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Talc Pneumoconiosis

Significance of Sublight Microscopic Mineral Particles

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Described herein is a patient with talc pneumoconiosis whose symptoms began fifteen years after heavy exposure and who progressed to massive fibrosis and death seven years later from cardiopulmonary insufficiency. Studies of pulmonary function showed restriction of lung volumes, loss of pulmonary compliance and increased venous admixture with moderate hypoxemia. Cardiac catheterization revealed pulmonary hypertension. Lung tissue was analyzed for mineral content by x-ray diffraction and electron microscopy, which established the presence of talc in the absence of histologic demonstration of mineral particles by conventional light microscopy. The significance of submicroscopic talc particles in the production of disease is demonstrated and related to similar findings in asbestosis.

The lung disease which was first related in 1934 [1] to the inhalation of talc has been the subject of many clinical and environmental investigations [2-5]. Studies of lung function generally have been concerned with the value of screening tests, such as vital capacity and carbon monoxide diffusing capacity, in large numbers of exposed workers [6-8]. Our purpose is to present more complete physiologic findings, including ventilation-perfusion relationships and data on hemodynamics and lung mechanics, in a patient with severe respiratory impairment due to talc pneumoconiosis. Lung tissue from this patient was obtained at open lung biopsy and at necropsy. Talc could not be found on histologic examination by light microscopy, but was demonstrated in lung tissue by various mineralogic technics, including x-ray diffraction and electron micrography. Particle size was shown to be below the limit of resolution of light microscopy, illustrating the significance of submicroscopic particles in the production of pneumoconiosis due to talc. The importance of such submicroscopic fibers in the pathogenesis of pneumoconiosis due to asbestos has recently been demonstrated [9,10].

MATERIALS AND METHODS

The diagnosis of talc pneumoconiosis was established by (1) history of prolonged occupational exposure to dust shown to be predominantly true talc by x-ray diffraction; (2) roentgenographic appearance of extensive pulmonary infiltrations; (3) histologic findings of granuloma formation and fibrosis; and (4) mineralogic and electron microscopic demonstration of talc particles in lung tissue.

Measurements of lung volumes, maximum voluntary ventilation,

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