Lung Perforation by a Mediastinal Teratoma with CT Evidence of a Fistula between the Tumor and Bronchus-Case Report

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Introduction

Patients with ruptured mediastinal teratomas perforating into the lung have been reported [1,2]. Usually these teratomas are associated with severe symptoms such as pleural effusion, pneumonia, fever, and hemoptysis [3-6] although some elicit no- or mild symptoms [1,7]. In such cases chronic infection such as concomitant pulmonary infection or tuberculosis may contribute to the differential diagnosis [7]. The English language literature contains few reports of mediastinal teratomas perforating into the lung [1,2]. Because of their malignant potential their image patterns must be better understood.

We present a patient whose mediastinal germ cell tumor perforating into the lung elicited mild symptoms. A teratoma-bronchial fistula was clearly demonstrated on CT images.

Case Report

This 53-year-old man with a history of persistent hemoptysis was admitted for mitral valve surgery. At the age of 32 he was diagnosed with an unenhanced area suggestive of a fluid component (Figure 2B). No consolidation or ground glass opacity. A chest Computed Tomography (CT) scan showed a mediastinal mass measuring approximately 3.0 cm with a small air cavity (Figure 2A). There was some calcification at its periphery. The mass was enhanced heterogeneously and exhibited airway epithelia. Micro-inflammation and fibrosis were observed in glandular-type tissues within the tumor (e.g. pancreatic tissues, salivary gland tissues, intestinal epithelium), inflammation elicited by sebaceous gland secretions, ischemia secondary to rapid tumor growth, pressure necrosis, and superimposed infection of pulmonary or hematologic origin [3,7].

As the tumor in our patient contained pancreatic tissues we posit that pancreatic enzymes were involved in its rupture. This hypothesis is supported by his harboring a lung abscess 20 years earlier. The abscess was the result of chemical pneumonitis or attributable to a tumor that had infiltrated the lung via digestive enzymes.

Cardiac and thoracic surgeons performed plastic surgery to the mitral valve, mediastinal tumor resection, and partial right upper lobectomy in one operative session. Intraoperatively a mediastinal tumor in front of the superior vena cava was identified. It infiltrated slightly into the parietal pleura and pericardium. A tumor at the anterior mediastinum with tight adherence to the lung surface of the upper lobe was also observed. The right internal mammary artery fed the mediastinal mass.

Histopathologically the mediastinal tumor with a fistula to the tracheobronchial tree was composed of hair, mature pancreatic- and intestinal tract tissue, endocrine-, exocrine-, and sebaceous gland tissue, thymic tissue, and skin (Figure 3). There were no immature or malignant components. The lung cystic lesion showed squamous and airway epithelia. Micro-inflammation and fibrosis were observed in the peribronchial area and bronchiectasis was identified. Perforation into the lung of the mediastinal germ cell tumor was confirmed and no immature components or malignancy were identified.

Discussion

Mediastinal germ cell tumors comprise 15% of anterior mediastinal tumors and 60% of mediastinal germ-cell tumors are benign teratomas in adults [8]. They often rupture into adjacent organs and factors leading to their rupture are controversial. Proposed mechanisms of tumor rupture are autolysis by digestive or proteolytic enzymes released from glandular-type tissues within the tumor (e.g. pancreatic tissues, salivary gland tissues, intestinal epithelium), inflammation elicited by sebaceous gland secretions, ischemia secondary to rapid tumor growth, pressure necrosis, and superimposed infection of pulmonary or hematologic origin [3,7].

As the tumor in our patient contained pancreatic tissues we posit that pancreatic enzymes were involved in its rupture. This hypothesis is supported by his harboring a lung abscess 20 years earlier. The abscess was the result of chemical pneumonitis or attributable to a tumor that had infiltrated the lung via digestive enzymes.

Ruptured mediastinal teratomas may elicit various symptoms
The presence of specific components such as fat and calcification may be unclear. In our case we observed an inhomogeneously enhanced mass with calcification; no fat component was evident on CT images.

We posit that the lung cystic lesion in our patient resulted from drainage of the abscess through the bronchus rather than from chronic pulmonary infection with a fungus or from tuberculosis. The image patterns of spontaneously ruptured mediastinal teratomas must be better understood and at the interpretation of radiographic images, the possibility of spontaneous rupture of a mediastinal teratoma must be considered even in the presence of only mild symptoms.

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