

## Ectopic Thymic Tissue in the Thyroid Gland

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### Abstract

A case of ectopic thymic tissue of the thyroid in a 30-year-old woman with Graves' disease is reported. The thyroidectomy specimen, removed because of failure of medical therapy, showed a continuous track of thymic tissue extending from the center of the gland to the capsule along an interlobular septum. This finding is unique, and the histogenesis of this ectopic thymic tissue is discussed. *Endocr Pathol* 4:162-164, 1993.

Parathyroid gland, thymic tissue, salivary gland remnants, and solid-cell nests are well known as embryological remnants in the thyroid gland. In fact, ectopic thymic tissue can be found in the thyroid gland, although it is infrequently encountered in the thyroid of adults [4,10]. The presence of ectopic thymic tissue in the thyroid gland is theoretically attributable to embryonic development. Recently, we encountered ectopic thymic tissue in the thyroid gland, in which the ectopic thymic tissue showed a unique feature.

### Case Report

A 30-year-old woman was diagnosed with hyperthyroidism due to Graves' disease in 1979. Medical treatment of the hyperthyroidism with propylthiouracil (300 mg/day) was unsuccessful, and a subtotal thyroidectomy was performed in February 1982. The results of thyroid function tests at the time of surgery were as follows; triiodothyronine ( $T_3$ ), 393 ng/dL (normal range, 80-190 ng/dL); thyroxine ( $T_4$ ), 17.0  $\mu$ g/dL (4.6-11.0); and thyroid-stimulating hormone (TSH), less than 1.0  $\mu$ U/mL (<10.0). The antimicrosome antibody titer was 1:6,400 (1:<100), and the antithyro-

globulin antibody titer was 1:1,600 (1:<100). TSH binding inhibitory immunoglobulin (TBII) and thyroid-stimulating antibody (TSAb) were not evaluated.

The resected thyroid gland (7 × 6 × 2 cm; 34 g) was routinely sectioned and examined. Microscopically, the thyroid gland showed diffusely hyperplastic changes with scattered lymphocytic aggregates, indicating Graves' disease hyperplasia. No areas of Hashimoto's thyroiditis were found. Ectopic thymic tissue was incidentally found in the middle portion of the right lateral lobe of the thyroid (Figs. 1-3). The ectopic thymic tissue was composed of abundant lymphoid tissue containing well-developed Hassall's corpuscles. The ectopic thymic tissue was embedded in an interlobular fibrous septum and extended from the center of the gland to the posterolateral surface of the gland, showing an infiltrating-like pattern.

### Discussion

Ectopic thymic tissue is infrequently observed in the thyroid gland of adults, and only a few observations of this condition have been reported [4,10]. In contrast, it is more frequently observed in the thyroid

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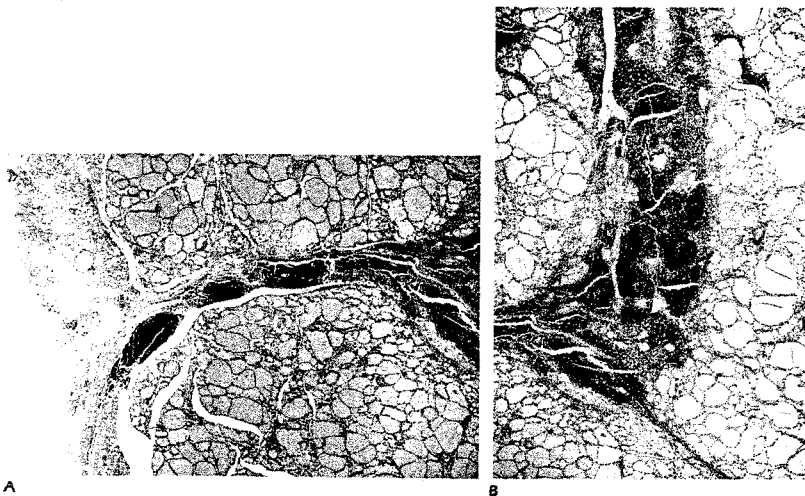
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**Figure 1.** Macroscopic appearance of the thyroid gland (Hematoxylin and eosin, original magnification  $\times 2$ ).

gland of neonates, infants, and children [2,3,5,9,13,14]. Carpenter and Emery [3] found intrathyroidal thymic tissue in 9 of 350 single-sectioned thyroids of infants. Beckner et al. [2] also found ectopic thymic



**Figure 2.** (A, B) Ectopic thymic tissue, embedded in the interlobular septum, extends from the center of the thyroid gland to the thyroid capsule (Hematoxylin and eosin, original magnification  $\times 20$ ).

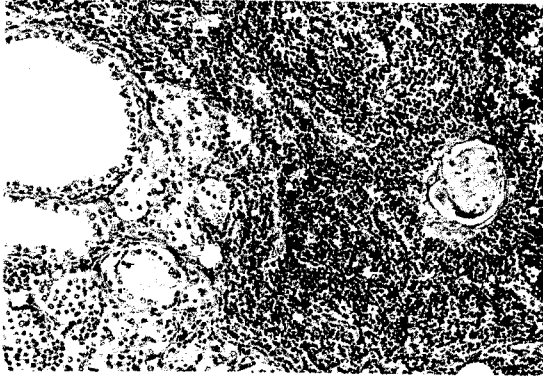
tissue in 4 of 18 serially sectioned neonatal thyroid glands. Yamaoka [14] reported that ectopic thymic tissue was found in 4 of 388 thyroids, all from neonates and infants.

The ultimobranchial bodies (UBB) in human embryos develop from the fourth and fifth branchial pouch complexes along with thymic and parathyroid tissues [12]. They become incorporated within the lateral thyroid lobe as tiny solid and cystic cellular nests, known as SCNs. This embryological development might also cause intrathyroidal thymic tissue or parathyroid tissue near the SCN [14]. Currently, most intrathyroidal thymic tissues are believed to have originated from the UBB, which are fused with lateral thyroid anlage in the fetal period and tend to disappear with growth of the thyroid gland [11]. The fact that ectopic thymic tissue is observed more frequently in neonates and infants supports this view. However, human thymic primordium also arises predominantly from the third branchial pouch and later the thymus descends into the thorax. Ectopic thymic tissue might also be present in the neck near the thyroid because of failure to descend. In fact, we frequently find ectopic thymic tissue adjacent to the thyroid gland.

We consider that there are 2 ways in which the intrathyroidal thymic tissue may form: (1) prenatal incorporation derived from UBB remnants, and (2) postnatal incorporation of perithyroidal ectopic thymic tissue. Perhaps the former evaluation is more likely to incorporate the thymic tissue into the thyroid gland compared with the latter process; our patient's tissue might have been caused by the former process. However, unique histological findings also suggested the possibility of the latter process (i.e., the ectopic thymic tissue adjacent to the thyroid gland can become incorporated into the thyroid gland during expansile growth of the thyroid gland during postnatal life).

The ectopic thymic tissue in the thyroid gland is important in connection with the occurrence of intrathyroidal thymoma. Several case reports of this condition have been reported (1,6-8); in most of the reports, the ectopic thymic tissue was purported to be the origin of the intrathyroidal thymoma.

Our case indicates that ectopic thymic



**Figure 3.** Thymic tissue is composed of abundant lymphocytes and well-developed Hassall's corpuscles (Hematoxylin and eosin, original magnification  $\times 100$ ).

tissue in the thyroid gland is found in adults, although it may be extremely rare as compared with infants and children, and that it might be a possible origin of intrathyroidal thymoma.

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