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Successful Management of Ectopic Mediastinal Thyroid Tissue Accompanying Multinodular Goiter Using Intraoperative Neural Monitoring

Stella Chin-Shaw Tsai*, Frank Cheau-Feng Lin**,***

Ectopic mediastinal thyroid tissue is a rare entity that is frequently mistaken for a malignant tumor or metastasis from a neighboring malignancy. We report a case of ectopic mediastinal thyroid tissue accompanying bilateral multinodular goiter, and complicated by the simultaneous presence of a nodular lesion in the lung. Preoperative workup tests included fine-needle aspiration cytology of the thyroid gland, which revealed atypical cells and an elevated thyroglobulin level. Due to a strong suspicion of thyroid malignancy, the patient underwent a bilateral total thyroidectomy via a collar incision using intraoperative nerve monitoring of the recurrent laryngeal nerve, and thoracoscopic resection of the mediastinal mass and right middle lobe lung nodule. The postoperative hospital course was uneventful. We noted no transient or permanent vocal palsy after surgery. Pathologic results showed bilateral thyroid goiter, ectopic mediastinal thyroid tissue, and atelectasis of the lung with focal fibrosis and hemorrhage. Using a combined cervical and thoracoscopic approach with the use of intraoperative recurrent laryngeal nerve monitoring, this uncommon case of simultaneous bilateral thyroid goiter, ectopic mediastinal thyroid tissue, and lung inflammatory lesion was successfully treated. ***(Thorac Med 2017; 32: 171-176)***

Key words: mediastinal thyroid tissue, intraoperative neural monitoring, recurrent laryngeal nerve

Introduction

Ectopic mediastinal thyroid tissue is very rare, comprising only 1% of all ectopic thyroid tissues [1-2]. It is often mistaken for a malignant tumor or metastasis from a neighboring malignancy. We report an uncommon case of ectopic mediastinal thyroid tissue accompanying bilateral multinodular goiter treated with a combination of cervical and thoracoscopic approaches under intraoperative neural monitoring.

Case Report

This 36-year-old woman with no major systemic disease was admitted to our hospital due to a mediastinal mass with trachea com-

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pression seen on chest radiography (CXR) at a routine health examination (Figure 1). She also complained of easily sweating, neck stiffness and snoring during the past 6 months. She denied body weight loss, poor appetite, fatigue, dysphagia or dyspnea. Computed tomography (CT) of the chest showed the presence of bilateral thyroid goiter, a mediastinal mass, and a tiny nodular lesion in the right middle lobe (RML) of the lung (Figure 2). Ultrasonography confirmed the presence of multinodular goiter in bilateral thyroid glands, but the left lobe also showed microcalcification. Fine-needle aspiration cytology was performed, and revealed atypical cells. Laboratory data showed TSH: 0.561μIU/mL (normal range: 0.25-4.0 μIU/mL), free T4: 1.133 (normal range: 0.7-1.8 ng/dl), and thyroglobulin: 397 (normal range <50). The patient subsequently underwent bilateral total thyroidectomy via a collar incision using intraoperative neural monitoring of the recurrent laryngeal nerve, and thoracoscopic resection of the mediastinal mass (Figure 3) and nodule in the RML of the lung. The thyroid isthmus and bilateral parathyroid glands were preserved. Except for transient hypocalcemia, the postoperative hospital course was uneventful. We noted no transient or permanent vocal

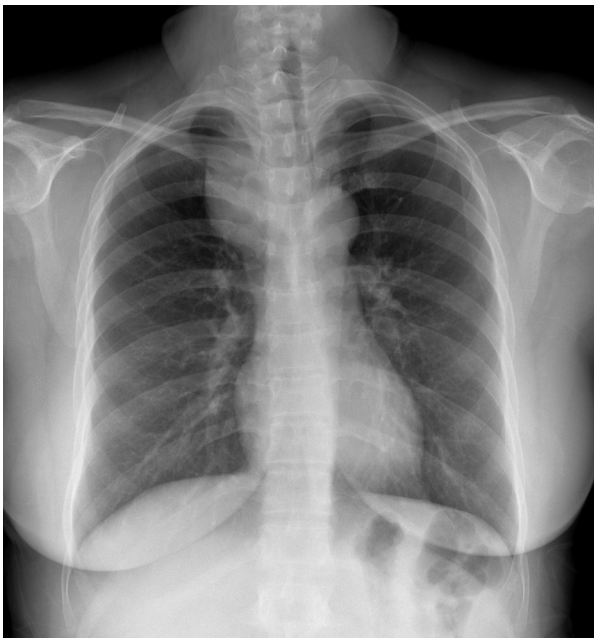

Fig. 1. CXR showed mediastinal widening with trachea compression.

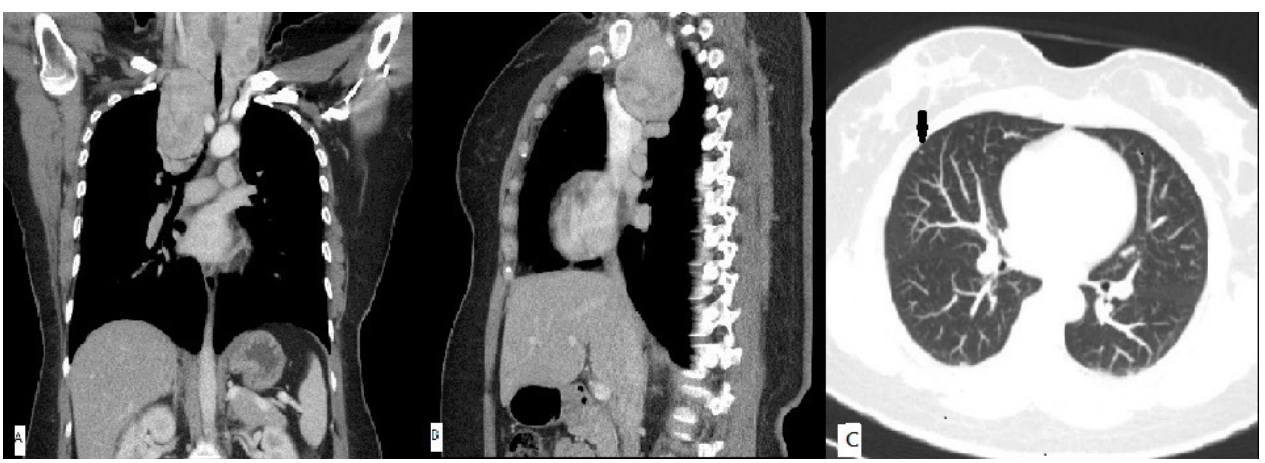

Fig. 2. A. CT scan with contrast (coronal view) showing low-density nodules in bilateral thyroid glands, and the presence of a separate mediastinal mass. B. CT scan with contrast (sagittal view) showing low-density nodules in bilateral thyroid glands, and the presence of a separate mediastinal mass. C. CT scan with contrast (axial view) showing a nodule (arrow) in the RML of the lung.

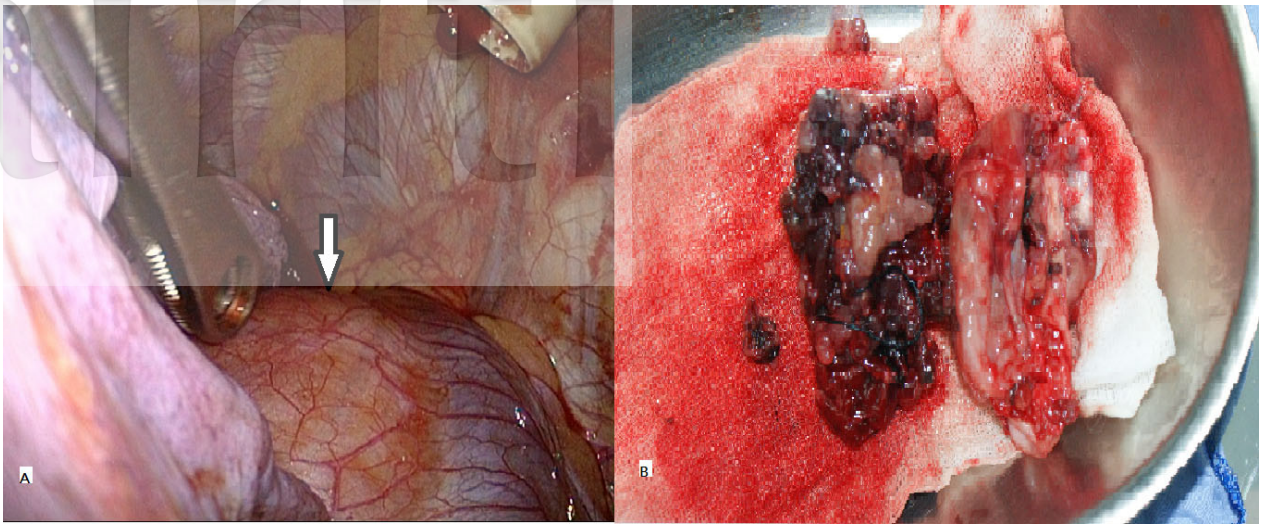

Fig. 3. A. Thoracoscopic view of the mediastinal mass showed a huge cystic lesion (arrow). B. Ectopic mediastinal thyroid tissue was cystic in nature.

palsy after surgery. Pathologic results showed bilateral thyroid goiter, an ectopic mediastinal thyroid tissue, and atelectasis of the lung with focal fibrosis and hemorrhage. At the 1-month postoperative follow-up visit, T3, T4, TSH and blood calcium levels were all normal.

Discussion

Using a combined cervical and thoracoscopic approach along with intraoperative recurrent laryngeal nerve monitoring, this rare case of simultaneous bilateral thyroid multinodular goiter, ectopic mediastinal thyroid tissue, and lung inflammatory lesion was successfully treated with functional preservation of recurrent laryngeal nerve integrity.

Ectopic thyroid tissue is an uncommon disease: fewer than 15 cases have been reported in the anterior mediastinum in the past 4 decades [3]. Having a propensity to show malignant transformation, 15% of all ectopic thyroid tissues were reported to be involved in cancer development [4]. In our case, the initial fine-needle aspiration cytology report showed atypical cells. The coincidental presence of a lung nodule raised further suspicion of malignancy. Although mediastinal thyroid cancer is very infrequently encountered and only 2 cases have been reported in the past [5-6], the possibility of thyroid cancer in the mediastinum could not be ruled out, unless complete surgical removal with pathology examination was performed. The differential diagnosis also included lung cancer with metastasis to the mediastinum.

Ectopic mediastinal thyroid tissues are usually asymptomatic and are often found incidentally on routine CXR, such as in this case. However, when there is a respiratory infection or hemorrhage into the ectopic thyroid tissues, compression of the trachea may lead to acute respiratory failure [7].

This case included the concomitant presence of bilateral multinodular goiters and distinct ectopic mediastinal thyroid tissue. The criteria for distinguishing ectopic thyroid from

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secondary goiters include the following: first, there is an independent blood supply from the intrathoracic vessels rather than the cervical vessels; second, the cervical thyroid gland should be normal; third, the pathologic process differs between the cervical gland and the ectopic mass; fourth, there is no history of malignancy [3]. Our patient fulfilled almost all the diagnostic criteria, except for the presence of goiters in the cervical thyroid gland.

We found it of interest that the thyroglobulin level was elevated in the preoperative workup. This, along with the ultrasound finding of microcalcification in the left lobe of the thyroid, the fine-needle aspiration cytology result of atypical cells, and the presence of a lung nodule, increased our suspicion of thyroid malignancy before surgery. Consistent with our finding, elevated thyroglobulin levels have been reported in pediatric cases with ectopic thyroid glands [8]. The authors attributed the increased thyroglobulin levels to the presence of functioning thyroid tissues in the ectopic thyroid glands. In this case, the final pathologic results eliminated the initial suspicion of thyroid malignancy, so the thyroglobulin level was not rechecked postoperatively, though the thyroid function returned to normal with the preservation of the thyroid isthmus.

An additional test, the thyroid scan, might have aided the diagnosis of ectopic mediastinal thyroid tissue preoperatively, though it was not performed in this case. Sood and Kumar reported the role of nuclear medicine techniques in the diagnosis and management of ectopic thyroid gland, and concluded that a thyroid scan could assist in determining the proper surgical management of ectopic thyroid gland [9].

Thoracoscopic excision has gained popularity in the diagnosis and treatment of mediastinal masses, as it is a more convenient surgical method and poses less danger of trauma to neighboring tissues, including nerves and vessels [3]. Although a cervical approach alone may be feasible in the surgical removal of an ectopic mediastinal goiter that is anteriorly placed, this type of surgical approach runs the risk of injuring the thoracic blood supply [10]. For larger mediastinal tumors, a combined approach with a transverse cervical incision has also been suggested [3]. Rarely is sternotomy required for the management of mediastinal goiters, except in cases of recurrent goiter, ectopic goiter, or invasive carcinoma [11]. We used combined cervical and thoracoscopic approaches for total thyroidectomy, as well as a simultaneous resection of the mediastinal mass and lung nodule located in the RML. With the use of intraoperative neural monitoring of the recurrent laryngeal nerve, we were able to prevent postoperative hoarseness or airway problems.

In conclusion, we presented an unusual case of ectopic mediastinal thyroid tissue complicated by the presence of multinodular goiters in the neck and an inflammatory lung lesion. Intraoperative monitoring of the recurrent laryngeal nerve successfully prevented injury to the nerve bilaterally.

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以術中神經監測成功進行縱膈異位暨頸部結節性甲狀腺手術

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縱膈異位甲狀腺組織是一種罕見的病灶，臨床上常會被誤判為惡性腫瘤或由附近惡性腫瘤的轉移。我們提出一例罕見縱膈異位甲狀腺組織，合併雙邊頸部多發性甲狀腺結節，並同時在肺部有一結節病灶的存在之複雜病例報告。術前檢查包括甲狀腺細針穿刺細胞學檢查報告顯示非典型細胞和甲狀腺球蛋白指數升高。在高度懷疑甲狀腺惡性腫瘤之下，患者接受術中使用喉返神經監測，以領狀切口行雙側甲狀腺全切除術以及經胸腔鏡切除縱膈腫塊和右中葉肺部結節病灶。術後住院過程很順利，無暫時性或永久性聲帶麻痺。病理報告顯示雙側甲狀腺腫、縱膈異位甲狀腺組織、以及肺膨脹不全合併局部纖維化和出血。透過搭配使用術中喉返神經監測、合併頸部和胸腔鏡的手術方法，同步成功地治療這一罕見雙側甲狀腺腫、縱膈異位甲狀腺組織和肺發炎性病灶的案例。*(胸腔醫學 **2017; 32: 171-176**)*

關鍵詞：縱膈甲狀腺組織，術中神經監測，喉返神經

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