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Case Report

Giant primary mediastinal well-differentiated liposarcoma with bilateral thoracic extension causing complete left lung collapse

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ABSTRACT

Primary mediastinal liposarcomas are exceedingly rare mesenchymal tumors that can grow to a massive size before becoming symptomatic, often leading to diagnostic and therapeutic challenges. We present the case of a 45-year-old male with a giant, well-differentiated liposarcoma occupying the entire left hemithorax, anterior mediastinum and extending into the contralateral hemithorax, causing complete collapse of the left lung. The patient underwent a successful complete surgical resection via a single posterolateral thoracotomy, leading to an excellent postoperative outcome. This case highlights the importance of considering this rare entity in the differential diagnosis of large thoracic masses and underscores the feasibility and efficacy of complete surgical excision even for tumors of exceptional size.

1. Introduction

Liposarcoma is a commonly encountered soft tissue sarcoma that accounts for over 20% of mesenchymal tumors often located in the retroperitoneum and limbs [1]. Their occurrence as a primary tumor in the mediastinum however is exceedingly rare, accounting for less than 1% of all mediastinal tumors [2]. Due to the large potential space within the thorax, these tumors can attain a significant size before producing clinical symptoms, which are typically related to compression of adjacent structures such as the lungs, heart, and great vessels [3]. Complete resection of the tumor with negative margins is the best treatment option, and recurrences are often the result of residual tumor after surgery [4]. We report a case of a giant intrathoracic liposarcoma in a middle-aged man who presented with progressive dyspnea and was successfully managed with complete surgical excision. This case report is written according to the SCARE criteria [5].

2. Case presentation

A 45-year-old active-duty military male presented to our clinic with a one-year history of progressively worsening left-sided chest pain and exertional shortness of breath. His symptoms had become significantly more pronounced in the three months prior to presentation, limiting his daily activities. He had no personal or family history of malignancy and denied any history of smoking, diabetes

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mellitus, hypertension, or other chronic medical conditions.

On physical examination, the patient appeared chronically ill. His vital signs were stable. The respiratory examination was notable for absent air entry and dullness to percussion over the lower two-thirds of the left hemithorax. The remainder of the physical examination was unremarkable.

Initial imaging with a chest radiograph followed by a computed tomography (CT) scan of the chest revealed a massive, predominantly fat-density mass occupying the majority of the left thoracic cavity, with interspersed soft tissue components. The mass caused a complete compressive atelectasis of the left lung and extended across the anterior mediastinum into the right hemithorax, displacing the heart and great vessels posteriorly and to the right (Fig. 1). Image guided biopsy was suggestive of liposarcoma. Based on these findings, a presumptive diagnosis of a giant anterior mediastinal liposarcoma with extension into the left hemithorax was made.

The patient was scheduled for elective surgical resection. A left posterolateral thoracotomy was performed through the 5th intercostal space. Upon entering the thoracic cavity, a massive, encapsulated, firm, fatty tumor was identified, occupying the entire left hemithorax (Fig. 2). The left lung was completely collapsed and displaced superiorly and posteriorly. The tumor was found to be attached to the visceral pleura of the inferior surface of the left lower lobe. It extended through the anterior mediastinum, anterior to the pericardium and great vessels, into the contralateral chest cavity.

To facilitate en bloc removal, the 5th rib was resected. The mass was meticulously dissected from its attachments to the lung, pericardium, and chest wall using a combination of blunt and sharp dissection. The contralateral extension was carefully delivered from the right hemithorax through the anterior mediastinum with gentle finger dissection. The entire mass was successfully removed without intraoperative complications or injury to surrounding vital structures.

The left lung was recruited and fully expanded. A 32 French chest tube was placed in bilateral pleural spaces, and the chest was closed in layers. The patient was extubated in the operating room and transferred to the post-anesthesia care unit in stable condition.

The patient's postoperative course was uneventful. A chest radiograph on the first postoperative day showed adequate re-expansion of the left lung with a small residual pleural collection. The chest tube drainage decreased significantly over the next 48 hours, and it was removed on the third postoperative day. The patient was mobilized and discharged home on the fifth postoperative day in good condition.

The resected specimen was a large, well-encapsulated mass measuring 35 x 25 × 15 cm and weighing 4.2 kg. Histopathological examination confirmed the diagnosis of a well-differentiated liposarcoma, with no evidence of high-grade features (Fig. 3). Further immunohistochemical studies were not performed due to resource limitations.

3. Discussion

Liposarcoma is a malignant tumor originating from primitive mesenchymal cells. Primary mediastinal liposarcomas only account for 1% of mediastinal tumors and 2% of all liposarcomas [6]. The majority of intrathoracic liposarcomas arise from the mediastinum. Histologically, liposarcomas are classified into well-differentiated (also termed atypical lipomatous tumor), dedifferentiated, myxoid, and pleomorphic subtypes. Among these, the well-differentiated subtype is the most frequently reported in the mediastinum and is more commonly encountered in the anterior mediastinal compartment than in other mediastinal regions [7].

Their insidious growth pattern often allows them to reach a massive size, as seen in our patient, before causing significant symptoms. The clinical presentation is highly variable and depends on the size and location of the tumor, with symptoms arising from the compression of adjacent organs [8,9]. Our patient's presentation with dyspnea and chest pain is consistent with the mass effect exerted by the large tumor on his lung and mediastinal structures.

Diagnosis is often established using imaging modalities such as computed tomography (CT) or magnetic resonance imaging (MRI), which delineate the extent of the tumor, its relationship to adjacent structures, and its characteristic fatty composition. Histopathological examination is subsequently performed to confirm the diagnosis [10].

Liposarcoma is not sensitive to chemotherapy or radiotherapy and as such radical resection of the tumor mass is the best treatment option. This offers the best prognosis and chance for local control. Given the size and extent of the tumor in our case, a posterolateral



Fig. 1. Preoperative contrast-enhanced CT showing anterior mediastinal and left thoracic huge fat and soft tissue density mass lesion with some extension to the right thoracic cavity as well.

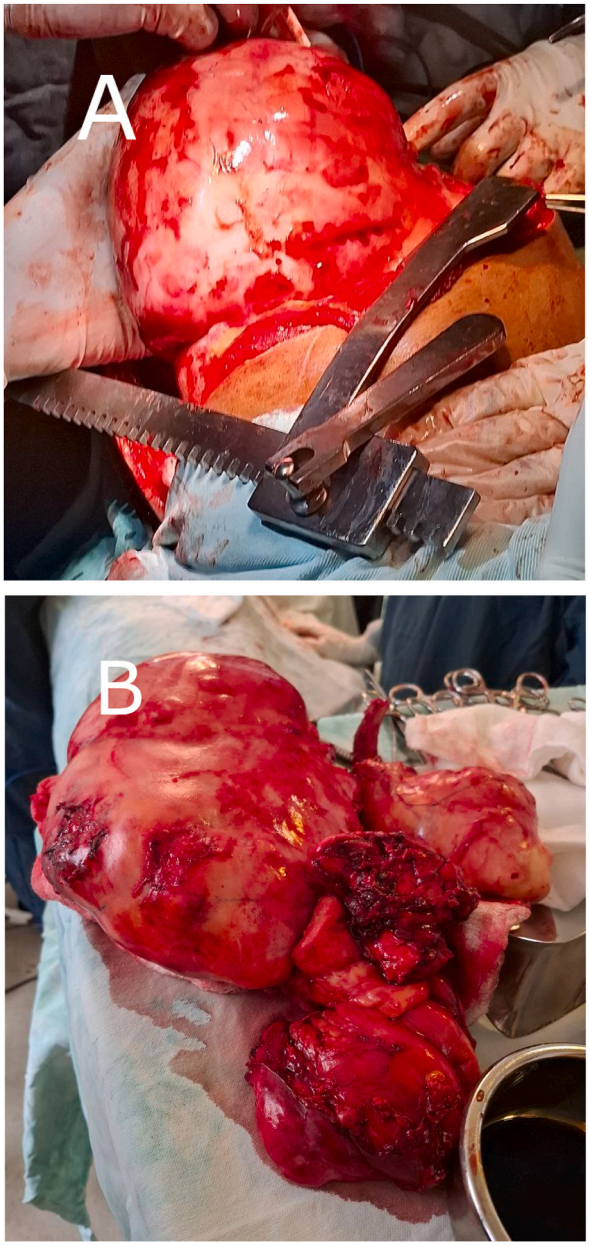


Fig. 2. An intraoperative image showing a firm well encapsulated mass occupying the left hemithorax (A) and Completely resected mass. A portion of the mass was amputated intraoperatively due to difficulty removing it entirely through the incision (B).

thoracotomy provided excellent exposure for complete resection, including the portion extending into the contralateral hemithorax [4, 8]. The prognosis for well-differentiated liposarcomas, like in our patient, is generally favorable after complete resection, although long-term follow-up is necessary due to the potential for local recurrence. Additional therapies such as radiation or repeat resection are typically reserved for relapsed or incompletely resected tumors [11].

This case demonstrates that even exceptionally large intrathoracic liposarcomas can be resected completely with good outcomes. It emphasizes the need for a high index of suspicion and meticulous surgical planning to achieve a successful result.

4. Conclusion

Giant primary intrathoracic liposarcoma is a rare but important differential diagnosis for large thoracic masses. Complete surgical resection is the treatment of choice and can be performed safely with favorable outcomes, even for tumors with extensive local involvement. Unilateral thoracotomy is a safe option for benign tumors that respect boundaries to surrounding structures without the

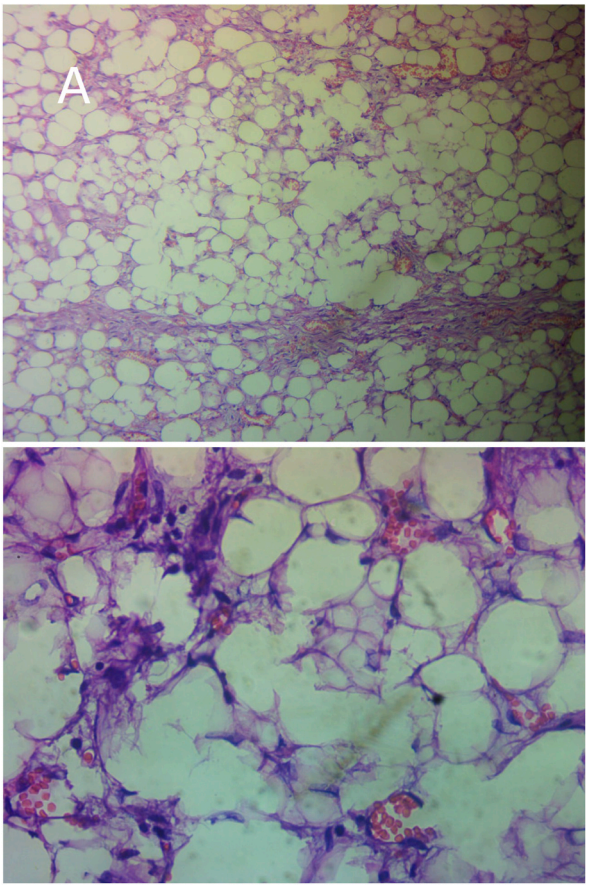


Fig. 3. Postoperative H&E demonstrating poliferation of variable sized Adipocytes with intervening fibrovascular septae (A) and a high power image depicting a lipoblast with its vacuolated cytoplasm and hyperchromatic and relatively centrally located nucleui (B).

need for more aggressive approaches like clamshell incision. Long-term surveillance is warranted to monitor for recurrence.

CRediT authorship contribution statement

Kenzu Mohammed Yesuf: Investigation, Writing – original draft. **Berhanu Nega:** Conceptualization, Investigation, Supervision, Validation. **Robel Tibebu Kasaye:** Conceptualization, Data curation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. **Michael Akalu Geleta:** Data curation, Methodology, Resources, Writing – review & editing. **Muluken Getinet Mekuriaw:** Investigation, Validation, Writing – review & editing. **Abdulmalik Mohammed Abdulmalik:** Data curation, Investigation, Validation.

Ethical statement

Informed consent for publication was obtained from the patient.
Institutional review board approval was not required for this single case report.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

No data was used for the research described in the article.

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