

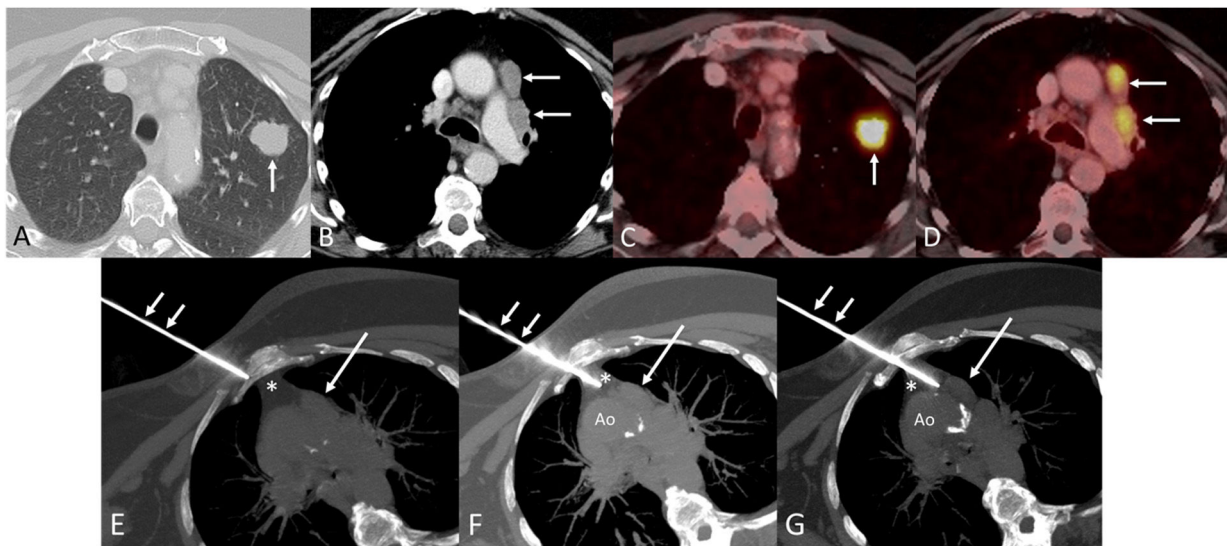
Clinical Image

## The Renewed Role of Interventional Thoracic Radiology in TNM-9 Staging of Left Upper Lobe Lung Cancer With Ipsilateral Mediastinal Involvement Inaccessible to Endobronchial Ultrasound

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**Fig. 1.** (A) Axial chest CT image (lung window) showing a solid nodule in the left upper lobe (arrow). (B) Axial CT image (mediastinal window) demonstrating enlarged lymph nodes in the prevascular and paraaortic stations of the ipsilateral mediastinum (arrows). (C and D) Axial fused PET/CT images showing intense FDG uptake in the left upper lobe nodule (C) and the ipsilateral mediastinal lymph nodes (D) (arrows). (E–G) Axial CT images demonstrating progressive transmediastinal needle insertion (short arrows) through the chest wall (E) and mediastinal fat pad (F) to reach the enlarged preaortic lymph node (large arrow, G). The asterisk denotes the transmediastinal trajectory. Note the right parasternal extrapulmonary approach and semilateral decubitus patient positioning to avoid aortic (Ao) puncture.

A 67-year-old patient with a history of smoking was found to have a solid nodule in the left upper lobe (LUL) and enlarged ipsilateral mediastinal lymph nodes involving stations 3A and 6, with extension to station 5, on chest computed tomography (CT) (Fig. 1A and B). Whole-body positron emission tomography–computed tomography (PET/CT) demonstrated intense fluorodeoxyglucose (FDG) uptake in both the LUL nodule and the ipsilateral enlarged mediastinal lymph nodes (Fig. 1C and D), consistent with clinical stage cT1cN2bM0 disease.

Because the involved mediastinal lymph node stations were not accessible using endobronchial ultrasound (EBUS), a percutaneous CT-guided transmediastinal biopsy was performed via a parasternal approach (Fig. 1E–G). The procedure was uneventful and confirmed metastatic involvement of the paraaortic lymph nodes, allowing comprehensive immunohistochemical and molecular characterization. The patient subsequently underwent definitive chemoradiation followed by consolidation immunotherapy.

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Accurate mediastinal staging remains a cornerstone in the management of lung cancer, as nodal involvement directly influences treatment strategy and prognosis. Although EBUS is the preferred first-line technique for mediastinal nodal sampling, lymph node stations 3A, 6, and 5 – frequently involved in LUL lung cancers – are not routinely accessible using this approach. In such cases, confirmatory staging traditionally relies on more invasive procedures, including mediastinoscopy, anterior mediastinotomy, or video-assisted thoracoscopic surgery.

The recent introduction of the TNM ninth edition has further underscored the importance of precise mediastinal nodal assessment by subdividing N2 disease into N2a (single mediastinal nodal station involvement) and N2b (multiple mediastinal nodal station involvement). Within this evolving staging framework, interventional thoracic radiologists have regained a pivotal role by performing image-guided transmediastinal biopsies, enabling safe and effective sampling of mediastinal nodal stations inaccessible by EBUS. By providing histopathologic confirmation, percutaneous mediastinal biopsy may reduce the need for surgical staging procedures, streamline diagnostic pathways, and expedite initiation of appropriate oncologic therapy.

#### **CRedit authorship contribution statement**

All authors contributed equally to the manuscript writing. L.G. selected and edited the radiological images. All authors provided input to the final version of the manuscript.

#### **Ethical considerations**

This article does not involve any studies on human participants conducted by the authors.

#### **Informed consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal.

#### **Declaration of generative AI and AI-assisted technologies in the writing process**

The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

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#### **Conflicts of interest**

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