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Subphrenic Mass Revealing Lung Carcinoma: A Case Report

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ABSTRACT

Lung cancer is the second most prevalent malignancy and the leading cause of cancer-related mortality worldwide. It typically manifests through respiratory symptoms, and parietal or subphrenic metastases as the initial presentation remain exceedingly rare. We report the case of a 72-year-old man, a severe chronic smoker, who presented with right hypochondrium pain. Ultrasound and thoraco-abdominal computed tomography revealed a subphrenic parietal mass associated with a spiculated nodule in the right upper lobe, pleural carcinomatosis, and multiple lymphadenopathies. Biopsy of the parietal mass revealed metastasis from a poorly differentiated carcinoma; an extended immunohistochemical panel confirmed a pulmonary origin. A parietal or subphrenic mass can be the presenting sign of lung cancer. This rare clinical presentation should not be mistaken for a benign soft-tissue lesion; biopsy with histological and immunohistochemical study remains essential to confirm the diagnosis.

KEYWORDS

subphrenic mass; parietal metastasis; poorly differentiated carcinoma; lung cancer.

MAIN ARTICLE

INTRODUCTION

Lung cancer is a leading cause of cancer death worldwide, particularly among smokers.(1) It may present with typical respiratory symptoms, but can also, more rarely, be revealed by an inaugural metastatic site: cutaneous, muscular, parietal, or subphrenic.(2) These atypical presentations can mislead the initial diagnosis. We report a case of a subphrenic/parietal mass leading to the diagnosis of a poorly differentiated carcinoma strongly suspected, on radiological grounds, to be of pulmonary origin, in a patient with severe chronic smoking history.

CASE PRESENTATION:

The patient was a 72-year-old man, a severe chronic smoker with a 30 pack-year history, with no other notable medical history, who presented with right hypochondrium pain evolving over one month, associated with unquantified weight loss. Clinical examination revealed a superficial, firm mass without local inflammatory signs.

First-line abdominal ultrasound showed a heterogeneous, hypoechoic mass in contact with the liver, initially raising suspicion of a hepatic or subphrenic origin (Figure 1).

Contrast-enhanced thoraco-abdomino-pelvic computed tomography was performed. At the thoracic level, it showed a spiculated, ill-defined, contrast-enhancing lesion in the right upper lobe (ventral segment), associated with nodular pleural enhancement and pleural nodules, and multiple ipsilateral lymphadenopathies (right supraclavicular, right paratracheal, and mediastinal). An additional parietal mass involving the left chest wall (intercostal space) was also identified, ovoid, well-defined, and enhancing after contrast administration. In addition, a right subphrenic parietal mass produced scalloping of hepatic segment IVb; it was ovoid, fairly well-defined, with regular contours, hypodense, heterogeneously enhanced after contrast administration, with a necrotic center (Figure 2).

Given this multifocal lesion pattern, a biopsy of the right subphrenic parietal mass was performed. Histopathological examination and immunohistochemistry confirmed a metastatic deposit of a poorly differentiated lung carcinoma.

The case was discussed at a multidisciplinary oncology tumor board; the therapeutic decision was pending at the time of writing.

DISCUSSION

Primary lung carcinoma typically manifests with central or peripheral respiratory symptoms, including cough, hemoptysis, dyspnea, or chest pain. In advanced stages, inaugural presentations secondary to distant metastases are not uncommon—frequently involving the brain, bones, liver, or adrenal glands. However, initial presentation as a subphrenic or parietal muscular mass remains an exceptionally rare clinical scenario, accounting for less than 1% to 2% of initial lung cancer manifestations.(3)

From an anatomical and pathophysiological standpoint, parietal or subphrenic involvement usually occurs via three main routes: direct extension from a contiguous peripheral pulmonary lesion through the pleura, hematogenous dissemination, or lymphatic spread. In our patient, the presence of diffuse pleural carcinomatosis alongside a distinct subphrenic mass favoring segment IVb scalloping suggests either micro-transdiaphragmatic lymphatic communication or systemic hematogenous seeding, rather than direct chest wall invasion.(4)

On cross-sectional imaging, subphrenic and chest wall metastases present a diagnostic challenge. On ultrasound, they typically appear as non-specific, heterogeneous, hypoechoic soft-tissue masses. Contrast-enhanced computed tomography (CT) plays a pivotal role in characterizing these lesions, often demonstrating a central necrotic component with heterogeneous rim enhancement, alongside cortical bone erosion or adjacent organ compression (e.g., hepatic scalloping).(5) Crucially, the key to diagnosis lies in maintaining a low threshold for extending the abdominal acquisition to a full thoraco-abdominal CT, which allows for the detection of an occult primary pulmonary lesion (such as the spiculated right upper lobe nodule in our case) and synchronous locoregional lymphadenopathy.

The differential diagnosis of a subphrenic or upper abdominal parietal mass is broad. It includes primary soft-tissue sarcomas, solitary fibrous tumors, peripheral nerve sheath tumors, abscesses, hematomas, and direct invasion or metastasis from intra-abdominal malignancies (e.g., hepatocellular carcinoma, renal cell carcinoma, or gastrointestinal tract carcinomas).(6)

Given the lack of pathognomonic radiological features, percutaneous ultrasound- or CT-guided core needle biopsy remains mandatory. Histopathological examination coupled with a targeted immunohistochemical (IHC) panel—typically including TTF-1 (Thyroid Transcription Factor-1), Napsin A, CK7, and p40/p63—is critical to confirm the epithelial

nature of the lesion, differentiate adenocarcinoma from squamous cell carcinoma, and rule out primary abdominal or soft-tissue neoplasms.(7)

Finally, the identification of atypical metastatic sites carries significant prognostic and therapeutic implications. Such presentations automatically classify the disease as Stage IV (M1b/M1c under the 8th Edition AJCC TNM staging system), shifting the therapeutic paradigm toward palliative systemic options—including chemo-immunotherapy or targeted therapies guided by molecular profiling (EGFR, ALK, ROS1, PD-L1)—rather than surgical resection.(8)

CONCLUSION

Subphrenic or parietal masses represent an unusual and misleading initial presentation of primary lung carcinoma. Radiologists and clinicians should keep pulmonary malignancies in the differential diagnosis of atypical abdominal soft-tissue lesions, particularly in elderly patients with a heavy smoking history. A comprehensive contrast-enhanced thoraco-abdominal CT is essential for complete staging and identification of the primary site, while image-guided biopsy with immunohistochemical analysis remains the gold standard for securing a definitive diagnosis and guiding systemic therapy.

FIGURES:

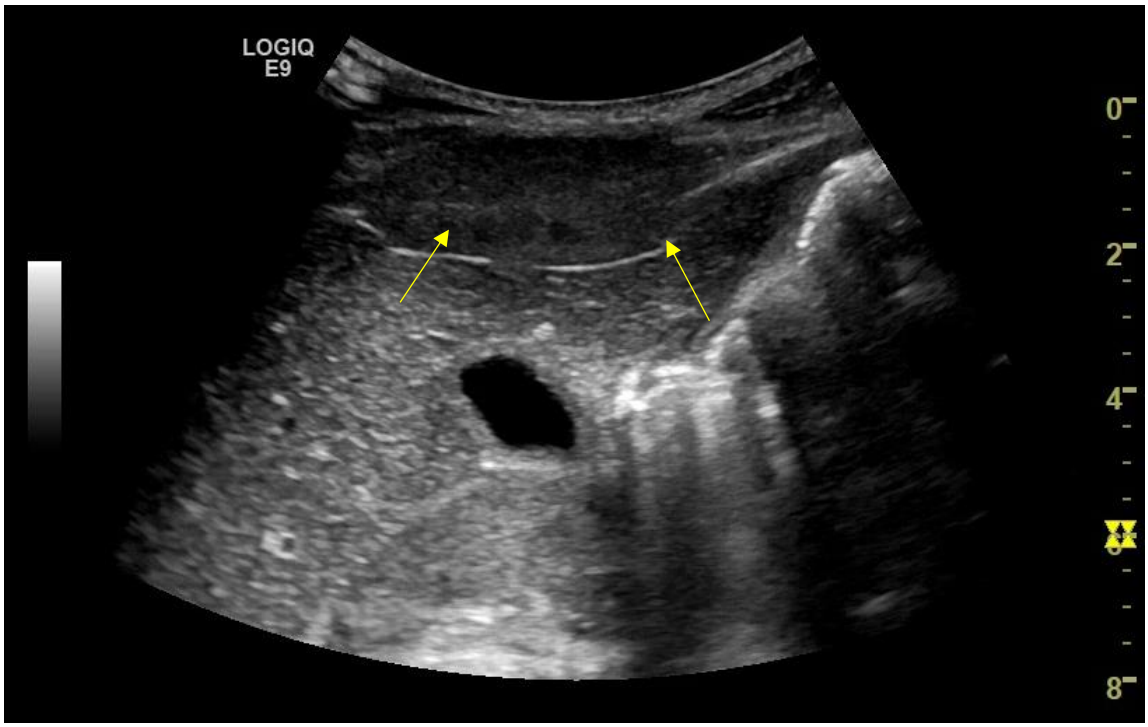

Figure 1: B-mode ultrasound of the right upper quadrant showing a heterogeneous, hypoechoic tissue mass located in the subphrenic parietal space, causing local mass effect and scalloping on adjacent hepatic segment IVb.(yellow arrow)

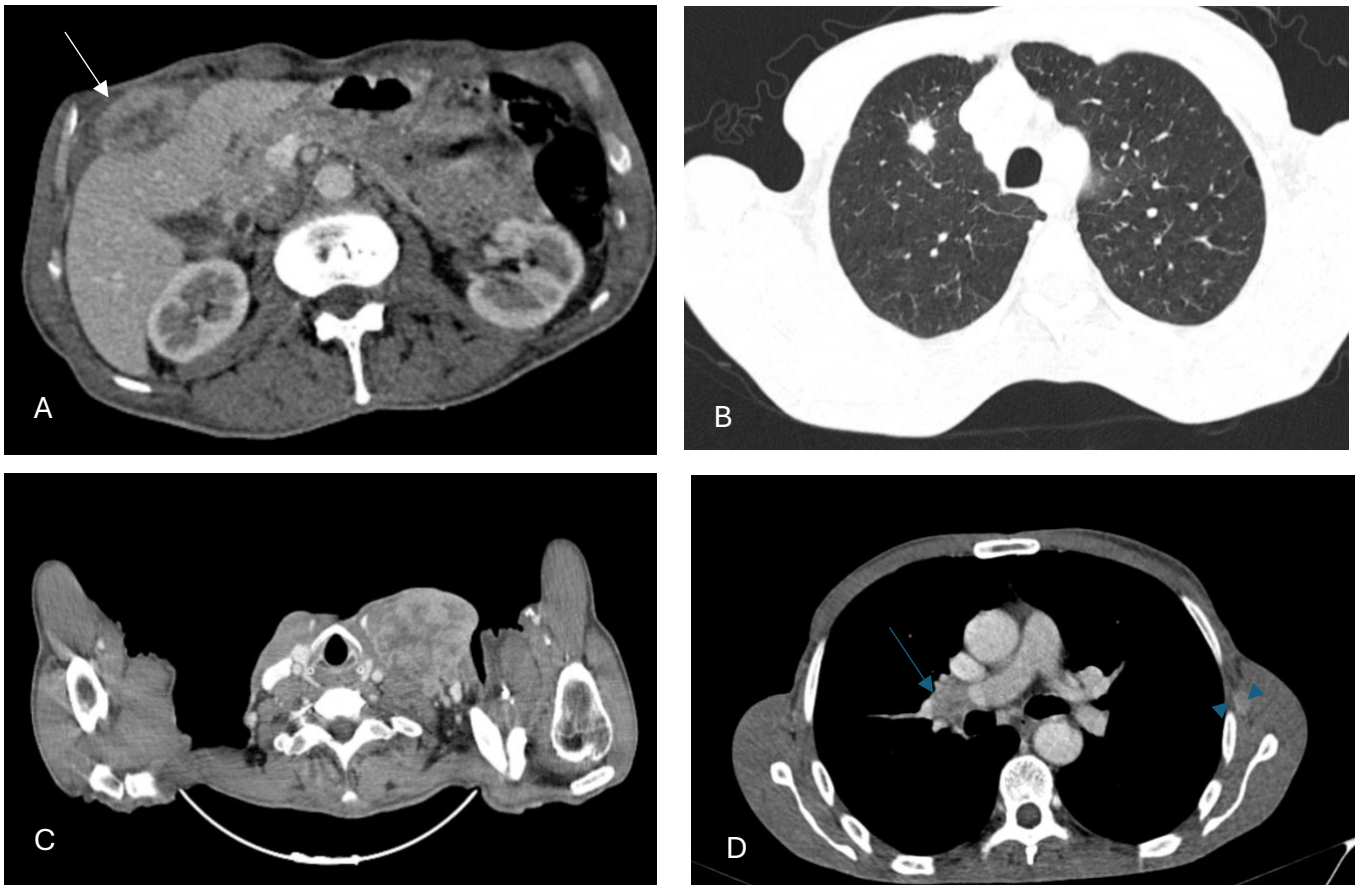

Figure 2: Computed tomography scans reveal: (A) A right subphrenic mass with central necrosis that enhances after contrast administration, causing a scalloping effect on the liver parenchyma. (white arrow) (B) Lung window image displaying a spiculatated nodule in the right upper lobe. (C) Necrotic left supraclavicular lymphadenopathy. (D) Mediastinal window demonstrating hypodense right hilar lymphadenopathy (blue arrow) in close contact with the right pulmonary artery branch, as well as an ovoid, regularly contoured, enhancing parietal mass involving the left intercostal space of the chest wall (blue arrowheads).

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