Plasma Cell Granuloma of Lung
Case Report and Review of Literature*

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The differential diagnosis of pulmonary space occupying lesions must constantly consider primary or metastatic malignant disease. A variety of pulmonary lesions may clinically mimic a malignant process and improved diagnostic techniques are required. One of these lesions is the plasma cell granuloma and plasmacytoma of the lung. The purpose of this paper is to present a case of plasma cell granuloma of the lung, clearly demonstrating the nature of the clinical and pathologic problems of this particular entity.

Case Report

A. R., a 70-year-old custodial care Puerto Rican woman, was admitted to Metropolitan Hospital on September 23, 1960 with a chief complaint of shortness of breath and wheezing. She has been a known asthmatic for several years. In the past month, wheezing had increased and in addition, the patient noticed back pain, ankle edema, paroxysmal nocturnal dyspnea, orthopnea and shortness of breath on exertion. There was no chest pain, cough, fever or hemoptysis.

Physical Examination: Blood pressure 170/100, pulse 84/min., respiration 24/min. She was well-developed, well-nourished, in no acute distress, alert, and cooperative.

Chest: Symmetrical, expiratory wheezes and rhonchi in both lung fields. Diminished breath sounds at right base. Heart sounds distant, no murmurs or thrills. Respiration 84/min. There was increased antero-posterior diameter of the thorax.

Abdomen: Soft, tender, liver 2-3 fingers below the right costal margin. No palpable organs or masses present.

Extremities: Deep tendon reflexes were equal bilaterally, and there was 2 plus pitting edema of the ankle. Venous pressure was 90 cm., H2O and circulation time 14 sec. Mantoux test—positive.

Laboratory Work: White blood count 13,000; Mazzini non-reactive; bronchial secretions negative for acid-fast bacilli; repeated sputa and bronchial aspirations and cell blocks negative for malignant cells; sedimentation rate 111 mm./hour; cephalin flocculation 2 plus; total protein 8 gram per cent; albumin 3.0; globulin 5.0; electrolytes normal.

Course in Hospital: She was originally felt to have chronic, increasingly intractable asthma, and cardiac cirrhosis. She reacted poorly to potassium iodide (Tedral), a combination of theophylline, ephedrine and phenobarbital, and antihistaminics, but was consistently afebrile. X-ray films of October 13 were interpreted as "clouding at the right base—pneumonitis should be considered." Those of October 10 and 27, after antibiotic therapy, showed "essentially no change" and were interpreted by the roentgenologist as "bronchogenic carcinoma." (Figs. 1 and 2).

Clinical Impression: Bronchogenic carcinoma of the right lower lobe.

After multiple consultations, right thoracotomy was performed on November 15, 1960, through an inferior approach via the fifth costal space. There were moderate adhesions noted between the visceral and parietal pleurae overlying the lung. There were no skin lesions. Mental artery and basal segmental artery were transected and the stump was closed. However,
she could not be resuscitated and expired. The operative impression was carcinoma of the lung. Necropsy was not obtained.

**Pathology:** Specimen consisted of the resected right lower lobe of the right lung, measuring 13x12x5 cm. in greatest diameter. The lateral surface was partially covered with adherent parietal pleura. The medial surface showed many creamy white discolorations. The lobe was almost entirely occupied by a mass which was previously bisected and showed a white-brownish mass, firm in consistency, not encapsulated, replacing the normal layer of pulmonary tissue in the upper aspect. Dissection of the bronchial tree revealed no intraluminal masses, the lesion compressing small and large bronchi.

**Microscopic:** The lesion compressed the surrounding pulmonary parenchyma into a pseudocapsule. It consisted of deeply basophilic sheets of small packed cells which in some areas obliterated landmarks and in others formed nodular aggregates in the interalveolar septa. There was compression of small bronchi by extraluminal masses. The predominant cell had a moderate amount of basophilic cytoplasm with an eccentric basophilic nucleus with stippled chromatin and was interpreted as a plasma cell. There was also a moderate number of scattered lymphocytes and fibroblasts present. No foam cells were noted. PAS and Gridley stains failed to reveal either sporulating or mycelial forms of fungi, and findings with acid-fast stain were negative.

The interpretation in this laboratory confirmed by Dr. Averill Liebow, of Yale, was "plasma cell granuloma" (Figs. 3 and 4).

**DISCUSSION**

Granulomatous pulmonary disease as a group presents an intriguing problem in pathogenesis. A popularly accepted definition of granulomatous inflammation regards the process as chronic, focal, associated with necrosis and varying numbers of lymphocytes, plasma cells, giant cells and histiocytic cells. Such a constellation of cells and structural alterations may represent a tissue response to a wide variety of unrelated etiologic agents. In the absence of a demonstrable etiology, the granuloma is regarded as non-specific. The primitive mesenchyme, upon appropriate stimulation, may differentiate into a variety of cell types including histiocytes, fibroblasts and plasma cells. A great body of accumulated evidence clearly establishes the plasma cell as the cellular source of antibody. Studies of Ortega and Mellors, and others have demonstrated gamma globulin in the plasma cell cytoplasm. Thus, intense plasma

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**FIGURE 1:** Persistent clouding, right lower lobe, postero-anterior. **FIGURE 2:** Persistent clouding, right lower lobe (right lateral).
cell infiltrates may represent local antibody formation and reflect a hypersensitive state. Plasma cell infiltration in and around malignant tumors may be related to a better prognosis as evidenced by carcinoma of the breast with plasma cellular infiltrate. It would appear that the response of the local mesenchyme to an antigen in a focal area is the proliferation of plasma cells. However, when the plasma cell accumulation reveals abnormal cells without other evidences of an inflammatory process and destruction of tissue, a plasmacytoma may be considered. That plasmacytomas represent an uncontrolled cellular response to an antigenic stimulus is an attractive hypothesis.

Extramedullary plasma cell lesions, primarily plasmacytomas, have been observed in the upper air passages, conjunctiva and gastrointestinal tract. The pathogenesis of these lesions is unknown, but several hypotheses have been advanced. Some observers suggest a myeloid theory for the evolution of the plasmacytomas and plasma cell granulomas (Lane). Gordon and Walker suggested that the granulomas might represent low grade malignancies. These workers cited two cases of solitary pulmonary granulomas in support of this idea (communicated by Dr. F. W. Stewart). The concept that these lesions are part of a broad spectrum of post-inflammatory tumors was advanced by Umiker and Iverson. They indicated that the nomenclature used depended on the predominating cell types such as foam cells, fibroblasts or plasma cells. To further complicate the issue, certain authors, in describing these lesions, retreat to the term “of contradictory pathology” (Brunn). Extramedullary plasma cell lesions composed essentially of plasma cells of varying degrees of maturity are, by accepted criteria, classified as tumors. In general, their biologic behavior is consonant with the cellular appearances of the tumor and deformation of adjacent structures. Admixtures of other mesenchymal cells may convert the diagnosis of granuloma and other descriptive terms in an attempt to indicate pathogenesis. Where the lesion clearly demonstrates histologic and biologic evidences of malignancy, then it may correctly be regarded as a “cancer.” The plasmacytoma or plasma cell granuloma of the lung should be regarded as variants of the same disturbed process of mesenchymal cell function dependent upon a variety of unknown factors.

The clinical picture is one of a mass in the lung non-responsive to usual therapeutic regimens for infectious processes. As the lesion expands to compress bronchi, wheezing may develop and eventually atelectasis closely simulating changes associated with carcinoma. The diagnosis may be suspected due to constant negative cyologic studies for exfoliated cancer cells. Kuley and Kuntman recommend needle biopsy to establish the diagnosis preoperatively. However, this procedure may be associated with a significant morbidity and
is currently not in wide use. Thus, thoracotomy and frozen section remain the only effective means of elucidating the nature of the lesion.

In the case presented, repeated attempts to identify an infectious agent were unsuccessful. While acid-fast, mycotic, other bacterial, and parasitic organisms could be reasonably excluded, a detailed attempt at isolation of viruses was not made. Plasma cell lesions of the lung should be considered in the differential diagnosis of solitary pulmonary circumscribed masses. It is generally believed that these lesions are essentially benign, although Childress and Adie\(^\text{10}\) report a recurrence in one of their cases.

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**References**


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