Plasma Cell Granuloma of the Lung – Resection and Steroid Therapy

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Summary
We report on three resected cases of intrapulmonary plasma cell granuloma. All of them were asymptomatic. One of them showed bilateral multiple lesions and in this case bilateral partial resections of lung in one stage were performed. Under light and electron microscopy the lesions were composed of plasma cells and other kinds of inflammatory cell. The plasma cells were mature and had rich endoplasmic reticulum but no kind of intracytoplasmic inclusion. Steroid therapy was effective for the recurrent lesion after the operation.

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Zusammenfassung

Key words: Pulmonary plasma cell granuloma – Mature plasma cell – Steroid

Introduction
Pulmonary plasma cell granuloma is comparatively rare and reports in Japan (4, 6, 9) are less than in United States or Europe (1-3, 5, 10-13). As for the etiology of plasma cell granuloma, it has been considered that it is a kind of post-inflammatory pseudotumor. Histologically the characteristic feature is the infiltration or accumulation of mature plasma cell and other kinds of inflammatory cell (1, 3, 4, 7). In the past 10 years we had three resected patients with pulmonary plasma cell granuloma in our clinic, one of whom showed an interesting clinical course. The purpose of this report is to describe the findings of these patients, and review the recent literature.

Report of cases
Case 1: A 51-year-old female was admitted to our clinic because of abnormal lung shadow. She had no symptom. The lesions on the chest X-ray film were multiple, two in the right lung and one in the left lung (Fig. 1). The chest radiograph and computed tomogram revealed round and/or oval tumors with comparatively clear margin (Fig. 2). From the sputum and bronchoscopic brushing no malignant cell was found. Metastatic lung tumors with unknown origin were suspected. The patient underwent bilateral thoracotomy in one stage. Histologic diagnosis was plasma cell granuloma originating in the lung. Eleven months after the operation the recurrence of granulomatous lesion occurred in the right lung (Fig. 3). She refused the re-operation, and steroid was administered orally for 1.5 months, and as a result the lesion disappeared completely (Fig. 4). No recurrence has been observed.

Case 2: A 27-year-old male was admitted to the hospital because of an abnormal shadow on the chest X-ray film. He had no symptom. Sputum

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cytology showed no malignant cells. Mantoux reaction was positive. The culture for tuberculous bacilli was negative. The admission chest X-ray and tomograms showed a round lesion with comparatively clear margin (Fig. 3). The lesion was diagnosed as pulmonary tuberculoma and anti-tuberculous therapy was performed for three months and resulted in no improvement. He underwent a right upper lobectomy.

Case 3: A 8-year-old boy was admitted to the hospital because of an abnormal shadow on the chest X-ray film of the routine annual medical examination at school. No symptom related to the lung shadow was seen. The chest radiograph revealed a round lesion in the hilar zone of the right upper lobe. Right pneumonectomy was carried out because of the strong adhesion between the tumor and hilar structures. Since the surgery he has been well and showed no recurrence.

Histologic findings

Macroscopically all cases showed yellowish-white and elastic-hard lesions with circumscribed and well-defined margins.

Under the light microscopy these lesions were composed of many mature plasma cells and a few other kinds of inflammatory cells which were small lymphocytes, fibroblasts, foamy cells and other histiocytic cells (Fig. 6). Russel bodies were found occasionally. Mitoses were not observed. Although some development of collagenous fibrous tissue was noted through the inflammatory cells, the formation of hyaline lamellae was not present. Foreign-body giant cells and the deposition of amyloid could not be found.

The ultrastructural investigation was performed in cases 1 and 2. The mature plasma cells with abundant rough endoplasmic reticulum and rich ribosomes were observed in high frequency (Fig. 7). Histiocytic cells had two types of figure of cytoplasm; one had the rich intracytoplasmic organelles and the other had scarce ones. Foamy cells and histiocytic cells showed the abundant lipid granules in the cytoplasm (Fig. 7 & 8).

Discussion

Plasma cell granuloma is an inflammatory pseudotumor, which shows the localized proliferation of mature plasma cells and other inflammatory cells. Bahadori and Liebow (1) described that they preferred the designation “plasma cell granuloma” since plasma cells represented the main cell type common to lesions. According to the predominance of other cells, the tumor should be classified as histiocytoma, xanthoma, fibroxanthoma or xanthogranuloma (2, 5, 8, 12, 13). The sclerosing hemangio-oma has also been considered to be a kind of inflammatory pseudotumor. However we believe it is better to distinguish plasma cell granuloma from sclerosing hemangio-oma histologically. In the report by Bahadori and Liebow (1), more than two thirds of the patients are less than 30 years of age. Children under 10 years were 29% of their patients. But in Japan the
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reports of plasma cell granuloma of children are very few (8). Umiker and Iverson (11) described that the majority of patients gave a history of respiratory infections, such as pneumonia, pleuritis or recurrent bronchitis, preceding discovery of intrapulmonary lesion. However three cases in this report had no history of an apparent previous infection of the lung.

Under light and electron microscopy the most characteristic feature of plasma cell granuloma is the combination of several cell components (8, 9). In plasma cell granuloma the mature plasma cells are predominantly observed (9). The presence of Russel bodies seems to support the theory that this is an inflammatory granuloma and never a kind of neoplasm. McCully et al (3) described in a report of their own case that plasma cell granuloma had histologic features similar to the lesion caused by murine sarcoma virus infection.

In this report, case 1 showed multiple lesions, which were usually uncommon in plasma cell granuloma, therefore it should be distinguished histologically from pulmonary hyalinizing granuloma (14), which occurs in young or middle-aged adults with multiple nodular shadows on the chest-radiograph. Microscopically, however, the pulmonary hyalinizing granuloma shows characteristic hyaline lamellae composed of whorled collagen bundles, which were absent in our case 1. Some inflammatory cells are seen in the periphery of pulmonary hyalinizing granuloma, but no diffuse cellularity as in our case.

As for the treatment of plasma cell granuloma, lung resection including the lesion has been the method of choice. Recently Imperato et al (15) reported good results by irradiation therapy. However we used steroid for the recurrent lesion in case 1 and with excellent effect. From this experience we would like to emphasize that steroid is an influential therapeutic method for the plasma cell granuloma in the lung.
References


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