Chronic expanding hematoma with Bronchopleural Fistula and Empyema Space

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Chronic expanding hematoma of the thorax is not typically accompanied by a bronchopleural fistula or purulent lesion. We report an extremely rare case of chronic expanding hematoma with a bronchopleural fistula and empyema space in a 66-year-old man with a history of tuberculous pleurisy admitted because of fever and bloody sputa. Computed tomography and a magnetic resonance imaging revealed a huge mass and an air space in the right thorax. A fiber-optic bronchoscope examination showed hemorrhagic effusion from the apical bronchus of the right lower lobe. First, open-window thoracostomy was undertaken to control the septic state and to prevent aspiration of infected pleural fluid. At operation, air leakage was found at the most superior portion in the rear of the thoracic empyema space; this was thought to be from the bronchopleural fistula. Enterococcus casseliflavus was detected in cultures for bacteria of the effusion from the empyema space. After an improvement of his general condition, a radical operation, including the complete extirpation of the hematoma and intrathoracic muscle transposition using the latissimus dorsi muscle, was successfully performed. (Ann Thorac Cardiovasc Surg 2009; 15: 171–173)

Key words: bronchopleural fistula, chronic expanding hematoma

Introduction

Chronic expanding hematoma in the thorax is a special type of chronic empyema. This lesion is usually nonpurulent with no bacteria. To the authors’ knowledge, no case accompanied with a bronchopleural fistula and an empyema space has been reported. We describe a case of successfully treated chronic expanding hematoma with a bronchopleural fistula and a purulent space.

Case Report

A 66-year-old man was admitted with fever and bloody sputa. Eight years earlier, he had suffered from right tuberculous pleurisy and was medicated for a year. Computed tomography (CT) on admission revealed a huge mass in the right thorax and an air space between the mass and the right lung. Magnetic resonance imaging (MRI) by T1-weighted images revealed a mass in the right thorax with heterogeneous low-signal intensity. On T2-weighted images, a high intensity area surrounded by a low signal area was present, particularly in the peripheral portion of the mass (Fig. 1). Gd-enhanced MRI revealed strong enhancement in the peripheral portion of the mass (Fig. 2). Hemorrhagic effusion was found in the apical bronchus of the right lower lobe on an examination with a fiber-optic bronchoscope. To improve his septic state and to prevent aspiration pneumonia, open-window thoracostomy was performed with an approximately 8-cm-long resection of the segment of the ninth rib. At operation, an air leakage was found at the most superior portion in the rear of the thoracic empyema space; this
was thought to be from the bronchopleural fistula. The mass was recognized in the inferior side of the empyema space and was partially obtained for pathological study. Specimens macroscopically revealed brownish soft tissue; histological examination showed organized tissue that was rich in dilated microcapillaries and accompanied by the deposition of a blood element and hemosiderin. No malignant lesion was observed. Enterococcus casseliflavus was detected in cultures for bacteria of the effusion from the empyema space. Mycobacterium tuberculosis was not detected. The general condition of the patient improved after surgery. Two months after the open-window thoracostomy, a radical operation was performed. Before the operation, arteriography showed that the mass was fed by intercostal arteries and the inferior phrenic artery. These arteries were embolized with platinum coils and gelform particles. Two days after the arterial embolization, the operation was performed through a right lateral thoracotomy that included in its trajectory the previous thoracotomy. The bronchopleural fistula found at the previous operation had disappeared. The mass was completely extirpated, and debridement of the cavity was satisfactorily achieved. The latissimus dorsi muscle was then transposed to the space, and the thoracotomy was closed. The operation time was 375 minutes, and blood loss during the operation totaled 3,850 mL. Though brownish and soft, the extirpated specimen was a solid mass weighting 980 g (Fig. 3). Histological examination showed the same findings observed in the tissue at the prior surgery; no malignancy was apparent. The postoperative course was uneventful, and the patient has been well with no symptoms for more than 5 years.

**Discussion**

Most hematomas resolve spontaneously, but some persist for long periods and grow space-occupying masses. Such
hematomas have been called chronic expanding hematomas, which can occur in various locations, and cases with a lesion arising in the thorax have been reported. Patients suffering from a chronic expanding hematoma of the thorax usually have a history of thoracoplasty, tuberculous pleurisy, or thoracic trauma. Although the pathogenesis of chronic expanding hematoma is not sufficiently understood, Labadie and Glover proposed that the breakdown products derived from erythrocytes, hemoglobin, leukocytes, and other solid blood elements induce neomembrane formation and thus contribute to the lesion's subsequent growth.

Chronic expanding hematomas grow slowly and often look like a malignant tumor. Pathological features of chronic expanding hematomas are not specific; therefore it is difficult to make a differential diagnosis from malignant tumors such as malignant lymphoma or soft-tissue sarcoma by biopsy specimens taken before surgery. Among the imaging modalities, MRI is useful for differentiating chronic expanding hematoma from neoplasms. It has been reported that T2-weighted images are characteristic: papillary high-intensity areas surrounded by low-intensity areas, called a “mosaic sign,” are noted on T2-weighted images. Moreover, T1-weighted images on Gd-enhanced MRI reveal strong enhancement in the peripheral portion of the mass, reflecting capillary bleeding.

A chronic expanding hematoma can cause mediastinal deviation or extrathoracic protrusion; therefore surgical resection has been chosen as the treatment. Complete resection including the capsule is the preferred surgical procedure, since an incomplete resection can induce uncontrollable bleeding from the subcapsular lesion, or it may result in a recurrence of hematoma.

A chronic expanding hematoma typically does not accompany with a bronchopleural fistula or purulent lesion. In the present case, the bronchopleural fistula probably occurred because of the growth of the hematoma, though the actual mechanism was unclear. Optimal drainage of the empyema space was essential to improve the septic state and to prevent the aspiration of infected pleural fluid in the lung. Since closed-chest tube drainage was impossible because of the intrathoracic mass, open-window thoracostomy was selected. Open-window thoracostomy followed by intrathoracic muscle transposition has been reported to be a therapeutic option in patients with empyema. After open-window thoracostomy, a spontaneous closure of bronchopleural fistula, as in the present case, sometimes occurs probably because the infection in the empyema space has improved.

To our knowledge, there are no reports of chronic expanding hematoma with a bronchopleural fistula and purulent space; thus an appropriate strategy for treatment has not been determined. In the present case, open-window thoracostomy was effective to improve the intrathoracic infection, after which a radical operation was successfully undertaken.

References