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Case Report

# Symptomatic Pleural Lipoma: A Case Report and Literature Review

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## Abstract

Pleural lipomas are extremely rare benign, slow-growing tumours of mesenchymal parietal pleura origin with the capacity to extend into sub pleural, pleural or extra pleural spaces. They present with a myriad of mild to severe compressive-related symptoms. Diagnosis can be made via CT, but histopathological intervention is required if the mass exhibits fibrous stroma or dystrophic ring-type calcifications to differentiate between similarly presenting fat-containing intrathoracic masses diagnostically. Watchful waiting and clinical and radiological follow-up are appropriate for those with small and asymptomatic lesions, the elderly, and populations unsuitable for surgical resection. However, surgical resection via thoracotomy has good outcomes and should be considered for diagnostic and therapeutic benefit to those with symptomatic pleural lipoma. Due to the rare occurrence of pleural lipoma, they have only been reported sporadically in the literature. As a result, it is important to report every identified case of pleural lipomas to improve diagnostic accuracy and patient health outcomes. Therefore, we report a case of a pleural lipoma on a chest radiograph (CXR) in a 28-year-old female presenting with localised right chest discomfort.

## Introduction

Lipomas are common benign tumours of the skin and subcutaneous tissue [1]. They occur with an annual incidence of 1 per 1000 people [1,2]. Pleural lipomas are rare and are usually found at the mediastinal, bronchial and pulmonary levels [3,4]. Because pleural lipomas develop slowly, most patients often remain asymptomatic [5,6]. As a result, pleural lipomas are generally found incidentally on chest radiographs or computed tomography (CT) examinations [4-8]. Although pleural lipoma is a benign tumour, when symptomatic, it should be completely resected, where possible, for diagnostic and therapeutic perspectives [3]. Due to the rare occurrence of pleural lipoma, they have only been reported sporadically in the literature. As a result, it is important to report every identified case of pleural lipomas to improve diagnostic accuracy and patient health outcomes. Therefore, we report a case of a pleural lipoma on a chest radiograph (CXR) in a 28-year-old female presenting with localised right chest discomfort.

### Case Presentation

A 28-year-old female presented to their general practitioner (GP) with localised right-sided chest discomfort. A routine CXR showed a pleural-based opacity at the right mid and lower zone with displacement of the adjacent right middle and right lower lobe measuring 11x3x9cm. A follow-up computerised tomography (CT) chest scan revealed the same (Figure 1). The patient underwent a core biopsy of the lesion at a metropolitan hospital for histopathological investigation. From a microscopic perspective, this revealed morphologically unremarkable fibro connective and adipose tissue. As the sample was too small to render a definitive diagnosis, a right thoracotomy was performed to remove the lesion entirely for diagnostic precision completely. This revealed multiple small fatty lobules on the free edge of the lung and a large mass arising from the middle lobe attached to the diaphragm, mediastinum, and chest wall. The mass and fat lobules were excised utilising a combination of blunt and diathermy dissection alongside significant wedge resection of the middle lobe. Once removed, the total dimensions of the mass were 135 x 115 x 35 mm, weighing 206.3 grams. Macroscopically, the tumour consisted of a fatty lesion seen intimately associated with portions of the lung, demonstrating two staple margins (Figure 2). The smaller lung portion measured 75 x 15 x 10 mm in depth, and the larger 120 x 50 x 15 mm in depth. The opposite surface demonstrated

a smooth surface covering a portion of the specimen. However, most of the area showed exposed lobulated fat. The specimen was transversely sectioned, and the cut surface demonstrated a general fatty appearance, with focal areas showing a fibrous appearance. The fatty lesion showed a smooth edge where it abuts the lung, with no evidence of lung infiltration. It also showed a smooth contour that abuts the strip of smooth tissue on the other face. The lung showed a minimum clearance of 4 mm from the fatty tumour. At least eight fatty lobules were identified macroscopically at the free edge of the right lower lung lobe (Figure 3). These lobules were up to 9 mm in maximum dimension, including a focus of heterologous differentiation in the right anterior chest wall biopsy. The cut surface demonstrated scattered pale areas (Figure 3). However, no solid nodules were identified. Microscopically and histologically, the samples comprised lung portions attached to a well-demarcated, encapsulated lipomatous tumour. It demonstrated extensive central coagulative necrosis and degeneration but no tumour-type necrosis (Figure 4). At its periphery, where more viable material was appreciated, there was a mild and patchy infiltrate of interstitial inflammatory cells, which included foamy histiocytes and scattered lymphocytes. Occasional areas showed a lobulated appearance, with delicate fibrous septa extending through the parenchyma. Plump spindle cells were occasionally observed in these regions, showing elongated nuclei with bland, finely granular chromatin. No increased or atypical mitotic activity was identified. A fibro-inflammatory response was appreciated where the tumour abuts the lung, but no extension into the lung parenchyma was identified. The lung itself was unremarkable, and the lung margin was well clear. Ancillary molecular studies were also performed on fresh tissue, which did not detect amplification of MDM2 on Fluorescent in situ hybridisation (FISH) analysis. The macro and microscopic appearances were those of a lipomatous neoplasm with no evidence of MDM2 amplification, in accordance with a benign pleural lipoma.

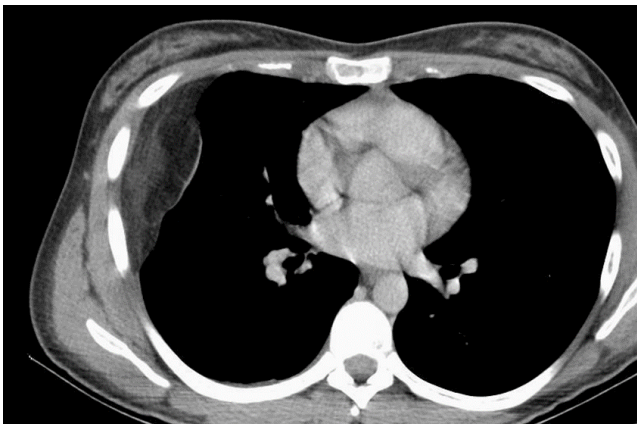

**Figure 1:** A chest CT showing a pleural-based opacity at the right mid and lower zone with displacement of the adjacent right middle and right lower lobe measuring 11x3x9cm.

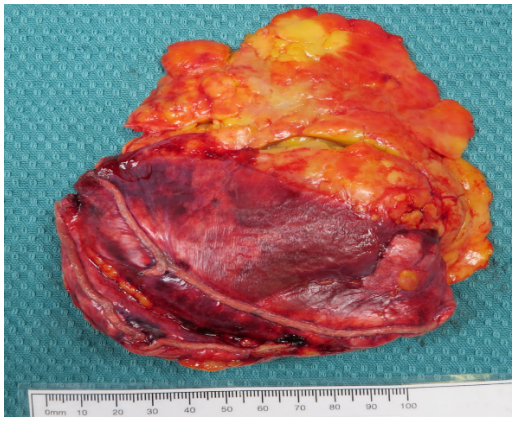

**Figure 2:** Excised pleural lipoma measuring 135 x 115 x 35 mm and weighing 206.3 grams.

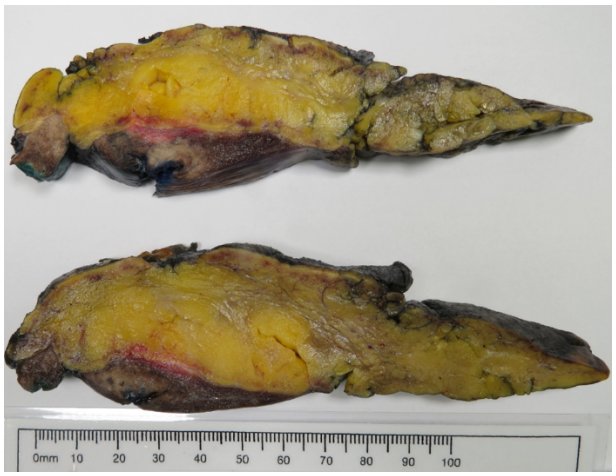

**Figure 3:** Excised right lower lung lobe showing least eight fatty lobules at the free edge, a focus of heterologous differentiation in the right anterior chest wall biopsy, scattered pale areas and no solid nodules.

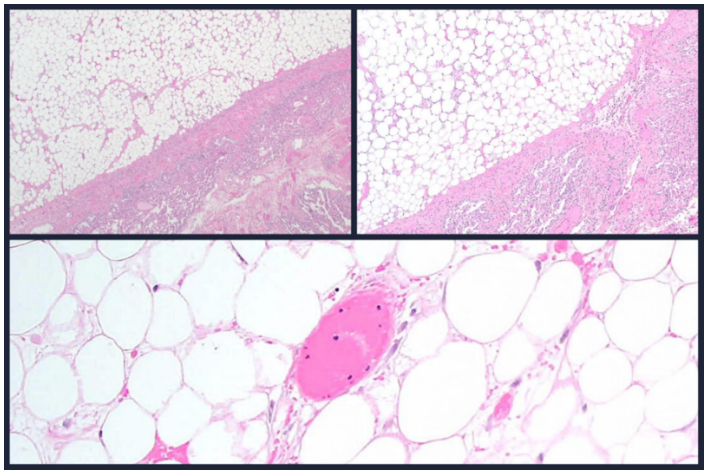

**Figure 4:** Histological sections of the lesion showing microscopic appearances in alignment with those of a lipomatous neoplasm such as a benign pleural lipoma.

## Outcome and Follow-Up

Follow-up with the case was conducted three years post-intervention. The patient experienced an uncomplicated recovery post-thoracotomy and excision and, after ten weeks, returned to independent daily activity. The patient has also been involved in regular follow-up through biannual CT scans and CXR with no tumour recurrence. No medical or surgical intervention has been required throughout this period. However, the patient expressed that they had longstanding neuropathic pain at the excision site and surrounding margins. These margins measure 8 cm long and 3 cm wide band anteriorly. Furthermore, during the 12 months post-intervention, the patient stated that the clothes caused a 'heavy' sensation at the surgical site. Since then, these symptoms have subsided to a manageable but noticeable level.

## Patient Perspective

"I was lucky to be treated by an excellent team. My respiratory physician and surgeon were very experienced, highly skilled and kind. The results of the biopsy and scan were always communicated to me quickly, and decisions were made efficiently and methodically with my input and consent. I found my hospital stay in a shared ward after the surgery challenging. The ward was noisy, and it was difficult to sleep, and the lack of privacy added to my sense of vulnerability while I was so physically debilitated." The pain around my surgical site was significant but well managed. I did not expect to experience such long-term neuropathic pain at the front of my chest. The neuropathic pain has improved over the years but has never entirely resolved."

## Discussion and Implications

Lipoma is a benign mesenchymal origin that commonly originates in the deep and subcutaneous areas of the body [5]. Lipomas are classified into several types depending on their origin [5]. These include end bronchial, diaphragmatic, and, in this case, pleural lipoma, which is of sub mesothelial parietal pleura origin with the capacity to extend into sub pleural, pleural or extra pleural spaces [5]. Lipomas can also be sub classified as (1) purely intrathoracic lipomas, such as our case, or; (2) hourglass or dumbbell lipomas that traverse the thoracic inlet or intercostal spaces [5]. Intrathoracic lipomas are rare presentations and lipomas of pleural origin, such as this case, are extremely rare [9-12]. To our knowledge, only sporadic cases of pleural lipoma have been reported since Fothergill first described intrathoracic lipomas in 1781 [3]. For example, only three out of 3502 thoracic tumour cases were reported in a review [13]. Lipomas have often been reported to grow slowly [14-18]. As a result, they are commonly detected either incidentally on imaging or at a late evolutionary stage once they become symptomatic [4,6,18]. However, there are documented cases of rapidly growing lipoma, highlighting the need for close follow-up once detected in patients. For example, a case identified lipomas of 9×7×3 cm and 187 g and 19×16×10 cm and 1044 g in 2 cases with a previously normal CXR at seven months and three years, respectively [3]. The symptomatology of pleural lipoma is dependent on size and location. Due to the slow growth of lipomas, most patients remain asymptomatic. However, due to their capacity to grow into giant lipomas, they can cause compressive symptoms. As a result, common presentations include a non-productive cough, dyspnoea, dysphagia, odynophagia and, such as in this case, thoracic discomfort. Additionally, lipomas have had case reports of presentations of intratumoral haemorrhage, cervical radiculopathy, rib fracture, pneumonia, and empyema and have the capacity to induce rib lysis through intercostal space invasion [11,19,20]. There are also reports of lipoma-related death due to compressive symptoms. For example, Jack et al. reported a case with severe left ventricular dysfunction resulting in cardiac arrest due to the cardiac compression of an intrathoracic, extra-pericardial lipoma [21]. Diagnostically, CT imaging has replaced x-ray and ultrasound due to its accuracy in thoracic lipomas [5]. Overall, demonstrating a homogeneous, obtuse-angled, fat-attenuating mass allows a definitive diagnosis of lipoma on CT [22]. However, there are case reports of lipomas containing fibrous stroma or dystrophic ring-type calcifications [23,24], proving challenging diagnostically on radiological evidence alone. As a result, a histopathological investigation is recommended to differentiate between similarly presenting fat-containing intrathoracic masses. These similarly presenting masses include germ cell neoplasms, thymolipomas, lip sarcomas, end bronchial hamartoma, and teratoma [25]. Due to the slow-growing and commonly asymptomatic nature of pleural lipomas, their management strategy is debated and dependent on age, tumour size, and symptoms [26]. Many authors recommend, when possible, surgical excision for improved therapeutic and diagnostic

outcomes [5,9]. This is reinforced by the good outcomes of surgical resection by thoracotomy, with a recurrence rate of less than 5% [27]. However, some authors agree that watchful waiting alongside clinical and radiological follow-up is appropriate for those with small and asymptomatic lesions, the elderly, and populations unsuitable for surgical resection [5]. In this case, the patient was symptomatic and relatively young. As a result, surgical excision was an appropriate management plan for diagnostic and therapeutic outcomes.

In conclusion, pleural lipomas are extremely rare benign, slow-growing tumours. They can grow large and present with a myriad of mild to severe compressive-related symptoms. Diagnosis can be made via CT, but histopathological intervention is required if the mass exhibits fibrous stroma or dystrophic ring-type calcifications to differentiate between similarly presenting fat-containing intrathoracic masses diagnostically. Watchful waiting alongside clinical and radiological follow-up is appropriate for those with small and asymptomatic lesions, the elderly, and populations unsuitable for surgical resection. However, surgical resection via thoracotomy has good outcomes and should be considered for diagnostic and therapeutic benefit to those with symptomatic pleural lipoma. Due to the rare occurrence of pleural lipoma, they have only been reported sporadically in the literature. As a result, it is important to report on every identified case of pleural lipoma to improve diagnostic accuracy and patient health outcomes.

**Patient consent:** Obtained.

**Data availability:** Readers can access all supporting data of this study outlined on lines 265 to 279.

**Conflicts of interest:** The authors declare that there are no conflicts of interest regarding the publication of this article.

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