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Case report

Well-differentiated papillary mesothelioma with invasion to the chest wall

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ABSTRACT

Well-differentiated papillary mesothelioma (WDPM) is an uncommon tumor with a papillary architecture, bland cytologic features, a tendency toward superficial spread without invasion, and good prognosis with prolonged survival. WDPM occurs primarily in the peritoneum of women, but also rarely in the pleura. We here report a case of 48-year-old woman who developed WDPM in the pleura with no history of asbestos exposure. Tumors were multifocal and widespread with a velvety appearance on the surface of parietal and visceral pleurae resected by extrapleural pneumonectomy (EPP). Tumors showed papillary structures with fibrovascular cores and lined by epithelioid cells. Immunohistochemically, these epithelioid tumor cells were positive for epithelial membrane antigen (EMA), a marker of malignant mesothelioma, with more than 50% positive for p53. Tumor cells microinvaded into subpleural parenchyma of the lung and minimally spread to adipose tissues of the mediastinal lesion. In addition, tumor cells invaded into the chest wall with a trabecular or glandular architecture. Based on these findings, this case is pathologically considered as WDPM of the pleura with malignant potential.

1. Introduction

The majority of malignant mesothelioma arising from the pleura proliferates with a diffuse infiltration, resulting in the obliteration of the thoracic cavity. This type of malignant mesothelioma is conventional and referred to as diffuse malignant mesothelioma (DMM). DMM is considered to occur in association with asbestos exposure, and shows a very poor prognosis with a median survival of less than 1 year [1,2]. On the other hand, well-differentiated papillary mesothelioma (WDPM) is an uncommon subtype of mesothelioma characterized by superficial spreading of papillary formations lined by bland epithelioid cells. WDPM occurs primarily in the peritoneum of women in the thirties and forties with no history of asbestos exposure, but it also develops at other sites including the pleura [3–9].

WDPM of the pleura is an extremely rare tumor. Yesner and Hurwitz first reported a case of WDPM arising from the pleura in 1953, and Höllinger and Gaeng reported another case in 1997 [10,11]. Recently, two groups reviewed WDPM of the pleura with respect to affecting sites, the relation to asbestos exposure, and the prognosis. Butnor et al. reported 14 cases of WDPM, 7 of which originated in the pleura, 6 in the peritoneum, and 1 in the tunica vaginalis [12]. They demonstrated that WDPM is a rare variant of mesothelioma, which is related to asbestos exposure in some cases, with variable clinical behaviors. In addition, Galateau-Sallé et al. reported 24 cases of WDPM of the pleura, half of which were associated with histories of occupational asbestos exposure [13]. They concluded that WDPM of the pleura is an unusual mesothelial tumor possessing a specific clinicopathologic entity distinct from conventional DMM, because WDPM of the pleura is characterized by a lack of deep invasion and associated with an indolent clinical course and long survival.

We here report a case of 48-year-old woman who developed WDPM in the pleura without any history of asbestos exposure. Tumors were multifocal and widespread with microinvasion into subpleural parenchyma of the lung, minimal spreading to adipose tissues of the mediastinal lesion, and invasion into the chest wall. This case was pathologically considered as WDPM of the pleura with malignant potential.

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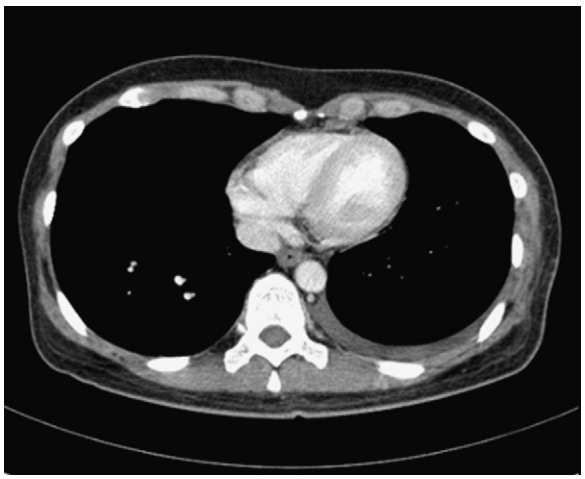

Fig. 1. CT scan. CT scan shows pleural effusion in the left thoracic cavity. Neither remarkable thickness of the pleura nor nodular lesions on the pleural surface were observed.

2. Case report

A 48-year-old woman was incidentally detected to have left pleural effusion by chest X-ray. The patient had no symptoms associated with the pleural effusion, such as dyspnea and cough. A plain computed tomography (CT) scan showed left free-flowing pleural effusion, but neither pleural thickening, nodular lesions in thoracic cavity, nor intrapulmonary mass (Fig. 1). The value of hyaluronic acid in the pleural effusion was 10 μg/ml, showing no significant elevation. The values of tumor markers, such as cytokeratin 19 fragment, tissue polypeptide antigen, and carcinoembryonic antigen, were not significantly elevated in serum. The patient is a housewife and had no history of occupational and environmental asbestos exposure.

Pleural effusion cytology revealed abundant cell clusters with a tridimensional or papillary structure, large two- or multi-nucleated cells, and single cells with variable nuclei in size and shape. The cytoplasm of tumor cells was optically dense. Some tumor cells showed fuzzy cell membrane with elongated microvilli (Fig. 2A and B). These cytological features strongly suggested mesothelioma.

A surgical biopsy of the parietal pleura was performed under video-associated thoracoscopy (VATS). Biopsy tissues contained a part of the tumor, which was characterized by papillae consisting of stout fibrovascular cores covered by a single layer of relatively uniform cuboidal mesothelial cells. Individual tumor cells showed

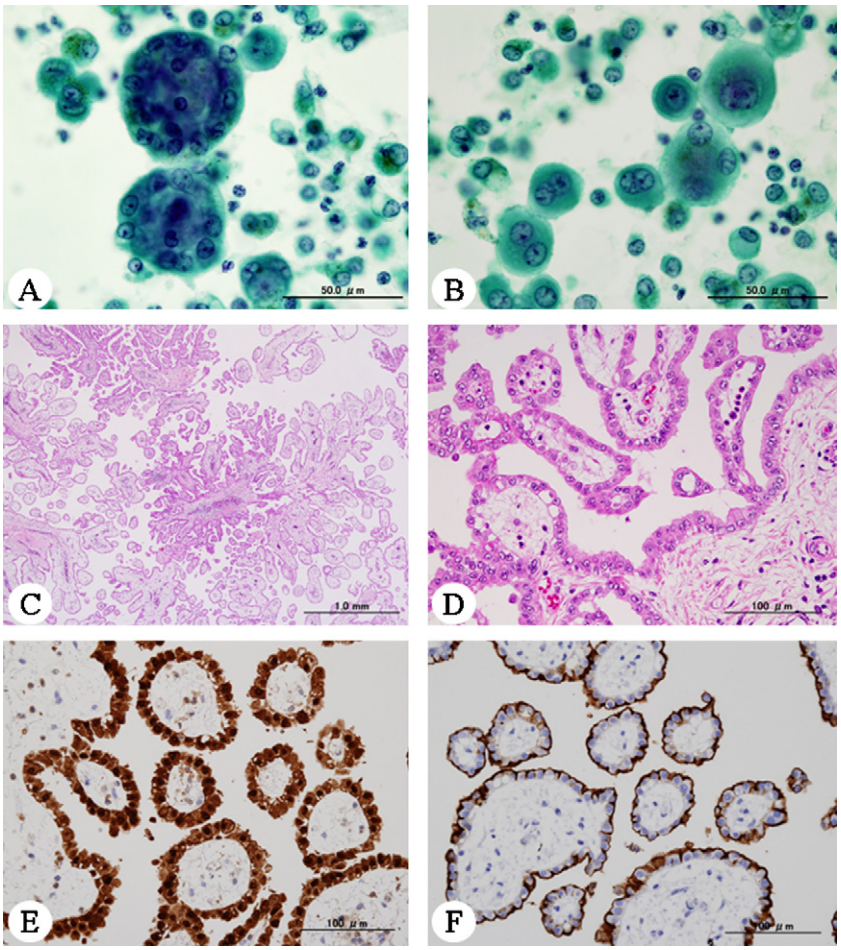

Fig. 2. Cytology of pleural effusion and histopathology of pleural biopsy. (A) and (B) Papanicolaou smear staining. (C) and (D) Hematoxylin and eosin staining. (E) Immunostaining with calretinin. (F) Immunostaining with D2-40. (A) There are abundant cell clusters of tridimensional (cell ball) or papilla formation of variable sizes. Cells within the clusters show nuclei of various sizes and shapes, with prominent nucleoli. (B) Large, two- or multi-nucleated cells are observed. These cells have dense cytoplasm and fuzzy cell membrane due to microvilli. (C) A striking well-differentiated papillary architecture is observed. (D) Broad papillae with paucicellular fibrous tissues and small vessels are lined by a single layer of relatively uniform cuboidal epithelioid cells. (E) The cytoplasm and nuclei of tumor cells are positive for calretinin. (F) The membrane of tumors is linearly positive for D2-40.