

Case Report

Lung and Thyroid Cancer Diagnosed During a Single Bronchoscopic Procedure

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Abstract

Endobronchial Ultrasound-guided Transbronchial Needle Aspiration (EBUS-TBNA) is a minimally invasive sampling modality used in the evaluation of lung cancers with mediastinal and hilar/lobar lymphadenopathy. Its diagnostic utility in the evaluation of other mediastinal lesions is less clear.

We report a case of an 81-year-old male with concomitant lung and substernal thyroid lesions suspicious for malignancy on radiographic evaluation. Bronchoscopy with central EBUS-TBNA of the intrathoracic mass and electromagnetic navigation-guided nodule biopsy was performed without complication. To our knowledge, this is the first case of lung and thyroid cancer being diagnosed simultaneously during a single bronchoscopic procedure.

Keywords: EBUS-TBNA; Endobronchial ultrasound; Intrathoracic thyroid; Transbronchial needle aspiration

Introduction

EBUS-TBNA has emerged as the gold standard for the evaluation of mediastinal lesions due to its excellent diagnostic accuracy and safety profile [1-3]. Clinical utility has been well-established in the diagnosis and staging of lung cancers with mediastinal and hilar/lobar lymphadenopathy. However, its role in the evaluation of other intrathoracic lesions is less clear.

Ultrasound-guided Fine Needle Aspiration (US-FNA) biopsy is the sampling modality of choice in the evaluation of suspicious thyroid nodules/masses [4]. However, substernal thyroid lesions are not readily accessible via percutaneous approach, often necessitating

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diagnostic mediastinoscopy or surgical biopsy to exclude malignancy. Successful and safe intrathoracic thyroid sampling with EBUS-TBNA has been reported, potentially reducing the need for more invasive procedures [5]. This benefit is augmented in patients with suspicious lung and/or mediastinal lesions, allowing for concurrent evaluation of secondary cancer with a single procedure.

Case Description

An 81-year-old male with a 45 pack-year smoking history was referred to our clinic for pulmonary nodules detected on workup for a 3-month history of unintentional weight loss. He did not complain of voice hoarseness, dysphagia, or dyspnea. There was no past history of malignancy or thyroid disease. Thoracic Computed Tomography (CT) revealed a 2 x 1.9 cm and 3.3 x 1.7 cm nodule with irregular margins in the superior and inferior lingular segments of the left lung, respectively, suspicious for malignancy. An enlarged and heterogeneous appearing 6 x 4 x 6.3 cm left thyroid lobe with mediastinal mass effect narrowing and rightward shift of the trachea was also noted (Figure 1). ¹⁸F-Fluorodeoxyglucose Positron Emission Tomography (FDG-PET) follow-up demonstrated intense avid-FDG uptake of all lesions. Flexible bronchoscopy was performed under general anesthesia with central EBUS-TBNA of the mediastinal nodes and thyroid mass followed by electromagnetic navigational sampling of the lingular nodules. The trachea was noted to be significantly deviated to the right with saber-sheath narrowing from extraluminal compression (Figures 2a,2b). Total procedure time was 76 minutes without complications.



Figure 1: CT chest showing significantly enlarged left thyroid lobe with heterogeneous appearance. There is resultant mild superior mediastinal extent as well as mass effect upon the trachea which is narrowed and displaced toward the right.

Lung histopathology revealed TTF1 positive, thyroglobulin and p63 negative malignant cells consistent with primary lung adenocarcinoma. There were no malignant cells detected in the mediastinal lymph nodes. Thyroid cytology showed foci of atypical follicular epithelial cells with powdery chromatin pattern, occasional nuclear grooves and rare intranuclear inclusions suspicious for papillary thyroid cancer. The patient was referred to otolaryngology for left thyroid substernal lobectomy and potential total thyroidectomy.



Figure 2a: Flexible bronchoscopy demonstrating rightward tracheal deviation with saber-sheath narrowing to 6 mm transverse luminal diameter.



Figure 2b: Endobronchial ultrasound image of intrathoracic thyroid transbronchial needle aspiration.

Discussion

It is estimated that up to 19% of substernal thyroid lesions are malignant [6]. Diagnostic sampling with US-FNA is challenging due to the overlying sternum and anatomic relationship with several mediastinal structures. As a result, most cases require mediastinoscopy or surgical thoracotomy which may be poorly tolerated in patients with underlying cardiopulmonary disease [7].

EBUS-TBNA is a minimally invasive alternative with comparable diagnostic yield to mediastinoscopy for sampling of mediastinal lesions [8]. In the largest systematic literature review to date, 20 published cases of EBUS-TBNA thyroid aspiration have been reported to date [5]. Adequate aspirate was obtained in all cases with only one reported procedural complication. This has led to a growing body of literature supporting the role of EBUS-TBNA in the evaluation of substernal thyroid lesions with publication of protocolized procedures [9].

Our patient presented with lung and thyroid lesions both suspicious for malignancy, making bronchoscopy an ideal modality to acquire tissue samples from all lesions in a single procedure. The intrathoracic thyroid mass was successfully aspirated using EBUS-TBNA without procedural complications. Lung and thyroid cancer were diagnosed simultaneously, preventing the need for invasive diagnostic mediastinoscopy. This highlights the cost-effectiveness and safety of bronchoscopy as a multisampling modality. As the indications of EBUS-TBNA continue to expand, larger studies are needed to further validate diagnostic accuracy moving forward.

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