

Successful Treatment with Video-assisted Thoracoscopic Surgery of Simultaneous Bilateral Spontaneous Pneumothorax Complicated with Unilateral Hemothorax

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Simultaneous bilateral spontaneous pneumothoraxs and spontaneous hemopneumothorax are both rare conditions but can happen concomitantly. We report a case that met the above problems and was successful treatment with two-stage video-assisted thoracoscopic surgery.

Key words: simultaneous bilateral spontaneous pneumothorax, hemothorax, VATS

INTRODUCTION

Simultaneous bilateral spontaneous pneumothoraxs (SBSP) occur infrequently if there is lack of underlying disorders. Most of them are found associated lung parenchymal diseases especially lung cancers. Spontaneous hemopneumothorax is widely recognized to result from torn vascular adhesion between the parietal and visceral pleura, or rupture of vascularized bullae. This rare disorder often complicates with spontaneous pneumothorax and need emergent surgical intervention. Based on the advantage of endoscopic surgery, video-assisted thoracoscopic surgery is our first choice to treat this rare condition¹.

CASE REPORT

A 20-year-old male presented with left pleuritic chest pain in one day's duration. He came to our emergency room and then was admitted to our thoracic surgery division as diagnosis of simultaneous bilateral spontaneous pneumothoraxs. Emergent left tube thoracostomy was undertaken to secure at least one lung ventilation (Fig. 1). The past history was non-remarkable and he denied history

of smoking. Physical examination revealed diminished intensity of bilateral breath sounds. The whole blood count was as follows: hemoglobin, 15.5 g/dl; hematocrit, 45.8%; mean corpuscular volume, 85.4 fl; mean corpuscular hemoglobin, 28.9 pg; leukocytes, 11700/ μ l; platelets, 233000/ μ l. Serum biochemical tests were all within normal range. The general condition of the patient was stable. The drained amount from chest tube was about 350 ml when the patient was admitted to general ward. However, there was no active fresh blood drained out on the following hours.

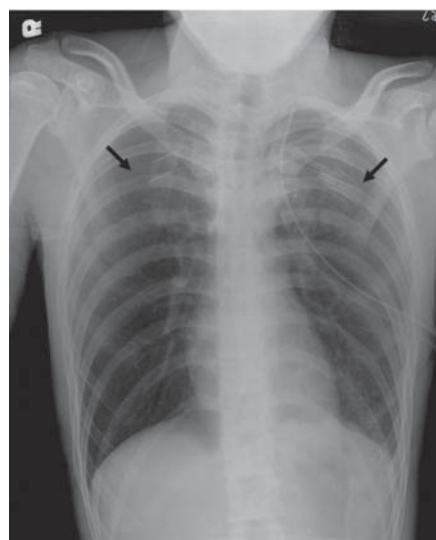


Fig. 1 A chest radiograph showing bilateral pneumothoraxs (left > right) (black arrow) without obvious fluid collection about the dome of diaphragm. Note left chest tube place in pleural cavity.

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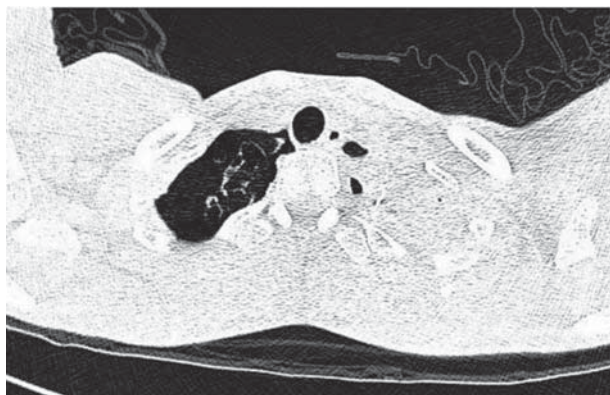


Fig. 2 Computed tomographic scan of the lungs demonstrating bullae over right apex lung and fluid contain in left pleural cavity.

Six hours later, thoracic high resolution computed tomography (HRCT) scans demonstrated blebs in the right apex lung and large amount of fluid contained in left pleural cavity (Fig. 2). The chest tube was noted malfunction because of blood clot obstruction in the lumen resulting blood retention in the left pleural cavity. As the patient showed ongoing hypotension despite blood transfusion was given, emergent surgical intervention for checking bleeder was indicated. Under general anesthesia with one lumen endo-tracheal tube and low tidal volume ventilation, video-assisted thoracoscopic surgery (VATS) was performed under right lateral decubitus position. A large amount of blood clot and some blebs in the apical lung were found. After evacuation of blood clot with ring forcep carefully, one torn adhesion band with active bloody oozing between the blebs and the parietal pleura was identified (Fig. 3). Hemostasis was obtained by clipping the torn adhesion band. After irrigation of pleural cavity, the blebs were resected with endo-stapler. The patient had blood transfusion of 500 ml whole blood during operation and the total estimated blood loss was 2000 ml.

Two days later, the patient sustained exacerbated right pneumothorax and tube thoracostomy was undertaken immediately. Considering blebs lesion of right apical lung, we performed second VATS again. Microscopically, the both sections of resected specimen demonstrated emphysematous change without evidence of malignancy (Figs. 4, 5). The patient had stable post-operative recovery and uneventful in 6-month follow-up without recurrence of pneumothorax. Discussion Spontaneous pneumothorax is a relatively common disease and is generally recognized to occur most often in tall, thin young men with an average age from 15 to 30 years². However, simultaneous bilateral



Fig. 3 Thoracoscopic view of one tear adhesion band with blood oozing between the bullae and the parietal pleura (white arrow).

spontaneous pneumothorax (SBSP) occur infrequently if there is lack of underlying disorders. Most of them are found secondary to pulmonary disease such as histiocytosis X, lymphangioleiomyomatosis, osteogenic sarcoma with pleural and pulmonary metastases, Hodgkin's disease, mesothelioma, cystic fibrosis or miliary tuberculosis³. Besides, the frequency of lung cancer is particularly high in another report⁴. SBSP that progress to hemothorax has rarely documented. This disorder is associated with apical subpleural blebs and the hemorrhage is widely recognized to result from torn vascular adhesion between the parietal and visceral pleura, or rupture of vascularized blebs^{5,6}. In our case, the source of bleeding was torn vascular adhesion between the blebs and parietal pleura. Clinically, the hemorrhage associate with torn adhesion band may not be found immediately after tube thoracostomy.

The symptoms of SBSP are essentially those of unilateral pneumothorax as sudden onset of chest pain with predominant side frequently, shortness of breath and cough. Diagnosis often can be made by chest radiography. Various options have been documented to treat pneumothorax initially including observation, needle decompression and tube thoracostomy. As in SBSP, we suggest at least one tube thoracostomy should be carried out for the possibility of developing into tension pneumothorax⁷. In addition, the risk of spontaneous hemothorax cannot be underestimated after placement of a chest tube⁸. Careful monitor of vital signs should be obtained in all these cases even lack of air-fluid level at initial chest radiography. Once unstable

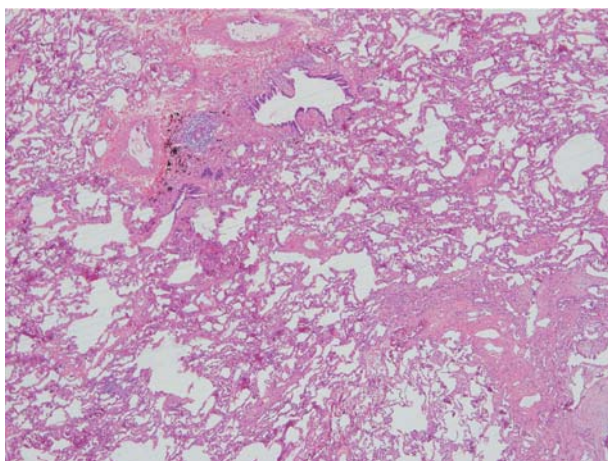


Fig. 4 The sections of left pulmonary blebs showed pictures of emphysematous change of alveolar spaces with focal interstitial stromal fibrosis. (H&E, 40X)

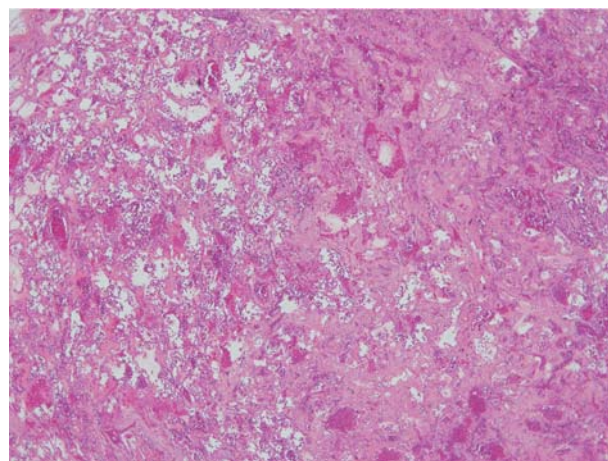


Fig. 5 The sections of right pulmonary blebs showed pictures of massive intra-alveolar hemorrhage with emphysematous change of alveolar spaces and diffuse interstitial stromal fibrosis. (H&E, 40X)

hemodynamic condition with physical signs of shock develops, prompt recognition and early operative intervention must be accomplished.

Spontaneous hemopneumothorax is life-threatening and often needs emergent operation⁹. Conservative treatment is not suggested as it may result in risk of unrecoverable shock and in the formation of a pleural thickening with impaired lung expansion that require further decortication⁸. The surgical treatment of spontaneous hemopneumothorax has two major advantages including the establishment of hemostasis, removal of coagulated blood from the pleural cavity, and sealing of air leaks from the lung surface by resection of areas with blebs. Early surgery is recommended because it is associated with better outcome. VATS is getting popular not only to diagnose the chest lesions but is also used in the treatment of various thoracic diseases. In particular, VATS which is associated with potentially fewer post-operative complications and shorter hospital stays compared with thoracotomy, should be considered in patients with spontaneous hemopneumothorax who are hemodynamically stable¹⁰. In our case, because the preoperative condition of the patient was reversible shock and relatively stable, VATS was our first choice of treatment. Dramatically, our case developed exacerbated right pneumothorax after post operative third day and was performed second VATS with blebs excision. Although Yim et al suggests bilateral VATS is safe procedure in the treatment of SBSP, it is debated with concomitant spontaneous hemopneumothorax¹¹⁻¹³.

In conclusion, it should be remembered that there are

some rare cases of SBSP would lead to massive hemothorax after tube thoracostomy causing life-threatening condition needed prompt diagnosis and treatment. VATS is feasible and can be the first surgical treatment choice if the patient does not show irreversible hypotension. Besides, for high contralateral recurrence of SBSP, one-stage bilateral VATS may also be considered.

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