

Successful Medical Treatment for A Devastating Event-Esophageal Perforation by A Fish Bone: A Report of 2 Cases and Review of Literature

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Abstract

Esophageal perforation is a severe complication with a high mortality rate. According to previous reports, surgery has been the standard treatment of choice. However, medical treatment is now used more frequently due to improvements in nutritional therapy and the development of aggressive antibiotic treatment. In this report, we describe two uncommon cases in which esophageal perforation due to swallowed fish bones was successfully treated with conservative medical therapy, even though one of the cases was associated with an abscess within the mediastinum. (J Intern Med Taiwan 2017; 28: 372-376)

Key Words: Esophageal perforation

Introduction

Although complications related to esophageal foreign body ingestion are uncommon, the associated morbidity may be severe and even life-threatening¹. Esophageal perforation is a serious condition with a high mortality rate². However, the early symptoms of esophageal perforation are nonspecific, and a diagnosis is difficult unless associated history and appropriate studies are performed to locate the perforation³. Successful treatment depends on the size of the perforation, the time elapsed between rupture and diagnosis, and co-morbidity of the patient. Common causes of esophageal perforation include medical instrumentation, foreign-body ingestion, and trauma². Conservative medical treatment can

be effective for some patients in literatures, however an appropriate treatment plan should be determined on a case-by-case basis.

Case Report

Case 1

A 74 year-old male suffered from a foreign body sensation and neck discomfort for 6 days. He initially visited a local clinic and was then referred to our emergency department (ED). At the ED, an ENT doctor was consulted, however no pharyngeal foreign body was noted and follow-up at our outpatient department was suggested. He came back to our hospital 2 days later due to the persistence of symptoms, and he was then admitted. The patient denied history of any systemic disease or major

operation. He also had no psychiatric illness before.

After admission, laboratory data showed white blood cell count was $15700/\mu\text{L}$ with a shifting to the left (neutrophil 85.6%). Esophagogastroduodenoscopy (EGD) was performed which showed a large amount of food remnants over the upper third of his esophagus, some of which was removed. Chest computed tomography (CT) was then arranged because of narrowing of his esophagus was suspected during the EGD examination, and because a chest X-ray (Fig 1) showed some areas of air density over his right lower neck. The CT (Fig 2) showed a 0.9×3.2 cm foreign body at the right pyriform sinus, marked edematous changes of the aryepiglottic folds and pre-vertebral muscles, and an extensive gas-forming abscess in the retropharyngeal, right carotid and posterior cervical spaces extending into the posterior mediastinum to the level of the carina. A second look EGD was then performed, and a sharp triangular-shaped fish bone with maximal dimension about 3.2cm mixed with food remnants was removed with biopsy forceps. Aggressive antibiotic treatment with invanz treatment was given from admission for total 14 days. Partial parenteral nutritional support was also given with nothing per os (NPO). The blood cultures showed no growth of microorganism later. Nasogastric tube feeding was gradually implemented on the 10th day, and 4 days later he could drink water from his mouth without discomfort. Esophagography (using water-soluble contrast) was performed on the 20th day, and no contrast extravasation from the esophagus was noted. He was able to tolerate oral intake and was finally discharged after 25 days of admission. His condition remained stable after 6 months of follow-up from the time of discharge.

Case 2

A 71 year-old female without history of any systemic disease or major operation and no psychiatric illness before suffered from foreign body impaction

the night before admission after eating fish. She initially visited a local clinic and was then referred to our ED where she was examined by an ENT doctor. No foreign body was noted, so EGD was performed which showed a sharp fish bone impacted over her upper esophagus. A triangular-shaped fish bone with sharp border and maximal dimension about 2.2cm was removed with biopsy forceps with prior insertion of an overtube. The bone was impacted tightly and she still complained of chest discomfort after removal of the bone. A chest X-ray was

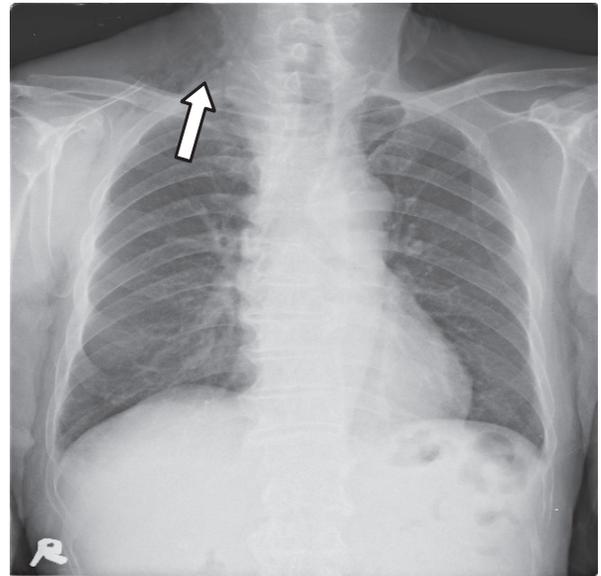


Figure 1. Some air densities over the right lower neck.

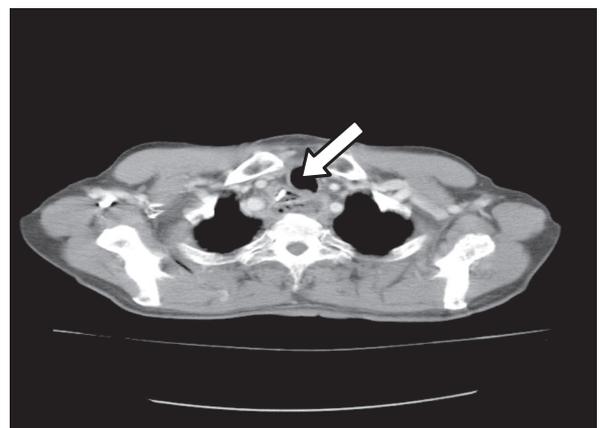


Figure 2. A 3.2cm radiodense foreign body at right pyriform sinus with perforation into retropharyngeal space with extensive abscess in retropharyngeal space and posterior mediastinum.

taken and then chest CT was performed (Fig 3 and 4). Pneumomediastinum was noted and esophageal perforation due to a sharp foreign body was suspected. So she was admitted for further treatment. Laboratory data showed white blood cell count was $10050/\mu\text{L}$ with a mild shifting to the left (neutrophil

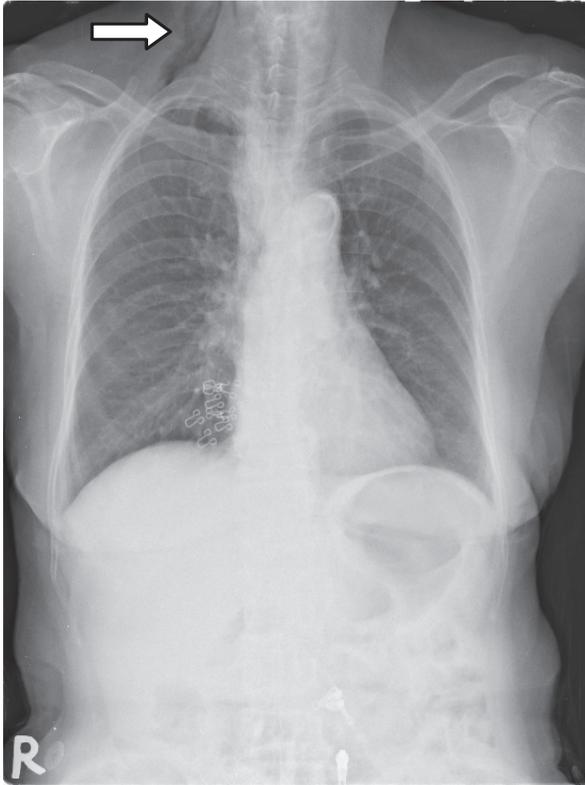


Figure 3. Subcutaneous emphysema at right neck.



Figure 4. Extensive soft tissue emphysema and pneumomediastinum.

77.6%). A chest surgeon was consulted and conservative treatment was suggested. NPO and parenteral nutritional support were given from admission. There was no significant fever and her vital signs were stable. Antibiotic treatment with tazocin was given for total 8 days and blood culture showed no growth of microorganism later. Nasogastric tube feeding was gradually implemented on the 7th day, and 3 days later, she could drink water from her mouth without discomfort. Esophagography (using water-soluble contrast) was performed on the 20th day, and no contrast extravasation from the esophagus was noted. She was able to tolerate oral intake and she was discharged after 21 days of admission.

Discussion

Foreign body ingestion and food bolus impaction are common⁴. Although the majority of ingested foreign bodies will pass spontaneously, impaction, penetration and even perforation may occur within the gastrointestinal tract⁵. Sharp, pointed, and elongated foreign bodies have been reported to be associated with an incidence of perforation as high as 35% and should be removed⁶.

The esophagus is a special part of the gastrointestinal tract that lacks a serosal layer, making it more vulnerable to rupture or perforation. Once a perforation occurs, saliva, gastric juice and bile enter the mediastinum and can result in mediastinitis. These fluids are often infectious and have a low pH, and they can also result in pericarditis, or cardiac tamponade². The most common cause of esophageal perforation is iatrogenic, usually from medical instrumentation. The incidence of perforation from simple endoscopies is 0.03%, while that for pneumatic dilation for achalasia ranges from 1 to 10%. The most common location of perforation from endoscopy is at the cricopharyngeus muscle, and spontaneous perforations and trauma are responsible for up to 20% of all perforations. Perforation can also develop secondary to foreign body ingestion,

with gradual erosion of the impacted foreign body through the esophageal wall, leading to a perforation within 2 weeks after ingestion². Other causes include invasion of the esophagus by contiguous primary or metastatic carcinoma, caustic injury, medication-induced injury, viral and fungal infections, and peptic ulcerative esophagitis². Both of our cases were related to ingestion of a sharp foreign body (triangular-shaped fish bone) and occurred within 1 week of ingestion.

Symptoms and signs of esophageal rupture and perforation include an acutely ill-appearing patient with fever, subcutaneous or mediastinal emphysema, tachycardia, tachypnea, vomiting, and dysphagia². Neck swelling, erythema, tenderness, or crepitus may also occur⁴. The neck discomfort in Case 1 may have been partly related to subcutaneous emphysema. Pleural effusion, pneumothorax, pneumomediastinum, severe atelectasis, and soft tissue emphysema are the most common findings in plain x-ray examinations, and mediastinal emphysema, which is highly suggestive of the diagnosis, requires 1 hour to develop after the perforation³. If a standing X-ray is negative and the clinical presentation continues to suggest perforation, an esophagogram and/or chest CT scan should be performed². Contrast esophagograms have a reported false-negative rate of up to 10%⁷. CT is ideally suited for defining the extent of extra-luminal air and fluid, and it may also be useful in monitoring the clinical course of a patient treated conservatively. It is also the best technique to define the para-esophageal manifestations of an esophageal rupture and may have a role in selecting patients for medical management⁷. CT findings of esophageal rupture and mediastinitis include air in the soft tissue of the mediastinum, abscess formation, and pleural effusion². Other CT abnormalities include esophageal thickening, peri-esophageal fluid, and extra-luminal air, of which extraesophageal air is the most useful finding. The most likely source of extra-luminal air is rupture of

the esophagus or tracheobronchial tree or penetrating trauma⁷. The present cases are different from the previous case report⁵ with significant abnormal findings by X-ray & CT examinations which are compatible with these above descriptions.

It remains controversial whether or not perforation of the esophagus associated with mediastinitis should be treated surgically immediately⁸. According to Cameron et al., conservative therapy is only indicated for patients 1) with esophageal disruptions well contained either within the mediastinum or between the mediastinum and visceral lung pleura, 2) in whom the cavity demonstrates good drainage back into the esophagus, 3) presenting with only minimal symptoms, and 4) only minimal signs of clinical sepsis⁹. Others studies have suggested that conservative management of perforations is only appropriate for contained esophageal perforations in stable patients without evidence of sepsis. Shaffer et al. concluded that the most relevant criterion for medical management was the degree of containment of the perforation. Both of our cases had well contained perforations, mild symptoms and no signs of sepsis.

The majorities of esophageal perforations are not contained and require surgery. Indications for surgery include Boerhaave syndrome, clinically unstable patients with sepsis, contamination of the mediastinum or pleural space, perforation with retained foreign bodies, and failed medical therapy².

Overall, the reported mortality rate from esophageal perforations is 22%. Cervical perforations have a lower mortality rate than thoracic perforations, and the rate is markedly increased in patients with delay in treatment of more than 24 hours and in those with underlying esophageal diseases such as strictures and achalasia. A prolonged pre-diagnostic course, evidence of underlying sepsis, and hemodynamic collapse are all predictors of poor outcomes². A significantly higher mortality rate has also been reported in patients with a

delay in diagnosis, thoracic perforations, and Boerhaave syndrome³. However, the survival rate has been reported to be around 95% when the primary repair is completed within 24 hours of rupture². Fortunately, both of our cases had uneventful courses and remained stable after 6 months of outpatient follow-up.

In conclusion, esophageal perforation is a devastating event. Prompt diagnosis and immediate treatment is necessary. Medical treatment including endoscopic retrieval of the foreign body along with close observation, intravenous antibiotics and nothing by mouth can be an option in select patients with favorable results⁵.

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以內科方式成功治療因魚骨導致食道穿孔： 兩病例報告

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摘要

食道穿孔是嚴重的併發症且合併高死亡率，根據以往的報告，手術乃標準的治療方式，然而隨著抗生素及營養支持的進步，內科治療目前已逐漸被常使用。此篇病例報告中描述兩罕見病例(因吞食魚骨導致食道穿孔)，並且成功以保守內科方式治療，其中一例甚至合併中膈腔化膿。