

## CASE REPORT

# Ectopic thyroid cancer diagnosed by endobronchial ultrasound-guided transbronchial needle aspiration

Jingwen Hu, Ming Li &amp; Lin Xu

Department of Thoracic Surgery, Jiangsu Cancer Hospital, Jiangsu Institute of Cancer Research, Nanjing Medical University Affiliated Cancer Hospital, Nanjing, China

**Keywords**

Endobronchial ultrasound-guided transbronchial needle aspiration; mediastinal ectopic thyroid carcinoma; mediastinal lesion.

**Correspondence**

Ming Li, Department of Thoracic Surgery, Jiangsu Cancer Hospital, Jiangsu Institute of Cancer Research, Nanjing Medical University Affiliated Cancer Hospital, Baiziting 42, Nanjing 210009, China.  
Tel: + 86 25 8328 4700  
Fax: +86 25 8364 1062  
Email: liming750523@163.com

Received: 12 April 2017;

Accepted: 3 July 2017.

doi: 10.1111/1759-7714.12486

Thoracic Cancer 8 (2017) 703–705

**Abstract**

We report a case of papillary carcinoma in a mediastinal ectopic thyroid diagnosed by endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). In this case, the tumor was adjacent to the central airway; therefore, we attempted to perform EBUS-TBNA to obtain specimens for a diagnosis of papillary thyroid carcinoma. Surgical resection was conducted, and histological evaluation of the resected specimen confirmed ectopic papillary thyroid carcinoma, consistent with the histology from the EBUS-TBNA specimen. As a safe and minimally invasive procedure, EBUS-TBNA may be considered for the diagnosis of mediastinal lesions, including papillary carcinoma in mediastinal ectopic thyroid.

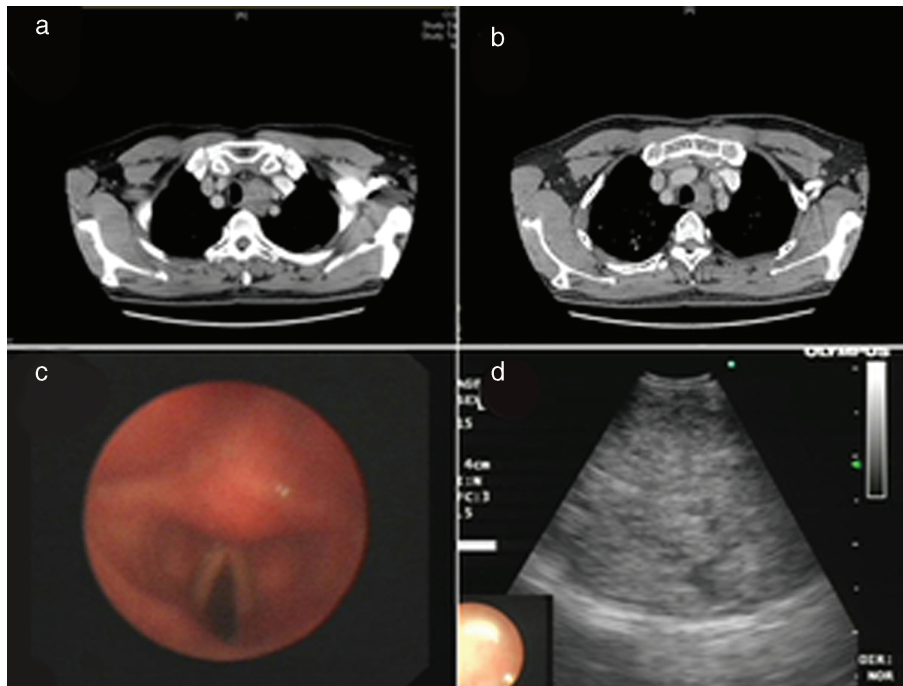
**Introduction**

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a safe and minimally invasive technique for sampling mediastinal lesions adjacent to the trachea and bronchi. EBUS-TBNA is a well-established technique for staging as well as diagnosing lung cancer,<sup>1</sup> and is increasingly being used for benign thoracic diseases, such as sarcoidosis and tuberculosis.<sup>2</sup>

Ectopic thyroid tissue is uncommon, with a reported incidence of 1 in 300 000. Most ectopic thyroid lesions are benign, with only 1% being malignant.<sup>3</sup> The clinical challenge is to determine how to exclude malignancy. Many ectopic thyroid lesions are difficult to diagnose, particularly when they are mediastinal. These cases are subject to less specific follow-up imaging studies or invasive diagnostic procedures, such as mediastinoscopy or surgical resection. To our knowledge, we report the first case of a papillary carcinoma in a mediastinal ectopic thyroid with a normal eutopic thyroid gland diagnosed by EBUS-TBNA. The ethics committee at our hospital approved this case report.

**Case report**

A 76-year-old man was admitted to our hospital for a mediastinal mass after experiencing hoarseness for over a month. A chest computed tomography scan revealed a 25.8 × 34.5 mm mass located on the tracheoesophageal groove and in close contact with the esophagus (Fig 1a,b). His medical history was unremarkable. Physical examination revealed a heart rate of 86 beats per minute and normal blood pressure. Laboratory examination showed that blood work and electrocardiography were within normal ranges. We performed EBUS-TBNA of the mediastinal mass under conscious sedation, using an ultrasonic bronchoscope (BF-UC260FW, Olympus, Tokyo, Japan) and a 21-gauge needle (NA-201SX-4021, Olympus). Bronchoscopy revealed left vocal cord paralysis (Fig 1c), but no mass was obstructing the tracheal lumen. EBUS showed that the superior left paratracheal region contained a hypoechoic structure and Doppler mode confirmed some irregular flows within the lesion. The maximum diameter was approximately 30 mm (Fig 1d). Three TBNA procedures



**Figure 1** (a) Contrast-enhanced chest computed tomography showing a mediastinal mass located on the tracheoesophageal groove and (b) in close contact with the esophagus. (c) Bronchoscopic examination revealed left vocal cord paralysis. (d) Endobronchial ultrasound views of mediastinal mass located in the superior left paratracheal region with hypoechoogenicity.

were performed and all were well tolerated with no complications. The histology of the mass was papillary thyroid carcinoma (Fig 2a). Further staging investigations, including computed tomography imaging of the brain, neck, and abdomen did not demonstrate any evidence of extrathoracic malignancy. A complete resection of the tumor was performed via thoracotomy. The tumor surrounded the recurrent laryngeal nerve, and invaded the esophageal muscle. The thyroid gland had no obvious nodules. Histological examination revealed a normal thyroid gland and an ectopic papillary thyroid carcinoma in the mediastinal mass (Fig 2b).

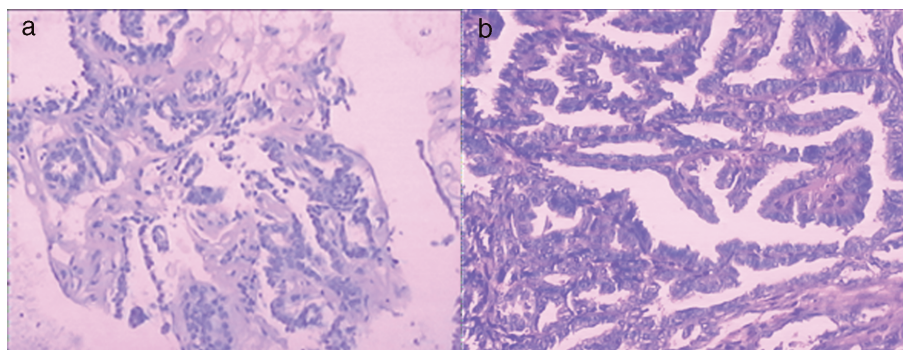
## Discussion

Ectopic thyroid lesions infrequently occur. Ectopic tissues are thought to originate from defective or aberrant embryonic development. Ectopic thyroid lesions are commonly

located in the lingual region, but have also been found in the anterior cervical area, lateral cervical area, submandibular region, mediastinum, gallbladder, liver, and adrenal gland. Carcinomas arising from ectopic thyroid glands are rare. Case reports have described the rare occurrence of ectopic thyroid carcinomas in the neck, submandibular triangle, and mediastinum.

Mediastinal ectopic thyroid lesions were initially reported as goiters arising in thyroid tissue located in the trachea, esophagus, lungs, and heart. Most mediastinal ectopic thyroid lesions are asymptomatic, but some cases exhibit dyspnea, cough, difficulty in swallowing, and chest pain. Because of the location, the major challenge is to determine how to diagnose and treat these lesions.

In recent years, EBUS-TBNA has become widely available for sampling lymph nodes and masses adjacent to the trachea and bronchi.<sup>4-6</sup> It is now the procedure of choice for staging and diagnosing lung cancer and evaluating



**Figure 2** Representative microphotographs from (a) endobronchial ultrasound-guided transbronchial needle aspiration showing papillary thyroid carcinoma. (b) Thoracotomy showing an ectopic papillary thyroid carcinoma (magnification  $\times 100$ ).

other intrathoracic pathologies, such as sarcoidosis and tuberculosis. EBUS-TBNA is a safe procedure that is performed under conscious sedation, and the reported complication rate is low. For staging and diagnosing lung cancer, EBUS-TBNA has equivalent diagnostic value compared to mediastinoscopy, with a reported sensitivity of more than 90% and specificity of 100%. EBUS-TBNA also has high sensitivity and specificity for diagnosing other intrathoracic pathologies. A few cases of EBUS-TBNA for the diagnosis of mediastinal ectopic thyroid lesions have previously been reported. Most of these lesions were found to be malignancies on pathological analysis. Moreover, all malignancies were metastatic to the thyroid, and none were primary thyroid neoplasm.<sup>7–9</sup>

To our knowledge, we report the first case of a papillary carcinoma in a mediastinal ectopic thyroid diagnosed using EBUS-TBNA. The tumor was located at the tracheoesophageal groove, adjacent to the esophagus. The tumor location made diagnostic biopsy very challenging. We attempted EBUS-TBNA to obtain specimens for a diagnosis of papillary thyroid carcinoma. This procedure was safe and did not result in any complications. Surgical resection was subsequently conducted and histological evaluation of the resected specimen confirmed ectopic papillary thyroid carcinoma, consistent with the histology from the EBUS-TBNA specimen.

We report a case of papillary carcinoma in mediastinal ectopic thyroid in which an accurate diagnosis was made using EBUS-TBNA, with no complications. In summary, EBUS-TBNA is a minimally invasive technique that may allow for the safe and simple sampling of mediastinal ectopic thyroid lesions.

## Disclosure

No authors report any conflict of interest.

## References

- Hwangbo B, Kim SK, Lee HS *et al.* Application of endobronchial ultrasound-guided transbronchial needle aspiration following integrated PET/CT in mediastinal staging of potentially operable non-small cell lung cancer. *Chest* 2009; **135**: 1280–7.
- Tremblay A, Stather DR, MacEachern P, Khalil M, Field SK. A randomized controlled trial of standard vs endobronchial ultrasonography-guided transbronchial needle aspiration in patients with suspected sarcoidosis. *Chest* 2009; **136**: 340–6.
- Cordes S, Nelson JJ. Papillary carcinoma arising in median ectopic thyroid tissue: Management of the thyroid gland. *Ear Nose Throat J* 2010; **89**(5): E4–7.
- Sun J, Bao L, Teng J *et al.* [Endobronchial ultrasound-guided transbronchial needle aspiration in the diagnosis of intrathoracic metastasis from extrapulmonary malignancy]. *Zhongguo Fei Ai Za Zhi* 2015; **18**: 295–300. (In Chinese.)
- Sun J, Teng J, Yang H *et al.* Endobronchial ultrasound-guided transbronchial needle aspiration in diagnosing intrathoracic tuberculosis. *Ann Thorac Surg* 2013; **96**: 2021–7.
- Chen YB, Jiang JH, Mao JY, Huang JA. Diagnostic value of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) in solitary mediastinal, hilar lymphadenectasis, or peribronchial lesions: Six cases reports and review of literature. *Medicine (Baltimore)* 2016; **95**: e5249.
- Chow A, Oki M, Saka H, Moritani S, Usami N. Metastatic mediastinal lymph node from an unidentified primary papillary thyroid carcinoma diagnosed by endobronchial ultrasound-guided transbronchial needle aspiration. *Intern Med* 2009; **48**: 1293–6.
- Diaz J, Chawla M, Simoff M. Endobronchial ultrasound-guided transbronchial needle aspiration in the diagnosis of metastatic thyroid cancer. *J Bronchology Interv Pulmonol* 2009; **16**: 70–1.
- Casal RF, Phan MN, Keshava K *et al.* The use of endobronchial ultrasound-guided transbronchial needle aspiration in the diagnosis of thyroid lesions. *BMC Endocr Disord* 2014; **14**: 88.