

A Rare Case Oesophageal Perforation by a Fish Bone, Leading to Pericardial Penetration and Cardiac Tamponade

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ABSTRACT

An 82-year-old woman swallowed a fish bone and presented to our hospital 3 days later when she had breathing difficulty and became hypotensive. Chest computed tomography (CT) showed a linear structure with high bone density extending from the oesophagus into the pericardium, along with pericardial effusion, air, and a left pleural effusion. We diagnosed the patient with oesophageal perforation by a foreign body (a fish bone) leading to pericardial penetration, cardiac tamponade, and left empyema. The patient underwent emergency surgery. Pericardial fenestration and drainage of the pericardial and thoracic cavities were performed. Chest CT showed a recurrent abscess cavity in the pericardium on day 6. A pigtail catheter was placed in the recurrent abscess cavity under CT guidance for drainage. The patient gradually improved and was discharged after 5 months.

Key words: oesophageal perforation, fish bone, pericardial penetration and cardiac tamponade

BACKGROUND

Foreign body ingestion is a cause of oesophageal perforation, and the foreign bodies most commonly involved are meat and fish bones and dental prostheses. The associated complications include acute adenoiditis, peri-oesophagitis, and mediastinitis. However, cases of pericardial penetration and cardiac tamponade are very rare.

CASE PRESENTATION

An 82-year-old woman developed neck and left shoulder pain 3 days prior to admission to our hospital. On the following day, she experienced breathing difficulty and was referred to a district hospital with suspected myocardial or lung infarction. Her blood pressure was 84/68 mmHg, with heart rate (HR) 104 bpm and SpO₂ 91% (room air). Laboratory data showed an elevated white blood cell count (18,270/ μ l), elevated C-reactive protein (35.21 mg/dl), and a decline in renal function. A chest X-ray showed cardiac enlargement. An electrocardiogram showed an HR of 104 bpm and atrial fibrillation. Echocardiogram examination showed pericardial effusion but no asynergy or aortic regurgitation. Chest CT in the horizontal sectional view showed peri-

cardial effusion with air, left pleural effusion, and a punctate structure with high bone density in the pericardium. Coronal and sagittal chest CT showed a linear structure with high bone density penetrating from the oesophagus into the pericardium (Figure 1).

We diagnosed the patient with oesophageal perforation by a foreign body (a fish bone) leading to pericardial penetration, cardiac tamponade, and left empyema. An emergency operation was performed, including a median sternotomy in the right lateral recumbent position. Dissection of the cardiac sac revealed extensive purulent pericardial effusion and a purulent epicardium. When the heart was lifted, we observed a fish bone that protruded from the oesophagus to the adjacent pericardium (Figure 2). Intraoperative endoscopy revealed that the fish bone extended dorsally until the oesophagocolumnar junction. The bone, which was approximately 5 cm in length, was removed using biopsy forceps (Figure 3). There was no large perforation. Indwelling 19-Fr drainage tubes were placed at the cardiac apex and anterior mediastinum. Thereafter, we performed thoracoscopic surgery (3 ports) in the left thoracic cavity. Although purulent effusion was noted, no saburra was observed. The oesophageal perforation was likely to be small and was not closed, given its duration. Indwelling 19-Fr drainage tubes were placed in the posterior media-

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Figure 1 CT showed a linear structure with high bone density penetrating from the oesophagus into the pericardium.



Figure 2 When the heart was lifted, we noted that a fish bone protruded from the pericardium adjacent to the cardiac apex.

stinum and at the diaphragm, and the operation was completed. A nasogastric tube was inserted, and the patient was managed with a proton-pump inhibitor and broad-spectrum antibiotics. Laboratory data revealed a recurrent elevated inflammatory reaction on day 6. Chest CT showed the development of a recurrent abscess cavity in the pericardium. The drain in the cardiac apex did not reach the recurrent abscess cavity (Figure 4). Therefore, the anterior mediastinal and cardiac apex drains were removed. A pigtail catheter was placed in the recurrent abscess cavity under CT guidance for drainage. Cultures from the abscess contained *Haemophilus influenzae*

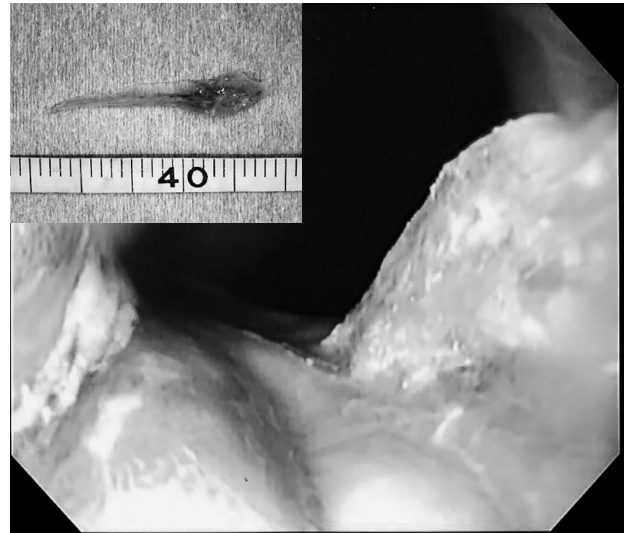


Figure 3 Intraoperative endoscopy revealed a fish bone that extended dorsally until the oesophagocolumnar junction. The bone was approximately 5 cm in length and was removed.

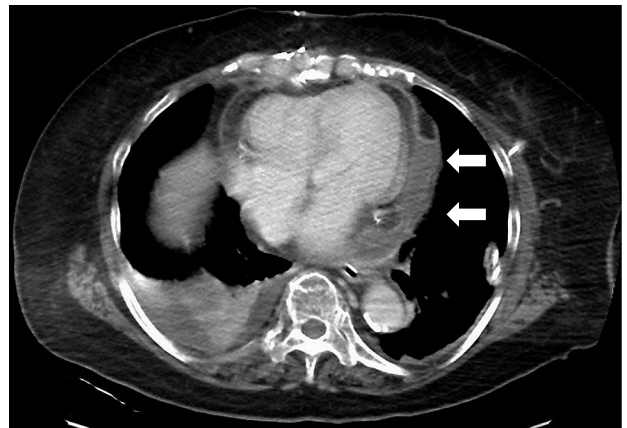


Figure 4 CT showed recurrent abscess cavity on day 6.

(β -lactamase-negative ampicillin-resistant), *Eikenella corrodens*, and *Streptococcus anginosus*.

A follow-up Gastrografin examination on day 18 showed no leakage into the surrounding tissues and no stenosis. The patient started drinking liquids at this time and started consuming food on day 21. The pigtail catheter and thoracostomy drain were removed on day 23. The patient developed a surgical site infection at the median sternotomy site; however, her condition gradually improved and she was discharged after 5 months.

DISCUSSION

Fish bones are the most common foreign body (in 60% of cases)³. The perforation of the oesophagus by a foreign body is frequently associated with pharyngo-oesophageal and thoracic constriction. However, diaphragmatic constriction is uncommon. The success of diagnosis depends on careful history taking and CT. Endoscopy can be used for diagnosis and treatment; however, during air introduction in endoscopy, fish bones may lodge deep in the oesophagus, resulting in major complications such as aerodermection, mediasti-

nal abscess, pneumothorax, and thoracic empyema¹⁰. Intraoperative endoscopy was selected over preoperative endoscopy in the present case because of the potential for coronary or myocardial injury. Common oesophageal complications caused by a fish bone are mainly acute adenoiditis, peri-oesophagitis, mediastinitis, mediastinal abscess, mediastinal emphysema, and thoracic emphysema. Severe complications including aorto-oesophageal fistula⁴, aortic pseudoaneurysm⁷, penetration into the thyroid gland¹¹, and injury of the subclavian artery⁶. To our knowledge, only 3 cases leading to pericardial penetration and cardiac tamponade have been reported in the English literature^{2,8,9}. Nonoperative treatment may be appropriate in selected patients with no signs of active infection, minimal symptoms, a removed foreign body, and a well-drained perforation. In cases where surgery is required, if the perforation occurred more than 24 hours previously, draining is preferred to closure because of the risk of oesophageal fistula, stenosis, and leakage¹². In the present case, we decided not to close the oesophagus as the perforation was small and the duration since onset was long. The overall mortality associated with oesophageal perforation can reach 9–13% within 24 hours of onset, but can increase to 26–45% after more than 24 hours since onset^{1,15}. Nonetheless, even though the patient was admitted 3 days after symptoms developed in the present case, treatment with appropriate surgery and early drainage was successful. Although median sternotomy might not be the best approach for drainage of pericardial effusion because mediastinitis and osteomyelitis can occur, especially in cases of contamination, we believe that left thoracotomy might be the approach of choice.

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