Case Report

Triple CT-Guided Biopsy in a Lung Cancer Patient Performed in a Single Diagnostic Interventional Session and Revealing Two Neoplasms

Luis Gorospe, Miguel Ángel Gómez-Bermejo, Sofía Ventura-Díaz, Patricia Paredes-Rodríguez

* Department of Radiology, Ramón y Cajal University Hospital, Madrid, Spain
† Department of Nuclear Medicine, Ramón y Cajal University Hospital, Madrid, Spain

Lung cancer is the leading cause of cancer death worldwide and, unfortunately, the majority of patients present with advanced/metastatic disease.1 A significant proportion of lung cancer patients present with just one or few distant metastases (oligometastatic patients) on imaging, which raise diagnostic and therapeutic concerns and may have a different prognosis than patients with a larger number of distant metastases.2 Tissue diagnosis of (oligometastatic) extrapulmonary lesions in certain patients may allow differentiation between extrapulmonary lung cancer metastasis and an organ-specific primary tumor. We present

Fig. 1. (A) Axial CT image (lung window) shows a suspicious lung nodule in the left upper lobe (asterisk). (B and C) Axial CT images show an ill-defined left retroperitoneal mass (B, asterisk) and an enlarged right lymph node (C, arrow). (D–F) Axial fused PET/CT images corresponding to lesions shown in A–C, respectively, show intense FDG uptake by the left upper lobe lung nodule but mild FDG avidity by the retroperitoneal lesion and inguinal lymph node. (G–I) Axial CT images show the needles targeting the enlarged right inguinal lymph node (G), the left retroperitoneal lesion (H), and the left upper lobe nodule (I), respectively. The duration of the triple lung biopsy procedure was 54 min (time elapsed between the acquisition of the first CT scout and the last series acquisition), and the patient was discharged 6 h following the procedure.
the case of a patient in whom a triple computed-tomography (CT)-
guided core-needle biopsy performed in a single interventional
procedure allowed the diagnosis and correct staging of two simul-
taneous neoplasms.

A 74-year-old active smoker female was found to have a
suspicous lung nodule in the left upper lobe (Fig. 1A). An
18F-fluorodeoxyglucose (FDG) whole-body positron emission
tomography/CT (PET/CT) performed for staging purposes ruled out
mediastinal involvement but detected two additional extrathoracic
lesions: a left retroperitoneal mass (Fig. 1B) and an enlarged right
inguinal lymph node (Fig. 1C). PET/CT also confirmed that the FDG-
avidity of the lung lesion (maximum standardized uptake value
[SUVmax]: 9.8) was significantly different than that of the extrapulmonary
lesions (SUVmax of retroperitoneal mass: 5.7; SUVmax of inguinal lymph node: 5.2), suggesting the possibility that the
three lesions could represent different conditions (Fig. 1D–F). Since
the patient was taking aipababan for atrial fibrillation, the interven-
tional thoracic radiologist proposed to attempt a triple CT-guided
core-needle biopsy during one single session. The uneventful triple
CT-guided core-needle biopsy procedure was performed sequen-
tially: first, the lesion with the lowest anticipated biopsy-related
risk (the inguinal lymph node) was biopsied (Fig. 1G); second, the
lesion with an intermediate biopsy-related risk (the retroperitoneal
mass) was biopsied (Fig. 1H); and last, the lesion with the high-
est biopsy-related risk (the lung nodule) was biopsied (Fig. 1I).

The pathological diagnosis confirmed that the pulmonary lesion
was a primary lung adenocarcinoma (stage I) whereas the other 2
lesions represented a non-Hodgkin’s lymphoma. The patient was
treated first for her lung cancer (thoracoscopic surgery) and 1
month later she initiated systemic chemo-immunotherapy for the
non-Hodgkin’s lymphoma.

A significant proportion of lung cancer patients present with just
one or few distant metastases (oligometastatic patients) on imag-
ing, which raise diagnostic and therapeutic concerns and may have
a different prognosis than patients with a larger number of dis-
tant metastases. Additionally, the detection on imaging tests of one
or just a few extrapulmonary lesions in patients with lung cancer
does not necessarily imply that they correspond to metastases.

In patients with oligometastatic extrapulmonary disease, tissue
diagnosis may allow differentiation between extrapulmonary lung
cancer metastasis and an organ-specific primary tumor, and thus

may significantly impact patient staging and management. Unlike
conventional staged-biopsy procedures in patients with more than
one tumor lesion (in which patients return following a convales-
cent period for the second or subsequent biopsy), our single-session
triple CT-guided biopsy allowed an expeditious histological diagno-
sis of two different neoplasms, a correct staging of both malignant
tumors, and a prompt management of both cancers.

We believe that our case is interesting since a triple percu-
taneous CT-guided biopsy performed in a single interventional
procedure in lung cancer patients has not been previously docu-
mented. We also believe that histological confirmation of suspected
extrapulmonary metastases should be attempted as early as possi-
ble in some oligometastatic lung cancer patients, especially
if imaging modalities (particularly PET/CT) suggest a differing
metabolic behavior.

Authors’ contributions

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not only the conception and design of the manuscript, but also the
drafting and critical revision of the article.

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Conflict of interest

The authors declare no conflict of interest.

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