Virchows Arch. A Path. Anat. and Histol. 375, 83–85 (1977)

Virchows Archiv A

Letter to the Editor

Human Pulmonary Fibrosis

J.C. Belton and N. Crise
Department of Biology, California State University, Hayward, California 94542, USA

In a recent report on human pulmonary fibrosis, Brody and Craighead (1976) drew conclusions from cellular identifications that are inconsistent with a large body of literature. The major cell shown in Figure 7b of that paper was labeled as a fibroblast in close structural relationship with the basal lamina and associated collagen fibrils. This cell contained a few round cytoplasmic vesicles of coarsely electron dense material, purportedly "pre-collagen fibrils". There is no documented report of similar collagen secretory vesicles in fibroblasts. The cell shown has striking similarities to micrographs of mast cells (Wilson, 1974; Serafini-Francassini et al., 1969; Said and Luri, 1971).

The number of pulmonary mast cells increases in response to a wide variety of conditions, including pulmonary injury or respiratory distress (Wilson, 1974). We have completed an ultrastructure study of a lung biopsy from a case of idiopathic spontaneous pneumothorax (Tueller et al.). This lung had considerable thickening of the basal lamina such as that demonstrated by Brody and Craighead and, in addition, many mast cells were found in the lung parenchyma (Fig. 1).

The degranulation of cytoplasmic vesicles of mast cells and the resulting release of histamine is capable of initiating pathological changes in lung structure (Said and Luri, 1971). It is possible, although not proven, that histamine may have contributed much to the abnormal lung structure described by Brody and Craighead.

The misidentification of mast cells was not the only area of doubt raised by this article on human pulmonary fibrosis. There were portions of two other cells, identified as fibroblasts (Figs. 3 and 4), which have many of the characteristics of pulmonary macrophages. It is well documented that macrophages increase in number and migrate through the interstitial tissue in response to a wide variety of pulmonary insults, including pulmonary fibrosis (Hance and Crystal, 1975). The cells in question have a very electron-dense cytoplasm and appear to contain many lysosome-like granules.

For offprints contact: Prof. Dr. J.C. Belton

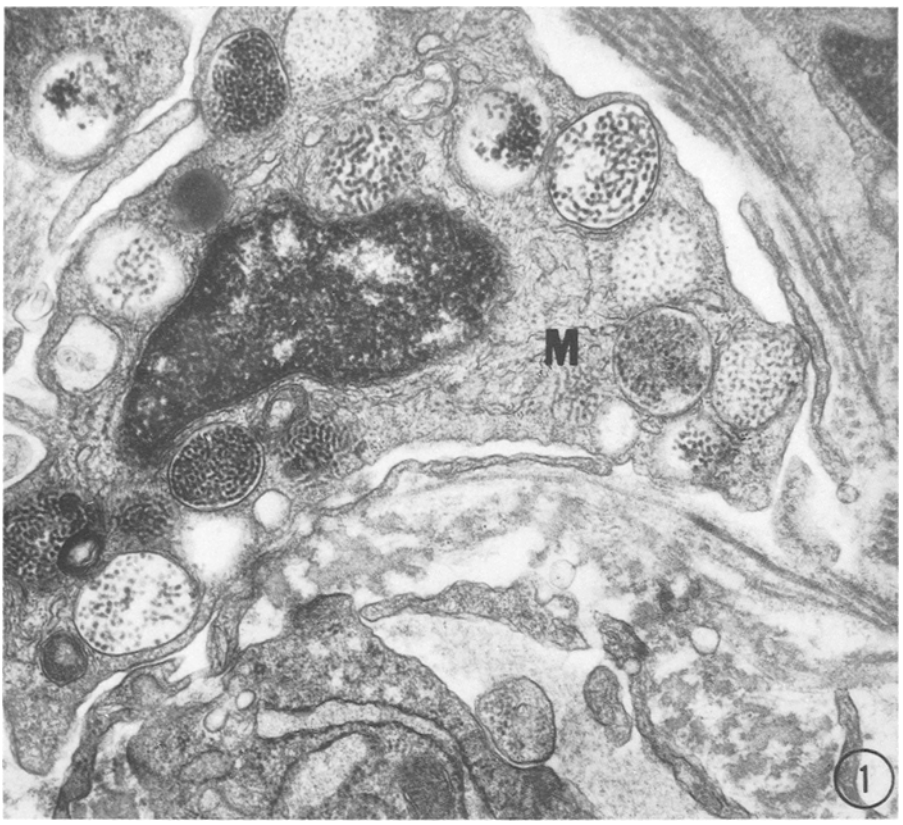

Fig. 1. The mast cell (*M*) is a common interstitial cell of human lungs that have been subjected to injury or respiratory distress. This cell was found in a lung biopsy near the damaged pleura of idiopathic spontaneous pneumothorax. The cell has many cytoplasmic vesicles that show various degrees of degranulation

In view of the above documentation, Brody and Craighead's conclusion that there were fibroblast-like cells lining the walls of the air spaces in their material must be open for further scrutiny. It is well known that type II pneumocytes replace type I cells as the lining for the alveoli in response to many different pulmonary insults (Adamson and Bowden, 1975). The stimulated type II cells become flattened and structurally resemble fibroblasts in some respects after exocytosis of their lamellar cytoplasmic vesicles (Belton et al.). This is not to negate the possible contribution fibroblasts may have in pulmonary fibrosis, but much better documentation is required and unquestionable identification of cell types must be made before this conclusion can be drawn.

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Received April 18, 1977