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Complicated meals: 2 Case reports illustrating complications of ingested bones

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Abstract
Majority of bone ingestions are uneventful but could be hazardous at times. We report two adult patients presented on the same night with different duration of presentation and suffered from different complications. Cases are illustrated with images and various complications of adult foreign body ingestion are discussed.

Keywords: Foreign body ingestion, bone foreign body, oesophageal perforation, caecal perforation, chicken bone, fish bone

Introduction
Bone ingestion during eating could be either accidental or sometime intentional. In most of instances, these incidences are uneventful and asymptomatic. In very rare occasions, the ingested bone can be impacted, perforate and cause complications such as bowel obstruction, and abscess formation. Patient can present early to medical attention due to symptoms of pain or dysphagia. However, in some patients, symptoms of complication may be delayed and the initial incidence may not be recalled by the patient during initial history taking.
We report two cases who presented to Emergency Department on the same night where the first patient presented acutely with complaint of chicken bone ingestion and the second patient presented with weeks of abdominal discomfort.

Case 1
Mr A, 56 years old gentleman, who had a habit of chewing and swallowing the cartilaginous part of chicken bone, swallowed part of the chicken femur during dinner and immediately experienced severe throat pain and odynophagia. He came to the emergency department immediately. After initial evaluation by ENT team, patient proceeded to rigid pharyngoscopy. Attempts to remove the chicken bone which lodged in proximal oesophagus had failed as the smooth cartilaginous part of the ingested bone is facing superiorly. Unfortunately, bone fragment migrated further deeper down the distal oesophagus beyond the reach of rigid scope. Patient went into respiratory distress and CT thorax performed showed left tension hydropneumothorax (figure 1a). A hyperdense foreign body (mean attenuation +210HU) impacted at the gastroesophageal junction with wall thickening at the level of impaction (figure 1b and 1c). Proximal oesophagus was dilated. Unfortunately, the exact site of oesophageal perforation was not demonstrable in the CT study.

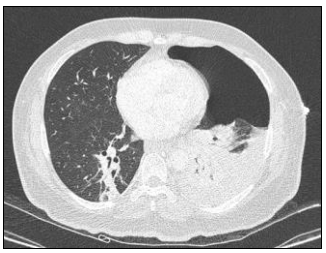

Fig 1a: CT thorax axial view in lung window, showing left tension hydropneumothorax and left lung near total collapse

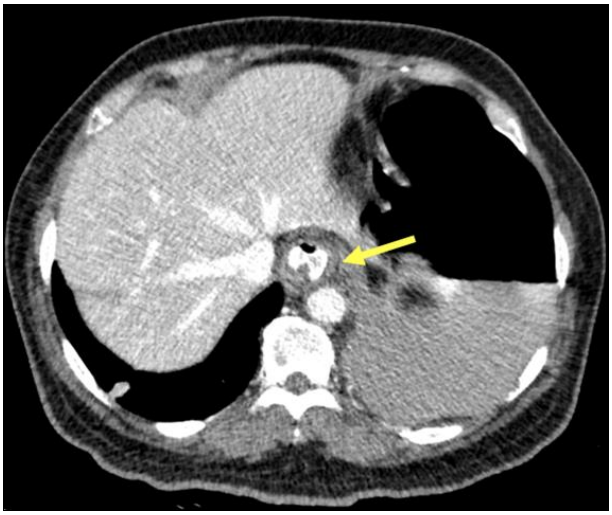

Fig 1b: Contrasted CT thorax axial view at the level of gastroesophageal junction. The impacted chicken bone is seen at the gastroesophageal junction (yellow arrow)

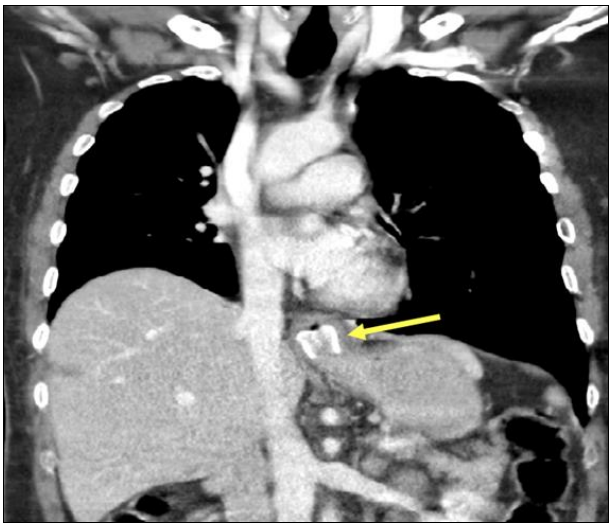

Fig 1c: Contrasted CT thorax in coronal reformatted view. Yellow arrow showing impacted chicken bone at gastroesophageal junction

Patient underwent emergency video assisted left thoracoscopic surgery and found a 1cm slit-like perforation at left distal oesophageal. The culprit chicken bone fragment had dislodged into stomach. Oesophageal repaired with polydioxanone 4O sutures in 2 layers. Mr A recovered uneventful.

Case 2

Mr S, a 46 years old gentlemen, presented with 10 days history of abdominal pain radiated to back. He has intermittent fever with loss of appetite. He denied symptoms of bowel obstruction and gastrointestinal track bleeding. On examination, patient's vital signs were stable with no elevated body temperature. Full blood count showed mild leucocytosis with total white blood cell count of 13 x 10^9/L. The rest of the laboratory investigations were normal. Abdominal radiograph showed no bowel dilatation or pneumoperitoneum (figure 2a). Ultrasound abdomen study revealed a heterogeneously hypoechoic intra-abdominal collection at right lumbar region which has no contact with adjacent bowel loops. Within this collection, there was a short echogenic needle-like structure with minimal posterior shadowing seen.

Upon further questioning, patient recollected the incidence of accidental fish bone ingestion 1 month ago. Patient subsequently underwent abdominal computed tomography (CT) study of 1mm slice thickness with oral and intravenous iodinated contrast media. There was a small multiloculated rim enhancing intraperitoneal collection at right lumbar, measuring 0.6 x 1.2 x 2.0 cm (AP x W x CC) in size (figure 3a and 3b). A hyperdense linear structure measuring 1.1cm with attenuation of 265 HU seen at the centre of this collection (figure 3a and 3b). No intracollection gas locule noted. No connection or contact between this collection with adjacent bowel loops was demonstrated. The anterolateral wall of the caecum was thickened and enhancing with surrounding fat streakiness. More linear hyperdense structures were also noted within the caecum (figure 3b and 3c). No pneumoperitoneum or intra-abdominal free fluid. CT concluded as sealed caecal perforation secondary to ingested fish bones, resulting in right lumbar intraperitoneal abscess formation.

Fig 2a: Abdominal radiograph shows no pneumoperitoneum

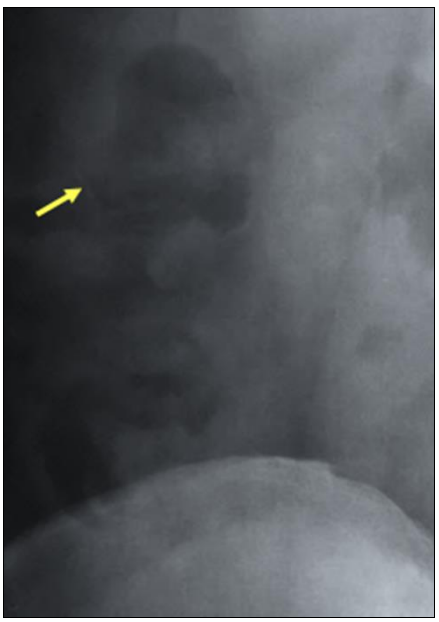

Fig 2b: Retrospective careful review of abdominal radiograph found fine linear opacity at right lumbar region (yellow arrow)

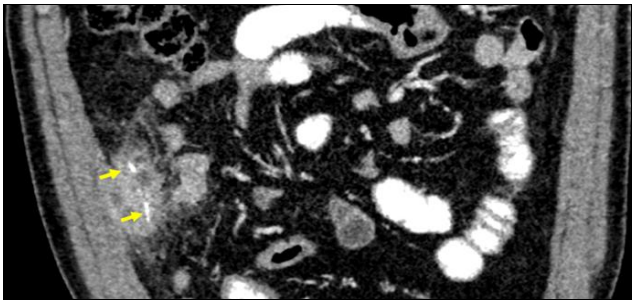

Fig 3a: Contrasted CT abdomen with selected coronal reformatted view at lumbar level. Right lumbar thick-walled collection with two needle-like opacities within (yellow arrows) and surrounding fat streakiness

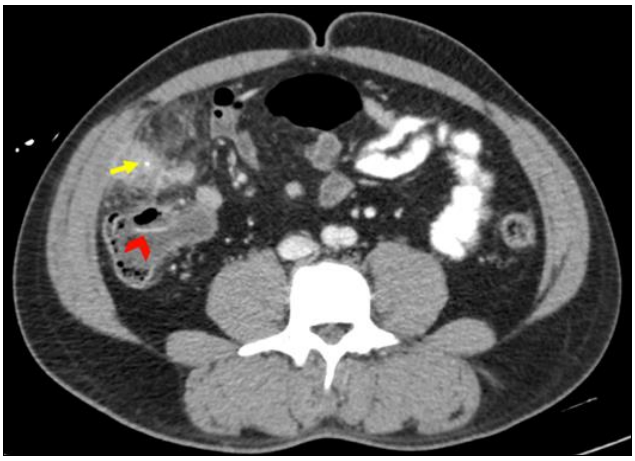

Fig 3b: Contrasted CT abdomen in axial view. The intraperitoneal collection is seen anterior to the caecum and one of the fish bone within the collection is seen as a dot-like opacity (yellow arrow). One of the fish bones within caecum is pointed by red arrow head

Fig 3c: Coronal reformatted CT abdomen in bone window. The fish bone within caecum is pointed out by red arrow head

Retrospectively, the initial abdominal radiograph was reviewed in detailed and revealed fine linear opacity at right lumbar region (figure 2b).

During emergency laparotomy, operating team found a fish bone in the omentum with surrounding inflammation and caecal perforation with surrounding omental and bowel adhesions. Right hemicolectomy with primary bowel anastomosis were performed. Post-operative recovery was uneventful.

Discussion

Adult foreign bodies ingestions are commonly related to meals, which 73-76% of hospitalised adult cases had ingested animal bones [1-3].

Although near 90% of the cases are unintentional, some of the foreign bodies ingestions were on purpose [4]. People with dentures, orthodontic implants, bad eating habit are at risk of swallowing foreign bodies due to suppressed oral sensory feedback [4, 5].

It was classically believed that most ingested foreign bodies were uneventful, and less than 1% resulted in perforation [6, 7]. However, Zhang and Peng *et al*. reported the rate of perforation among patients presented with foreign body are 6% and 8.5% respectively [2, 8]. Another study found perforation rate as high as 20% in patient hospitalized due to oesophageal foreign body [9]. The true incidence and risk of complication may be higher particularly concerning for oesophageal foreign body.

If the swallowed object is larger than 6 cm, it is unlikely to pass through stomach. Foreign body smaller than 6 cm has the commonest impaction site at ileocaecal junction [7].

Unless the swallowed bone is large enough or the alimentary tract has pathological narrowing lead to impaction, the rest of the complications are related to perforation. The commonest site of oesophageal perforation is cervical oesophagus [1]. In the abdomen, terminal ileum is the commonest site of perforation (39 – 66.7%), following by sigmoid colon (23.8 – 27%). [5, 10-12] The proposed explanations include calibre change and anatomical angulation [10, 13]. Out-pouching structures such as Meckel's diverticulum, appendix and diverticula are also at risk of perforation [4, 5, 12]. Gastrointestinal perforation presented with average 9.3 – 10 days delayed [4, 11] and it is not surprising that many patients do not relate the presenting symptoms with the bone ingestions like our second case.

Foreign body migration after initial perforation can lead to unexpected insult to surrounding organs such as lung, liver, pericardium, aorta, pancreas. Fistulous formation such as one found intraoperatively described in our second case is also frequently reported secondary to orchestrating perforation, inflammation and infection [12].

Secondary infection and abscess formations cease in after initial perforation, further deteriorate patients' condition. Overall mortality of foreign body ingestion is rare [1]. However, in a serial of 10 patients with associated aortic injury, only 1 patient eventually survived [14]. Other reported mortality are mainly related to sepsis such as disseminated intravascular coagulopathy or multiorgan failure [1, 2, 4].

The management of bone or foreign body ingestion depends on the characteristic and location of ingested material as well as associated complication. Treatment commenced less than 24 hours improve outcome for patients with oesophageal foreign body in terms of less complications and shorter hospital stay [8].

Conclusion

Ingested bones could lead to unexpected complications and even results in mortality. We encourage people to be mindful while eating and strongly discourage intentional consumption of bones.

Consent: Written consent had been taken from both patients.

Conflict of Interest: We declare no conflict of interest.

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