Mixed Clinicopathologic Behavior of a Solitary Mesothelioma*
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A large solitary mesothelioma was found to exhibit malignant features microscopically, but benign characteristics grossly, including a surgically curative resection. The mixed behavior of this tumor supports the evolving understanding of mesotheliomas as progeny of multipotential subserosal cells with capabilities of differentiating into several tissue types with varying degrees of anaplasia. (Chest 1988; 94:1293-94)

Mesothelioma is a primary tumor of the serosal surface. Although the mesothelium lines various parts of the body, including the peritoneum, pericardium, and genital tract, a primary tumor of this structure most commonly arises from the pleura.¹

Controversy has existed regarding the actual existence of pleural mesotheliomas. Traditionally, tumors in the pleural space were believed to be metastases or to arise from tissues of the chest wall. It was not until the 1940s that studies of these tumors in tissue culture showed they could differentiate into mesothelium, and thus suggested the existence of true mesotheliomas. Until recently, pathologists continued to have difficulty in distinguishing certain mesotheliomas from metastatic adenocarcinomas. The diagnosis of mesothelioma was often only made in the context of a primary adenocarcinoma not being clinically detected elsewhere.²

We describe here a case of solitary fibrous mesothelioma [Image: Chest 1988; 94:1293-94]

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that exhibits a mixed clinicopathologic behavior and discuss this finding in the context of the continuing evolution of our understanding of mesotheliomas.

CASE REPORT
A 54-year-old white man was admitted to the Veterans Administration hospital at Asheville, North Carolina, in April, 1983, for elective excision of a large left hydrocele.

His medical history was significant for hypertension which was controlled with administration of propranolol and prazosin, and peptic ulcer disease requiring partial gastrectomy five years earlier. The patient had served in the military as a cook 30 years ago and worked in a food processing plant for the past 15 years. He never smoked, drank, or had any significant drug use. He recalled no occupational or accidental exposure to any chemicals or dusts such as asbestos.

On admission, his only symptom was insidious onset of dyspnea on exertion over the past several months. Physical examination revealed a left scrotal mass, and on chest examination, he had dullness to percussion of the left posterior hemithorax and decreased breath sounds on auscultation of the same area. Result of routine preoperative evaluation consisting of complete blood counts, blood chemistries, urinalysis, and electrocardiogram was normal. The admission chest roentgenogram (Fig 1) revealed a large density in the left hemithorax. Thoracentesis resulted in a dry aspirate. A chest computerized tomogram (Fig 2) showed a solid mass without a fluid component. Fiberoptic bronchoscopy revealed normal airways except for extrinsic compression of the left lower lobe bronchus. Preoperative pulmonary function testing showed a restrictive ventilatory impairment with 50 percent reduction in total lung capacity. The patient underwent exploratory thoracotomy. A large tumor mass was found in the pleural space causing compressive atelectasis of the left lower lobe. Total resection of the pleura required excision of the pleura with minimal lung parenchyma. On pathologic examination, the specimen grossly appeared benign and weighed 2,110 grams. It was encapsulated and homogeneously white without areas of necrosis or cysts. Microscopically (Fig 3) the tumor contained spindle-shaped nuclei with pleomorphism and scattered mitotic figures. There was minimal invasion of the lung parenchyma. A

Figure 1. Posteroanterior and lateral chest roentgenograms show a large homogenenous mass density in the left hemithorax.

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diagnosis of fibrous mesothelioma was made and confirmed by the Armed Forces Institute of Pathology.

The patient had an uneventful postoperative course and was discharged after 19 days of hospitalization. He has remained alive and free of pulmonary symptoms, confirmed by a recent chest roentgenogram, five years after the operation.

**DISCUSSION**

The present-day classification of mesotheliomas is based on several clinicopathologic criteria. Grossly the tumor is divided into diffuse and localized types. Microscopically the tumor is judged by the degree of pleomorphism and angiogenesis, and the number of mitoses. Histologically subdivisions are made based on tissue organization: epithelial (carcinomatous), mesenchymal (fibrous), or mixed.

Our report describes one of the largest solitary fibrous mesotheliomas that has been curatively resected. A review of the literature shows that such an outcome, despite the tumor size, has been the rule rather than the exception when complete surgical resection is achieved. In general, benign mesotheliomas tend to be fibrous, solitary, noninvasive, with limited degree of pleomorphism and a small number of mitotic figures. They are not associated with previous asbestos exposure. Case reports have described huge benign mesotheliomas (up to 5 kg) which have been surgically excised with cure. The malignant types, in contrast, tend to be diffuse, invasive (locally and metastatic), and more pleomorphic accompanied by rudimentary angiogenesis. Often their diffuse nature precludes complete surgical resection. Chemotherapy and radiation therapy have been equally ineffective in extending survival time.

This report also illustrates the difficulty in diagnosing mesotheliomas. In general, thoracentesis and needle biopsy seldom lead to the diagnosis, because there is often no clear distinction by traditional histologic criteria between reactive mesothelium and its well-differentiated malignant counterpart. Advances in histochemistry and electron microscopy have at least enabled diffuse mesotheliomas to be diagnosed on cytology when a sufficient quantity of pleural fluid is available. The solitary type, in contrast, often occurs only as a solid mass. Its diagnosis, therefore, can only be made by thoracotomy and analysis of a sufficient block of tissue.

Aside from illustrating these generalizations, this case does present an interesting twist. While diffuse mesotheliomas are inevitably malignant, the categorization of solitary types can be difficult. Microscopic features suggestive of malignancy may not be reflected by its gross appearance or eventual clinical outcome. Recent studies on the origin and differentiation of the mesothelium suggest that there are "multipotential cells" which naturally exist under the single layer of surface epithelium. These submesothelial cells have been shown to be able to differentiate into either surface mesothelium or subserosal fibroblasts. In addition, various mesotheliomas, either epithelial or fibrous, appear to possess the ability to display a spectrum of histologic differentiation ranging from well-differentiated to anaplastic. The mesothelioma presented in the present case can be viewed as an example. Microscopically its relatively high degree of pleomorphism and mitotic rate with invasion of lung parenchyma suggested malignant behavior, while the solitary, fibrous features along with its curative outcome indicated otherwise and illustrate the interesting mixed behavior of this tumor.

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**REFERENCES**