

A Case of Giant, Benign Schwannoma Associated with Total Lung Collapse by Bloody Effusion

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Benign schwannoma is the most common neurogenic tumor in the mediastinum. Mediastinal benign schwannomas are most often asymptomatic and rarely accompanied by bloody pleural effusion. In the clinical analysis of 7 cases of pulmonary schwannomas, pleural effusion, and blood invasion were evident in 3 patients with malignant schwannoma. Herein, we report a rare case of giant, benign schwannoma presented with total collapse of right lung by massive, bloody pleural effusion.

Keywords: Neurilemmoma; Pleural Effusion

Introduction

A variety of benign and malignant tumors of peripheral nerve origin can occur in the mediastinum. They are most frequently found in the posterior compartment of the mediastinum and benign schwannoma is the most common tumor type. Mediastinal benign schwannomas are usually asymptomatic and if symptoms are present they usually develop by compression of nerve or blood vessel¹. Benign schwannomas are rarely accompanied by pleural effusion and bloody effusion is usually associated with malignant schwannoma². The

authors experienced a case of giant, benign schwannoma which presented with total collapse of right lung by massive, bloody pleural effusion. The case is reported here along with a literature review.

Case Report

A 36-year-old female presented with dyspnea with onset one week prior. Chest X-ray showed total opacity in the right lung (Figure 1). Chest computed tomography revealed massive pleural fluid collection with total passive atelectasis of right lung. In addition, an inhomogeneous mass was found at the posterior portion of fluid collection (Figure 2A). The mass was well-circumscribed and showed minimal enhancement by radio-contrast dye (Figure 2B). A closed thoracentesis was performed and the aspirated pleural fluid was grossly bloody. Pleural fluid analysis was as follows: total protein 5.0 g/dL, lactate dehydrogenase 97 IU/L, glucose 96 mg/dL, pH 7.22, red blood cell 95,000/mm³, white blood cell 18/mm³ (differential count was impossible due to the small number of leukocytes), adenosine deaminase 21.9 IU/L. Cytologic exam was negative for malignant cell and a culture of pleural fluid did not grow any significant respiratory pathogens. Video-assisted thoracic surgery (VATS) revealed that right pleural cavity was filled with bloody fluid and a dumbbell-shaped tumor was found

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in the posterior thorax wall (Figure 3). Because the mass was tightly fixated to the thoracic wall, VATS was converted into an open thoracotomy for the complete resection of the tumor. Upon removal, the mass was revealed to be a whitish soft tumor measuring 10.0×12.0×3.0 cm with a yellow cut-surface (Figure 4A). Upon microscopic exam, the tumor was composed of spindle cells with elongated nuclei, forming interlacing bundle with focal nuclear palisading. Mitotic figures were rare (Figure 4B). Immunohistochemical studies showed a strongly positive reaction with S-100 protein (data not shown). All of these findings are consistent with benign schwannoma. In the afternoon of the operation day, the patient complained of dyspnea and chest X-ray showed total haziness in the right lung (Figure 5A), which must have developed by re-expansion pulmonary edema after removal of massive pleural effusion. The patient was closely monitored in the intensive care unit with restriction of fluid administration. Several days later,

the pulmonary edema was resolved and the patient was discharged on the 10th day after operation. Chest X-ray taken a month after the surgery showed full expansion of right lung (Figure 5B).

Discussion

Neurogenic tumors comprise 19% to 39% of all mediastinal tumors. They develop from mediastinal peripheral nerve, sympathetic and parasympathetic ganglia, and embryonic remnants of neural tube³. Because posterior compartment of mediastinum includes spinal nerves, vagus nerve, and sympathetic chains, neurogenic tumors of the mediastinum are most commonly present in the posterior mediastinal compartment⁴⁻⁶. Among posterior mediastinal neurogenic tumors, schwannoma is the most common. Mediastinal benign schwannomas originate from Schwann cells. They affect both genders equally and develop predominantly in the third and

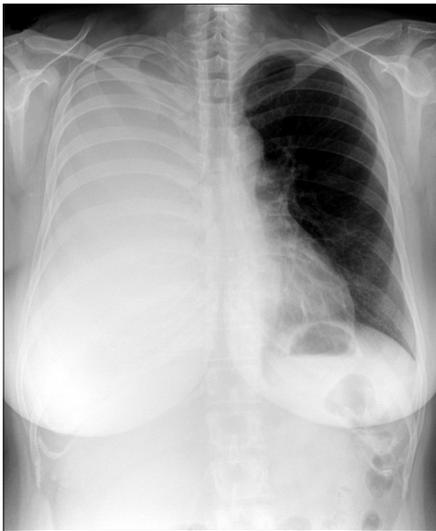


Figure 1. Chest posterior-anterior taken on the day of admission. There is total opacity of the right lung.



Figure 3. Video-assisted thoracoscopic view. A dumbbell-shaped, whitish tumor was found in the posterior thorax wall.

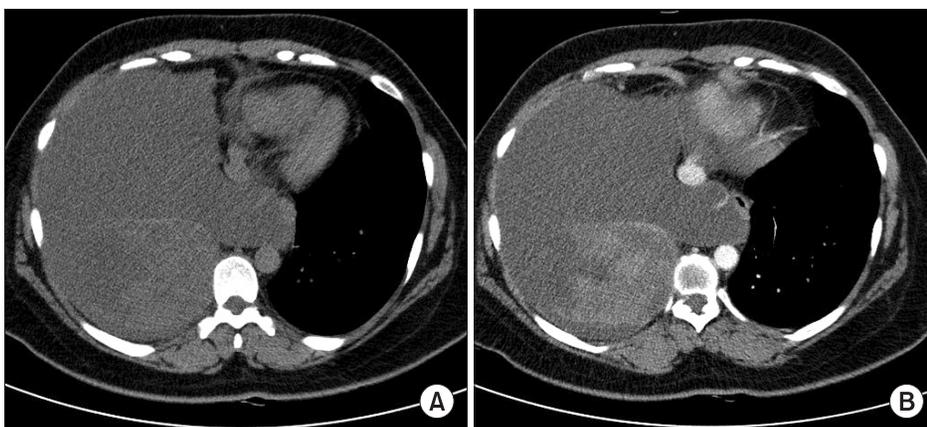


Figure 2. Pre- and post-contrast chest computed tomography (CT). (A) Pre-contrast chest CT revealed massive pleural fluid collection in the right lung with near total, passive atelectasis. (B) With contrast enhancement, relatively well-circumscribed mass was found in the posterior portion which showed minimal and inhomogeneous enhancement with radio-contrast dye.

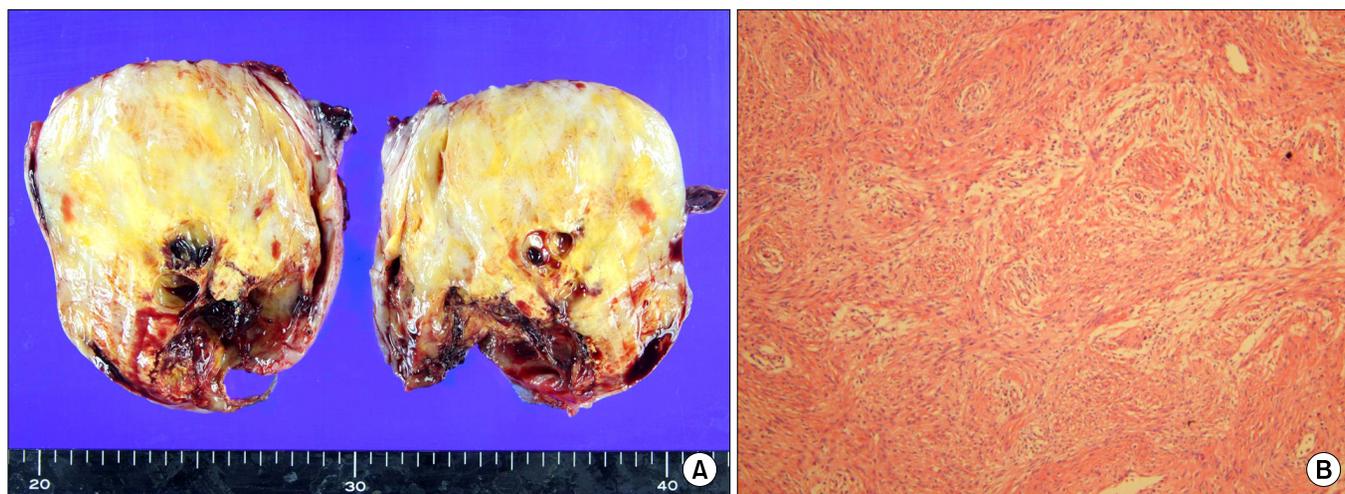


Figure 4. Pathologic examination. (A) Upon gross evaluation, the mass was a whitish soft tumor measuring 10.0×12.0×3.0 cm with a yellow cut-surface. (B) Upon microscopic exam, the tumor was composed of spindle cells with elongated nuclei, forming interlacing bundle with focal nuclear palisading. Mitotic figures were rare (H&E stain, ×100).

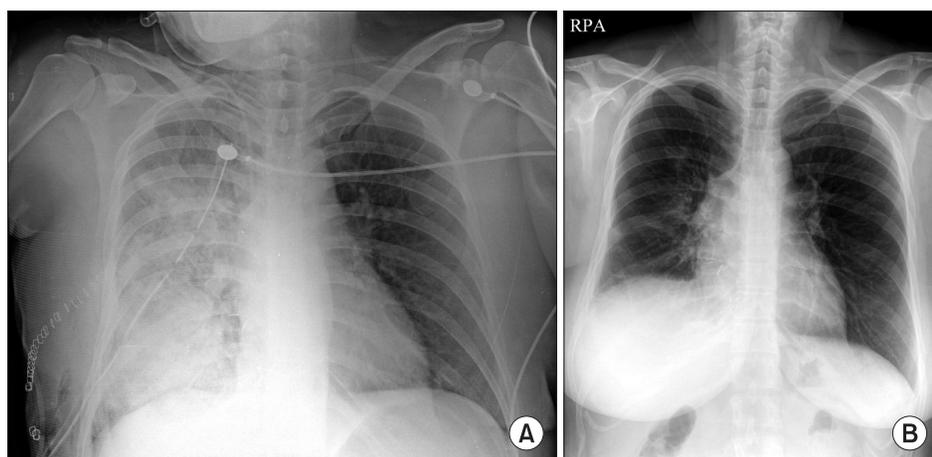


Figure 5. Early postoperative and post-discharge chest posterior-anterior images (PAs). (A) A chest PA taken in the afternoon of the operation showed total haziness in the right lung by re-expansion pulmonary edema. (B) A month after the surgery the right lung was fully aerated without infiltration.

fourth decades of life². Multiple tumors can be presented with neurofibromatosis. Mediastinal benign schwannomas are most often asymptomatic. However, sometimes mediastinal benign schwannomas can cause severe problems such as cardiac tamponade⁷ or pleural effusion^{8,9}, though bloody pleural effusion is usually associated with malignant schwannoma^{2,10}. It is noteworthy that massive and bloody pleural effusion was associated with benign schwannoma in this case. Benign schwannomas are typically treated by surgical resection; because VATS can decrease hospital stay and minimize post-operative complications, it has become the preferred method for resection for posterior neurogenic tumors¹¹. In the present case, VATS was converted to an open thoracotomy because the mass was large and fixed to the posterior thoracic wall. It is important to note that postoperative course may be complicated in schwannoma cases that are accompanied by mas-

sive pleural effusion; our patient suffered from re-expansion pulmonary edema after removal of a large mass and massive pleural effusion.

In summary, benign schwannoma can be accompanied by massive, bloody pleural effusion and patient should be monitored carefully during the postoperative period for the development of re-expansion pulmonary edema.

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