

## Aspiration Cytology of Cervical Thymoma – A Case Report –

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Received : January 5, 2010  
Accepted : May 12, 2010

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\*This work was supported by Inha University Research  
Grant.

An ectopic cervical thymoma is an uncommon tumor of the neck displaying the same histologic features as a mediastinal thymoma. Because of its unusual location, this mass is often confused as originating from the thyroid. In this report we describe a case of cervical type AB thymoma. Aspiration cytologic smears were highly cellular and revealed irregular tissue fragments, cohesive sheets, and clusters of crowded epithelial cells intermingled with many small lymphocytes. The epithelial cells had oval and spindle shaped bland-looking nuclei and scant cytoplasm with indistinct cell borders. Mitosis, nuclear atypia, and necrosis were not observed. The cells were focally arranged in a nesting pattern. Many small lymphocytes, a few activated lymphocytes, and lymphoid tangles were seen in the background. A cytologic misdiagnosis of "possible carcinoma" was rendered. Therefore, ectopic thymoma should also be considered in fine needle aspiration cytology of a neck mass when the smear shows epithelial and lymphoid components.

**Key Words :** Thymoma, Cervical; Fine-needle aspiration cytology

Thymoma, a tumor of the thymic epithelial tissue, is the most common primary neoplasm of the anterosuperior mediastinum in adults. Ectopic thymomas are rare and arise from a migration defect during embryogenesis.<sup>1</sup> A cervical thymoma is commonly located in the anterolateral part of the neck, near or inside the lower pole of the thyroid.<sup>2-10</sup> Because of this location, a cervical thymoma is often confused with a thyroid nodule.<sup>2-10</sup> The cytologic features of a fine needle aspiration (FNA) of a mediastinal thymoma are well known.<sup>11-13</sup> However, a cervical thymoma is sometimes misdiagnosed on FNA cytology due to its rarity. Therefore, the differential diagnosis of a neck mass with a dual population of cohesive clusters of epithelial cells intermingled with lymphocytes should include cervical thymoma, especially in elderly females. We present a case of cervical thymoma assessed by FNA.

### CASE REPORT

A 62-year-old female was referred to our hospital to evaluate

a left neck mass. The mass was incidentally detected during a recent routine general check-up. The patient had a history of hypertension for 10 years and a history of renal stones 7 years ago. Metastatic cancer or a malignant tumor of the thyroid was suspected clinically, and the patient underwent a radiological evaluation. Computed tomography and an ultrasonogram of the neck disclosed an ill-defined, oval shaped solid mass with calcification at level IV of the left neck, abutting to the lower pole of the left thyroid (Fig. 1). The mass was rubbery, solid, and firm. Sono-guided FNA was performed, and a diagnosis of "possible metastatic carcinoma" was made by cytomorphology alone. An excisional biopsy was performed based on the cytologic findings. The tumor was a well-circumscribed mass and was separated from the thyroid. Finally, the tumor was diagnosed as minimally invasive cervical thymoma type AB based on the immunohistochemical findings and morphological features. A subsequent positron emission computed tomography scan revealed increased 18F-deoxyglucose uptake at the aortocaval lymph node and the pancreatic tail. Excised retroperitoneal lymph nodes revealed tuberculous lymphadenitis.

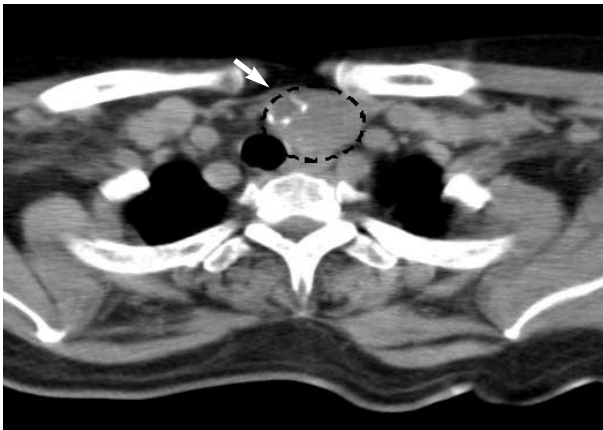


Fig. 1. Computed tomography of the neck shows an ill-defined, oval shaped mass (4.5 × 3.3 cm in diameter) with calcification near the lower pole of the left thyroid.

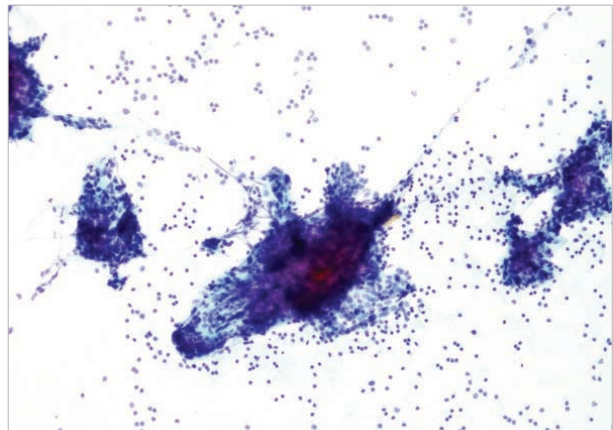


Fig. 2. The aspiration cytologic smear is highly cellular and reveals irregular tissue fragments, cohesive sheets, and clusters of crowded epithelial cells intermingled with many lymphocytes.

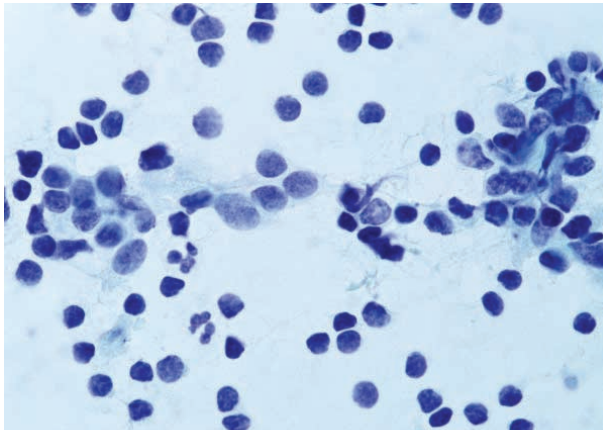


Fig. 3. The epithelial cells are spindle and oval shaped cells with small round, oval and spindle shaped bland-looking nuclei, showing dispersed finely granular chromatin, inconspicuous nucleoli and scant cytoplasm with indistinct cell borders.

### Cytologic findings

A FNA was performed using a 10 mL syringe with a 23 G needle. Ethanol-fixed slides were stained using the Papanicolaou method. The aspiration cytologic smears were highly cellular and revealed irregular tissue fragments, cohesive sheets, and clusters of crowded epithelial cells intermingled with many lymphocytes (Fig. 2). Many small lymphocytes, a few lymphoid tangles (crushed lymphocytes), activated lymphocytes, and tingible body macrophages were seen in the background. The epithelial cells were oval and spindle shaped and revealed round, oval, spindle shaped, and bland-looking nuclei with finely dispersed granular chromatin, inconspicuous nucleoli, and scant cytoplasm with indistinct cell borders (Fig. 3). Mitosis, nuclear atypia, and

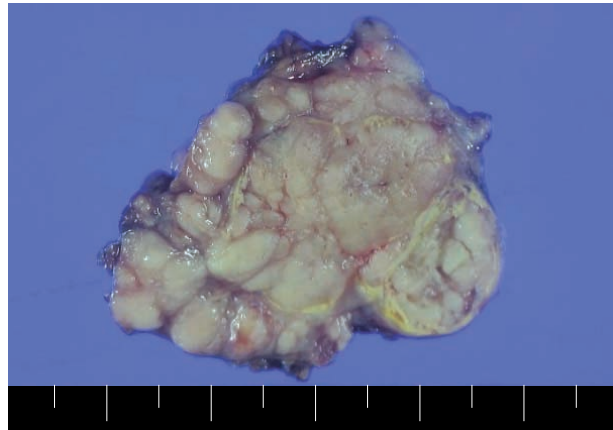


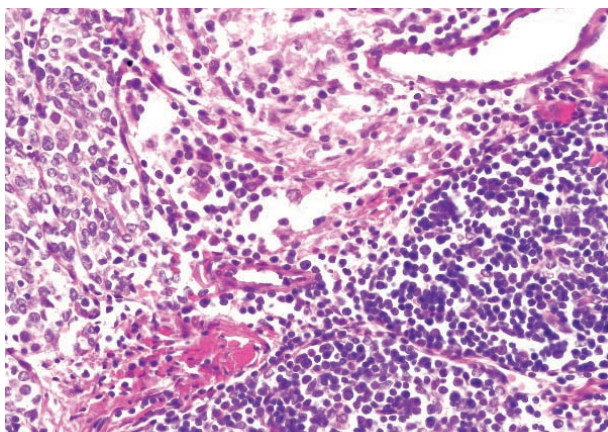
Fig. 4. The mass is whitish-yellow to tan and has a nodular cut surface with focal calcification.

necrosis were not observed. Some of the small lymphocytes were intimately associated with epithelial cell clusters. A few loose aggregates of epithelioid cells with slightly dense cytoplasm were also observed. A cytologic diagnosis of “possible carcinoma” was rendered, and an excision biopsy was recommended for a histological confirmation and a definitive diagnosis.

### Gross and histological findings

Grossly, the excised specimen was a relatively well demarcated multinodular solid mass measuring 4.5 × 3.3 × 2.3 cm. The mass had a whitish-yellow to tan, nodular cut surface with focal calcification (Fig. 4). Necrosis or hemorrhage was not found.

Microscopically, the mass had a thick fibrous capsule with thick fibrous bands dividing the tumor into lobules. The tumor showed a nodular growth pattern and had diffusely invaded into



**Fig. 5.** The tumor reveals a variable mixture of lymphocyte-poor and lymphocyte-rich areas. The oval to spindle shaped epithelial tumor cells are oval and spindle shaped bland looking cells with small round, oval or spindle nuclei showing dispersed chromatin.

the capsule and surrounding soft tissue. The tumor revealed a variable mixture of lymphocyte-poor and lymphocyte-rich areas. The tumor cells were oval to spindle shaped epithelial cells with bland-looking, small round, oval or spindle shape nuclei with dispersed chromatin, inconspicuous nucleoli, scant cytoplasm, and indistinct cell borders (Fig. 5). Medullary differentiation was not found. The lymphoid cells were small mature lymphocytes and had neither convoluted nor cleaved nuclei. The lymphocytes were positive for TdT (1 : 50; Neomarker, Fremont, CA, USA), an immature T-cell marker, on immunohistochemical staining. The tumor was diagnosed as minimally invasive cervical thymoma type AB, according to the World Health Organization classification.

## DISCUSSION

The thymus is derived from the third and fourth pharyngeal pouches and descends into the anterior mediastinum during embryogenesis.<sup>1</sup> Ectopic thymic tissue may present at any site along the descending pathway.<sup>1</sup> Ectopic cervical thymic tissue occurs frequently in children and males and shows a cystic component.<sup>14</sup> In contrast to ectopic cervical tissue, cervical thymomas have a female predilection with a ratio of 9 : 1 and occur at an older age.<sup>1-10,15,16</sup> Ectopic thymomas have been described in submandibular, paratracheal, intratracheal locations, and within the thyroid gland as well as in the substernal area, lung, pleura, and pericardium.<sup>4,6,9,16-18</sup> The incidence of cervical thymoma is extremely low.<sup>1</sup>

Patients usually present with a mass in the anterolateral neck,

which is sometimes clinically confused with a thyroid mass. Paraneoplastic manifestations are unusual in cervical thymoma.<sup>1-10</sup> Cervical thymomas show a benign clinical course, but rare recurrence or metastasis has been reported.<sup>1,3,4,8-10</sup> The gross and microscopic features are identical to those of mediastinal thymoma.<sup>1-10</sup> The cytologic features of cervical thymoma aspirates are identical to those of mediastinal thymoma, but a correct diagnosis is difficult because of the unusual location and its rare incidence.

Although more than 20 cases of ectopic cervical thymoma have been reported, a description of FNA cytology features is rare. To our knowledge, this is only the tenth reported case in which a FNA of a cervical thymoma has been performed.<sup>2-10</sup> In six of the nine cases previously reported, the tumors contained predominantly a lymphocytic component,<sup>5-10</sup> one case revealed a dual population of lymphocytes and epithelial cells,<sup>4</sup> and two cases revealed an epithelial component predominantly.<sup>2,3</sup> Five cases were diagnosed as Hashimoto's thyroiditis, lymphocytic thyroiditis vs malignant lymphoma, and primary malignant lymphoma of the thyroid on FNA cytology.<sup>5-8,10</sup> In one of the lymphocyte predominant cases, the cytologic diagnosis was ectopic cervical thymoma vs ectopic cervical thymic tissue using flow cytometry and cytology.<sup>9</sup> The cytologic diagnosis of the case with a dual population of epithelial cells and lymphocytes was thyroid neoplasm not further classified and Hashimoto's thyroiditis.<sup>4</sup> One of the two cases with a major epithelial component was compatible with a spindle cell lesion<sup>3</sup> and the other case was misdiagnosed as "possibly a thyroid papillary carcinoma."<sup>2</sup>

The cytologic features of a thymoma with a mixture of neoplastic epithelial cells and non-neoplastic small lymphocytes vary by case and in different parts of the same lesion.<sup>11-13</sup> The majority of reported cervical thymomas reveal a lymphocytic component and a small number of epithelial cells.<sup>5-10</sup> The epithelial cells show varying degrees of intercellular cohesion. The cytoplasm of the epithelial cells is scant to moderate, with squamoid or indistinct cell borders, and varies from delicate to dense.<sup>13</sup> The nuclei are bland-looking with a smooth nuclear outline and pale, finely granular chromatin, and often with small prominent nucleoli. Mitosis is rarely observed. Thymomas showing spindle cells with elongated regular nuclei and inconspicuous nucleoli, as well as clear cells have also been reported.<sup>11-13</sup> The proportion of epithelial cells and lymphocytes varies and may lead to the erroneous diagnosis of metastatic carcinoma when the lymphocyte component is sparse, while the predominance of lymphocytes may simulate a malignant lymphoma or chronic lymphocytic thyroiditis.<sup>5-10</sup> Ectopic hamartomatous thymo-

ma, which is a benign and distinctive tumor, can also occur in the deep soft tissues of the neck and has an intricate admixture of bland-looking spindle cells, epithelial cells, and adipose cells. Ectopic hamartomatous thymomas differ morphologically from a thymoma in that they lack a jigsaw puzzle-like lobulation and cytologically lack a dual population of epithelial cells and lymphocytes.<sup>19,20</sup>

A diagnosis of thymoma can be made when the epithelial and lymphocytic components are well displayed in the aspirate. The case presented here was initially misinterpreted on FNA as a "possible metastatic carcinoma of the lymph node." Finally, faced with our inability to classify this tumor, we recommended surgical excision for a definitive diagnosis. Several cytologic clues were helpful after retrospectively reviewing the present case. A dual population of neoplastic epithelial cells and non-neoplastic small lymphocytes, and the absence of nuclear atypia, mitosis, single cells, and necrosis can exclude malignancy. A careful search and a precise interpretation of the epithelial cell and lymphocytic components could lead to an accurate diagnosis.

In conclusion, ectopic thymoma may clinically present as a palpable neck mass that is frequently confused with a thyroid nodule. The possibility of thymoma should be considered when the FNA of a neck mass reveals a dual population of lymphoid and epithelial cells without nuclear atypia. This case highlights the importance of awareness for this entity, and the characteristic cytologic features may help prevent a misdiagnosis.

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