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Video-Assisted Thoracoscopic Surgery under local anesthesia for right empyema secondary to aspiration pneumonia caused by esophageal achalasia: case report

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A 55-year-old man was admitted to the Department of Internal Medicine of our hospital with chief complaints of fever, cough, and right-sided chest pain. Plain radiography of the chest revealed widening of the mediastinum (attributed to esophageal achalasia), pneumonia, and right pleural effusion. According to the properties of the pleural fluid, empyema was diagnosed. Because the empyema was resistant to antibiotic treatment and was in the fibrinopurulent stage, it could not be drained effectively. Therefore, after treatment of the esophageal achalasia by balloon dilatation of the lower esophagus, the empyema was treated by video-assisted thoracoscopic surgery, i.e., by video-assisted thoracoscopic drainage and curettage of the empyema cavity, under local anesthesia.

Key words: video-assisted thoracoscopic surgery (VATS), empyema, aspiration pneumonia, achalasia, local anesthesia

INTRODUCTION

Esophageal achalasia is a functional disease of the esophagus that manifests mainly as swallowing difficulty and is sometimes complicated by aspiration pneumonia. A patient with acute empyema secondary to aspiration pneumonia was treated by video-assisted thoracoscopic surgery under local anesthesia at our hospital. The case is reported herein.

CASE REPORT

Patient: A 55-year-old man.
Chief complaints: Fever, cough, and right-sided chest pain.
Medical history: At the age of 35 years, the patient underwent balloon dilatation of the lower esophagus for esophageal achalasia.
History of present illness: On October 17, 2004, the patient suffered sudden fever and right-sided chest pain. He was admitted to the Department of Respiratory Internal Medicine of our hospital. The patient's body temperature was 38.2°C and he reported a productive cough. Plain radiography of the chest revealed mediastinal widening, which was judged to be due to achalasia, and right-sided pleural effusion (Fig. 1). Diagnostic thoracentesis performed yielded pleural fluid with a specific gravity of 1.019, protein concentration of 4.6 g/dL, sugar level of 7 mg/dL, lactate dehydrogenase level of 1206 IU/L, and 100 or more neutrophils per high power field. Bacterial culture of the fluid was negative; however, the fluid met the diagnostic criteria for empyema. Streptococci species, constituents of the normal oropharyngeal flora, were isolated from sputum. Computed tomography (CT) revealed consolidation of the middle and inferior lobes of the right lung (Fig. 2). The wall of the cavity, which was encysted on the posterior aspect of the right inferior lobe, was thickened; there was no evidence of air in the cavity. On the basis of these findings, acute right-sided empyema was diagnosed. It was judged to be secondary to aspiration pneumonia caused by

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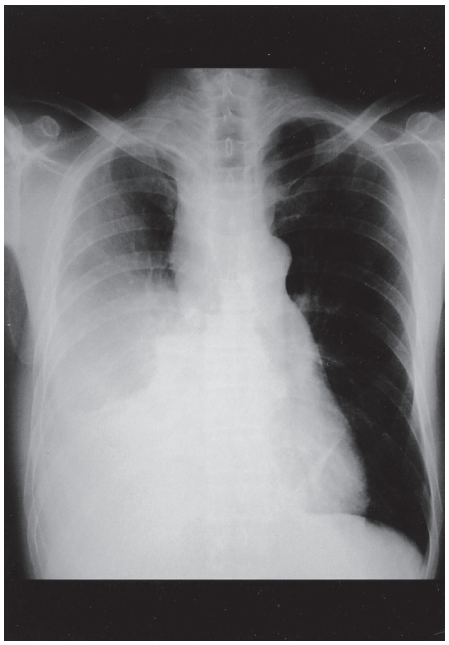


Fig. 1 Chest radiograph on admission. Widening of the mediastinum is observed with right pleural effusion.

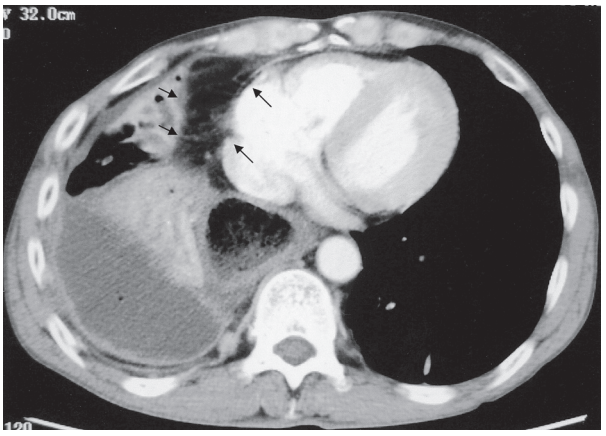


Fig. 2 Preoperative chest CT. The empyema cavity is encysted on the posterior aspect of the right inferior lobe. Consolidation of the middle and inferior lobes of the right lung was noted. The middle and inferior lobes of the right lung were atelectatic, causing the pericardial fat pad (arrows) to appear prominent.

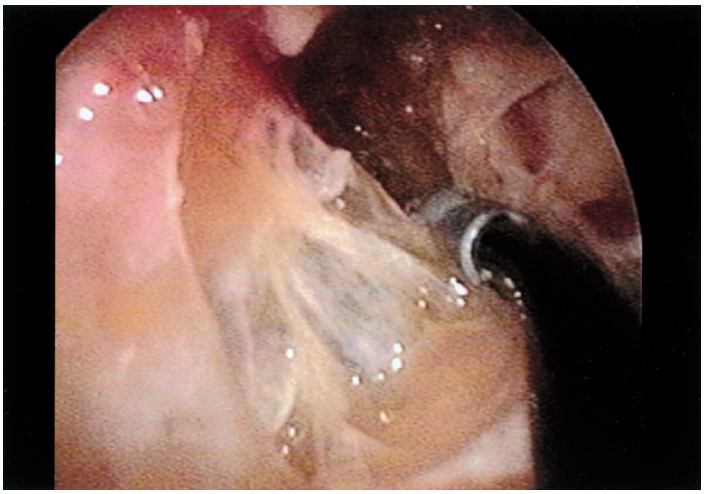
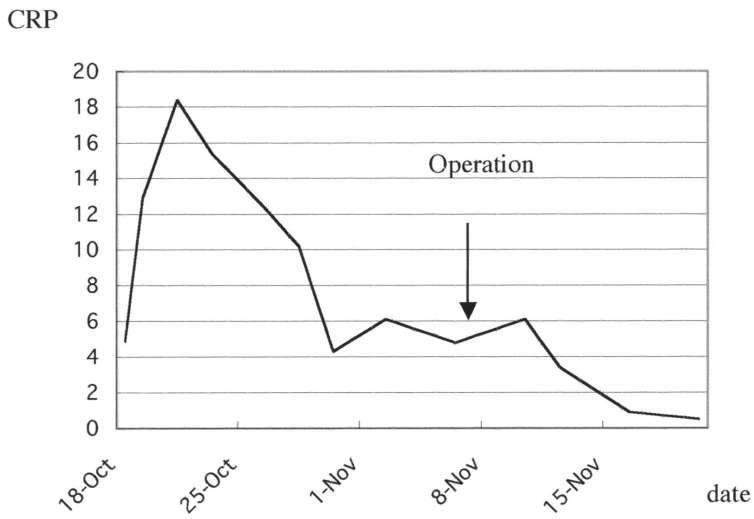


Fig. 3 Intraoperative photograph.

esophageal achalasia. The patient was treated with antibiotics and thoracentesis. Ultrasound examination of the thorax revealed multiloculated fluid accumulation in the right pleural cavity. The pleural fluid could not be drained effectively by needle thoracentesis. On October 27, the esophageal achalasia was treated by balloon dilatation of the lower esophagus. Although some reduction in the serum C-reactive protein (CRP) level was noted, the level remained high, and open drainage was considered necessary (Table 1). The patient was then referred to the Department of Thoracic Surgery.

Surgical findings: Surgery was performed on November 8 under combined epidural and local anesthesia. With the patient positioned in the left lateral recumbent position, a single 3-cm long skin incision was made over the 9th intercostal space. A 5-mm oblique-viewing

Table 1



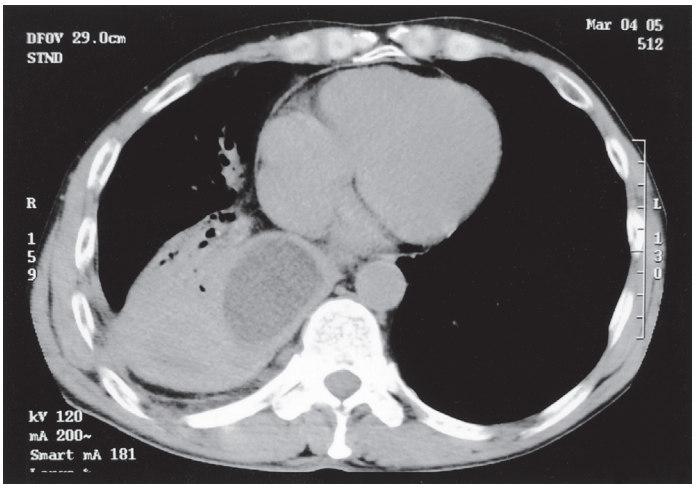


Fig. 4 Postoperative chest CT. The empyema has resolved completely, with complete closure of the pleural cavity, and the right middle lobe shows evidence of aeration. However, there were no changes evident in the right inferior lobe as compared to the findings in the preoperative CT.

rigid thoracoscope and a suction tube were inserted through the wound, and curettage of the empyema cavity was performed under thoracoscopic observation. Adhesions in the loculated empyema cavity were disrupted with the suction tube. The thoracoscope was pushed forward while the visual field was slowly prepared by suctioning each cystic lumen (Fig. 3). After excision and curettage of the fibrous peel on the parietal pleura, the thoracic cavity was irrigated, and a thoracic drainage tube was placed before the surgery was completed. The operation time was 35 minutes, and intraoperative blood loss was not significant.

Postoperative treatment: The thoracic cavity was irrigated with 50 ml of physiological saline daily for 6 days. Bronchoscopy was performed, and a large amount of mucoid secretion was aspirated from the middle and inferior lobes of the right lung. Culture of the bronchoscopic aspirate, similar to the

sputum culture, yielded streptococci, species, constituents of the normal oropharyngeal flora. Postoperative chest CT revealed complete closure of the empyema cavity and findings of aeration of the right middle lobe (Fig. 4). No changes were observed in the right inferior lobe. The serum CRP level returned to within normal range (Table 1), and the patient was discharged on December 1.

DISCUSSION

Empyema is a pathologic condition characterized by the accumulation of purulent fluid in the pleural cavity [1]. For a diagnosis of empyema, the aspirated pleural fluid should satisfy the following criteria: specific gravity of 1.018 or more; at least 500 leukocytes per mm^3; total protein concentration of at least 2.5 g per dL. Bacterial culture is not necessary for the diagnosis [2-4]. Empyema has three pathological stages: the effusion stage, fibrinopurulent stage, and organization stage [1, 2]. Empyema is often refractory to antimicrobial therapy and may worsen despite such therapy. Thus, empyema is considered to be among the more serious respiratory infections. Adult patients with empyema frequently have underlying disease [5], the major ones being chronic obstructive respiratory disease (32%), malignant tumor (30.5%), and pneumonia (55.5%) [6]. Infection spreads to the pleural cavity by three major routes: via the lymphatics [2], via bronchopleural fistula [7], and by direct [7] contact. The major initial symptoms of empyema are dyspnea (82%), fever (81%), cough (70%), and chest pain (67%) [6]. However, empyema may also be asymptomatic [3].

Esophageal achalasia is a functional disease of the esophagus, mainly manifesting as swallowing difficulty. The condition is considered to be etiologically related to an Auerbach's plexus abnormality. Achalasia of the esophagogastric junction causes dilatation of the middle and lower segments of the esophagus to various degrees. The condition is treated by balloon dilatation of the lower esophagus or by radical surgery. Endoscopic injection of botulinum toxin in the vicinity of the lower esophageal sphincter has been used for treatment, but the practice is not common [8]. Balloon dilation is relatively safe, but radical surgery may be indicated if repeated dilatations are required.

Because reflux of the esophageal contents into the pharynx occurs in patients with esophageal achalasia, aspiration pneumonia and lung suppuration are often encountered as complications, particularly in the elderly. Our patient developed aspiration pneumonia, and preoperative chest CT revealed consolidation of the middle and inferior lobes of the right lung. The pericardial fat pad appeared prominent, probably because of atelectasis of the right middle lobe as a result of long-standing inflammation. In some patients with chronic lower respiratory infection, different bacteria are detected between specimens obtained by transtracheal aspiration and sputum specimens. In our patient, however, culture of the bronchoscopic aspirate yielded only streptococci species, constituents of the normal oropharyngeal flora, and the pneumonia was determined to be a result of aspiration secondary to esophageal achalasia.

The aspiration pneumonia secondary to esophageal achalasia was considered to have spread transpleurally in our case, resulting in empyema. To the best of our knowledge, there has been only one reported case of aspiration pneumonia secondary to esophageal achalasia and progressing to empyema [9]. In the present patient, surgical treatment of the empyema was considered because the response to antibiotic treatment alone was unsatisfactory. The empyema was shown to be in the fibrinopurulent stage, which made it almost impossible to conduct efficient intercostal drainage to treat the empyema.

In recent years, the increasing popularity of thoracoscopy for thoracic surgery procedures has led to the use of VATS for treatment of various respiratory diseases, including lung cancer [10, 11]. In our case, excision and curettage of the empyema cavity were performed as a VATS procedure for the treatment. In cases of acute, localized empyema without evidence of bronchopleural fistula, as in our case, general anesthesia may not be necessary. VATS under combined local and epidural anesthesia allows favorable control of the intraoperative pain and safe surgical treatment.

CONCLUSION

We encountered a patient with esophageal achalasia and acute right-sided empyema.

The empyema was considered secondary to aspiration pneumonia. The esophageal achalasia was treated by balloon dilatation of the lower esophagus, and the empyema was treated by VATS under local anesthesia. The patient's response to treatment was satisfactory, and closure of the empyema cavity was achieved.

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