

## CASE REPORT

# Pleural lipomatosis: An unusual CT Chest Feature

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### Abstract

*Intrathoracic benign neoplasm can develop from any tissue; inside the thoracic cavity, however, pleural lipomatosis is unusual disposition of adipose tissue in the pleural and subpleural layer. Asymptomatic presentation may be proven commonly and revealed by unintended radiology with a measured Hounsfield scale “100 to -50. We report this case of pleural lipomatosis by radiological finding though thoracoscopic finding is the ideal for diagnosis and with pathological examination of the specimen confirmed the diagnosis of lipomatosis. A radiological diagnosis of pleural lipomatosis can be made by computed tomography, transthoracic ultrasound as a diagnostic investigation because of their characteristic fat attenuation. Medical thoracoscopic biopsy provides a more accurate and confirmed diagnosis. Pleural lipomatosis is a rare clinical pleural dilemma that needs suspicious sense and a feasible radiological diagnosis as soon as a strong evidence of malignant transformation is excluded.*

*Excessive unencapsulated infiltrative fat deposition is known as mediastinal lipomatosis (Fig 5). Lipomatosis is commonly associated with obesity and exogenous steroid administration.*

**Keywords:** Hounsfield unit, lipomatosis, medical thoracoscopy

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### Introduction

Lipomatosis is a benign but unusual and excessive deposition of adipose tissues that can develop all over the body. Lipomatosis can develop in fat-containing tissues such as the mediastinum, diaphragm, bronchus, lung, or thoracic wall; however, atypical localization can be noticed in the pleura as pleural lipoma or lipomatosis. 1,2.

These lesions are thought to originate from the submesothelial layers of the parietal pleura,

extending into the subpleural, pleural, or extrapleural space. Pleural lipomatosis are excessive deposition of fat with a slow growth rate. Pleural lipomatosis is found by the way on a chest radiograph or a computed tomography (CT) examination of the chest for patients presented with complains other than pulmonary problems.

Extrapleural fat is fat deposition outside the parietal pleura in the chest wall. It is a component of the loose connective tissue of the endothoracic

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fascia and is most abundant along the posterolateral aspects of the fourth through eighth ribs bilaterally 3,4. The resulting soft-tissue shadow that is produced can be confused with pleural thickening at conventional radiography. Pleural plaques may calcify, whereas extrapleural fat does not. When this finding is not present, secondary features are used to differentiate between these two entities. Extrapleural fat is typically bilateral, symmetric, and located along the midlateral chest wall. Pleural plaque is asymmetric, is randomly distributed, and spares the apices and costophrenic angles. Definitive diagnosis is made at CT when the lesion in question shows fat attenuation of approximately “100 HU.

### Radiographic features

Plain radiography

- well defined, convex lesions forming obtuse angles with the pleura
- normally vertically orientated in relation to the chest wall
- no rib erosion
- appears denser than fat because of interface with air in the lung

### Cross sectional imaging

- homogeneous fat density or fat signal intensity
- no enhancement
- Definitive diagnosis is made at CT when the lesion in question shows fat attenuation of approximately “100 HU.

### Differential diagnosis

The principal differential diagnosis is encysted pleural effusion. Ct chest typical fat attenuation and pleural diagnostic tap reveal the diagnosis.

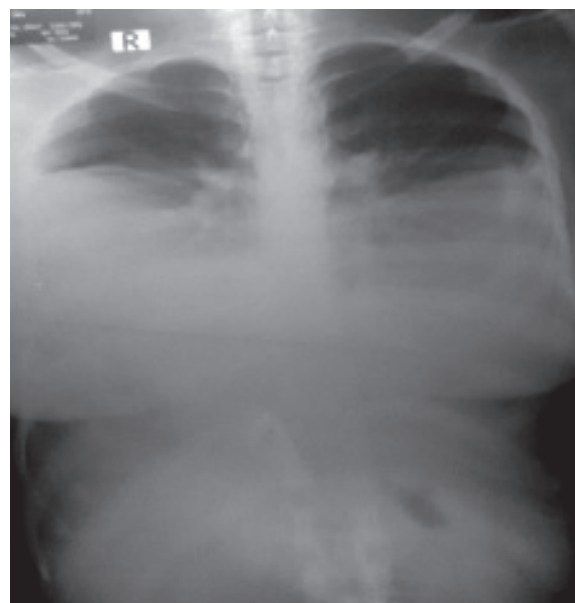
Extrapleural fat represents fat outside the parietal pleura. It is part of the loose connective tissue of the endothoracic fascia, most abundant along the posterolateral aspects of the 4<sup>th</sup> through 8<sup>th</sup> ribs. Extrapleural fat is typically *bilateral, symmetrical*, and located along the mid-lateral chest wall <sup>1</sup>.

### Presentation of case

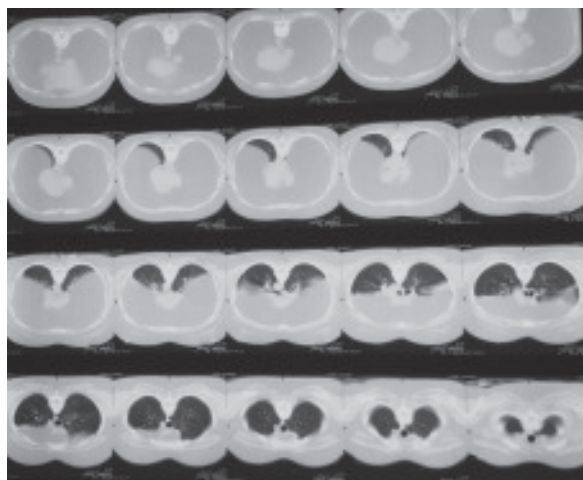
A 28-year-old house wife was admitted after she was incidentally found her abnormal x-ray for medical fitness. She had no significant respiratory constitutional symptoms. He had no previous history of chest troubles or cardiac disorders. Chest radiography was performed and indicated bilateral

encysted moderate pleural effusion. Transthoracic ultrasound examination was performed for localization and as guidance for aspiration, which showed pleural fluid with simple anechoic criteria of about 2600 ml in volume with few pleural-based nodules. Pleural aspiration was tried and revealed dry tap. Other routine laboratory tests of complete blood count, and liver and kidney function tests were of normal range. Collagen profile was done which was normal. Tuberculosis profile was normal. Cardiac evaluation was done and found normal. A CT of the chest reveals that non dense homogenous opacity all over the anterior chest wall and from 8<sup>th</sup> rib posterior chest wall.

Patient was counseled and medical thoracoscopy was advised but declined for the procedure because of financial constrains. FOB done to see endobronchial lesion, which reveal that shiny mucosal swelling. Preplanned biopsy taken. Histopathological examination of the biopsy with staining of block with hematoxylin and eosin indicated well-differentiated mature adipocytes, with no pleomorphism, necrosis, or mitotic activity, suggestive of lipomatosis Finally CT chest report was reviewed and discussed with radiologist which showed Hounsfield unit -100 which is fat attenuation unit for diagnoses of lipomatosis.



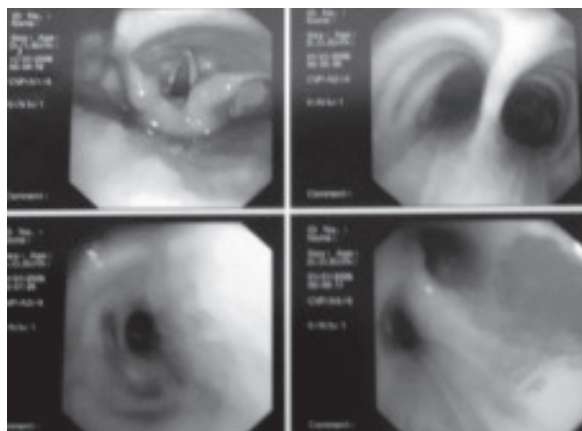
**Fig.-1:** Chest x-ray PA view



**Fig.-2:** CT scan chest



**Fig.-3:** CT scan chest



**Fig.-4:** Fibre optic bronchoscopy

### Discussion:

In general, lipomatosis is benign mesenchymatous adiposes that develop all over the body composed of mature adipocytes presenting just about half of soft tissue tumors and 80% of benign fat-containing neoplasms. Ordinary lipomatosis may be found all over the body, but they are rarely found in the thoracic cavity. Consistent with classifications established by Keeley & Vana and Williams & Parsons, they can be divided into two classes:

Along with their origin, they are classified as follows:

- i. Endobronchial lipomatosis originating from the submucosal fat of the tracheobronchial tree,
- ii. Parenchymal lipomatosis originating from interstitial adipocytes and located peripherally,
- iii. Pleural lipomatosis originating from the submesothelial layer of parietal pleura,
- iv. Mediastinal lipomatosis and
- v. Pericardial lipomatosis 1,2,4..
- vi. Pleural lipomatosis are usually multiple and have no association with other extrathoracic locations; they involve both sides with the same frequency, but there is no malignant conversion.

They are most commonly detected between the ages of 30 and 50 years, often associated with obesity. Lipomatosis is commonly associated with obesity and exogenous steroid administration.

The pleural lipomatosis observed originated in the submesothelial layer of parietal pleura and showed hemispherical sessile lesions distributed widely all over the costal pleural surface<sup>4,5</sup>. From the clinical point of view, no specific signs or symptoms of this kind of lesion were detected apart from conventional pulmonary symptoms such as dyspnea and dry cough until they attained a large size, and once it spreads over the wide costal surface, it may induce compression symptoms such as persistent dry cough, chest pain, increased dyspnea, or chest heaviness sensation. In 11% of cases as part of Pierre Marie's syndrome, clubbing was observed, which disappeared after surgical resection of lesion<sup>1</sup>. In a study by Zidane *et al.* <sup>2</sup>, accompanying signs were occasional; bone erosion, cortical thickening, and hyperostosis secondary to extrinsic pressure, and periosteal irritation have been documented.

CT chest provides essential information to differentiate between benign and malignant pleural disease, and determine the location and extent of disease; it occasionally enables characterization of tissue on the basis of signal attenuation. The radiological diagnostic criteria are as follows: a well-defined nodular appearance composed of homogeneous fat (-50 to "150 HU), not enhanced by an injected contrast medium, with obtuse angles with the chest wall and displacing adjacent pulmonary parenchyma and vessels 1,2,6,7. However, differentiation between malignant liposarcomas and benign lipomatosis may be challenging on CT images. The typical characteristics of a malignant tumor include invasive growth, infiltration of surrounding structures, rather than displacement, inhomogeneous enhancement after intravenous contrast medium application, attenuation values greater than -50 HU, poor delineation of the lesion, and occurrence of metastases 1,2,7. Ultrasound of the thoracic wall may facilitate the diagnosis, confirming the pleural origin of the tumor 1,8. If there is doubt in radiological diagnosis by CT, MRI may be useful. Its main value is its ability to differentiate between lipomatosis and liposarcoma. Pathological examination is the definitive diagnosis by which differentiation between these two tumors can only be achieved only by, which should differentiate between these two tumors. No definitive lines of a management strategy for pleural lipomatosis have been established as yet. A close monitoring policy with clinical and radiological follow-up may be suitable for patients, especially in those with small and asymptomatic lesion 2,4,7. However, a surgical excision is considered to be the treatment of choice. Sometimes, intracavitary radiotherapy can be, to some extent, valuable, fearing of recurrence. Infiltration of lipomatosis to the surrounding structures can cause severe symptoms, such as for example invasion to intercostal spaces, and induce rib destruction 1,2. Thoracoscopic surgery has become a more common technique for thoracic tumor operations, being an effective, well-endured procedure that is associated with less morbidity and mortality than that with conventional surgery 1,5,9. Surgical resection can be performed easily by an open thoracotomy to provide relief of symptoms and to confirm diagnosis.

### Conclusion:

Pleural lipomatosis, however, is a rare pleural lesion; concern should be put in mind for lipomatosis as being one of the possible etiologies before stating the case as idiopathic effusion. The clinical scenario usually does not involve a neoplastic course as well as a thoracoscopic view; hence, transthoracic ultrasound and/or CT assessment by Hounsfield unit represent important noninvasive diagnostic tools that have the advantages of decreased surgical morbidity, not as much pain, and a reduced duration of hospital stay.

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