



# Pancreatic metastasis from non-small-cell lung cancer diagnosed using endoscopic ultrasound-guided fine needle aspiration biopsy: A case report

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## ABSTRACT

A 56-year-old man presented with a chest computed tomography (CT) finding of a right upper lobe nodule, which was diagnosed using brush cytology as adenocarcinoma stage IB (cT2aN0M0). Repeat CT scan for preoperative evaluation revealed a small, slightly hypodense spot in the pancreatic body, which was diagnosed as pancreatic metastasis from lung cancer using endoscopic ultrasound-guided fine needle aspiration biopsy (EUS-FNAB). Because of the presence of distant metastasis, surgical resection was deferred and chemotherapy was chosen instead. Pancreatic metastasis from non-small-cell lung cancer (NSCLC) is rare and might present with few symptoms when the tumor is small. EUS-FNAB is a useful modality for detecting and providing accurate histological diagnosis of pancreatic tumors. Although pancreatic metastasis from NSCLC is rare, appearance of a new lesion in the pancreas should immediately warrant EUS-FNAB.

**Keywords:** Pancreatic metastasis, non-small-cell lung cancer, endoscopic ultrasound, endoscopic ultrasound-guided fine needle aspiration biopsy

## INTRODUCTION

Pancreatic metastasis from the lungs is rare and accounts for less than 5% of pancreatic malignancies that are not detected on autopsy (1). The most common indication for pancreatic metastasectomy is spread from renal cell carcinoma (RCC), whereas the most common metastatic sites of lung cancer are the adrenal glands, liver, brain, and bones (2,3). A previous systematic review identified only 27 publications with data from 32 patients who underwent pancreatic metastasectomy for metastases from lung cancer (4). Therefore, detection of metastatic lung cancer to the pancreas is relatively rare in a living patient (i.e., not on autopsy). Furthermore, detection of small pancreatic tumors and differentiating between malignant and benign etiologies are difficult. Endoscopic ultrasound-guided fine needle aspiration biopsy (EUS-FNAB) is a useful modality to improve the diagnosis of pancreatic tumors and to guide the treatment plan (5). In this study, we described a rare case of pancreatic metastasis from non-small-cell lung cancer (NSCLC) that was diagnosed using EUS-FNAB.

## CASE PRESENTATION

A 56-year-old man with a smoking history of 42 pack-years underwent regular follow-up computed tomography (CT) scans for adult-onset type II citrullinemia and idiopathic pulmonary fibrosis. In 2015, CT scan revealed a right upper lobe nodule measuring 31 mm in diameter; no mass was observed in the pancreas (Figure 1). Bronchoscopy was performed, and he was diagnosed with adenocarcinoma using brush cytology. Positron emission tomography/CT (PET/CT) showed high fluorodeoxyglucose uptake in the right upper lobe nodule and no abnormal uptake in the hilar and mediastinal lymph nodes, as well as in other organs, including the pancreas (Figure 2).

Based on a clinical staging of cT2aN0M0 (stage IB), we decided to surgically resect the lung cancer. Two months after the nodule was detected, we performed a repeat CT scan (Synapse Vincent; Fujifilm Medical, Tokyo, Japan) to prepare a preoperative three-dimensional imaging of the pulmonary vessels and bronchi.

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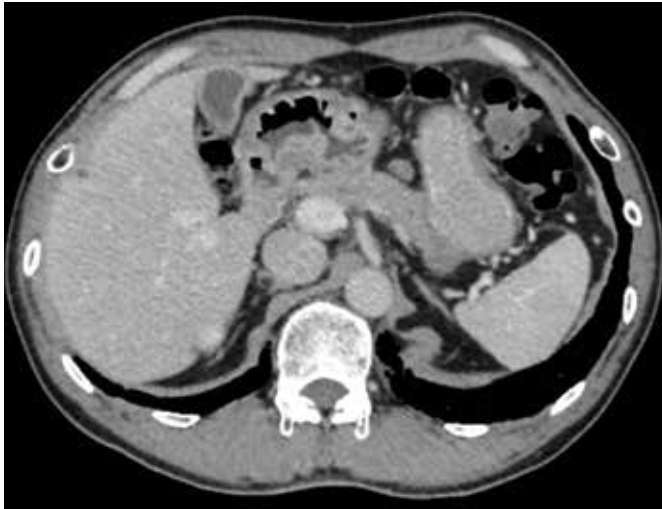
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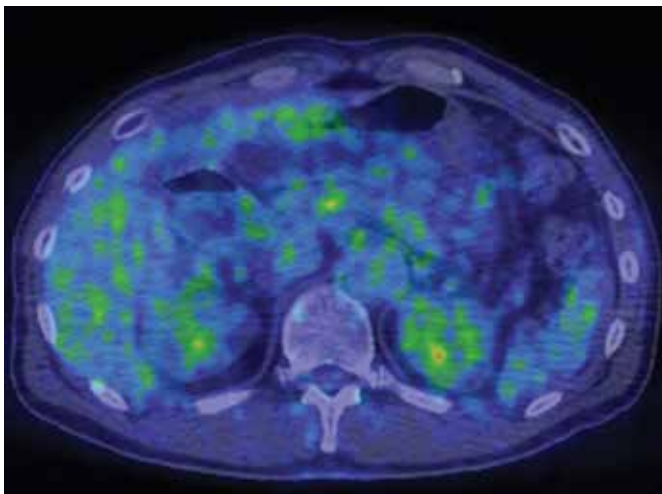
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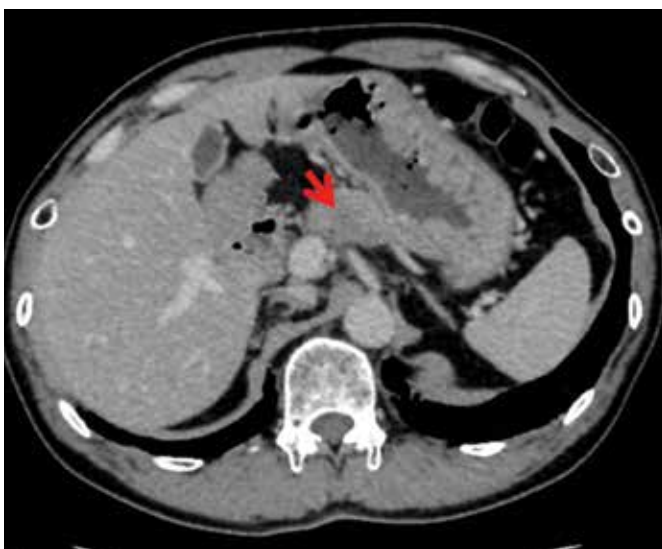
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**Figure 1.** Computed tomography (CT) images on routine workup. There is no mass in the pancreas



**Figure 2.** There is no abnormal uptake in the pancreas on positron emission tomography/computed tomography (PET/CT)



**Figure 3.** Repeat computed tomography (CT) scan after 2 months reveals a small and slightly hypodense spot in the pancreatic body

At this time, CT scan revealed a new small slightly hypodense spot in the pancreatic body (Figure 3). On retrospective review, the small pancreatic tumor was not present in the preceding CT scan. Our considerations were as follows: 1) lung metastasis from pancreatic cancer, 2) pancreatic metastasis from lung cancer, or 3) double primary lung and pancreatic cancers.

To decide the treatment plan, EUS was performed, and it revealed a hypoechoic mass in the pancreatic body, which was biopsied using EUS-FNAB (Figure 4). Histopathological examination using hematoxylin-eosin stain revealed adenocarcinoma (Figure 5); thyroid transcription factor-1 (TTF-1) was positive (Figure 6). In general, TTF-1 is negative and CA19-9 is positive in pancreatic cancer, whereas TTF-1 is positive in lung adenocarcinoma. Based on these results, we diagnosed the patient with pancreatic metastasis from primary lung cancer stage IV [c-T2aNxM1b (pancreas)]. Thereafter, the patient was administered chemotherapy with carboplatin and weekly paclitaxel. Three months after detection, the pancreatic metastasis progressed, and the patient died despite two courses of chemotherapy.

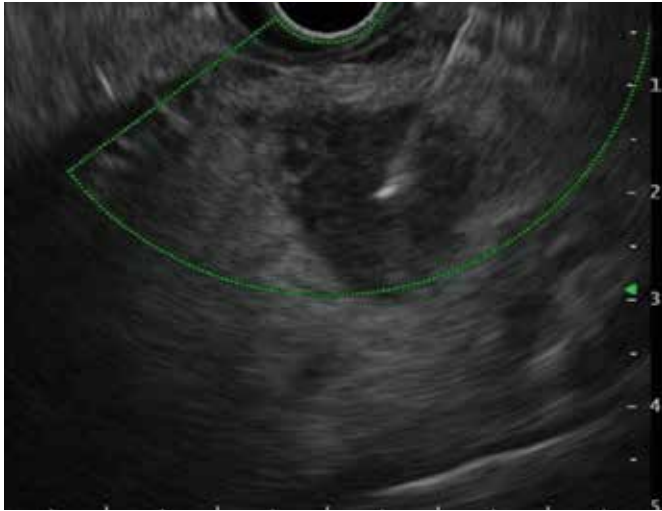
Written informed consent was obtained from the patient for publication of this case report and its accompanying images.

## DISCUSSION

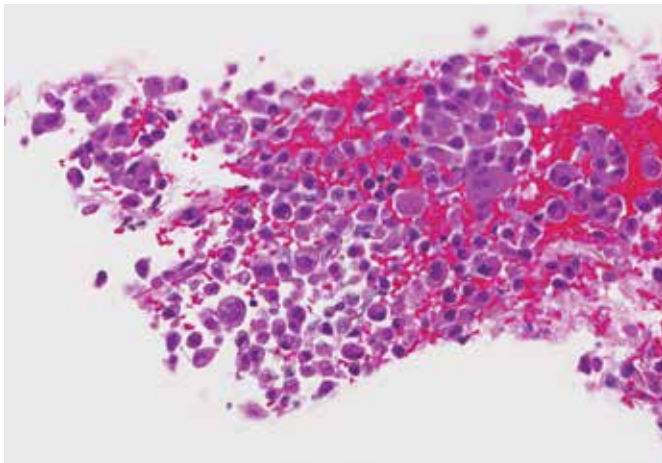
Pancreatic metastasis from the lungs is rare and accounts for less than 5% of pancreatic malignancies in living patients. The most common indication for pancreatic metastasectomy is spread from RCC (2). Yoon et al. (6) reported 53 pathologically proven pancreatic tumors that were metastases from RCC (n=14), gastric cancer (n=11), colorectal cancer (n=5), lymphoma (n=4), NSCLC (n=3), and small-cell lung cancer (n=2). According to that report, pancreatic metastasis from NSCLC was extremely rare at <0.28%, small in size, and presented with few symptoms. Therefore, it is unusual to detect pancreatic metastasis from NSCLC, except during autopsy. Adler et al. (2) reported that only eight of 399 patients underwent pancreatectomy for metastatic pancreatic cancer from the lungs. Because the number of cases is small, evidence that will support pancreatectomy for oligometastasis from NSCLC is inadequate.

In this case, the pancreatic tumor was not detected by PET/CT and CT scan 2 months earlier. Fortunately, we were able to classify the lung cancer as stage IV using EUS-FNAB preoperatively; we were able to avoid unnecessary surgery and administered chemotherapy instead. The rapid progression of the pancreatic metastasis within 3 months of detection supported our decision that the pancreatic tumor was inoperable.

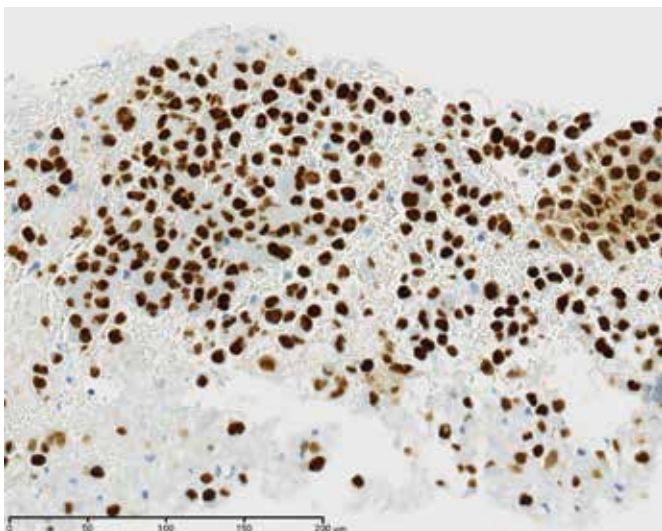
Okasha et al. (7) reported that the sensitivity and specificity was 84% and 100%, respectively, for EUS-FNA, and 85.5% and 90.4%, respectively, for percutaneous ultrasound-guided FNA (US-FNA); EUS-FNA had nearly the same accuracy (88.9%) as US-FNA (87.2%) for the diagnosis of pancreatic tumor. An ad-



**Figure 4.** Endoscopic ultrasound (EUS) revealed a hypoechoic mass in the pancreatic body, which is biopsied using endoscopic ultrasound-guided fine needle aspiration biopsy (EUS-FNAB)



**Figure 5.** Photomicrograph of the endoscopic ultrasound-guided fine needle aspiration biopsy (EUS-FNAB) sample from the pancreatic tumor. There are acinar adenocarcinomas (hematoxylin-eosin stain)



**Figure 6.** Photomicrograph of the endoscopic ultrasound-guided fine needle aspiration biopsy (EUS-FNAB) sample from the pancreatic tumor. Immunohistochemistry is positive for thyroid transcription factor-1 (TTF-1)

vantage of EUS-FNA is the lower complication rate (1.38%) compared with that of US-FNA (5.6%). In addition, lesions <20 mm in size were not easily visible or accessible by US-FNA. Therefore, we considered that EUS-FNAB is the first choice for the detection and accurate histological diagnosis of pancreatic tumors, particularly when the tumor is small. Although pancreatic metastasis from NSCLC is rare, appearance of a new lesion in the pancreas should immediately warrant EUS-FNAB for the appropriate choice of treatment.

**Informed Consent:** Written informed consent was obtained from the patient for publication of this case report and its accompanying images.

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**Author contributions:** Concept - N.K., H.S.; Design - N.K., H.S.; Supervision - Y.M.; Data Collection and/or Processing - N.K., H.S., H.N., H.K., Y.M.; Analysis and/or Interpretation - N.K., H.S., H.N., H.K., Y.M.; Literature Search - N.K., Y.M.; Writing - N.K.; Critical Reviews - H.S., H.N., H.K., Y.M.

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**Conflict of Interest:** The authors have no conflicts of interest to declare.

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