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Thymolipoma, Report of a Case Suggesting an Origin from Thymic True Hyperplasia

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Brief title: thymolipoma from thymic true hyperplasia

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Abstract

We describe a rare case of thymolipoma in a 26-year-old, otherwise healthy woman presenting with general fatigue. Radiologic examinations disclosed a large anterior mediastinal mass. Macroscopically, the resected tumor was approximately 5 x 10 cm with nodular configuration and, microscopically, three components were identified: a normal thymic rim, hyperplastic thymic tissue, and a typical thymolipomatous component at the periphery of the hyperplastic area. The predominant component of the tumor was hyperplastic thymic tissue. The tumor was diagnosed as thymolipoma at the initial stage of development. This case suggests the histogenesis of thymolipoma — fatty regression or infiltration of fatty tissue into a previously hyperplastic thymus.

Keywords: thymolipoma, thymic true hyperplasia, fatty regression
Thymolipoma is a rare tumor of the anterior mediastinum (less than 100 cases in the literature\textsuperscript{1}). Here, we present a unique case of thymolipoma suggesting the pathogenesis of the tumor.

**Case Report**

**Clinical Findings**

A 26-year-old, otherwise healthy woman presented with general fatigue. A radiologic examination revealed a large anterior mediastinal mass (Figure 1). No symptoms of myasthenia gravis were observed, and anti-acetylcholine receptor (AchR) antibody was negative. Laboratory findings were unremarkable, and no endocrinological abnormalities were observed. The tumor was wholly resected through thoracotomy. The patient is doing well and is free of the disease for six months after the surgery.

**Pathological Findings**

Macroscopically, the resected tumor was thinly encapsulated and measured approximately 5 x 10 cm (Figure 2A). A cross-section of the lesion showed a nodular or lobular configuration with a thin rim of normal thymic tissue (Figure 2B). Microscopically, a normal thymic rim with lobular pattern, hyperplastic thymic tissue without lobular pattern (Figure 3A), and a thymolipomatous (mixed thymic and lipomatous) component at the periphery of the hyperplastic area (Figure 3CD) were identified. In the hyperplastic area, both the thymic cortex and the medulla with
Hassall’s corpuscles were observed (Figure 3B). This is true thymic hyperplasia and not lymphoid (germinal center) hyperplasia. The predominant component of the tumor was hyperplastic thymic tissue. At the periphery of the hyperplastic nodule, the typical histology of thymolipoma with thin septae of atrophic thymic tissue (Figure 3E) was noted. Adipocytes were found in the perivascular space of hyperplastic thymic tissue and cytokeratin 19 (CK19) immunostaining highlighted the initial phase of adipose infiltration in the hyperplastic area (Fig. 4AB). In the thymolipomatous area, CK19-positive epithelial cell nests were intermingled with fat tissue (C), whereas CK19-positive epithelial cells clearly surrounded normal thymic tissue (D). Based on the above findings, the tumor was diagnosed as thymolipoma at the initial stage of development.

Discussion

Thymolipoma, a rare mediastinal tumor with no sex predilection may occur at any age, but is most commonly encountered in young adults (10-30 years old, mean age 33 years).\(^1\) It may remain asymptomatic for a long period, and about 7% of such patients demonstrate myasthenia gravis.\(^2\) As in our case, it may be incidentally found as a large, well circumscribed anterior mediastinal mass and can reach 16kg in weight and 360 mm in diameter.\(^3\) The biological behavior and pathogenesis of thymolipoma are controversial, although several theories have been proposed for its pathogenesis.\(^4\) Its biological behavior is, by most authors, described as a benign neoplasm. One theory of its pathogenesis is that thymolipoma is a type of thymic hamartoma (also called
thymolipomatous hamartoma). Interestingly, another theory has proposed that thymolipoma originates from specialized thymic stroma.\textsuperscript{4,5} Still other theories suggest that thymolipoma represents fatty regression or infiltration of fatty tissue into a previously hyperplastic thymus.\textsuperscript{6} Replacement of diffuse thymic hyperplasia by adipose tissue seems to be the most widely accepted explanation.\textsuperscript{7,8} In our case, part of the hyperplastic thymic parenchyma was involved in lipomatous infiltration and, furthermore, CK19 immunostaining supported the process of adipose infiltration, suggesting that the lesion was in the initial stage of the development of thymolipoma. Although thymolipoma may comprise a group of heterogeneous tumors, our case, at least, showed the initial stage of lipomatous infiltration into the hyperplastic nodule of the thymus, leading to thymolipoma. Therefore, we speculate that our case shows the initial stage of the development of thymolipoma.

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References


**Figure legends**

**Figure 1**
Computed tomographic scan of the tumor found in the anterior mediastinum (asterisk).

**Figure 2**
Macroscopic findings of the tumor.
(A) The tumor was approximately 5 x 10 cm with a thin fibrous capsule. (B) The cut surface is nodular with a normal thymic rim. On the right side, a more yellowish area can be identified.

**Figure 3**
Microscopic findings of the tumor.
(AB) Histology of boxed area 1 in Figure 2B. Normal thymic rim (*) surrounding hyperplastic thymic tissue (A: x 40, B: x 100, hematoxylin and eosin stain). (CDE) Histology of boxed area 2 in Figure 2B (CD: x 40, E: x 100, hematoxylin and eosin stain). Typical histology of thymolipoma with thin septae of atrophic thymic tissue.

**Figure 4**
Immunohistochemical findings of the tumor (cytokeratin 19 (CK19)).
(A) Adipocytes are found in the perivascular space (PVS) of hyperplastic thymic tissue. (x 100, hematoxylin and eosin stain) (B) CK19 immunostaining highlights the initial
phase of adipose infiltration (arrows). CK19-positive epithelial cell nests are
intermingled with fat tissue in the typical thymolipomatous area (C), whereas
CK19-positive epithelial cells surround normal thymic tissue (D). (BCD: x 100).
true thymic hyperplasia
Fig. 4