Carcinoma of the thyroid gland showing thymic-like elements: hypofunctioning nodule accumulating $^{99m}$Tc-MIBI and $^{18}$F-FDG

To the Editor: Carcinoma showing thymus-like elements (CASTLE) is a rare tumor of thymic origin occurring in the thyroid gland or in adjacent soft tissues of the neck. Here we present a 55 years old man without symptoms. Physical examination revealed a 2.5cm hard nodule on the lower part of the right thyroid lobe, which was movable during swallowing. No cervical lymph node was palpable and the neck was not tender to palpation. Thyroid function and calcitonin tests were within normal limits. Thyroid US showed a lobulated, solid, noncalcified, hypoechoic mass, measuring 2.7×2.3cm in cross-sectional diameter and demonstrating moderate vascularity on color flow images (Fig. 1).

![Figure 1](image1.png)

Figure 1. Thyroid ultrasonography showed a lobulated, solid, noncalcified, hypoechoic nodule (A) with moderate vascularity on color flow image (B).

On thyroid scans using technetium-$^{99m}$pertechnetate ($^{99m}$TcO$_4^-$) and $^{99m}$Tc-methoxy-isobutyl-isonitrile ($^{99m}$Tc-MIBI), a hypofunctioning (cold) thyroid mass (Fig. 2A and 2B) was seen in the lower part of the right thyroid lobe. Fluorine-$^{18}$-fluoro-2-deoxy-d-glucose-positron emission tomography/computed tomography ($^{18}$F-FDG-PET/CT) showed an irregular mass with soft-tissue density, extending from the lower part of right thyroid lobe into the tracheo-esophageal groove, infiltrating the right posterior tracheal wall. The distribution of $^{18}$F-FDG exhibited a heterogeneously focal pattern with maximum standard uptake value (SUV$_{max}$) 5.3 (Fig. 3). At surgery a 2.5-cm, solid, lobulated tumor was seen closely attached to the trachea. A total thyroidectomy was performed followed by radiotherapy. Microscopic examination revealed confluent nests and lobules of epithelioid and spindle-shaped cells with pleomorphic vesicular nuclei, distinct nucleoli with small lymphocytes and plasma cell infiltration, and focal squamous differentiation. Solid islands of tumor cells were separated by thick fibrous septa. Immunohistochemical tests showed that the tumor was positive for CD5 and CD117 (Fig. 4).

This tumor was originally described by Miyauchi et al in 1985 [1]. Since then, fewer than 30 cases of this unusual tumor have been reported based on a MEDLINE search on January 5, 2011. It typically occurs in adults in the fifth decade, in the middle to lower part of the thyroid, and may invade adjacent soft tissue and metastasize to regional lymph nodes. Clinically, surgery alone is sufficient for patients without lymph node metastases. The role of radiotherapy when lymph node...
matastases has occurred can limit subsequent recurrence, but there is no evidence that chemotherapy is beneficial [2].

Histopathological examination and immunohistochemical tests can provide the final diagnosis of CASTLE according to favorable features including lobulated architecture, infiltration by lymphocytes, scarce neutrophils, a low mitotic count, perivascular-like spaces, and expansile growth, provided lymphoepithelioma-like carcinoma of the skin, primary aero-digestive tract squamous cell carcinoma, and metastatic squamous cell carcinoma of unknown primary have been excluded. The sensitivity and specificity of the pathologic diagnosis of CASTLE by immunohistochemical staining with CD5, a marker of carcinoma of thymic origin, were 82% and 100%, respectively [3]. Recently, the overexpression of CD117 (a tyrosine kinase-KIT receptor) has been found in thymic carcinomas but is absent in thymomas.

In conclusion, we present a case of a rare CASTLE case in the thyroid gland characterized by a hypofunctioning nodule that accumulated ⁹⁹ᵐTc-MIBI and ¹⁸F-FDG.

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Bibliography


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