Alveolar Adenoma of the Lung: A Case Report

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Alveolar adenoma is a rare pulmonary neoplasm. This report describes a case of alveolar adenoma of the lung in a 61-year-old woman. A chest X-ray demonstrated a solitary round pulmonary nodule. After six years of observation, this lesion had increased in size. Thoracoscopic left upper segmentectomy was performed on account of a possible low-grade malignant tumor. Histologically, the neoplastic epithelial cells, which had the appearance of proliferative type II pneumocytes, revealed no evidence of malignancy. These findings indicated that the tumor is alveolar adenoma of the lung. The course of disease remains uneventful, one year after the resection.

Key words: alveolar adenoma, lung, type II pneumocyte, surgical resection

Introduction

Alveolar adenoma of the lung (AAL) is a rare benign neoplasm with proliferative alveolar epithelium (type II pneumocytes) and septal mesenchyma. The first report was described by Yousen in 1986.1 AAL is usually asymptomatic, and in most cases, it is found by a random chest X-ray as a solitary, peripheral neoplasm. Recurrence has never been reported after surgical resection.2 Some reports suggest that AAL may represent the benign counterpart of bronchioalveolar carcinoma (BAC).3 AAL mostly strikes an older population.

Case Report

During a regular medical examination, the chest X-ray of a 61-year-old woman revealed a left pulmonary nodule. A computed tomography (CT) scan demonstrated a solitary round nodule in the left upper lobe, which was followed, radiologically, for 6 years and was though to be benign (Fig. 1A and 1B). When the most recent chest X-ray revealed an increase in size of the nodule, the woman was admitted to our institute to undergo a surgical operation. The chest CT showed a well-demarcated, solitary 2.4-cm mass in the left upper lobe (Fig. 1C and 1D). Although fluorine-18-fluorodeoxyglucose positron emission tomography (FDG-PET) showed the benign nature of the lesion, thoracoscopic segmentectomy was performed due to the possibility of a low-grade malignancy. The resected tissues contained a plural-based tumor, which was globular, 2.4-cm in diameter, soft, and pale yellow. The cut surface had a glistening, protruding feature and was shelled out from the surrounding lung parenchyma (Fig. 2A). The postoperative course of the disease was uneventful, and one year later there was no sign of recurrence.

Histologically, the tumor was a well-demarcated, multicystic mass with ecstatic spaces filled with eosinophilic proteinaceous granular material and a few foamy cells (Fig. 2B and 2C). Cystic spaces were lined by neoplastic epithelial cells, which had hyperplastic type II pneumocytes. These cells revealed minimal cellular atypia, no mitosis, and no invasive growth (Fig. 2C). Neither ciliated cells nor Clara cells were observed in the inner line of the cystic spaces separated by connective tissues (Fig.
Fig. 1  (A, B) The computed tomography scan (CT) examined 6 years before revealed a 1.8 cm hollow nodule in the left upper lobe.  (C, D) CT after 6 years observation demonstrated a well-demarcated solitary 2.4 × 2.3 cm round solid lesion at the same lesion.

Fig. 2  (A) Macroscopic findings of the tumor.  (B, C, and D) Stained with hematoxylin-eosin.  (B) Tumor locates closely to the pleura.  (C) The inset (high magnification) shows neoplastic epithelial cells with the cuboidal shape.  (D) The inset (high magnification) shows plasma cells with Russell body.  Bars indicate 2 mm in B, 100 µm in C, D.  T, tumor; Pl, pleura
Immunohistochemically, the neoplastic epithelial cells were reactive for type II pneumocyte markers, thyroid transcription factor-1 and surfactant apoprotein, all indicating that the tumor was alveolar adenoma originating from type II pneumocytes.

Discussion

The rare and benign AAL has distinctive gross and microscopic findings. Since its first description, less than 30 cases have been reported. The age range of patients is 39 to 74 years, with a slight female predominance. Patients are usually asymptomatic, and the tumor is usually an incidental radiographic finding. Chest CT appearance is solitary well-circumscribed peripheral lung nodule with homogeneous density, indicating its benign nature. This type of nodule is often described as growing slowly over years, which we had also observed. The radiographic presentation, including the FDG-PET, is nonspecific, so the diagnosis requires a histological examination. However, a definitive diagnosis by small biopsy sections is difficult because AAL closely resembles normal lung parenchyma.

Tumors measuring from 0.7 to 6.0 cm feature well demarcated smooth, lobulated, multicystic, soft to firm and pale yellow cut surfaces. Microscopically, AAL displays multicystic patterns consisting of proliferations of alveolar structures lined by type II pneumocytes. Flow cytometric analyses have confirmed that the neoplastic cells are diploid, supporting that AAL is benign. In our case, the p53 test was found to be negative as previous reports have described.

The differential diagnosis included papillary adenoma, lymphadenoma, hamartoma, sclerosing hemangioma, which are markedly differ from AAL in terms of histological findings. Atypical adenomatous hyperplasia (AAH) and BAC are also considerations. AAL should be distinguished from AAH, which is though to be a precursor lesion to adenocarcinoma. The focal character of BAC shows a well-circumscribed pulmonary lesion and an excellent prognosis after resection as well as AAL, but AAL lack histological malignancy. Among patients who underwent resection, no recurrence was reported, confirming the benign nature of this neoplasm.

In conclusion, AAL is a rare, benign neoplasm that usually presents in asymptomatic patients with a solitary coin lesion on chest X-ray. Histological appearance resembles normal alveolar pulmonary tissue. Surgical resection is thought to be curative for this tumor.

References