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# Primary Papillary Thyroid Carcinoma Diagnosed by Using Endoscopic Ultrasound with Fine Needle Aspiration

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There is paucity in the literature on the use of endoscopic ultrasound (EUS) for evaluating the thyroid gland. We report the first case of primary papillary thyroid cancer diagnosed by using EUS and fine needle aspiration (FNA). A 66-year-old man underwent EUS for the evaluation of mediastinal lymphadenopathy. FNA of the lymph nodes showed benign findings. A hypoechoic mass was noted in the right lobe of the thyroid gland. Therefore, FNA was performed. The cytological results were consistent with primary papillary thyroid cancer.

**Key Words:** Thyroid; Papillary cancer; Endosonography; Biopsy, fine-needle; Esophagus

## INTRODUCTION

Upper endoscopic ultrasound (EUS) is mainly used to examine the mediastinal and upper intra-abdominal structures. During an EUS examination, part of the thyroid is usually visualized at 18 to 20 cm from the incisors.<sup>1</sup> There is paucity in the literature about the use of EUS to examine the thyroid gland. We report here the first case of primary papillary thyroid carcinoma diagnosed by using EUS with fine needle aspiration (FNA).

## CASE REPORT

A 66-year-old man with a history of treated esophageal adenocarcinoma underwent EUS for the evaluation of mediastinal adenopathy observed on a computed tomography/positron emission tomography scan. He denied dysphagia and weight loss. His physical examination was normal.

Endoscopic examination revealed a normal esophagus. EUS

showed a few benign-appearing mediastinal lymph nodes. FNA of the lymph nodes yielded benign findings.

Upon withdrawing the radial EUS scope, a 1.7×1.5-cm hypoechoic well-defined lesion was noted in the right thyroid lobe close to the common carotid artery (Fig. 1A). Internal vascularity was noted on color flow assessment (Fig. 1B). The linear endoscope was advanced through the mouth into the proximal esophagus. Under echoendosonographic guidance, FNA with a 22 G needle (Expect EUS-FNA 22 G needle; Boston Scientific, Menomonie, WI, USA) was performed successfully and easily. The FNA results showed colloid cells, histiocytes, Hurthle cells, follicular cells, and psammoma bodies. Furthermore, intranuclear inclusions and nuclear grooving were both noted to be consistent with papillary thyroid carcinoma (Fig. 2). A thyroid ultrasound was done to fully examine the thyroid gland. It showed a 1.4-cm heterogeneous, predominantly hypoechoic mass centered within the body of the right thyroid lobe with internal vascularity on color flow assessment. Tiny punctate echogenic foci were noted consistent with calcifications (Fig. 3).

The patient was contacted after 3 days, and he reported no clinical complaints.

He was referred to the surgery department. The surgeon opted to reassess the patient in 3 months to detect for recurrence of the esophageal cancer before contemplating any surgery.

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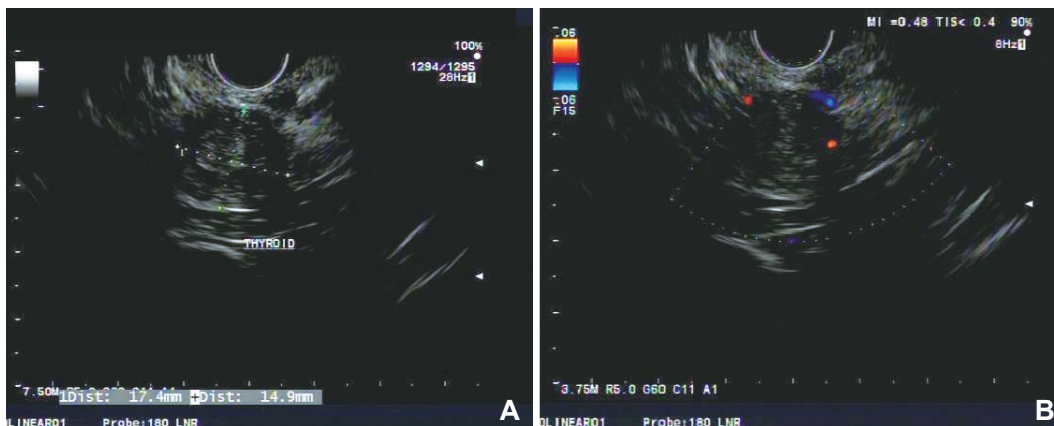
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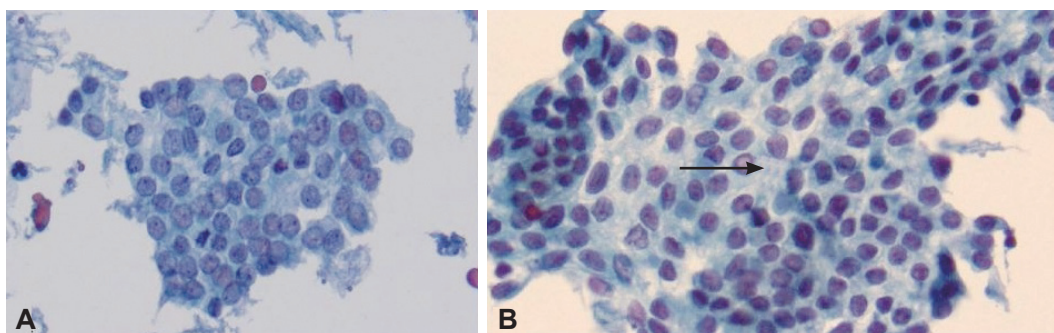
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**Fig. 1.** Endosonographic image of the hypoechoic mass in the right thyroid lobe (A) without and (B) with Doppler.

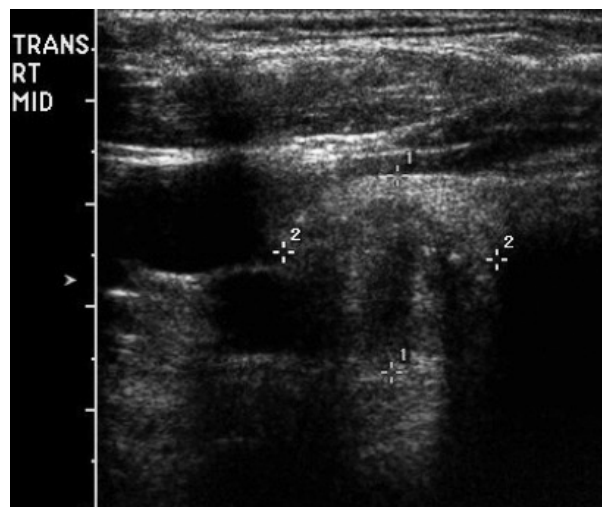


**Fig. 2.** Cytological images showing nuclear grooving (A) and intranuclear inclusions (B; arrows) consistent with thyroid papillary carcinoma (Papanicolaou stain,  $\times 40$ ).

**DISCUSSION**

Thyroid cancer is a common cancer in the United States. The lifetime risk is estimated at 1.08%.<sup>2</sup> The median age at presentation is 50 years. The age-adjusted incidence rate is around 12.2 per 100,000 persons per year. There has been increase in the incidence of thyroid cancer between 1973 and 2002.<sup>3</sup> It is more common among Caucasians and Asians.<sup>2</sup> Thyroid cancers are seen more commonly among women.<sup>3</sup> Generally, thyroid cancer has an excellent survival rate especially in the early stages. The 5-year relative survival of localized thyroid cancer is 99.9%, and that of regional cancers is 97.4%. Most thyroid cancers are found at early stages. Only 4% of patients with thyroid cancers develop metastatic disease.<sup>2</sup> However, medullary carcinoma of the thyroid gland and anaplastic carcinoma are aggressive tumors with a low survival rate.<sup>3</sup> Around 1.5% of esophageal cancers metastasize to the thyroid gland.<sup>4</sup>

EUS can visualize the inferior portions of the thyroid gland.<sup>1</sup> To our knowledge, only one case of thyroid cancer (Hurtle cell neoplasm) has been diagnosed by using EUS and FNA. In that case, the tumor was described as an irregular, hypoechoic, and heterogeneous mass with anechoic areas.<sup>5</sup> In our case (papillary thyroid cancer), the mass appeared as a well-defined hypoechoic lesion without an anechoic area.



**Fig. 3.** Transcutaneous ultrasound images of the thyroid lesion.

EUS and endoscopic bronchial ultrasound with FNA have been reported to be useful tools for diagnosing cases of metastatic (rather than primary papillary) thyroid cancer to the pancreas, lung, and lymph nodes.<sup>6-9</sup> Furthermore, two studies have demonstrated the usefulness of EUS in assessing esophageal invasion by thyroid cancers; however, EUS is limited in visualizing the upper portions of the thyroid glands.<sup>10,11</sup>

During an upper EUS examination, the thyroid gland is usually visualized close to the upper esophageal sphincter. In our case, the position was slightly unstable and we asked our technician to hold the scope's shaft to obtain a stable position. We avoided significant deflection of the tip of the scope to avoid any possible injury to the upper esophageal sphincter.

This is the first case report in the literature to show endosonographic images of primary papillary thyroid cancer. Furthermore, this is the first case to illustrate the feasibility of diagnosing primary papillary thyroid cancer by using EUS and FNA. In addition, this case emphasizes the importance of carefully examining the thyroid gland during routine EUS examinations.

Because transcutaneous ultrasound with FNA is less invasive than EUS with FNA, it should continue to be the first-line evaluation in the routine diagnosis of and obtaining cytological specimens from thyroid gland lesions.

In summary, because of the high prevalence of thyroid cancer and the favorable prognosis at the early stage, endoscopists are encouraged to incorporate thyroid gland examination during an EUS examination. Endoscopists should consider FNA for suspicious lesions that are encountered during an upper endoscopic examination. Furthermore, EUS with FNA of thyroid lesions can be considered in case transcutaneous ultrasound and FNA are either unsuccessful (e.g., in case of a large retrosternal goiter) or contraindicated (e.g., because of interposing vessels).

#### Conflicts of Interest \_\_\_\_\_

The authors have no financial conflicts of interest.

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