Plasma Cell Granuloma of Lung*

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A survey of the recent literature on the subject of extramedullary plasma cell granuloma of lung reveals this article to be the third published report dealing with this type of pseudotumor. Childress and Adie in 1949 and Cotton and Penido in 1952 have preceded our own presentation with examples of a similar lesion encountered in their own patients. The lesion which we report is then not only of rare occurrence but appears to be the largest of its type so far described in publication.

Case History

K. W., a 28 year old white male, ship electrician, had suffered from persistent, moderately severe cough, productive of one ounce of semi-mucoid sputa from April to June 1951, and related one episode of minimal hemoptysis in June 1951. He had incurred no significant weight loss. While in the Canal Zone in June 1951, he was informed, following a pre-employment examination, that his chest film showed a tumor in the left pericardial region and a tuberculosis-like infiltrate in the left apex. He promptly returned to his home in Portland, Maine, and was studied while hospitalized there at the United States Public Health Service Hospital from July 10, 1951 to August 30, 1951. Gastric cultures for acid fast bacilli were negative. He remained on outpatient status for four months and was then admitted to the Tumor Clinic, United States Public Health Service Hospital, Baltimore, Maryland for excision of the tumor in the left lower thoracic cavity. Because preoperative smears showed tubercle bacilli on smear and because it was felt prudent to obtain stabilization of the tuberculous process before attempting left thoracotomy, he was transferred to the U.S.P.H.S. Hospital, Manhattan Beach, New York, where he remained from February 15, 1952 to August 1952. The February 1952 chest x-ray film showed a normal right lung; in the left lung field were a fibro-exudative infiltrate in the first and second anterior interspaces and a large mass in the posterior inferior region of the pleural cavity. Tomograms revealed a small cavity in the apical-posterior segment of the left upper lobe. Sizptomycin grams one every other day and PAS grams daily were begun February 20, 1952, INAH 300 mgm. daily started August 4, 1952 and these drugs have been maintained without interruption to the present time (January, 1953).

Past history: No member of his family was known to have had tuberculosis. He further stated that as part of his duties as a ship electrician from July 1950 to March 1951 he would remove accumulated dust from the carbon brushes of the ship generators periodically, an act which caused some irritation of the naso-pharynx. During the years 1948 to 1950 he worked as a hardware salesman, spending a great deal of his time in the San Joaquin Valley, California, but he had felt in good health during this period. An earlier chest film in June 1950 was reportedly negative. However, it is quite possible the tumor was so small at that time that its presence on a posterior-anterior projection was concealed by the then larger cardiac silhouette.

By August, 1952 the left apical cavity had closed the left upper lung infiltrate had sufficiently cleared and stabilized. He was transferred to the U.S.P.H.S. Hospital, Staten Island for left thoracotomy. He was well-developed and presented no significant abnormality on physical examination—even of the chest. Blood pressure 106/60.

Laboratory work (prior to surgery): Leukocyte count 7500. Hemoglobin 15. Routine urine analysis was normal. VDRL and Mazzini—negative. Sputa smears—negative for acid fast bacilli. Barium swallow showed no esophageal abnormality, no evidence of hiatus hernia (see figures 1 and 2). Electrocardiogram showed non specific T and ST wave changes—suggesting an abnormality localized to the posterior myocardium or pericardium. Histoplasmin and coccidioid skin tests were negative.

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It was the impression of the surgeons that the upper lobe infiltration was tuberculous and that the mass in the lower lung field was a benign tumor. Left thoracotomy was performed on August 28, 1952. The upper lobe collapsed readily but the lower lobe maintained most of its configuration. Throughout the upper lobe could be palpated aggregates of nodular disease most numerous in the apical-posterior segment, presumably tuberculous. Occupying the central portion of the lower lobe was a firm, multilobular mass which displaced and compressed adjacent lung parenchyma in some areas and in others presented a glistening, yellow appearance beneath the visceral pleura. The inferior pulmonary ligament was abnormally and highly vascularized. Several small mediastinal nodes were present. Left lower lobectomy was performed and to prevent overexpansion of the residual lobe a tailoring thoracoplasty—periosteal, stripping of ribs one and four, resection of postero-lateral portions of ribs two and three—was completed. The postoperative course was uneventful and he made a rapid convalescence.

Gross description of the excised specimen: Specimen consists of a lower lobe of lung which weighs 380 grams and measures 14.5 x 6.5 x 9.0 cms. Pleural surfaces are smooth and glistening. There is a well circumscribed but unencapsulated 9.0 x 5.0 x 4.0 cms. dumb-bell shaped firm tumor mass occupying the lower two-thirds of the lung. The surrounding lung tissue is compressed but otherwise appears normal. The tumor shows no intimate relationship to adjacent lung parenchyma or regional segmental bronchi. When removed from lung it weighs 198 grams. It is fibrocartilagenous in consistency and cuts with a firm, gritty resistance. The cut surface bulges slightly and appears somewhat whorled, and is white to cream-tan in color. No major vessels are seen leading to tumor or are lying on its cut surfaces. Minute spicules of ossified material occur in its central portion. Several submitted lymph nodes (hilar) measure up to 0.4 x 0.4 x 0.6 cm. and are fleshy on cut surface. Note figure 3.

Microscopic description: Sections show neoplasm which is well separated from adjacent normal lung parenchyma but lacks a definite capsule. Within tumor there are nests and cords of cells resembling predominantly plasma cells admixed with lymphocytes. Such areas are surrounded by dense, fibrous connective tissue bands. No major blood vessels are seen histologically. Some sections reveal small areas of calcifications within dense fibrous connective tissue. The sectioned lymph nodes reveal mild chronic reactive hyperplasia. Figures 4 and 5.

Additional studies were made postoperatively because the unusual gross and microscopic characteristics of the tumor suggested kinship to other diseases of tumoral, metabolic, or inflammatory etiology. Skeletal survey of skull, spine, and long bones showed no abnormality. Urine showed no Bence-Jones protein. Cholesterol determinations were within normal limits. Acid phosphatase 0.2 B. U. Alkaline phosphatase 2.8 B. U. Total protein 8.2 grams per cent. N. P. N.—48 mgm. per cent. Aspiration from the right iliac crest revealed normal bone marrow.

Figure 1: In this pre-operative chest film note the density lateral to the left cardiac border.—Figure 2: The esophagus is visualized by barium. The arrows indicate the extent and location of this lesion.
He is still in the hospital (January, 1953) receiving appropriate therapy and making satisfactory progress in overcoming pulmonary tuberculosis. The operative procedure had no detectable adverse effect upon the status of this disease.

Discussion

In a comprehensive review of the literature, Hellwig\(^3\) in 1943 reported 127 cases of extramedullary plasmacytoma to which he added one of his own. In a personal communication Dr. F. W. Stewart mentioned to him that he had observed two others. Of these, 110 occurred in the air passages and conjunctiva, however, they may occur in the digestive tract or soft regions of the body. Although they are usually single, they may be multiple. Often they are benign and do not lead to metastases except in rare cases to regional lymph nodes. Histologically, plasmacytomas have

FIGURE 3: Gross appearance of tumor occupying \(\frac{3}{4}\) of left lower lobe.
FIGURE 4, above: Areas of tumor with nests of round cells in which plasmal cell predominates. H & E stain high dry power field.

FIGURE 5, below: Areas of calcification in dense fibrous connective tissue within tumor. H & E stain. 400x.
the appearance of true primary tumors consisting solely of plasma cells. This type can be classified as a plasma cell tumor. Another type which has been described consists mainly of plasma cells, but lymphocytes, leucocytes, and fibroblasts are also present. This form should be differentiated from the tumoral type and preferably should be considered a plasma cell granuloma. The latter occurs in areas of focal infection. The presence of plasma cells in chronic inflammatory conditions is well known.

Xanthomatous tumors are distinct both morphologically and histologically from plasmacytomas being characterized by the presence of foam cells in addition to chronic inflammatory cells. Grossly they are golden-yellow. The isolated xanthomata of lung reported by Scott in 1948 and Ford in 1950 showed no abnormality in the serum cholesterol. Although the diagnosis of xanthoma was not entertained in our case, we point out that our patient's cholesterol and cholesterol esters were within normal limits. No foam cells were seen in our lesion.

Plasma cells in plasmacytoma resemble myeloma cells. They have characteristic excentric nuclei which reveal clumped chromatin in a cartwheel like appearance.

The cytoplasm is mildly to strongly basophilic. The origin of the plasma cell is in dispute but the concept gaining widest acceptance is that these cells arise from the myeloid tissue in the myelomas or from lymphatic tissue in the case of the extramedullary plasmacytoma and inflammatory disease; the stem cells in either case are the reticulo-endothelial cells. Multiple myelomas invariably and extramedullary plasmacytomas commonly are attended by an upset in the serum protein balance of the blood due to an increase in serum globulin. Our patient showed normal serum protein levels and a normal A/G ratio. At no time did he have albuminuria or Bence-Jones protein in the urine. Postoperative skeletal roentgen studies failed to reveal any pathology which would suggest myeloma.

Special stains failed to reveal specific organisms—namely fungi, bacteria, or acid fast bacilli. The supposition that this lesion is a coccidiodial granuloma can be eliminated because of the negative coccidiodin skin test and the absence of endosporules in tissue sections. The negative venereal disease history and negative serology exclude the possibility of a luetic gumma. The coincidental occurrence of active pulmonary tuberculosis in the left upper lobe suggests tuberculosis as the specific etiologic factor. However, smears and cultures from the excised lesion were negative, and the histologic picture was not characteristic for tuberculosis.

We regard the lesion described herein as a plasma cell granuloma of nonspecific inflammatory origin because of its variable composition with a preponderance of plasma cells.

**SUMMARY**

We regard the lesion described herein as a plasma cell granuloma of lung treated by lobectomy. The pseudotumor itself weighed 198 grams, measured 9 x 5 x 4 cms., and is the largest of its type thus far reported in the literature.
PLASMA CELL GRANULOMA OF LUNG

RESUMEN

Presentamos un caso de "plasma cell" granuloma extramedular del pulmón tratado por lobectomía. El seudo tumor pesaba 198 gramos, media 9 x 5 x 4 cms., y es el mayor de su tipo hasta hoy relatado en la literatura.

REFERENCES