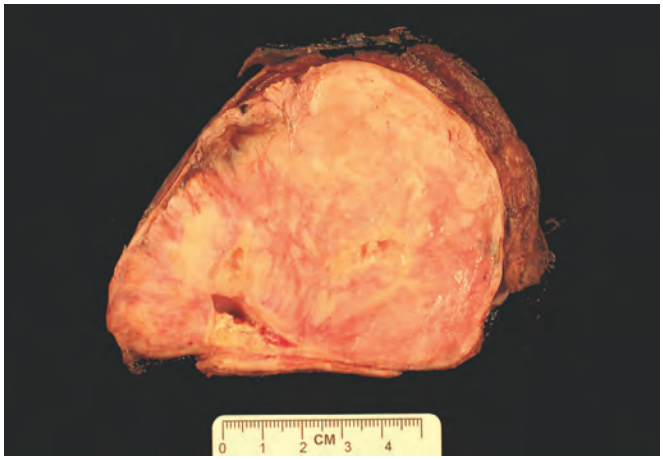

Figure 15-50 Solitary fibrous tumor. Cut surface is solid with a whorled appearance. (Courtesy Dr. Justine A. Barletta, Department of Pathology, Brigham and Women's Hospital, Boston, Mass.)

from any organ of the body may spread to the pleural spaces. Ovarian carcinomas, for example, tend to cause widespread implants in both the abdominal and thoracic cavities. In most metastatic involvements, a serous or serosanguineous effusion follows that often contains neoplastic cells. For this reason, careful cytologic examination of the sediment is of considerable diagnostic value.

Solitary Fibrous Tumor

Solitary fibrous tumor is a soft-tissue tumor with a propensity to occur in the pleura and, less commonly, in the lung, as well as other sites. The tumor is often attached to the pleural surface by a pedicle. It may be small (1 to 2 cm in diameter) or may reach an enormous size, but it tends to remain confined to the surface of the lung (Fig. 15-50).

MORPHOLOGY

Grossly, solitary fibrous tumor consists of dense fibrous tissue with occasional cysts filled with viscid fluid; microscopically, the tumor shows whorls of reticulin and collagen fibers among which are interspersed spindle cells resembling fibroblasts. Rarely, this tumor may be malignant, with pleomorphism, mitotic activity, necrosis, and large size (>10 cm). The tumor cells are CD34+ and keratin-negative by immunostaining, features that are helpful in distinguishing these lesions from malignant mesotheliomas (which show the opposite phenotype). The solitary fibrous tumor has no relationship to asbestos exposure.

It has recently been shown to be highly associated with a cryptic inversion of chromosome 12 involving the genes *NAB2* and *STAT6*. This rearrangement creates a *NAB2-STAT6* fusion gene that appears to be virtually unique to solitary fibrous tumor. It encodes a chimeric transcription factor that is hypothesized to be a key driver of tumor development.

Malignant Mesothelioma

Malignant mesotheliomas, although rare, have assumed great importance in the past few decades because of their increased incidence among people with heavy exposure to asbestos (see Pneumoconioses). Thoracic mesothelioma arises from either the visceral or the parietal pleura. In coastal areas with shipping industries in the United States and Great Britain, and in Canadian, Australian, and South African mining areas, as many as 90% of mesotheliomas are asbestos-related. The lifetime risk of developing mesothelioma in heavily exposed individuals is as high as 7% to 10%. There is a long latent period of 25 to 45 years for the development of asbestos-related mesothelioma, and there seems to be no increased risk of mesothelioma in asbestos workers who smoke. This is in contrast to the risk of asbestos-related lung carcinoma, already high, which is markedly magnified by smoking. Thus, for asbestos workers (particularly those who are also smokers), the risk of dying of lung carcinoma far exceeds that of developing mesothelioma.

Asbestos bodies (see Fig. 15-20) are found in increased numbers in the lungs of patients with mesothelioma. Another marker of asbestos exposure, the *asbestos plaque*, has been previously discussed (see Fig. 15-21).

Although several cytogenetic abnormalities have been detected, the most common is homozygous deletion of the tumor suppressor gene *CDKN2A/INK4a*, which occurs in about 80% of mesotheliomas. Demonstration of this deletion (usually by FISH) invovling chromosome 9p can be very helpful in distinguishing mesothelioma from reactive mesothelial proliferations. Deep sequencing of mesothelioma genomes is ongoing and may produce new insights.

MORPHOLOGY

Malignant mesothelioma is a diffuse lesion arising either from the visceral or parietal pleura, that spreads widely in the pleural space and is usually associated with extensive pleural effusion and direct invasion of thoracic structures. The affected lung becomes ensheathed by a thick layer of soft, gelatinous, grayish pink tumor tissue (Fig. 15-51).

Microscopically, malignant mesotheliomas may be epithelioid (60%), sarcomatoid (20%), or mixed (20%). This is in keeping

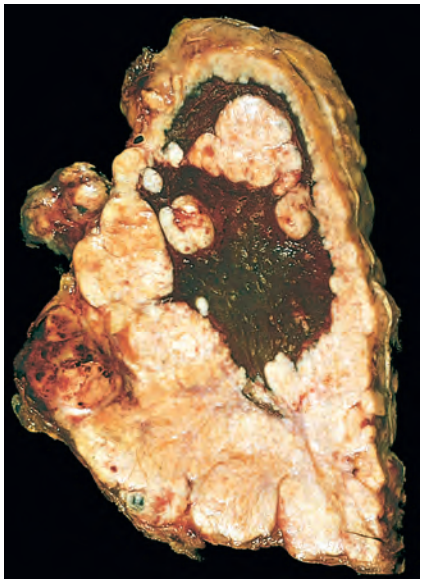

Figure 15-51 Malignant mesothelioma. Note the thick, firm, white pleural tumor tissue that ensheathes the lung.