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Case Report

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Skeletal Muscle Metastasis revealing Pulmonary Adenocarcinoma

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Abstract

Skeletal muscle metastasis from non-small cell lung carcinoma (NSCLC) is an uncommon manifestation of a common malignancy. Its diagnosis remains challenging because of its rarity and nonspecific imaging findings. We report the case of a 57-year-old man who presented with lumbar and inguinal pain. Ultrasound examination revealed a suspicious soft-tissue lesion within the left obturator externus muscle. Subsequent contrast-enhanced computed tomography (CT) demonstrated a left upper lobe pulmonary adenocarcinoma with mediastinal lymphadenopathy and multiple muscular metastases, which were confirmed histologically. This case illustrates the diagnostic value of ultrasound and CT in detecting atypical metastatic localizations and underlines the need for systemic evaluation in patients presenting with unexplained muscular lesions.

Introduction

Lung cancer remains the leading cause of cancer-related mortality worldwide, accounting for nearly one in five cancer deaths. Despite advances in early detection and multimodal therapies, its five-year survival rate remains poor, around 14 % [1]. Distant metastases typically involve the adrenal glands, liver, brain, and bones. However, skeletal muscle metastases (SMMs) are extremely rare, with an estimated prevalence below 1 % [2].

SMMs may occur in various muscle groups, including the psoas, paraspinal, gluteal, and thigh muscles. Their pathogenesis is not fully understood: despite the rich vascularization and high oxygen tension of muscles, they appear relatively resistant to hematogenous dissemination. Theories include hematogenous spread via tumor emboli and the presence of aberrant intramuscular lymphatic channels [3,4].

We present a case of pulmonary adenocarcinoma of the left upper lobe, initially revealed by a symptomatic muscle metastasis of the left obturator externus muscle, detected on ultrasound and confirmed by CT and histopathology.

Case Report

A 57-year-old man, chronic smoker, was admitted to our department with persistent lumbar and left inguinal pain evolving over several weeks. Clinical examination revealed a firm, poorly defined deep mass in the left inguinal region, with moderate tenderness and limited hip mobility.

An inguinal ultrasound revealed a poorly defined hypoechoic lesion within the left obturator externus muscle, measuring approximately 50 × 40 mm, heterogeneous with irregular margins and without Doppler vascular uptake (Figure 1). The findings were suggestive of a suspicious muscular lesion of indeterminate nature.

A contrast-enhanced CT scan of the chest, abdomen, and pelvis was performed

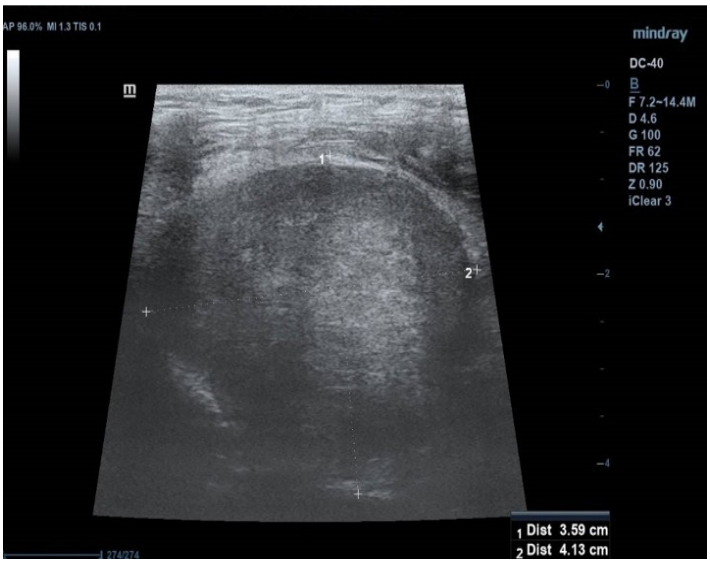

Figure 1: *Ultrasound of the left obturator externus muscle showing a poorly defined hypoechoic lesion with heterogeneous internal echoes and irregular margins without Doppler uptake*

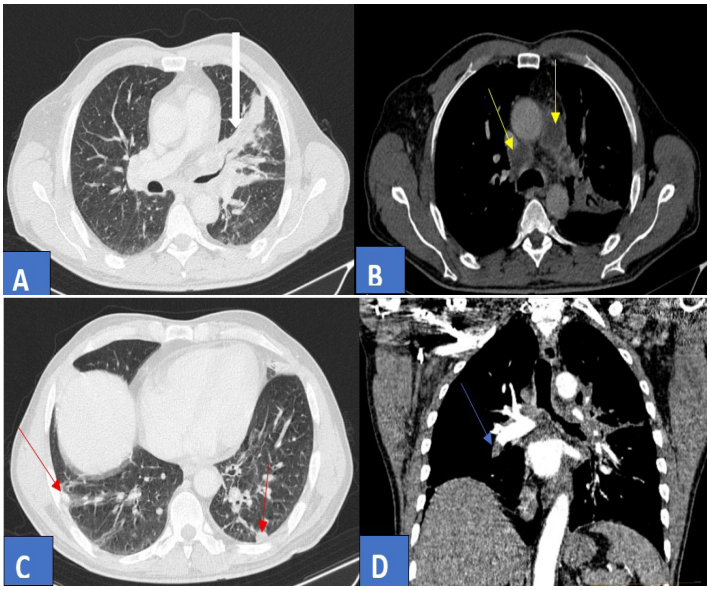

Figure 2: *Axial Contrast-enhanced CT scan of the chest parenchymal (A and C) and mediastinal(B) windows showing a left upper lobe heterogeneous mass (white arrow) with multiple mediastinal lymph nodes (yellow arrow) , bilateral parenchymal nodules(red arrow) and segmental pulmonary embolism within the right lower lobe pulmonary artery. (blue arrow).*

for further evaluation. It revealed a heterogeneous mass in the left upper lobe of the lung, associated with mediastinal lymphadenopathy and bilateral pulmonary nodules, consistent with primary lung carcinoma. It also revealed a segmental pulmonary embolism within the right lower lobe pulmonary artery. In addition, multiple soft-tissue lesions were observed: one in the left obturator internus and externus muscles, another in the paravertebral region near T12, and a smaller one in the left subclavicular muscle (Figures 2 and 3).

A CT-guided core biopsy of the pulmonary mass

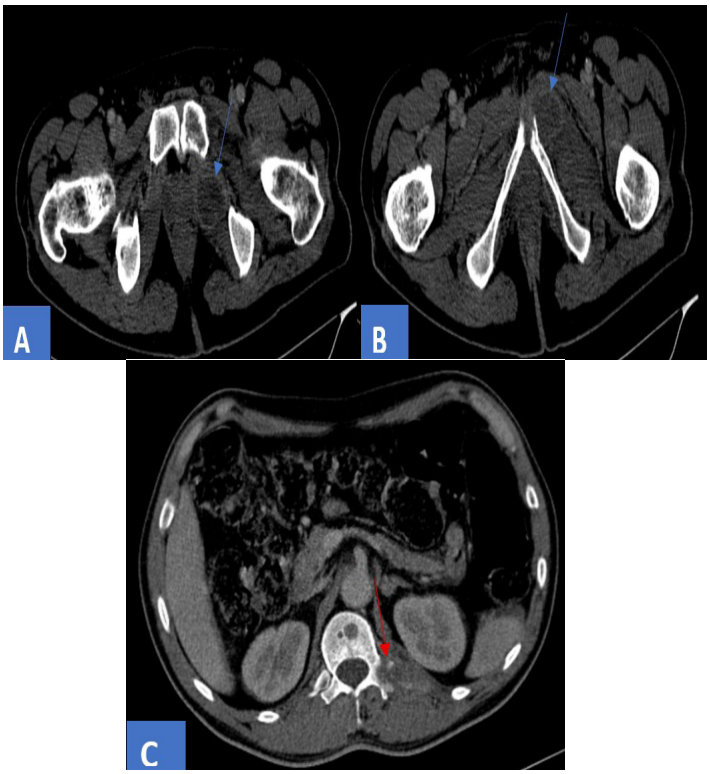

Figure 3: *Axial and coronal CT scan showing rounded metastases involving the internus and externus left obturator muscles (Blue arrow) , and paravertebral left tissue at the T12 level (red arrow).*

confirmed poorly differentiated adenocarcinoma. The muscle lesion biopsy revealed identical histological features, confirming skeletal muscle metastasis from pulmonary adenocarcinoma.

Discussion

Skeletal muscle metastases from lung cancer are exceedingly uncommon, despite the high incidence of the primary tumor. In the largest reported series, the prevalence was less than 1 % of all lung cancers [2]. The muscles most frequently affected include the psoas, paraspinal, gluteal, and thigh groups, while pelvic muscles such as the obturator externus are rarely involved.

Several mechanisms have been proposed to explain this rarity: constant muscle motion, local pH changes, and high lactic acid concentration may inhibit tumor implantation. The most widely accepted hypothesis remains hematogenous dissemination via tumor emboli, facilitated by microvascular injury or venous congestion [3,4].

Clinically, SMMs may manifest as painful or firm swellings, occasionally mimicking soft-tissue abscesses, hematomas, or primary sarcomas. In our patient, lumbar and inguinal pain were the initial symptoms leading to imaging work-up.

Imaging plays a key role in detection and characterization.

Ultrasound is often the first-line investigation for

localized pain or swelling. Metastases usually appear as hypoechoic, heterogeneous lesions with irregular contours, occasionally with minimal Doppler flow [5].

CT enables assessment of lesion extent, density, and enhancement pattern, and is particularly useful for identifying multiple sites in staging studies [6].

MRI can further evaluate tissue planes and differentiate metastases from infectious or inflammatory myositis; typical findings include low signal on T1 and high signal on T2-weighted images [7].

Histologic confirmation remains essential, especially to distinguish metastases from soft-tissue sarcomas or inflammatory pseudotumors.

Therapeutic options depend on the extent of disease. Localized lesions may benefit from surgical resection or radiotherapy, but in most cases, treatment is palliative, aiming to relieve symptoms and maintain mobility. Prognosis remains poor and closely tied to the burden of systemic disease [4,8].

This case underlines the importance of considering metastatic disease in patients with new muscular lesions, especially in individuals with known or suspected lung malignancy.

Conclusion

Skeletal muscle metastasis is an unusual presentation of lung adenocarcinoma. Its clinical and imaging features are often nonspecific, requiring histopathological confirmation. Ultrasound is a valuable initial tool, and CT is indispensable for staging and detecting multiple sites. Recognizing this rare metastatic pattern allows timely diagnosis and optimal management.

Informed consent: Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

Ethics approval: Our institution does not require ethical approval for reporting individual cases or case series

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