

small cell areas to other regions where the appearances were more characteristic of epithelioid mesothelioma.

- The nucleocytoplasmic features of small-cell mesothelioma differ subtly from those of small cell carcinoma (Figs. 43.30 and 43.31), so that the mesothelioma cells often possess greater amounts of cytoplasm, or alternatively, the nuclei are more open and vesicular in pattern with finely divided chromatin, in comparison to the "salt and pepper" nuclear chromatin pattern characteristic of small cell carcinomas, with nuclear molding.
- Immunohistochemical studies on these mesotheliomas reveal features characteristic of mesothelial differentiation, with no evidence of neuroendocrine differentiation as shown, for example, by immunostaining for synaptophysin or chromogranin.

Nonetheless, we have encountered extremely rare cases of mesothelioma where there was some focal evidence of neuroendocrine differentiation, but such cases appear not to have been described in any detail in the literature.

Deciduoid Mesothelioma

In 1994, Nascimento et al.⁷⁷⁵ described three cases of peritoneal mesothelioma in young females, where the tumor cells possessed abundant eosinophilic cytoplasm and showed a resemblance to decidual cells, and such cases had no identifiable prior exposure to asbestos.⁷⁷⁶ Reports of other cases of "deciduoid" mesothelioma followed.⁷⁷⁶⁻⁷⁸⁰

It is now recognized that deciduoid mesotheliomas (Fig. 43.25)^{126,778,779,781-785} are confined neither to the peritoneum nor to young women, and they can arise in the pleura and in men.⁷⁸⁶ Their natural history is akin to other epithelial mesotheliomas, although a few patients have

had long survivals,⁷⁷⁹ whereas the tumors comprising the original report⁷⁷⁵ pursued an aggressive clinical course. Mesotheliomas that consist only of deciduoid tissue are rare, but it is not uncommon in biopsy tissue to see a transition from more usual patterns of epithelial mesothelioma to foci of deciduoid tissue. We do not consider deciduoid mesothelioma to represent a distinctive subtype, and instead we refer simply to these mesotheliomas as epithelioid mesotheliomas with focal deciduoid features. The immunophenotype of such "deciduoid" mesotheliomas is essentially the same as for other MMs of epithelioid type.⁷⁸⁶

Mucin-Positive Epithelial Mesotheliomas

Up to about 5% of epithelial mesotheliomas show focal staining with Mayer's mucicarmine, PAS-diastrase, and Alcian blue/colloidal iron with hyaluronidase. We refer to these mesotheliomas as mucin-positive mesotheliomas.⁵⁰⁵

Ernst and Atkinson⁷⁸⁷ reported seven of 18 epithelial mesotheliomas to be mucicarmine positive. They attributed the positive staining reaction to hyaluronic acid. The review article on MM by the U.S.-Canadian Mesothelioma Panel⁷⁸⁸ illustrated a case of mucicarmine-positive mesothelioma and indicated this finding did not exclude the diagnosis of mesothelioma. Some mucin-positive epithelial mesotheliomas show staining of the cell membrane with mucin stains and are sensitive to hyaluronidase pre-digestion (Fig. 43.109). Others show intracellular droplet staining with Mayer's mucicarmine (Fig. 43.110), PAS-diastrase (Fig. 43.111), and Alcian blue with and without hyaluronidase (Fig. 43.112). In our experience, these mucin-positive epithelial mesotheliomas are the ones that show crystalloid structures ultrastructurally (see Ultrastructural Features of Mesotheliomas, above).

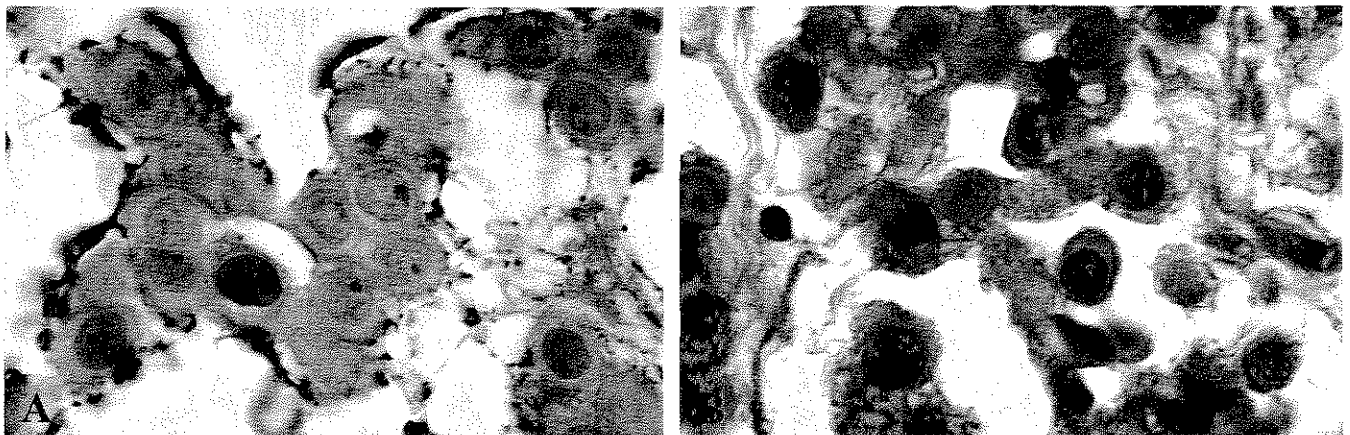


FIGURE 43.109. (A) This epithelial mesothelioma shows cell membrane staining for mucicarmine. (B) When pretreated with hyaluronidase, the mucicarmine staining does not occur, suggesting the mucicarmine staining is caused by hyaluronic acid.

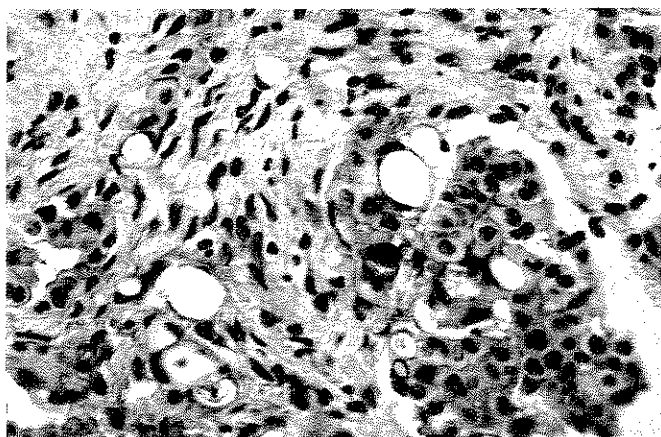


FIGURE 43.110. This epithelial mesothelioma shows intracellular droplet-like staining for mucicarmine that is resistant to hyaluronidase pre-digestion.

Benjamin and Ritchie⁷⁸⁹ examined the staining results for glycogen and mucosubstance of 30 diffuse epithelial mesotheliomas. Tissue was fixed in formalin and processed using standard techniques. Tissue sections were stained with the WHO stain for mucin, PAS reagent with and without diastase, Hale's colloidal iron stain with and without hyaluronidase, potassium hydroxide-PAS technique, and Alcian blue at pH 1.0 and 2.5. They found that seven of the 30 mesotheliomas failed to stain by any method tested, and concluded the staining reactions of epithelial mesotheliomas with mucopolysaccharide stains were too inconsistent to be of much value in diagnosing epithelial mesotheliomas.

MacDougall et al.⁵³⁹ reported a case of epithelial MM, the diagnosis documented by electron microscopy and immunohistochemistry, which was mucicarmine and PAS-D positive.

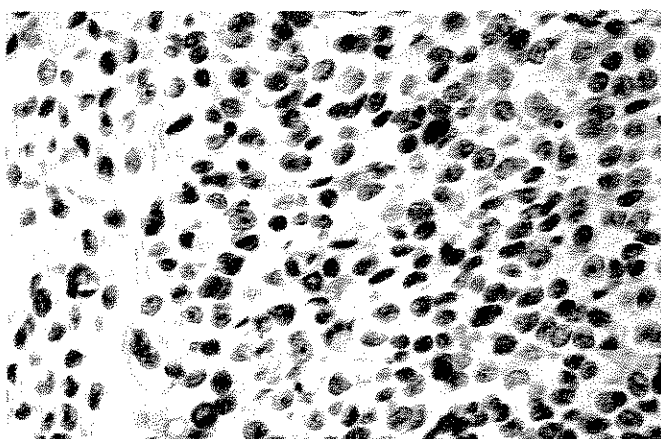


FIGURE 43.111. Intracellular PAS and PAS-diastase droplet-like staining is observed in this epithelial mesothelioma.

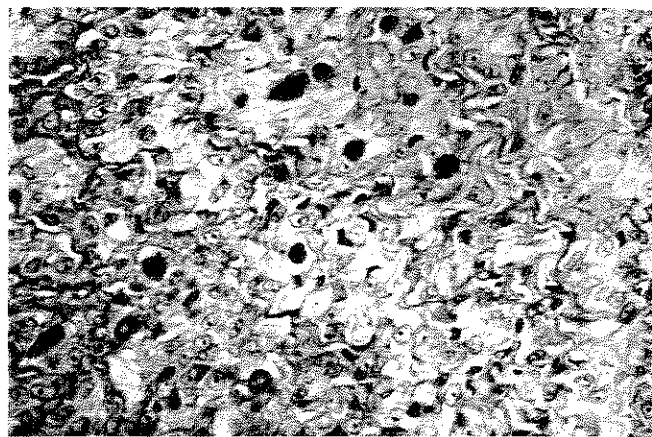


FIGURE 43.112. Alcian blue droplet-like staining is seen in this epithelial mesothelioma and is resistant to hyaluronidase pretreatment.

Gaucher Cell-Like Mesotheliomas

Gaucher cell-like mesotheliomas are one of the rarest, if not *the* rarest, epithelioid type of mesothelioma. These mesotheliomas are composed of large cells that are mostly round and contain intracytoplasmic inclusions and resemble Gaucher cells (Figs. 43.113 and 43.114). Ultrastructurally, these cells show some very unique crystalloid structures within the cisternae of the rough endoplasmic reticulum²¹¹ (Fig. 43.115). We have seen this neoplastic pattern only in mesotheliomas and not in any other type of tumor.

Multicystic Mesothelioma

Multicystic mesotheliomas are well recognized in the peritoneal cavity,⁷⁹⁰⁻⁸⁰⁷ mainly in women and less often in

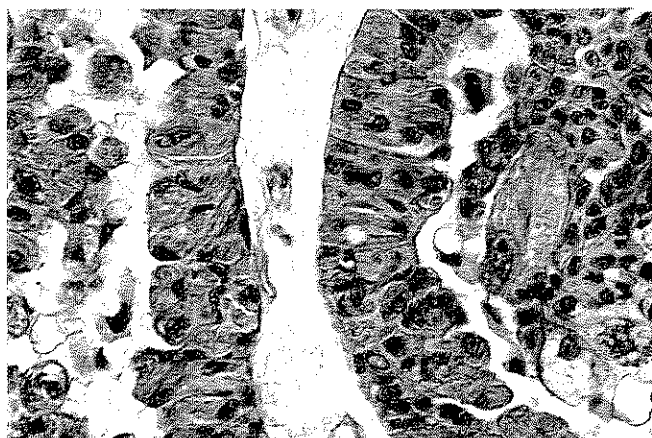


FIGURE 43.113. This epithelial mesothelioma is composed, in part, of numerous large cells with intracytoplasmic inclusions that resemble those seen in Gaucher cells.