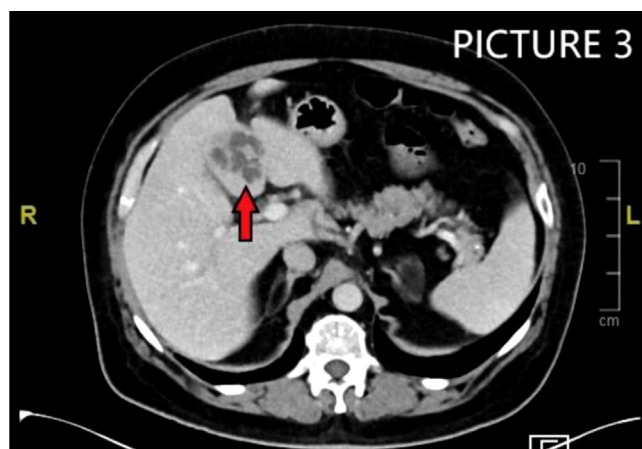


Fig. 3. Arrow pointing liver abscess.

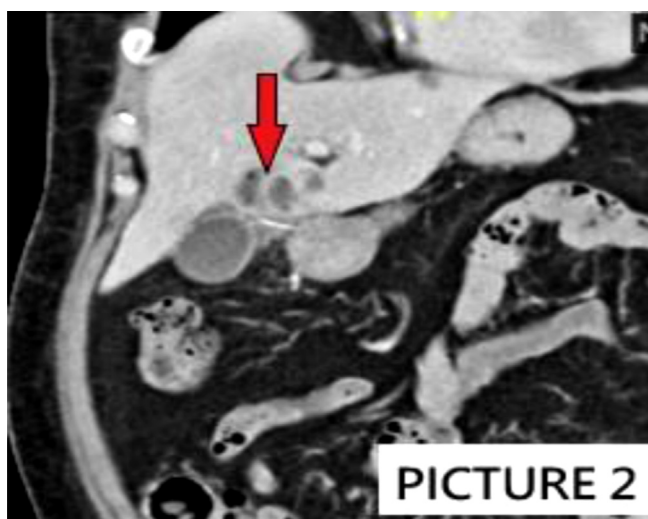


Fig. 2. Arrow pointing the presence of air locules within the abscess collection with linear hyper dense foreign body.

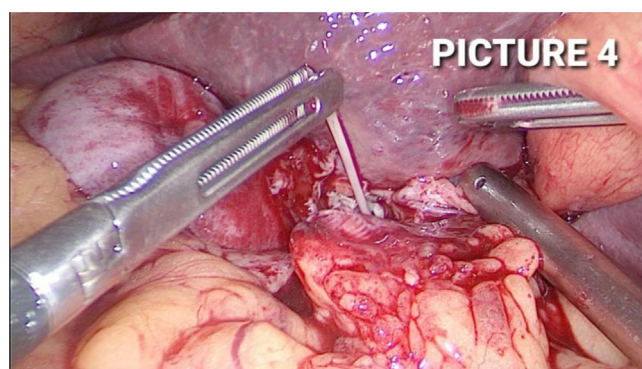


Fig. 4. Foreign body retrieval from abscess cavity.

intravenous paracetamol and metoclopramide. After adequate resuscitation, his arterial blood gas parameters were normalized and his serum lactate dropped to 0.4 mmol/l after a few hours of treatment. In view of the clinical suspicion of septic shock, he was subjected for computed tomogram of his thorax, abdomen, and pelvis which revealed a possible foreign body which had perforated through the pylorus of stomach and the first part of duodenum [Figs. 1 and 2] with a localized 7 cm abscess cavity and the presence of air locules close to it [Fig. 3]. The tip of the foreign body was seen penetrating into the segment 4B of the liver with another 3 cm intra parenchymal abscess cavity.

After being counselled, the patient consented for an emergency surgery. On diagnostic laparoscopy, extensive adhesions of the omentum was seen in the liver bed area. The abscess cavity was reached after adhesions of the omentum were released. After a sample of pus was taken for culture and sensitivity, the abscess cavity was drained completely. On further exploration of the abscess cavity, a long elongated foreign body of 6 cm [possibly a fish bone] was found and removed [Fig. 4]. No obvious enterotomy or bile spillage was noted in the pylorus and duodenal region. Inferior surface of the liver and the hepatic flexure of the colon looked grossly normal. Rest of the Small bowel and colon examination was normal.

Gastroscopy was done intraoperatively which revealed an inflamed mucosa with duodenitis changes in the first part of du-

denum. Rest of the gastroscopy examination till the third part of duodenum was normal. Nil air leak was observed (sealed perforation) in the antrum and duodenal region during insufflation of the stomach at the time of gastroscopy. A thorough wash was given in the peritoneal cavity and a wide bore drain was placed in the abscess cavity and Morrison's pouch.

His blood cultures and cultures from the abscess cavity had grown streptococcus constellatus species which were sensitive to cephalosporins. Post-operatively, he was continued on sensitive intravenous antibiotics for a week's time. Oral Feed was started from the second postoperative day and the diet was escalated based on his progress. His recovery was otherwise uneventful. His inflammatory markers were down-trending in the post-operative period. The abdominal drain was removed on postoperative day 7 and he was discharged from hospital on the next day.

A further course of culture sensitive oral antibiotics were given for three weeks duration in view of the documented liver abscess seen in the initial imaging studies. During the follow-up period, he was in good health, and the previously documented liver abscess had resolved completely during a repeat Computed tomogram of his abdomen six weeks after the initial presentation [Fig. 5].

3. Discussion

Foreign body ingestion is quite common in the paediatric population, alcoholics, and psychiatric patients. In the adult population (especially edentulous geriatrics), they are usually secondary to involuntary or accidental ingestion of dietary foreign bodies.

The high risk features for ingestion and subsequent impaction is common in:

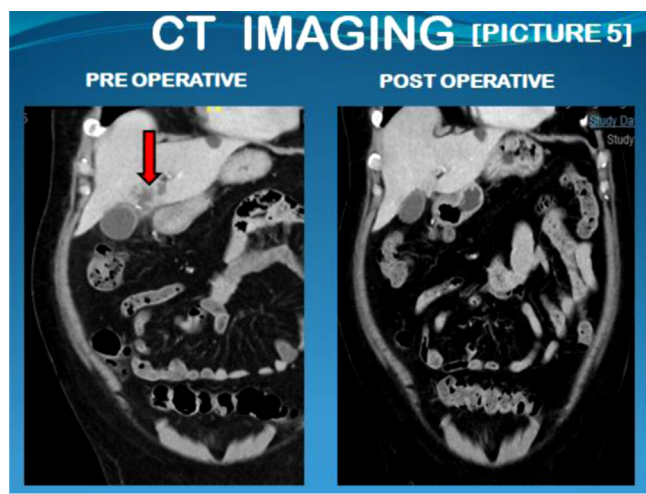


Fig. 5. Pre-operative and post-operative imaging showing resolution of liver abscess.

A] Geriatric patients with dentures (loss of sensation over palate in view of dentures).

B] Previous gastric surgery with bypass anastomosis which facilitates passage of foreign bodies.

C] Previous abdominal surgery with adhesions.

D] Patients with sensory deficits related to cerebrovascular accidents.

The absence of preoperative history of foreign body ingestion usually causes a diagnostic dilemma.

Around 80% of the ingested foreign bodies can pass through the bowel lumen and gets excreted without causing significant complications [2]. However the size and structure of the ingested foreign body play an important role in causing the type of complication (which varies from non-specific abdominal pain to obstruction, perforation, haemorrhage, and fistula formation [3]). Foreign bodies like dentures, fishbone, chicken bone, and tooth sticks have been known to cause bowel perforation. The risk of bowel perforation is very rare (<1%) and is related to the length and sharpness of the ingested foreign body.

The most common sites of perforation are angulated and narrowed areas like ileocecal junction and sigmoid colon. The other potential sites are rectum, colonic flexure, DJ flexure, and the anal sphincters. Rare incidences of foreign body impaction in appendix, colonic, small bowel diverticulum, and in the Meckel's diverticulum have been reported in literature [4,5]. Foreign body related perforations of the small bowel will usually present with acute symptoms whereas perforations of stomach, duodenum, colon will more likely present with chronic symptoms such as pyrexia of unknown origin, abdominal mass, and abscess collection [6]. In our case, we encountered such a perforation in the first part of duodenum, which is relatively uncommon.

The average time difference from time of ingestion to time of perforation is on an average of 9.3 [7] to 10.4 days in literature [8]. In rare cases, studies have reported the migration of a foreign body beyond the intestinal lumen to unusual locations like the hip joint, urinary bladder, liver, and peritoneal cavity [9].

Plain radiographic examination of the neck (anteroposterior and lateral films), chest, and abdomen will be required in all suspected foreign body ingestions. Subtle objects are usually non-opaque or insufficiently opaque to be seen in plain radiography films and hence, computed tomography imaging is the modality of choice which will often diagnose the foreign body perforation. Multiplanar reformatting CT images [10] helps in identifying the cause and also to locate the foreign body in 86% of patients, thus making it an

important tool for preoperative diagnosis [11]. CT scans can detect non opaque foreign bodies with the identification of narrowed parts of the intestinal tract which may predispose to impaction [inflammatory or malignant lesions causing narrowing of lumen].

Although in some cases imaging can be nonspecific, identification of the foreign body can be done with additional findings such as an associated inflammatory with thickened bowel loops, increased mesenteric fat density, localized collection of extra luminal gas, features of mechanical bowel obstruction, and presence of an abscess strongly suggest the diagnosis [12]. Rarely, can an ultrasound examination directly visualize foreign bodies and uncover secondary signs of perforation.

Surgical intervention is almost mandatory in those cases. Foreign bodies located in the oesophagus or stomach can be removed endoscopically whereas exploratory laparotomy is almost necessary in patients who present with signs of peritonitis related to foreign body ingestion in the small intestine. Laparoscopic approach can be attempted in stable patients [13] and with clinical presentation of chronic symptoms similar to our reported case. The treatment usually involves removal of foreign body with resection of the involved portion of bowel, though occasionally simple suture of the enterotomy defect has been described. Surgical removal needs to be considered if a foreign body has sharp points or if it remains in the same location for ≥ 5 days with the presence of symptoms. Laxatives, cathartics, and dietary medication will be of no proven benefits in the management of ingested foreign bodies [14]. A high index of suspicion is required to make a diagnosis of ingested foreign body in acute abdomen patients, especially in extremes of age.

4. Conclusion

Intestinal perforation related to foreign body are rare complications which occur in <1% of the patients. The usual perforation sites are angulated areas like ileocecal junction and recto-sigmoid area though other potential sites have been reported in rectum, colonic flexure, DJ flexure, and the anal sphincters. Duodenal perforations related to foreign bodies are very rare in clinical practice and hence demands reporting. CT scans are the best modality for preoperative imaging which identifies the cause as well as locates the foreign body which assists in planning the surgical approach. The imaging findings of identification of the foreign body with additional findings such as an inflammatory mass and associated thickened bowel loops, increased mesenteric fat density, localized collection of extra luminal gas, features of mechanical bowel obstruction, and presence of an abscess strongly suggest the diagnosis. In most cases, a history of foreign body ingestion was not obtainable and hence a high index of suspicion is required to make a diagnosis of ingested foreign body in acute abdomen patients, especially in extremes of age. Though the majority of patients will require an exploratory laparotomy, minimally invasive procedures can be attempted in stable patients.

Declaration of Competing Interest

Nil.

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Nil.

Ethical approval

Not applicable patient consent obtained.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

1] Dr. Kishore Rajaguru: Writing: Original manuscript draft, Video Editing. (Operative Video link: <https://youtu.be/7iCx4T929nY>).

2] Dr. Seow Choon Sheong: Writing: Review and editing.

Registration of research studies

Not applicable.

Guarantor

1] Dr. Kishore Rajaguru.

2] Dr. Seow Choon Sheong.

Provenance and peer review

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