NOTE

A Case of Malignant Thymoma Mimicking Thyroid Carcinoma: A Pitfall in Fine-needle Aspiration

BUNZO MATSUURA, HITOO TOKUNAGA, TERUKI MIYAKE, SACHIKO UTSUNOMIYA, HISAKA MINAMI AND MORIKAZU ONJI

The Third Department of Internal Medicine, Ehime University School of Medicine, Shigenobu, Ehime 791-0295, Japan

Abstract. A case of malignant thymoma presenting as an anterior neck mass is reported. The tumor extended from the thyroid gland to the superior mediastinum. It did not accumulate Tc-99m pertechnetate, but continued to accumulate Tl-201 at the late phase. A fine-needle aspiration cytology from the tumor showed tight clusters of epithelial cells with crowded ovoid nuclei. The tumor was initially diagnosed as thyroid carcinoma, clinically and cytologically. A thymoma with a dominant epithelial component has to be considered in the differential diagnosis of a suspected papillary carcinoma of the thyroid.

Key words: Thymoma, Papillary carcinoma of thyroid, Fine-needle aspiration cytology

THYMOMA most frequently presents in the superior and anterior mediastinum, and rarely presents in the anterior neck. Thyroid carcinomas, however, sometimes extend into the superior mediastinum. Thymoma is variously composed of both epithelial and lymphoid elements. The epithelial cells are neoplastic, while the lymphocytes are not [1]. When the epithelial cells predominate, the differential diagnosis between thymoma and other epithelial carcinomas such as thyroid carcinoma is difficult. Here we report a case of malignant thymoma presenting as an anterior neck mass that was initially diagnosed as thyroid cancer, clinically and cytologically.

Case Report

A 71-year-old male was admitted to our hospital in September 2002 with an anterior neck mass, which was detected on computed tomography during examinations for emphysema. A physical examination revealed a firm nodule 3 cm in diameter in the left lower pole of the thyroid. The nodule moved up and down with swallowing. Enlargement of the cervical lymph nodes was not noticed.

Ultrasonography and computed tomography revealed the tumor existing continuously from the left lower pole of the thyroid to the superior mediastinum. Magnetic resonance imaging (MRI) was not undertaken. The tumor did not accumulate Tc-99m pertechnetate, but continued to accumulate Tl-201 for 90 min after injection (Fig. 1). These clinical findings suggested a thyroid nodule.

Serum thyroid function tests were normal, and serum autoantibodies against thyroid (thyroglobulin antibody and microsome antibody) were negative. Serum thyroglobulin level was normal (Table 1).

Cytological findings of a fine-needle aspirate from the nodule revealed tight clusters of epithelial cells with crowded ovoid nuclei. A rare, small “intranuclear inclusion body” was seen (Fig. 2). No groups of lymphoid cells were seen on any smears. We considered the possibility of a papillary carcinoma of the thyroid. The patient underwent surgery for tumor resection and...
definite diagnosis.

Macroscopically, the tumor was connected with the thyroid gland from mediastinum. The tumor, however, was easily separated from the thyroid by hand. We resected only the tumor. The resected tumor measured 4 × 4 × 3 cm. It was well-encapsulated, yellowish, and lobulated with regions of fibrosis. A few foci of necrosis and cystic change were seen. Microscopically, the tumor was composed of the epithelial cells and lymphocytes, with epithelial cells predominating, and the epithelial cells invaded the capsule. The nuclei were relatively large and irregular in shape, with folds, indentations, and cytoplasmic inclusions. The nucleoli were inconspicuous. The central portions of the nuclei were relatively pale and like ground glass

{Fig. 1. (a) Scintigraphy of Tc-99m pertechnetate showed a cold nodule in the left lower pole of the thyroid. (b) Scintigraphy of delayed phase of Tl-201 showed abnormal accumulation in the left lower pole of the thyroid.

Table 1. Serum levels of thyroid related markers.

<table>
<thead>
<tr>
<th></th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH</td>
<td>2.0 μU/ml</td>
</tr>
<tr>
<td>Free T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>1.6 ng/dl</td>
</tr>
<tr>
<td>Free T&lt;sub&gt;3&lt;/sub&gt;</td>
<td>3.6 pg/ml</td>
</tr>
<tr>
<td>Thyroglobulin antibody</td>
<td>(—)</td>
</tr>
<tr>
<td>Microsome antibody</td>
<td>(—)</td>
</tr>
</tbody>
</table>
| Thyroglobulin           | 12 ng/ml        | (0–45)

(Fig. 2). Fine-needle aspiration of the tumor yielded cohesive clusters of epithelial cells with crowded ovoid nuclei. A rare, small “intranuclear inclusion body” (arrow) was seen (Papanicolaou stain, ×100).

(Fig. 3). No cells in the tumor were stained by antibody to thyroglobulin. We finally diagnosed the lesion as malignant thymoma.
Discussion

Thymoma consists of a mixture of epithelial and lymphoid cells. The epithelial cells are round, oval, or spindle-shaped. The cytoplasm of the epithelial cells is scant to moderate, with indistinct borders, and ranges from delicate and histiocytic to dense and squamoid. The nuclei of the epithelial cells are not very different from other epithelial cancer cells. In our case, the epithelial cells of the tumor were almost the same as those of thyroid papillary carcinoma. Thus, we initially diagnosed it as thyroid carcinoma. Thyroglobulin is a protein specifically produced in the thyroid. So, when the tumor cells are stained positively for thyroglobulin, we can diagnose the tumor as thyroid in origin [8–10]. In our case, since no cells in the tumor were stained for thyroglobulin, we finally diagnosed it as thymoma.

When the lymphoid component is predominant, the tumor is considered to be a malignant lymphoma. Friedman et al. reported on fine-needle aspiration of a thymoma mimicking lymphoblastic lymphoma [11]. It has been reported a few times that fine-needle aspir-
ration of an ectopic cervical thymoma mimicked a thyroid lymphoid tumor, such as Hashimoto’s thyroiditis or malignant lymphoma [12–14]. An ectopic thymoma shows the same histological features as mediastinal thymoma. Other diagnostic pitfalls in mediastinal aspirates have been reported: an enlarged thymus misdiagnosed as a thymoma [15], and a solid and cystic thymoma as a bronchial inflammatory cyst [16].

 Ultrasonography is useful for the differential diagnosis between an intrathyroidal nodule and an invasive nodule to the thyroid, but it is difficult to assess the origin of the nodule when it is huge or multinodular. In our case, the tumor presented in the lower pole of the thyroid, and the tumor size was large at 3 to 4 cm in diameter, so we could not assess the origin of the tumor. Kiyosue et al. reported that MRI was helpful in this situation [17]. If a cervical tumor or a tumor connected with the thyroid is the different intensity as the thyroid gland, and is the same intensity as the mediastinal thymus, the tumor can be considered as thymus in origin. If we undertook MRI in our case, we might have diagnosed it as thymus in origin.

 Kawamura et al. and Pacini et al. reported that thyroglobulin concentration levels in the cyst fluid of primary thyroid nodules were markedly high, and those of nonthyroidal cysts such as parathyroid cyst, thyroglossal cysts, or lateral cysts were very low [18, 19]. Murakami et al. reported if thyroglobulin is detected in either cystic or solid tumors, they can be diagnosed as thyroid in origin [20]. In our case, the serum thyroglobulin level was not increased. If we measured thyroglobulin level in the tumor aspirate, and if the thyroglobulin level in the aspirates was not detected, we could diagnose it as thymic tumor preoperatively.

 Recently, Takano and Amino reported a new method of diagnosis of thyroid cancer using mRNA from tumor aspirates [21]. Oncofetal fibronectin mRNA from the aspirate can clearly distinguish thyroid cancer from benign thyroid tissue. If we use this method in the future, we can easily diagnose the tumor as thyroid in origin preoperatively.

 In conclusion, when a nodule exists continuously from the thyroid to the mediastinum, the possibility of thymoma should be considered before operation.

 Acknowledgements

 The authors gratefully thank Dr. S. Kinoshita and the surgeons in the First Department of Surgery, Ehime University School of Medicine, for their advice and encouragement.

 References

 12. Vengrove MA, Schimmel M, Atkinson BF, Evans D,


