



## A Case Report of Migrating Chicken Bone to the Pleural Space

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### Abstract

Esophageal perforation due to foreign body usually presents clinically with severe pain occurring within hours of the insult. Chest radiographs are usually abnormal demonstrating cervical or mediastinal emphysema, pneumothorax, or pleural fluid. Occasionally a foreign body may migrate into adjacent structures and in some cases lead to devastating complications like aorto-esophageal and aortopulmonary fistulas. This case is unusual as it exhibits an atypical case of chronic asymptomatic esophageal perforation presenting with foreign body migration inciting an insidious presentation.

### Abbreviations

CT: Computer Tomography; cm: Centimeter

### Case Presentation

An 84-year-old man attended the emergency department with a three-day history of progressively worsening shortness of breath and chest tightness. The triage nurse also reported cough, although the patient denied any cough. Over the past 1 month, he has been having right shoulder pain, which he attributes to sleeping on his right shoulder. The patient denies any recent falls or trauma; he also denies any recent fever, chills, abdominal pain, nausea, vomiting, diarrhea, and dysuria. There were no other symptoms or any recent weight loss. He is compliant with his medication. Upon arrival to the emergency department the patient was hypothermic tachycardic, tachypneic with a Temperature of 34.5°C, respiratory rate was 20 to 25/min and he had an oxygen saturation of 99% in room air, his abdominal examination showed mild tenderness to epigastrium.

His medical history was positive for coronary artery disease status post stent 10/2019, hypertension and hyperlipidemia, heavy tobacco use and congestive heart failure. Differential diagnosis included but not limited to myocardial infarction, pneumonia, pancreatitis and COVID-19 and heart failure. electrocardiogram did not show any significant change, His complete blood count did not show leukocytosis, his hemoglobin was 13.3, and there were no significant electrolyte derangements, renal function, liver function tests and lipase were within normal for the patient, chest roentgenogram showed a 3 cm right mid lung mass, with right basilar pleural thickening and pleural calcification were also seen and cardiomegaly unchanged from previous images was noted (Figure 1). Computer tomography of the chest was ordered to further evaluate and showed prominent loculated right pleural effusion with fluid in the minor fissure as well and pleural calcification and possible mass (Figure 2 and 3). To further evaluate the mass an abdominal and pelvic computer tomography was ordered and confirmed presence of a right-sided effusion and 3 cm parenchymal mass, no evidence of pneumothorax or soft tissue emphysema, other organs were clear (Figures 4 and 5). He was started on antibiotics for possible complicated pneumonia with a plan for video assisted thoroscopic surgery with decortication and washout with a pulmonary wedge biopsy. During the procedure there were thick fibrous adhesions surrounding the foreign body which when released and examined grossly was determined to be a chicken bone (Figure 5).

Lung wedge biopsy, pleural, lymph node and the foreign body were sent for pathology analysis. Results showed the foreign body to be consistent with a chicken bone, the lung showed signs consistent with chronic inflammation and consolidation, while pleura showed fibrous scarring. There was no evidence of malignancy. Empyema fluid did not show bacterial growth or evidence of malignant cells.

The patient recovered and a follow-up Water-soluble contrast esophagogram was performed prior discharge to exclude leak or fistula, the results were normal, and the patient was discharged

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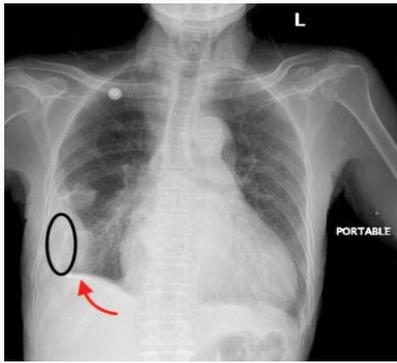
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**Figure 1:** Chest X-ray showing pleural effusion, calcification (red arrow) and the area containing the chicken bone (circled).



**Figure 4:** CT scan showing the chicken bone as indicated by the black arrow.



**Figure 2:** Chest CT scan, showing pleural effusion, pleural calcification (red arrow), and the area of the chicken bone (black arrow).



**Figure 5:** Picture of the extracted chicken bone, measuring 3 cm in length.



**Figure 3:** CT scan showing the chicken bone as indicated by the black arrow.

home.

### Discussion

There are numerous causes of esophageal perforation with iatrogenic being the most common. This case presents one of the uncommon complications of foreign body ingestion [1-4]. We present a case of foreign body ingestion with migration sequel exhibiting no evidence of wall perforation, in which a 3 cm chicken bone led to asymptomatic esophageal perforation and migration into the pleural space.

Perforation of the esophagus due to an ingested foreign body is uncommon as a majority of ingested foreign bodies pass through

the gastrointestinal tract, sharp bodies such as chicken or fish bones, however can be associated with esophageal perforation [3,5-8].

The esophagus is more vulnerable to injury than the rest of the gastrointestinal tract due to its lack of serosal layer, and its relatively poor blood supply, both which contribute to the increase risk of perforation. The mechanism of perforation is thought to be a combination of inflammation and direct pressure necrosis. The most common sites of perforation are the three anatomic constrictions: The cricopharyngeus, the crossing of the left main stem bronchus or aortic arch, and the gastroesophageal junction [3]. Patients may be immediately symptomatic or present weeks after the esophageal perforation, few cases may be asymptomatic for longer [3].

Esophageal perforation is still a life-threatening condition with an overall mortality of approximately 22%. Literature review on esophageal perforation showed that foreign bodies were the cause of 7% of the perforations, with fish and chicken bones being the most common [1,3]. Foreign body ingestion is more common in children and in high-risk groups of adults such as those with underlying esophageal disease, neurological pathology, prisoners, the mentally retarded, and those with psychiatric illnesses, and has also been reported with greater frequency in edentulous patients [3].

In our case, the patient could not remember ingesting a foreign body, he presented with a clinical picture showing a mixture of thoracic and abdominal symptoms. The initial chest roentgenogram showed a loculated right-sided pleural effusion and computer tomography showed presence of a hyper dense foreign body above the diaphragm and loculated right-sided fluid collection, there was no

evidence of pneumothorax or soft tissue emphysema.

The diagnosis was confirmed upon removal of a 3 cm chicken bone from the pleural cavity. The removed bone was surrounded by thick adhesions indicating the presentation was not acute in nature and the pleural fluid although purulent did not show microbial growth. The most common symptom of esophageal perforation is acute chest pain; other common symptoms include the development of pleural effusion, pneumothorax and emphysema [3]. We suspect the delayed presentation in our patient was due to the local containment of inflammation as evident by the extensive fibrosis surrounding the foreign body.

The gold standard for diagnosis if perforation is suspected initially is *via* water-soluble contrast swallow as this patient presented atypically with no obvious risk factors for perforation; it was performed after removing the foreign body and was normal. Rigid endoscopy can also provide clues on extra luminal migration such as the presence of a hematoma, edema, mucosal laceration, punctuate hemorrhage [3,5-7,9,10]. The use of the computed tomographic scan for unusual presentations is valuable to diagnose migration of foreign bodies as was described in our report [3,5-7,9,10].

Although this case did not show evidence of perforation, and patient showed clinical improvement after removal of the foreign body, the primary goal of treatment of an esophageal perforation should be that the defect be repaired as soon as possible, with the gold standard being Primary repair [10].

Migration of a foreign body to tissues outside the esophagus is rare especially when here is no evidence of perforation. Migration of esophageal foreign bodies has been most reported in the neck, this is thought to be due to the anatomic constriction of the cricopharyngeus, and due to the fact that these muscles are circular in arrangement, thus when contracted tend to push a foreign body outward increasing the chance of perforation. There are only a few published reports of foreign body migration: Migration to the lung [11,12], the subcutaneous tissues of the neck [10] thyroid gland [13], the inferior pulmonary ligament, and a major blood vessel [14], and in the pericardium [15] posterior mediastinum [10,14].

## Conclusion

The absence of a clear history of foreign body ingestion and the inability to identify an ingested foreign body on clinical examination, water-soluble contrast swallow or endoscopy does not rule out its presence. The persistence of symptoms and the presence of ominous signs should raise the suspicion of a migrating foreign body; migrated foreign bodies may remain undetected leading to incorrect diagnosis of disease. The reason for diagnostic delay in patients is due to neglecting the importance of detailing the remote history of

foreign body ingestion, absence of initial symptoms and the fact that patients may have multiple co-morbid conditions, which add to the confusion. Thus, we recommend having a high index of suspicion of esophageal perforation in patients presenting with atypical neck, chest or abdominal symptoms.

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