MALIGNANT MESOTHELIOMA WITH MINIMAL ASBESTOS EXPOSURE*

Wei-jen Chen, M.D.,† and N. Karle Mottet, M.D.‡

Abstract

The association of malignant mesothelioma and asbestos fibers is well established. The minimal exposure that may produce the tumor is not known. The present report documents the minimal exposure by thorough examination of occupational history and personal hobbies, and counting of the number of asbestos fibers in the lungs. The evidence for the elemental composition of asbestos fibers by electron probe (EDAX) is also presented.

The association of an increased incidence of malignant mesothelioma in industrial workers and others having extensive exposure to asbestos is well established epidemiologically.[1–4] The maximal safe exposure level remains a major problem because the presence of some asbestos in the lungs has been demonstrated in a large segment of the population.[5] The great individual variation in responses to exogenous chemicals further complicates the problem.

The case of malignant mesothelioma reported here is significant because we have established the presence of pulmonary asbestos fibers by means of electron probe analysis and we have obtained a complete and thorough history documenting a most casual and minimal exposure to asbestos in a nonsmoker. Estimation of the number of asbestos fibers in the lungs suggests the low level exposure and establishes that, for some individuals at least, slight exposure to asbestos can result in malignant mesothelioma.

CASE REPORT

A 59 year old white male, a nonsmoker, was in relatively good health until July 1975, when he developed mild

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†Assistant Professor, Department of Pathology, University of Washington School of Medicine, Seattle, Washington.

‡Professor, Department of Pathology, University of Washington School of Medicine. Staff, University Hospital, Veterans Administration Hospital, and Harborview Medical Center, Seattle, Washington.

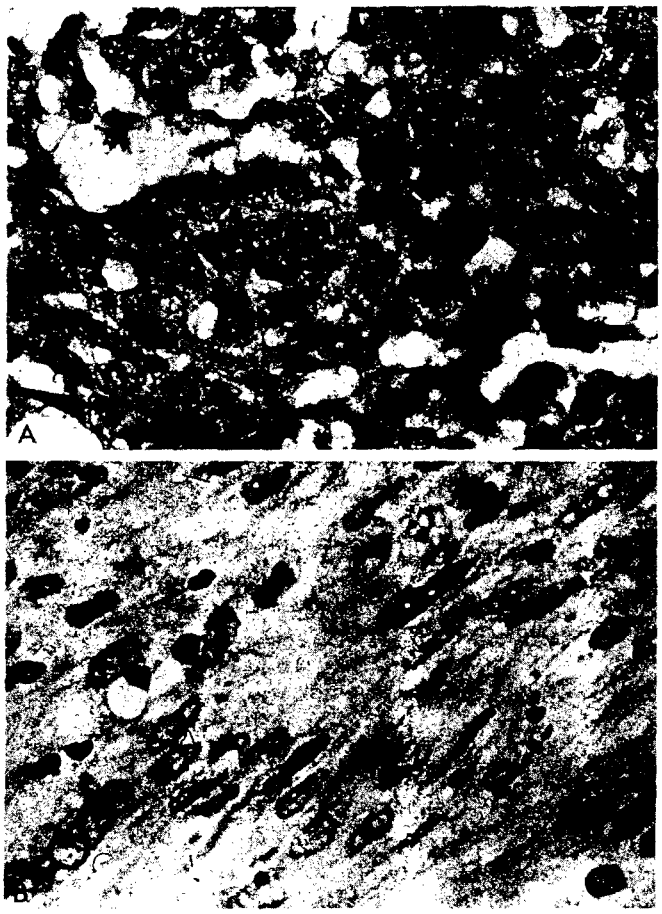


Figure 3. Sections of tumor from ight pleura showing two different atterns (epithelial and mesenchymal) f tumor cells, characteristic of malig- ant mesothelioma. *A*, Sheets and ag- regates of malignant epithelial cells. *B*, Spindle cells (sarcomatous pattern) ith hyperchromatic nuclei.

components resembling both epithelial and mesenchymal cells characteristic of mesothelioma (Fig. 3).[6] Five grams of parenchymal tissue was taken from each lung and digested with sodium hypochloride by the method of Smith and Naylor.[7] The extraction solution was filtered through a nuclepore membrane (5μ). Figure 4 shows one of the unstained asbestos bodies on a filter membrane under light microscopy. The entire membrane with retained fibers and crystals was coated with a thin

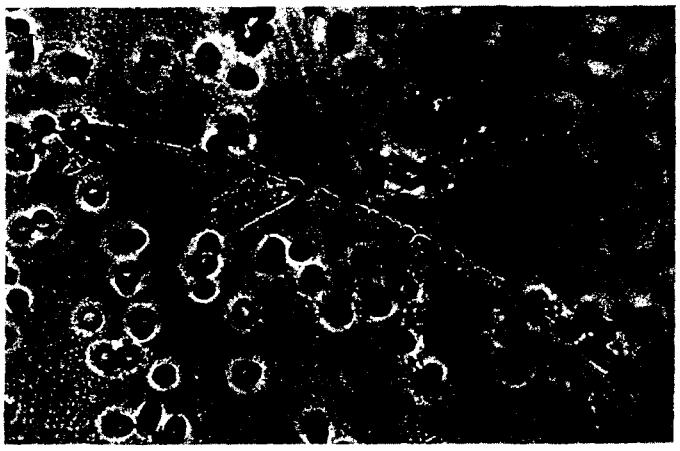


Figure 4. Extracted asbestos body retained on nuclepore membrane after filtration. The center asbestos fiber (core) and beaded portions are clearly discernible. (×400.)

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Department of Pathology
University of Washington School of Medicine
Seattle, Washington 98195 (Dr. Chen)