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CARCINOMA OF THE LUNG IN A DRYWALL TAPING WORKER REPORT OF A CASE

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SUMMARY

Squamous cell carcinoma, together with pulmonary asbestosis is reported in a drywall taping worker. In this trade vigorous sanding of dried taping compounds produces a dust which is known to contain chrysotile asbestos. Fibrils of chrysotile asbestos were seen on transmission electron microscopy of ashed lung tissue. The authors emphasize the need to institute adequate preventive measures in this trade.

INTRODUCTION

New industrial processes may considerably widen the range of occupational health hazards. Drywall construction was introduced in the United States on a large scale basis immediately after World War II. During the past two decades, drywall construction has achieved a dominant role in the United States construction industry. This trade has recently been described by us in detail, and has been shown to be associated with significant asbestos exposure [1,6]. The occurrence of a pulmonary carcinoma in a drywall taping worker with the finding of very large numbers of asbestos fibers in the lung raises the possibility that this trade may soon become the source of asbestos neoplastic disease, in addition to asbestosis.

Dust diseases of the lung may be diagnosed in different ways and with various degrees of accuracy. In order to achieve definitive diagnosis, the identification of the hazardous agent is required. The substance may be found in the material used in a work process, in air samples, or in human tissues, as a result of exposure.

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PLAINTIFF'S EXHIBIT SY-11

We report here a case of lung cancer in a drywall taping worker as well as the results of tissue analysis for asbestos fibers and other inorganic materials. The importance of utilizing adequate techniques for tissue analysis is stressed.

CASE REPORT

E.S., a 57-year-old white male, was admitted to another hospital in May 1971 because of weight loss, chest pain and sudden hemoptysis. Two weeks before, a chest radiograph had shown an infiltrative process in the left upper lung field. This persisted despite antibiotic therapy and the patient was admitted for further study.

Bronchoscopy was negative for malignancy, and cytological examination of bronchial washings showed only atypical cells. Scalene node biopsy was unremarkable. A left upper lobectomy was performed. A portion of the fourth rib was adherent to the pleural surface on the anterior lateral aspect. Section of the lung revealed an area of grayish consolidation beneath the rib adhesion. Macroscopically, the area was suggestive of a neoplastic tissue. There was no involvement of the lower lobe. The patient was followed for 1 year as an outpatient, developed symptoms suggestive of cerebral metastases, and died on May 23, 1972. No autopsy was performed. Past medical history had been unremarkable. The patient had been a heavy smoker and had been a drywall construction worker for 25 years, mixing, applying and sanding various spackling and taping compounds.

Histopathological examination

The tumor tissue in the surgical specimen from the peripheral part of the lung



Fig. 1. The peripheral part of the lung is shown with thickened neoplastic tissue and fibrotic alveoli. 270 x

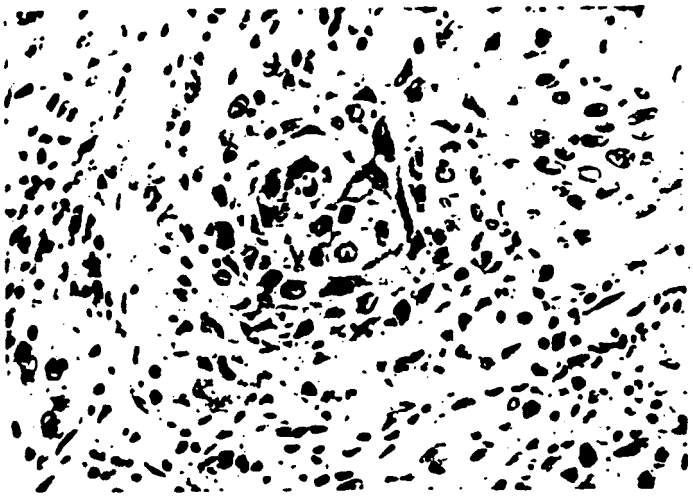


Fig. 2. Tumor tissue with pearl formation. 1700 x

was a well-differentiated squamous cell carcinoma (Fig. 1). The neoplastic cells were irregular in shape and formed nests of various sizes. Occasionally pearl formation was observed (Fig. 2). Polymorphism, atypical features and abnormal mitosis was remarkable. There was invasion of the tumor into the pleural region with much fibrosis.

In addition to the neoplastic changes described above, the pulmonary parenchyma showed congestion, edema and broncho-pneumonia, which was partially organized. Alveolar macrophages had accumulated in alveolar spaces. Hemosiderin and anthracotic pigments were frequently seen in the cytoplasm of the macrophages.

Of interest was the presence of pulmonary fibrosis, in the form of alveolar septal (Fig. 3) and peri-bronchiolar fibrosis. This fibrosis, consistent with pulmonary asbestosis, was not accompanied by the finding of asbestos bodies either in the alveolar space or in the fibrotic tissue itself.

Mineralogical analysis of lung tissue

A 5-μm thick unstained, uncovered, tissue section was prepared for electron microscopy by the carbon extraction technique [4]. The prepared specimen was examined by transmission electron microscopy utilizing an RCA EMU-3G. Scan magnification ranged from approx. 2000—31 000 X. At magnification greater than 15 000 X, particles too small to be seen by light microscopic methods became visible. The appearance of numerous particles by electron microscopy, invisible by all other microscopic techniques, has been described [5]. Everywhere in the relic tissue numerous particles were observed (Fig. 4). Sheet silicates, diatom fragments and chrysotile asbestos were observed in



Fig. 3. Alveolar septal fibrosis. 1600 x

