

# Metastasis to the Thyroid from Pulmonary Adenocarcinoma: Appearing as a Solitary Benign Looking Thyroid Mass on US

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A 62-year-old woman presented with lung cancer, and underwent FDG-PET/CT for staging. On PET/CT, thyroid mass with increased FDG uptake was incidentally found. Ultrasonography revealed a well-defined heterogeneous hypoechoic mass without microcalcification in right lobe of thyroid, appearing as benign thyroid mass. Subsequently, the thyroid mass was confirmed as metastasis by fine needle aspiration biopsy for staging. Thyroid metastases are uncommon, and may show sonographic findings of primary thyroid carcinoma except microcalcification. We report a case of thyroid metastasis mimicking solitary benign thyroid mass on ultrasonography.

**Key Words:** Thyroid, Ultrasonography (US), Metastasis

## Introduction

Thyroid metastases are uncommon but can be detected more frequently with routine use of fine needle aspiration biopsy (FNAB).<sup>1)</sup> Metastatic lesions to the thyroid may be presented with palpable thyroid nodules or incidentally found during imaging work-up of primary tumor.<sup>1-3)</sup> On ultrasonography (US), thyroid metastases can mimic primary thyroid carcinoma.<sup>2,3)</sup> However, we experienced a case of thyroid metastasis appearing as solitary benign looking thyroid mass. We report a case of thyroid metastasis mimicking solitary benign thyroid mass on ultrasonography.

## Case Report

A 62-year-old woman, suffering from intermittent chest pain for previous two years, presented with a

2-week history of aggravated chest pain. The CT scan revealed an approximately 3-cm mass of left lung and multiple enlarged lymph nodes at left hilar region and mediastinum, suggestive of lung cancer



**Fig. 1.** Chest CT scan shows lung cancer of left lower lobe, which abuts on adjacent pulmonary artery and descending aorta.

Received September 28, 2009 / Accepted November 28, 2009

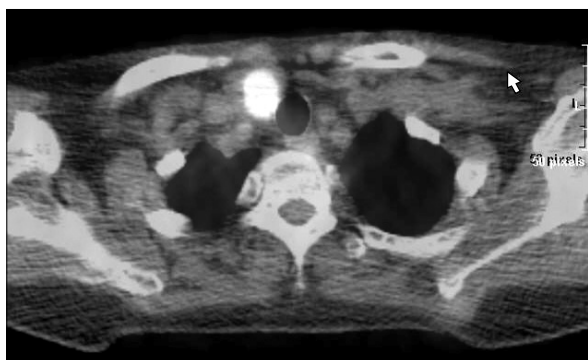
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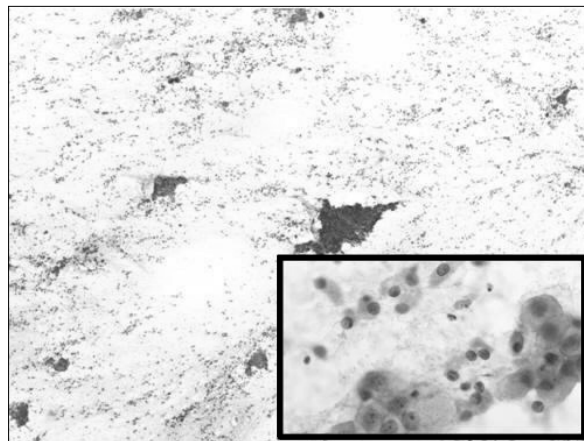
## Metastasis to the Thyroid

with lymph node metastases (Fig. 1). Transbronchial lung biopsy showed clustered atypical cells with diagnosis of pulmonary adenocarcinoma. FDG-PET/CT (fluorodeoxyglucose positron emission tomography/computed tomography) was subsequently obtained for staging. On PET/CT, increased FDG uptake (standardized uptake value=15.9) was seen at an incidentally found mass in right lobe of thyroid gland (Fig. 2). Neck US

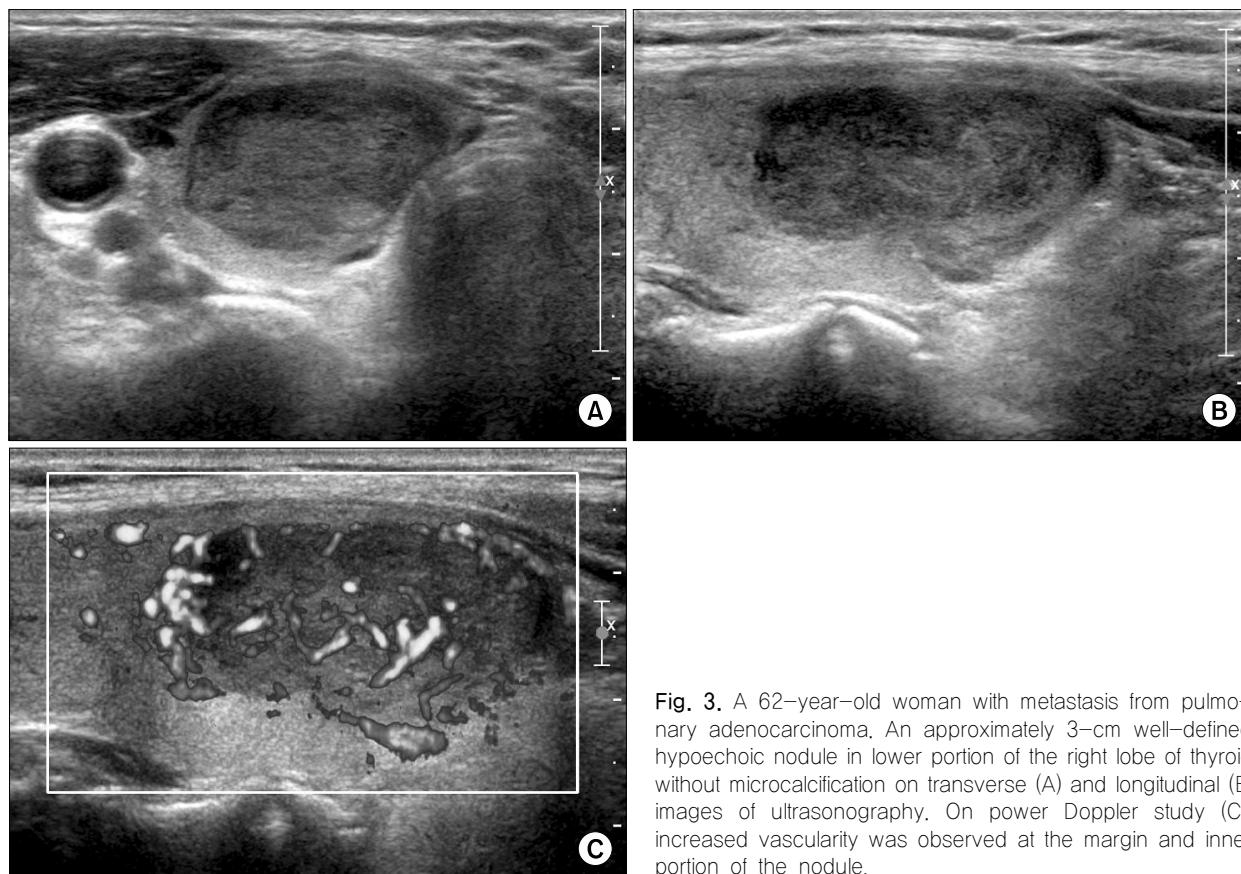
detected a well-defined heterogeneous hypoechoic mass without microcalcifications in lower portion of the right lobe of thyroid (Fig. 3). Abnormal cervical lymph nodes were not found on US and PET/CT. The patient



**Fig. 2.** PET/CT reveals thyroid nodule with high FDG uptake (SUV=15.9) in right lobe of the thyroid gland.



**Fig. 4.** Fine needle aspiration cytology shows hypercellular smear with spindle scattered cells and cellular clusters, showing mucin containing cytoplasm and round eccentric nucleus with prominent nucleoli (inset x400) (Papanicolaou stain x40).



**Fig. 3.** A 62-year-old woman with metastasis from pulmonary adenocarcinoma. An approximately 3-cm well-defined hypoechoic nodule in lower portion of the right lobe of thyroid without microcalcification on transverse (A) and longitudinal (B) images of ultrasonography. On power Doppler study (C), increased vascularity was observed at the margin and inner portion of the nodule.

underwent fine needle aspiration biopsy (FNAB). Cytology specimen revealed clustered or scattered atypical cells having mucin containing cytoplasm and eccentric nucleus (Fig. 4). This finding is consistent with metastatic adenocarcinoma, so that this mass was suspected as metastasis from pulmonary adenocarcinoma. Follow up was not done.

## Discussion

Metastasis to the thyroid is uncommon, but an overall incidence in autopsy study has been variable (1.2% to 24%) in patients with malignant disease.<sup>4-6)</sup> As use of US-guided FANB of asymptomatic thyroid nodules and various imaging modality including FDG-PET for evaluation of metastasis has increased recently, it seems that cases of thyroid metastases will be more detected.<sup>1)</sup> Common primary sites of metastatic thyroid cancer are breast, lung, and kidney and less frequent primary sites are pancreatic and gastrointestinal malignancies.<sup>1,3,4,6-8)</sup> Thyroid metastases are associated with widespread malignant disease and poor prognosis.<sup>1,4)</sup> Clinically, thyroid metastases may be presented as palpable neck mass, dysphonia, dysphasia or incidental US finding.<sup>2,3)</sup> Thyroid metastases Metastatic lesions to the thyroid may mimic primary thyroid carcinoma on US. Hypoechogenicity, ill-defined margin and intranodular vascularization are found in both primary thyroid carcinoma and metastatic carcinoma.<sup>3)</sup> But metastasis to the thyroid presented as a mass without microcalcifications which were frequently found in primary thyroid carcinoma.<sup>2,3)</sup> However, in our case, metastasis to the thyroid appeared as a single hypoechoic mass with

well-defined margin and intranodular vascularity. Although the thyroid mass showed increased FDG uptake, constellation of these US findings was close to benign looking thyroid mass. In conclusion, thyroid metastasis should be considered in a patient with a history of non-thyroidal primary malignancy even when a solitary thyroid mass showed benign looking US feature. Also, it is important for a radiologist (or a clinician) who performs FNAB for the thyroid mass to give information to a cytologist that the patient has a past history of carcinoma of non-thyroidal origin in order to avoid confusion and misdiagnosis.

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