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## Case Report

# Pleural lipomatosis: An often-forgotten intrathoracic tumor ☆☆☆

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## ABSTRACT

Lipomas are benign mesenchymal neoplasms that arise from adipocytes. Most lipomas are found in the subcutaneous tissue; however, they can be present throughout the body. Lipomas arising from the thoracic pleura are exceptionally rare, with only approximately 20 cases ever reported in the literature. While typically asymptomatic, pleural lipomas may cause compressive symptoms such as nonproductive cough, chest pain, and dyspnea if they reach adequate size. A CT scan is usually sufficient for the diagnosis and typically reveals well-defined nodules with homogenous fat attenuation of approximately -50 to -150 Hounsfield units. Management is dependent on various factors including tumor size and location, associated symptoms, and age of the patient. Pleural lipomatosis, although exceedingly rare, should be maintained in the differential diagnosis for any well-defined, fat-attenuating pleural mass identified on conventional radiologic studies. Here we report a case of pleural lipomatosis associated with bilateral pleural effusions identified in an 83-year-old male presenting with acute onset dyspnea.

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## Introduction

Lipomas are benign mesenchymal neoplasms that arise from adipocytes. Most lipomas are found in the subcutaneous tissue, however, they can be present throughout the body [1]. Lipomas originating from within the thoracic cavity

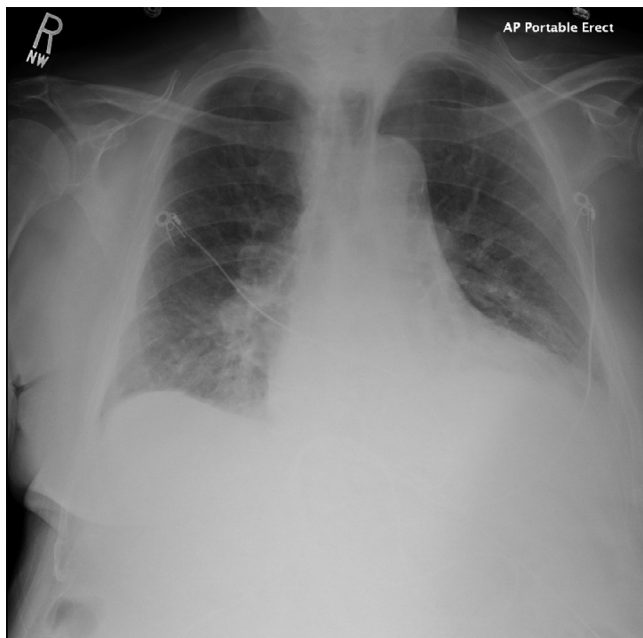
are uncommon and are usually associated with the lung parenchyma, bronchial tree, or mediastinum [2]. Lipomas arising from the thoracic pleura are exceedingly rare, with only approximately 20 cases ever reported in the literature [1–21]. While typically asymptomatic, pleural lipomas may cause compressive symptoms such as nonproductive cough, chest pain, and dyspnea if they reach adequate size. We report

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**Fig. 1 – Frontal chest radiograph showing an enlarged cardiomeastinal shadow with mild prominence of the pulmonary vasculature. There is slightly increased opacity at both lung bases.**

a case of pleural lipomatosis associated with bilateral pleural effusions identified in an 83-year-old male presenting with acute onset dyspnea.

### Case presentation

An 83-year-old male presented to the emergency department with complaints of progressive shortness of breath, dyspnea on exertion, and orthopnea over the past 10 days. He had a past medical history significant for end stage renal disease, chronic diastolic heart failure, insulin-dependent diabetes mellitus, hyperlipidemia, hypertension, and moderate aortic stenosis. On arrival he was afebrile, hypertensive with a blood pressure of 179/71 mmHg, and mildly tachypneic with an oxygen saturation of 96 percent on room air. Laboratory workup revealed no leukocytosis, a stable macrocytic anemia, renal function at baseline, a brain natriuretic peptide > 62,000 pg/mL (reference range: <450 pg/mL), and negative troponins.

A chest radiograph was performed which demonstrated stable enlargement of the cardiomeastinal silhouette, vascular congestion, and bilateral lung base opacities (Fig. 1). Transthoracic echocardiography (TTE) showed a left ventricular ejection fraction of 30% to 35%, consistent with severe aortic stenosis. Due to the patient's acute decompensated heart failure, computed tomography angiography (CTA) was performed to evaluate for possible transcatheter aortic valve replacement (TAVR).

CTA TAVR demonstrated small bilateral pleural fluid collections with associated compressive atelectasis (Figs 2, 3). In

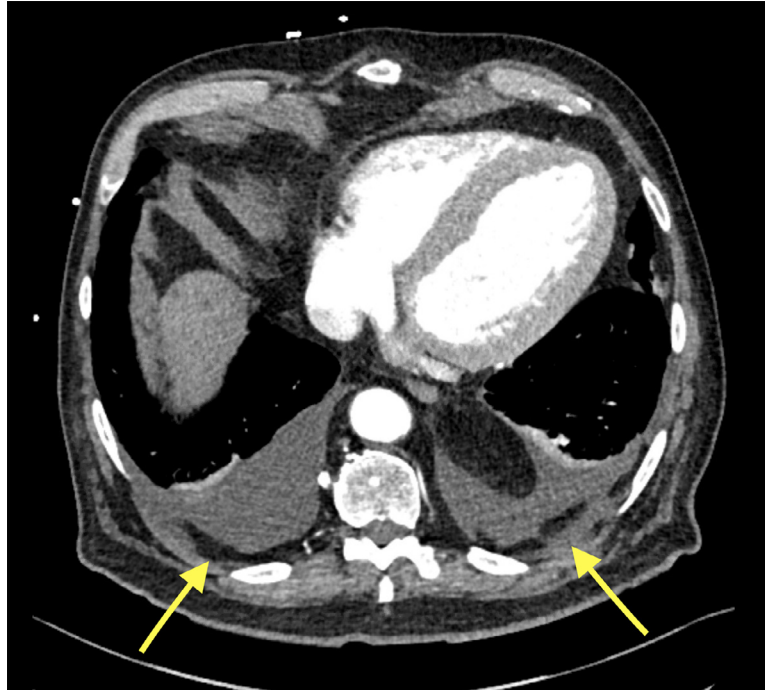
addition, multiple bilateral, well-delineated nodules of fat attenuation, -98 Hounsfield units (HU), were identified within the pleural fluid collections, consistent with pleural lipomas. The largest of these nodules was located in the inferomedial aspect of the left hemithorax and measured approximately 6.2 × 3.3 cm (Figs 2, 3). A few solid elements were visible within these lesions, likely representing fibrous stromal change or possibly low-grade liposarcoma. However, as the nodules originated from the pleura, were well-delineated, and lacked an identifiable invasive component, a diagnosis of pleural lipomatosis was considered most likely. The patient subsequently improved after 3.5 L was removed via hemodialysis. The patient was determined to be stable for discharge with planned TAVR in the future and periodic surveillance for interval progression of pleural lipomatosis.

### Discussion

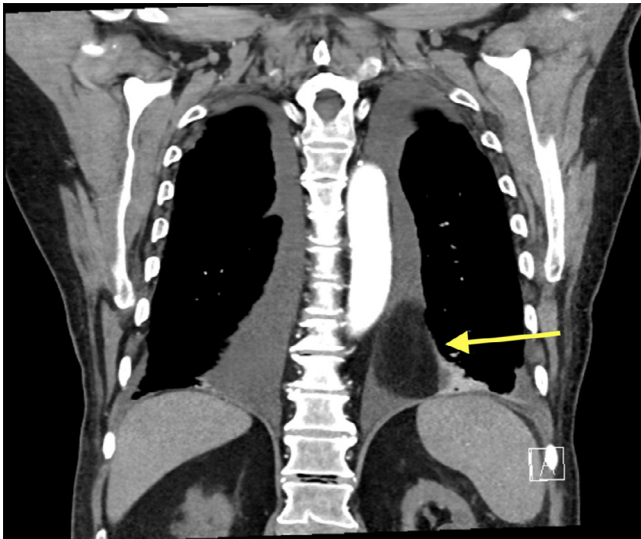
Conventionally, lipomas located in the thoracic cavity are categorized into 1 of 2 groups: (1) dumbbell/hourglass lipomas, which extend from the thoracic cavity across the anatomic thoracic inlet or intercostal space, or (2) purely intrathoracic lipomas [1,7]. Intrathoracic lipomas can be further subcategorized according to their location of origin. Endobronchial, lung parenchymal, and mediastinal lipomas are most common. Pleural lipomas, which originate from the submesothelial layer of parietal pleura, are exceptionally rare with only approximately twenty cases ever reported in the literature [1–21]. It is difficult to directly define the incidence of pleural lipomas in relation to other intrathoracic lipomas; however, it is estimated that only 1.6%–2.3% of all mediastinal tumors are intrathoracic lipomas [13].

Our patient was 83 years old. The majority of reported cases occurred in individuals between the ages of 45 and 62 years and were associated with obesity [7]. The majority of pleural lipomas are clinically asymptomatic and incidentally discovered on chest imaging for evaluation of other pathology [1,4]. However, if they reach adequate size, they may cause compressive symptoms such as nonproductive cough, chest pain, dyspnea, or a sensation of chest heaviness [1,6,7]. Other complications that may arise include intra-tumoral hemorrhage and rib lysis [1,6,7]. In retrospectively analyzing our patient's imaging records, he did have 2 chest radiographs over the previous year in the context of a hospital admission for dyspnea. Radiographic findings at that time showed mild cardiomeastinal shadow enlargement, pulmonary vascular congestion, and a small left-sided pleural effusion. While pleural lipomatosis could certainly have explained some of these radiological findings, it was felt that in the context of the patient's past medical history that an exacerbation of his underlying congestive heart failure was more likely.

A CT scan is usually sufficient for the diagnosis of pleural lipomatosis and typically reveals well-defined nodules with homogenous fat attenuation of approximately -50 to -150 HU [1,4,6,7]. As lipomas may contain fibrous stroma, the density may be nonuniform [1]. Thus, distinguishing between a benign lipoma and a well-differentiated liposarcoma may sometimes prove challenging. Nevertheless, CT is capable of discerning



**Fig. 2 – Axial computed tomography scan showing small bilateral pleural effusions with multiple, well-defined interspersed nodules of fat attenuation (–98 HU).**



**Fig. 3 – Frontal computed tomography scan demonstrating a large nodule of fat attenuation in the inferomedial aspect of the left hemithorax measuring 6.2 x 3.3 cm in greatest dimension.**

other features of malignancy including potential invasion of surrounding structures and contrast enhancement [1,4,7]. In equivocal cases, MRI can also be performed for greater soft tissue characterization [1,4,7]. For example, MRI can be helpful in more accurately defining the linkages between the tumor(s)

and the parietal pleura. On MRI evaluation, pleural lipomas are isointense to subcutaneous fat on all sequences, and exhibit complete fatty signal suppression on fat-saturation techniques [22]. A final benefit of MRI is in its ability to accurately distinguish lipomas from liposarcomas. Due to their broad fibrous septa and margin irregularity, liposarcomas often display considerable focal areas of hypoattenuation on T1-weighted sequences that lipomas do not [23].

A final consideration is the increasing role of bedside ultrasound in the intensive care unit setting and its potential role in the investigation of pleural lipomatosis. On ultrasound evaluation, pleural lipomas exhibit a homogenous, mildly echogenic, well defined ovoid structure [24]. A potential advantage of ultrasound is in its ability to define vascular supply, thus allowing easy differentiation of solitary fibrous tumors of the pleural that possess rich vascular supplies, from pleural lipomas [23]. Due to its low cost, safety, vast availability, and absence of radiation exposure, transthoracic ultrasound represents an emerging, robust option in the evaluation of pleuropulmonary pathology such as pleural lipomatosis [24].

Management of pleural lipomatosis is dependent on various factors including tumor size, location, associated symptoms, and age of the patient [7]. Since these tumors are typically slow-growing and have virtually no potential for malignant transformation to liposarcoma, periodic surveillance is an appropriate alternative to surgery, particularly for patients with small asymptomatic lesions [1,7]. Surgical resection is the treatment of choice for symptomatic lesions and can be performed either thoracoscopically or by open thoracotomy with a recurrence rate of 5% or less [1,8,9].

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## Conclusion

Pleural lipomatosis, although exceedingly rare, should be maintained in the differential diagnosis for any well-defined, fat-attenuating pleural mass identified on conventional radiologic studies.

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