Ectopic thyroid tissue surrounding the right laryngeal nerve: a case report

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Received June 27, 2014; Accepted August 2, 2014; Epub July 15, 2014; Published August 1, 2014

Abstract: Ectopic thyroid tissue (ETT) is a rare developmental anomaly of the thyroid tissue which is defined as the presence of thyroid tissue in locations other than the pretracheal area. However, ectopic thyroid tissue in the lateral neck surrounding the recurrent laryngeal nerve is unusually found. Here we describe a case of a 64-year-old woman who was found bilateral thyroid goiter by the ultrasound examination. The total thyroidectomy plus a modified radical neck dissection was performed. Surprisingly we also found a nodule surrounding the right recurrent laryngeal nerve at the same time. Nevertheless the diagnosis of the nodule was confirmed by pathology and Histologic examination demonstrating that it was the ectopic thyroid tissue. Ectopic thyroid tissue surrounding recurrent laryngeal nerve is a rare finding, with hardly any cases reported. For it is generally thought that any thyroid tissue found in the lateral aspect of the neck may indicate metastatic deposits from well-differentiated thyroid carcinoma. Although pathogenesis of ectopic thyroid tissue surrounding recurrent laryngeal nerve without any symptoms remains unknown, our case could suggest ectopic thyroid tissue should not be excluded in the differential diagnosis of lateral neck masses especially when the recurrent laryngeal nerves were surrounded by the nodules.

Keywords: Ectopic thyroid tissue, bilateral thyroid goiter, the recurrent laryngeal nerve, thyroiditis, ultrasound

Introduction

Ectopic thyroid tissue results from abnormalities in the embryological development and migration of the thyroid gland along the embryonic descent pathway of the medial thyroid anlage from the tongue to the trachea [1]. Its occurrence is about 1 per 100 000-300 000 people, rising to 1 per 4000-8000 patients with thyroid disease [2, 3]. In autopsy studies, however, the prevalence varies from 7 to 10% [4, 5]. The presence of benign thyroid tissue in the lateral of the neck is rare and not related to the development of the thyroid [6]. However, it usually remains difficult whether these nodules represent benign embryological remnants, or whether they represent metastatic disease from primary thyroid carcinoma. We report a case of ectopic thyroid tissue surrounding the right recurrent laryngeal nerve in a patient that simulated metastasis of a primary thyroid carcinoma.

Case report

A 63-year-old woman with no significant past medical, surgical, or family history and discomfort was found bilateral nodular goiter by the ultrasound examination. Her thyroid function was normal. Chest radiography and laboratory examinations including thyroid hormone showed no abnormal findings. Blood calcium level was also checked for the possibility of medullary thyroid cancer, and was within normal limits. In addition the thyroglobulin antibody and thyroid peroxidase antibody is < 0.90 IU/ml and 0.90 IU/ml respectively, both of which are in the normal range.

Ultrasonography of the neck revealed heterogeneous thyroid gland with presence of numerous normoechoic focal lesion with low echo and fluid parts in both lobes with the largest nodule 1.4 cm × 1.2 cm in the left and 1.8 cm × 1.2 cm in the right (Figure 1A, 1B). The surgery was performed during which we found the right recurrent laryngeal nerve surrounded partially by a tough and independent nodule measuring 0.2 cm × 0.2 cm (Figure 2A, 2B). The frozen sections of nodules were performed before thyroidectomy. The specimens of the bilateral thyroid were reviewed in our pathol-
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Figure 1. Ultrasonography of the neck revealed heterogeneous thyroid gland with presence of numerous normoechoic focal lesion with low echo and fluid parts in both lobes with the largest nodule 1.4 cm × 1.2 cm in the left (A) and 1.8 cm × 1.2 cm in the right (B).

Figure 2. The right recurrent laryngeal nerve was found surrounded partially by a tough nodule measuring 0.2 cm × 0.2 cm in the surgery process.

Ogy department, demonstrating bilateral thyroid goiter. Whereas the pathology of the nodule surrounding recurrent laryngeal nerve surprisingly showed to be benign thyroid tissue. Still the pathologist did not exclude the possibility of metastasis of occult primary thyroid carcinoma. Our patient underwent a left partial thyroidectomy and right total thyroidectomy plus a routine central neck (compartment VI) lymph node dissection in the right. The patient had no complications during the postoperative period and the tracheostomic tube was removed on the second day after surgery. Patient went back home.

The diagnosis of multinodular goiter associated with parasitic thyroid nodule was confirmed by Histologic examination, which demonstrated thyroid follicles of varying sizes showing the diagnosis of bilateral thyroid goiter (Figure 3A). Meanwhile the excised mass surrounding the recurrent laryngeal nerve also indicated that an epithelial lesion composed of glandular structures that had varied diameters. Within the glandular structures there is intraluminal colloid. There is a single layer of epithelial cells whose shape ranged from flattened to low columnar that lined these glands, and their cytoplasm is pale acidophilic to amphophilic staining quality. Histologically, the nuclear features of the thyroid follicles were bland. The nuclei were small, round with no ground-glass nuclei, pseudoinclusions, nuclear grooves, mitosis, papillae, stromal reaction, psammoma bodies, necrosis, or vascular invasion and did not show any morphologic features of papillary
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cancer (Figure 3B-D). The entire thyroid gland was benign. Thus, a diagnosis of benign ectopic thyroid tissue with bilateral thyroid goiter was established.

Discussion

Ectopic thyroid tissue is thyroid tissue not located anterior and lateral to the second, third, and fourth tracheal rings. Usually the frequent location for these developmental anomalies is along the midline of the neck, which is the path that the developing thyroid gland takes in descent during embryology [7]. Generally ectopic thyroid glands are hypoactive probably because of containing a few normal functioning thyroid tissues [8-10]. Sometimes complications of ectopic thyroid tissue include pressure on surrounding structures and, exceedingly rarely, malignant degeneration [11]. Many case reports exist of ectopic thyroid in the necks, including various symptoms (Table 1) [12-19]. However our case of the ectopic thyroid tissue partially surrounding the recurrent laryngeal nerve is intensely rare. To our knowledge, this is the first case report of ectopic thyroid tissue surrounding the recurrent laryngeal nerve with no symptoms. We review the literature about the effect of lesions on the recurrent laryngeal nerve, among which most case reports involved the influence of thyroiditis on the recurrent laryngeal nerve. Bukvic, B [20] reported a case

Figure 3. A: Hematoxylin and eosin (H&E) histology of bilateral thyroid goiter (100X) shows thyroid follicles of varying sizes. B-D: Hematoxylin and eosin (H&E) histology of the ectopic thyroid tissue surrounding the recurrent laryngeal nerve (100X) shows an epithelial lesion composed of glandular structures with varied diameters. There is a single layer of epithelial cells whose shape ranged from flattened to low columnar that lined these glands, and their cytoplasm is pale acidophilic to amphophilic staining quality. Histologically, the nuclear features of the thyroid follicles were bland. The nuclei were small and round, and did not show any morphologic features of papillary cancer.
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Table 1. Summary of cases of ectopic thyroid tissue found in neck

<table>
<thead>
<tr>
<th>References</th>
<th>Age/sex</th>
<th>Location</th>
<th>Presentation</th>
<th>Gross pathology</th>
<th>Other pathological condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faramarz Babazade et al. [12]</td>
<td>29/F</td>
<td>In the right submandibular region</td>
<td>Asymptomatic swelling</td>
<td>A palpable, firm, asymptomatic and defined 1.5 × 2 cm mass</td>
<td>Iron deficiency anaemia</td>
</tr>
<tr>
<td>Maria Rosa Pelizzo et al. [13]</td>
<td>54/M</td>
<td>In the right submandibular region</td>
<td>Visible asymptomatic swelling</td>
<td>An elastic, mobile, nontender and clearly defined 3 × 3 cm mass</td>
<td>Essential hypertension and diabetes</td>
</tr>
<tr>
<td>Alexandra Borges et al. [14]</td>
<td>45/M</td>
<td>In the left submandibular region</td>
<td>Painless and asymptomatic swelling</td>
<td>A lobulated, well defined 5.1 × 4.4 cm mass</td>
<td>Papillary thyroid carcinoma</td>
</tr>
<tr>
<td>Bipul Kumar Choudhury et al. [15]</td>
<td>17/F</td>
<td>In the lingual and submandibular areas</td>
<td>A midline swelling at the base of tongue with dysphagia</td>
<td>A defined 2.5 × 2.5 cm mass</td>
<td>Hypothyroidism</td>
</tr>
<tr>
<td>Ibrahim Nasiru Akanmu et al. [16]</td>
<td>55/F</td>
<td>In the right submandibular region</td>
<td>A painless and asymptomatic lateral neck mass</td>
<td>A firm, nontender right-sided defined approximately 2 × 3 cm</td>
<td>Multinodular goiter</td>
</tr>
<tr>
<td>Seung Hoon Woo et al. [17]</td>
<td>30/F</td>
<td>At the anterior part of the neck</td>
<td>A midline swelling at the base of tongue with dysphagia</td>
<td>A painless, movable, soft mass 1.5 × 1 cm</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>Fusun Aydogan et al. [18]</td>
<td>38/F</td>
<td>In the right submandibular region</td>
<td>Sweating and palpitations</td>
<td>Not mentioned</td>
<td>Left thyroid hemiagenesis and persistent mildly suppressed serum thyrotropin</td>
</tr>
<tr>
<td>Tomasz Zaton’ski et al. [19]</td>
<td>59/F</td>
<td>Right side of the larynx</td>
<td>Progressive dyspnea</td>
<td>A smooth and painless well-defined 2.2 × 1 cm mass</td>
<td>Nodular thyroid goiter</td>
</tr>
</tbody>
</table>
of a 75-year-old female patient with acute suppurative thyroiditis and right lobe thyroid abscess which induced the right vocal cord paralysis and suppression of the recurrent laryngeal nerve. Similarly Chang M [21] covered a patient with a history of right hemithyroidectomy for benign thyroid nodule, who had an episode of subacute thyroiditis associated with unilateral vocal cord paralysis. Surprisingly post operation, her vocal cord function recovered successfully indicating that unilateral vocal cord paralysis can be seen in thyroiditis, and that this can be reversed with steroids and antibiotics. Again this case also suggested that if surgery is necessary, care must be taken to preserve the recurrent laryngeal nerve. Unfortunately we could neither find literature about effect of nodular thyroid goiter on the recurrent laryngeal nerve nor the effect of ectopic thyroid tissue on the recurrent laryngeal nerve.

Moreover there is a controversial argument for the location of ectopic thyroid tissue in the neck lateral to the jugular vein for many authors agree that the lateral thyroid tissue are rarely benign in nature. The major characters that indicate occult metastatic disease in lateral aberrant thyroid involve the solidity, margin, adhesion with adjacent structures and the swelling of the substance of lymph nodes tissue. But the differentiated diagnosis of the thyroid carcinoma in early stage from the ectopic thyroid tissue induced by nodular goiter and chronic lymphocytic thyroiditis is still difficult. Because it is so important to rule out metastases from thyroid cancer when thyroid tissue is found in an ectopic location, the diagnosis should be confirmed by histological and pathological results. Furthermore literature also recommend that the therapy of ectopic thyroid includes suppression with thyroid replacement and surgical excision [22]. During the operation we found the tissue surrounding the recurrent laryngeal nerve was tough, smooth, oval and separated from the normal thyroid tissue. According to the knowledge above we could not exclude the possibility of metastasis of occult primary thyroid carcinoma. Therefore our patient underwent the thyroidectomy and the surrounded recurrent laryngeal nerve was well preserved.

Ectopic thyroid tissue should also raise suspicion of thyroiditis. Since the possible mechanisms for temporary paralysis of the vocal cord concomitantly with thyroiditis include compression of the recurrent laryngeal nerve and/or its blood supply [23], similarly ectopic thyroid tissue may also suppress the adjacent structure to cause the same symptoms to confuse the diagnosis. For related laboratory examination could distinguish thyroiditis from ectopic thyroid tissue including low TSH value, high free T4 level, low iodine 123 uptake, and a painful thyroid as well as responsiveness to corticosteroid treatment. Nevertheless our patient did not show any discomfort relating to the surrounding recurrent laryngeal nerve, let alone paralysis of the vocal cord. We support the hypothesis that size of the ectopic thyroid tissue is not large enough to induce the disfunction of the recurrent laryngeal nerve. Therefore, it is essential to exclude thyroiditis before making the diagnosis of ectopic thyroid tissue.

To sum up, in the case presented here, we describe a patient who appeared asymptomatic with ectopic thyroid tissue surrounding the recurrent laryngeal nerve in lateral neck. There have been cases of unilateral vocal cord paralysis associated with malignant thyroid disease due to compression of the recurrent laryngeal nerve and/or its blood supply [24]. While in our case the tissue even partially surrounding the recurrent laryngeal nerve could hardly induce any symptoms. As the possibility of metastatic well-differentiated thyroid carcinoma was strongly taken into consideration and a diagnostic total thyroidectomy was performed. In fact the nodule was entirely normal thyroid tissue. Thus we suggest the ectopic thyroid tissue should be included in the differential diagnosis of lateral neck masses especially when the recurrent laryngeal nerves were surrounded by the nodules since it is a very rare situation for ectopic thyroid tissue other than metastatic well-differentiated thyroid carcinoma surrounding the recurrent laryngeal nerves. Recurrent disease in the patient will be monitored owing to the possibility that this is a metastasis remaining. This is the first case report of ectopic thyroid tissue surrounding the recurrent laryngeal nerve with no symptoms.

Disclosure of conflict of interest

None.

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