Comment
Fungal infections in the lung transplant population are increasingly recognized, with major functional morbid complications, notably an increased risk of bronchiolitis obliterans syndrome [4]. Of these, pulmonary mucormycosis is uncommon, but has an extraordinarily poor prognosis across all organ transplant recipient populations. The extant literature on pulmonary mucormycosis clearly demonstrates that a combined strategy of surgical resection and amphotericin B yields the best survival outcomes. The largest series, which also reviewed previous reports within the literature, reported a mortality of 11% in patients undergoing combined surgical therapy, in contrast to 68% in patients treated with antifungal agents alone, although high-risk patients may have been denied surgical treatment [5]. Consequently, with clearly donor-derived bronchial invasive infection in the absence of disseminated disease, we chose an aggressive strategy of bilateral retransplantation. Our review of the literature suggests that this is the first reported case of donor-derived pulmonary mucormycosis successfully managed with reoperative lung transplantation. Two previous cases of allograft mucormycosis manifesting in the peritransplant period have been reported [6, 7]; these patients were managed nonoperatively with successful outcomes.

Obtaining donor organs in the DCD setting is common in abdominal organ transplantation, but comparatively rare in thoracic organ transplantation. However, recent results regarding the use of DCD lungs from centers in the United States [1], Canada [8], and Australia [2] are promising. We obtained a well-functioning donor organ block, but given possible ischemic injury and pulmonary edema in the DCD setting, we chose to evaluate the lungs using EVLP. In EVLP, donor lungs are ventilated mechanically and perfused with crystalloid-based Steen solution in a closed circuit [3]. EVLP can serve as a diagnostic tool for allograft functional assessment and to rehabilitate marginal donor lungs [8]. Thus, salient features of this case include reoperative bilateral lung transplantation as the critical element of the treatment strategy, the use of a DCD lung donor subjected to EVLP, and continued adjunctive systemic and local antifungal therapies.

References

Pulmonary Metastatic Gastric Cancer Mimicking A Giant Mediastinal Cyst
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Cysts and cavities are common radiologic abnormalities. Pulmonary metastasis comprises a rare entity of thoracic cystic diseases. We reported a case of giant cyst at the left anterior mediastinum that was pathologically confirmed as a lung metastasis from previously resected gastric cancer. The cyst was completely removed with wedge resection of the surrounding lung through a left anterior thoracotomy. One should always keep in mind the possibility of an intrathoracic cyst near or at the mediastinal region that may originate from metastatic lesions to the lungs when patients have previous cancer history.

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Cysts and cavities are common abnormalities on chest radiographs and chest computed tomography (CT). Confirmation of the nature of thoracic cystic or cavitary lesions may be challenging. Differential diagnoses of such lesions range from congenital to the acquired cystic diseases but very rarely cases of metastatic cancer [1, 2]. We report a case of lung metastasis from gastric cancer presenting as a giant cyst at the left anterior mediastinum that mimics a cyst of thymic origin.

A 73-year-old man was hospitalized on account of episodes of hemoptysis with a large mass abutting from the left anterior mediastinum on chest radiograph (Fig 1A). He had been treated for a stage II gastric cancer by subtotal gastrectomy half of year prior to this admission. The chest radiograph taken before gastrectomy appeared to be normal. Chest computed tomography (CT) revealed a well-defined thin-walled cyst, 10 cm in diameter, at the...
left anterior mediastinum that mimics a cyst of thymic origin with close contact to the pericardium (Fig 1B). Elevated serum CA-199 level was noted but there was no finding suggesting recurrence of gastric cancer in the abdominal CT and in panendoscopy. Transthoracic CT-guided biopsy was done but did not yield a pathologic diagnosis. Involvement to the heart or the pericardium as suspected by CT study was excluded by a study of heart magnetic resonance imaging. He underwent a left anterior thoracotomy with complete resection of the cyst.

Fig 1. (A) Chest radiograph showed a huge anterior mediastinal mass overlying the left hilum (arrowhead). (B) The large cyst occupying the left pre-vascular space with close contact to the pericardium (arrowhead) was shown on computed tomographic scan by an axial view. (C) Upon surgical exploration, the cyst showed dense adhesion and was inseparable to the adjacent left upper lobe (LUL) of the lung (arrow). (D) Resected specimens included a cyst containing dark bloody fluid (arrow), measuring 7 × 6.5 × 5 cm in size and 2 pieces of wedge resected lungs measuring up to 5.5 × 3.6 × 1.7 cm in size.

Fig 2. Histopathologic examination of the resected specimens is shown. (A) A pseudo-cyst without lining epithelia, composed of some fibrin-like contents and thick fibrotic wall (×100). (B) The wedge resected lung harbors tumor emboli (arrow, ×200) stained with high nuclear to cytoplasmic ratio by hematoxylin and eosin stain. (C) Tumor cells were positively stained for CK7 (arrows, ×200), whereas (D) thyroid transcription factor-1 was negatively stained (arrow, ×200).
Upon exploration, a dense adhesion was observed between the cyst and the adjacent left upper lung (Fig 1C) that mandated wedge resections to allow a complete removal of the cyst. Resected specimens are shown as a large blood-containing cyst along with wedge resected lungs (Fig 1D). Microscopic examination of the resected specimens revealed a pseudocyst without lining epithelia, composed of some fibrin-like contents and thick fibrotic wall (Fig 2A), with lung parenchyma harboring multiple small tumor emboli of gastric origin (Fig 2B). Immunohistochemical stains of the tumor part concluded positive staining for CK7 (Fig 2C) but negative for TTF-1 (Fig 2D) that excluded primary adenocarcinoma of the lung. He had led an uneventful postoperative course with adjuvant chemotherapy being offered toward metastatic gastric cancer. He has continued to do well at a follow-up of 7 months without disease progression at the time of this report.

Comment

Cystic masses at the anterior mediastinum comprise a heterogeneous group of asymptomatic or symptomatic conditions including congenital, infectious, or neoplastic entities [1]. Common anterior mediastinal cystic masses include cystic teratoma, pericardial cyst, lymphangioma, thymic cyst [1]. Metastatic carcinoma to the mediastinum is rare and may present as cyst-like lesions [2, 3]. Anterior mediastinal tumors can undergo cystic degeneration presenting as mixed solid and cystic lesions at CT or magnetic resonance imaging and these cystic lesions are almost indistinguishable from those of a congenital cyst if degeneration is extensive [4].

Depending on the location of the cyst, it may originate from the adjacent lung that has close contact to the anterior mediastinum. Among them, cystic or cavitary lung masses such as tumor with necrosis or lung abscess may appear as an anterior mediastinal cyst [4]. Many cystic and cavitary lesions of the lungs occur frequently in bronchogenic carcinoma (10% to 15%) and are associated more often with squamous cell carcinoma [3]. Occasionally, they also occur with sarcoma, transitional cell carcinoma of the bladder, and, less commonly, with lymphoma and metastasis [3, 5]. The frequency of cavitation or cystic change in pulmonary metastases is approximately 4%, as opposed to 9% in primary bronchogenic carcinoma [5]. Pulmonary metastases may present radiologically with a spectrum of unusual appearance including cavitation or cyst formation, calcification, and surrounding ill-defined hemorrhage [5]. It is essential to detect pulmonary metastases in the treatment of patients with cancer. Modern immunohistochemistry studies using special markers, such as thyroid transcription factor 1 (TTF-1), can help make this distinction between primary pulmonary adenocarcinoma and metastatic adenocarcinoma from another site [6].

It is challenging to differentiate a thymic cyst from the one reported in this case. Hemorrhage in metastatic lesions can be depicted on CT images and it is considered to be caused by rupture of the vessels within the fragile neovascular tissue [3]. One should keep in mind that a cyst in the thymic region may not be a thymic cyst as it can originate from the adjacent lungs that harbor other pathologies such as metastasis, especially when bloody cyst content is present. Based on the patient’s history of previous gastric cancer, intraoperative findings, and observations from histopathologic examinations with a negative immunohistochemical stain for TTF-1, it suggests that the cyst reported herein may be a hemorrhagic cyst arising from the lungs with metastatic gastric cancer. Further, the majority of thymic cysts present with solid components and usually do not grow as fast as in this case.

Lung metastases from a primary extrapulmonary malignancy are often a manifestation of widespread dissemination. Aggressive pulmonary metastasectomy in a number of different cancers may substantially prolong patients’ survival [7]. It has been reported that patients with lung metastasis of gastric cancer can potentially enjoy long-term survival by metastasectomy [8]. Nevertheless, the presence of tumor emboli in our patient suggests that it may not be a localized process, which needs continued follow-up for possible disease progression with treatment being offered accordingly.

In conclusion, we reported an extremely rare case of metastatic gastric cancer to the lung that mimics an anterior mediastinal cyst. One should always keep in mind the possibility of an intrathoracic cyst near or at the mediastinal region that may originate from metastatic lesions to the lungs when patients have previous cancer history. An aggressive diagnostic procedure such as biopsy or surgical exploration should be warranted to avoid delay in the diagnosis and treatment for potential cancer metastasis.

References