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Case report

Foreign body granuloma mimicking recurrence of malignant pleural mesothelioma

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ABSTRACT

A 72-year-old man visited our hospital due to right pleural effusion. He had worked as a welder at a shipbuilding company and had been exposed to asbestos. Cytological examination and thoracoscopic pleural biopsy yielded a diagnosis of epithelial malignant pleural mesothelioma (MPM); extrapleural pneumonectomy (EPP) was performed. Two years later, he became aware of right-back swelling that became a fist-sized mass over 2 months. Microscopy of a tissue specimen revealed no malignant cells, but did indicate foreign body granuloma. Subcutaneous lesions that develop after EPP do not necessarily result from the recurrence of MPM, but could have benign etiologies.

1. Introduction

Malignant pleural mesothelioma (MPM) is an aggressive malignancy arising from the mesothelial cells lining the pleura and is generally associated with a history of asbestos exposure [1]. The clinical benefits of radical surgery for MPM remain controversial. Extrapleural pneumonectomy (EPP) has been performed for patients with earlier disease and good physical condition, but the disease often recurs at wide intervals. Here we report a case of foreign body granuloma (FBG) that mimicked a postoperative recurrence of MPM.

2. Case report

A 72-year-old man visited our hospital for examination of right pleural effusion. He had worked as a welder at a shipbuilding company and had been exposed to asbestos for 43 years. His pleural effusion had been detected at a medical checkup for subjects with an occupational history of past asbestos exposure. Cytological examination of the effusion revealed the aggregated atypical mesothelial cells with nuclear enlargement and nucleus irregularity. Immunohistochemical analyses demonstrated that these cells were positive for calretinin, CAM5.2, CK5/6, AE1/AE3, WT-1, and EMA, and negative for CEA and TTF-1. These findings gave the diagnosis of epithelial subtype of MPM, and thoracoscopic pleural biopsy confirmed the diagnosis. EPP was performed; the pericardium and the diaphragm were also removed because the tumor had invaded the diaphragm. The pericardium and the diaphragm were reconstructed with Gore-Tex® mesh (1 mm in thickness, 20 cm × 15 cm, and 2 mm in thickness, 24 cm × 15 cm, respectively). The disease was categorized as T2N0M0, stage II, based on the staging system of the International Mesothelioma Study Group [2]; adjuvant chemotherapy consisting of carboplatin and pemetrexed was delivered. Talc was not used to treat the effusion during the course.

Two years later, the patient became aware that his right back was swelling. This swelling became a fist-sized mass over 2 months. Computed tomography (CT) of the chest visualized a tumor of soft-tissue density that expanded from the right pleural cavity into the subcutaneous tissue (Fig. 1A). Fluorine-18 2-fluoro-2-deoxy-D-glucose (18F-FDG) positron emission tomography (PET)-CT

Abbreviations: MPM, malignant pleural mesothelioma; EPP, extrapleural pneumonectomy; FBG, foreign body granuloma; CT, computed tomography; 18-F-FDG, fuorine-18 2-fluoro-2-deoxy-D-glucose; PET, positron emission tomography.

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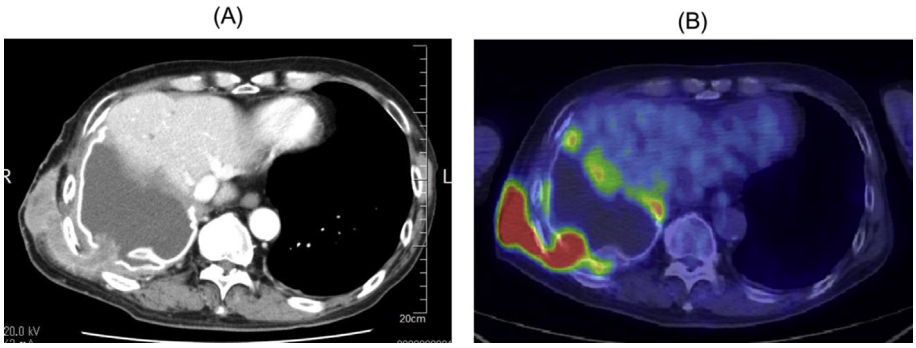

Fig. 1. Subcutaneous tumor on the right back of the patient. (A) CT of the chest revealed a tumor of soft-tissue density that expanded from the right pleural cavity into the subcutaneous tissue. (B) 18F-FDG PET-CT showed accumulation of 18F-FDG in the mass.

revealed an accumulation of 18F-FDG in the mass and along the pleura (Fig. 1B). It was near the chest tube site after the EPP. We suspected a recurrence of MPM, so we performed percutaneous needle biopsy. Microscopy of the tissue specimen showed no malignant cells; rather, we observed granulomas accompanied by giant cells, histiocytes, and inflammatory cells (Fig. 2). Immuno histochemical analyses revealed that these cells were negative for calretinin, CK AE1/3, or CAM5.2. Because the possibility of recurrence of MPM could not be ruled out with small specimen of needle biopsy, a tumorectomy was carried out. The tumor involved the Gore-Tex® mesh, so the mesh was removed with the tumor. Subsequent microscopy confirmed the diagnosis of FBG without evidence of MPM recurrence.

3. Discussion

A standard treatment for MPM has not yet been established. Patients exhibiting earlier stages of this disease have undergone EPP. However, a significant proportion of patients experience local recurrence as the first site of disease recurrence [3]. When patients who have undergone EPP display subcutaneous tumors, it is logical to suspect a recurrence of MPM.

FBG is a tumor-like mass or nodule of granulation tissue, with actively growing fibroblasts and capillary buds, consisting of a collection of modified macrophages resembling epithelial cells, surrounded by a rim of mononuclear cells, chiefly lymphocytes, and sometimes a center of giant multinucleate cells. It is due to a chronic inflammatory process associated with infectious disease or invasion by a foreign body such as surgical materials or pieces of stone or wood from a trauma. In the current case, we suspected that the causative foreign material was the Gore-Tex® mesh that was used to reconstruct the patient's diaphragm. It is quite rare that Gore-Tex mesh induced inflammatory reactions, however, in the current case, the Gore-Tex mash was involved in the tumor, so we considered that the granuloma was originated in the mesh.

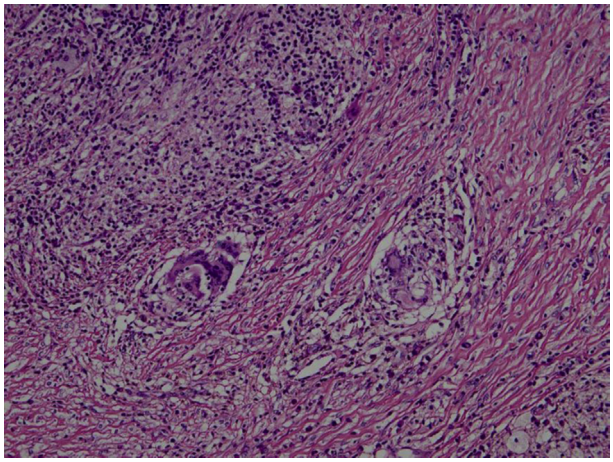

Fig. 2. Microscopy of the tissue specimen revealed a FBG accompanied by foreign-body giant cells, histiocytes, and inflammatory cells (×10).

Clinical diagnosis of FBG is challenging; it is difficult to identify FBG through physiological findings and CT. PET-CT is often applied to detect malignant lesions, but inflammatory lesions or granulomas (including FBG) would also accumulate 18F-FDG [4], rendering it difficult to diagnose FBG by imaging alone. The diagnosis should be confirmed through other means, such as percutaneous biopsy or surgery.

To our knowledge, this is the second report of FBG mimicking the recurrence of MPM; Shrestha et al. recently reported cases with pseudo-tumors that mimicked indwelling pleural catheter-tract metastases of MPM [5]. These cases remind physicians that subcutaneous lesions that develop after EPP do not necessarily result from the recurrence of MPM, but could have benign etiologies. Diagnostic procedures should be considered in such cases.

Conflict of interest

I declare on behalf of my co-authors and myself that we do not have any conflict of interest to declare.

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