

## Case Report

# Ectopic intrathyroidal thymus accompanied by intrathyroidal parathyroid as a cause of a solitary thyroid nodule in adult

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**Abstract:** Ectopic intrathyroidal thymic tissue can form a mass lesion within the thyroid gland and has rarely been reported in children. We report a case of intrathyroidal thymus accompanied by an intrathyroidal parathyroid gland in a 29-year-old woman who visited our hospital due to right neck mass diagnosed as metastatic papillary carcinoma by aspiration cytology in an outside hospital. She had a history of right thyroidectomy due to papillary thyroid carcinoma three years ago. Ultrasonographic examination of the left thyroid gland showed a well-defined hyperechoic nodule, which did not show change in size compared with the previous study. She underwent complete thyroidectomy with right neck dissection. Grossly, the left thyroid had a well demarcated pale yellow nodule measuring 0.9 cm in diameter. On microscopic examination, the nodule was composed of mature fat tissue, ectopic thymic tissue with Hassall's corpuscles, and an intrathyroidal parathyroid gland. This is an exceedingly rare case of ectopic intrathyroidal thymus with intrathyroidal parathyroid gland, in an adult.

**Keywords:** Thyroid gland, ectopic thymus, parathyroid gland

## Introduction

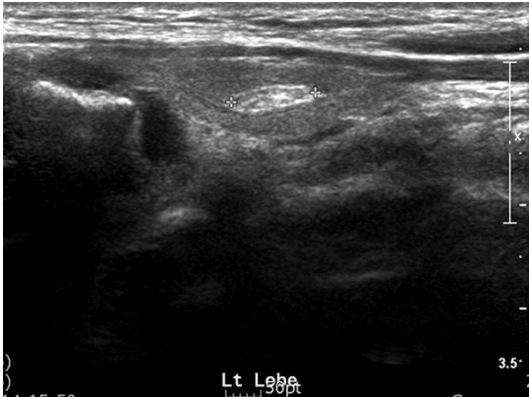
Ectopic intrathyroidal thymic tissue is a rare congenital anomaly and most of the cases were found incidentally during surgery for thyroid nodule [1]. A few cases of ectopic intrathyroidal thymus have been reported so far [1-11]. Most of the patients were children and two of the reported cases had intrathyroidal parathyroid gland surrounded by intrathyroidal ectopic thymic tissue within a single nodule [2, 3]. We present another case of intrathyroidal thymus accompanied by intrathyroidal parathyroid gland in a 29-year-old woman with a history of papillary thyroid carcinoma (PTC).

## Case report

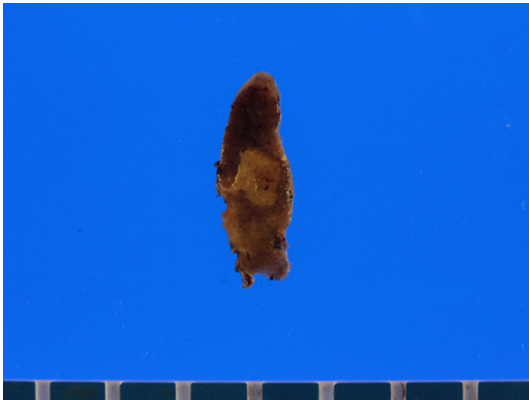
A 29-year-old woman visited our hospital for a right neck mass. Aspiration cytology for the right neck mass was performed in an outside hospital and she was diagnosed with metastatic PTC of the lymph node. On past medical history, she had undergone right lobectomy due to

PTC three years ago. On ultrasonographic examination, there were multiple enlarged lymph nodes in the right neck. The left thyroid gland showed a small well-defined hyperechoic nodule (**Figure 1**). Compared to the previous ultrasonography performed 17 months ago, size of the left thyroid nodule was not changed and the nodule considered benign. Fine needle aspiration cytology was not performed for the left thyroid mass. Because the right neck mass revealed metastatic PTC, the patient underwent complete thyroidectomy with right neck dissection. On gross examination, the left thyroid gland weighed 3.5 g and measured 3.0×1.5×1.2 cm in size. The thyroid capsule was smooth and intact. The cut surface showed a well demarcated yellow, soft consistent nodule measuring 0.9×0.8 cm (**Figure 2**). Microscopically, the left thyroid nodule was composed of an ectopic thymic tissue with Hassall's corpuscles and mature fat surrounding a well-defined parathyroid gland (**Figure 3**). A total of 23 lymph nodes were retrieved from the right neck and two level III lymph nodes had metastatic PTC.

## Ectopic intrathyroidal thymus and parathyroid



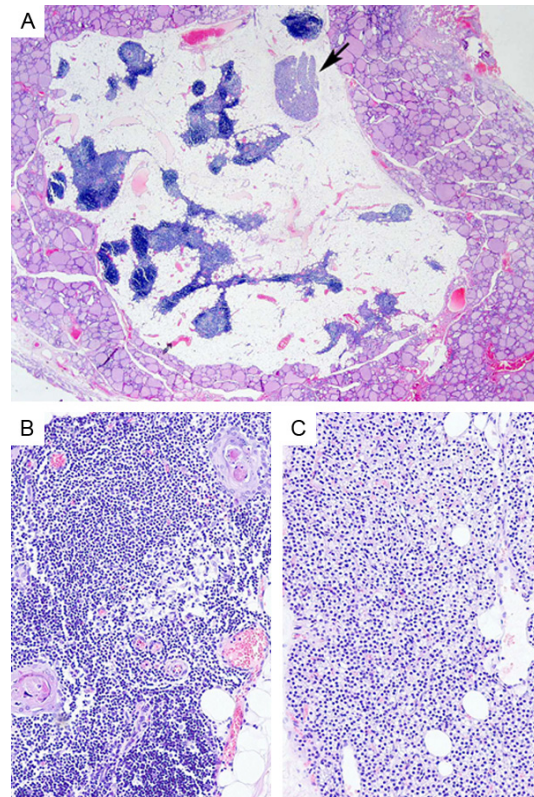
**Figure 1.** Ultrasonography of the left thyroid gland shows a well demarcated hyperechoic nodule.



**Figure 2.** The left thyroid gland has a well-defined yellow, soft consistent nodule measuring 0.9×0.8 cm.

### Discussion

The thymus and inferior parathyroid glands are derived from the third pharyngeal pouches. From the sixth week to the second month of gestation, they migrate together in a caudal and medial direction and reach their usual location [3]. During migration, the tail portion of the thymus breaks up into small pieces and becomes stuck on its way down into the thorax (called the thymopharyngeal tract); however, it usually disappears later on. Ectopic thymic tissue can develop as a consequence of aberrant thymic migration. If thymic rests persist along the thymopharyngeal tract, ectopic thymic tissue can be observed along the descending pathway from the base of the skull to the superior mediastinum [1, 4]. Inferior parathyroid glands could be located in variable anatomic areas because they are also derived from the third pharyngeal pouch and migrate together



**Figure 3.** On microscopic examination, the thyroid nodule is composed of an ectopic thymic tissue, a well-defined parathyroid gland (arrow) and mature fat (A, ×10). Medium power fields show thymic tissue with Hassall's corpuscles (B, ×100) and parathyroid tissue (C, ×100).

with the thymic tissue. They may be found in the cervical area, superior mediastinum or within the thyroid gland [1]. Intrathyroidal thymus usually appeared as a thyroid nodule sonographically. In pediatric patients with a solitary thyroid nodule, incidence of surgical removal is high because malignancy risk in a thyroid nodule is higher in children than in adults [12]. This is why intrathyroidal thymus was more frequently reported in children than in adults.

Ectopic intrathyroidal thymus is a rare entity and only three cases including our case had both ectopic thymic and parathyroidal tissue within a single thyroid nodule (**Table 1**). Wu et al. [2] reported a case of ectopic thymus accompanied by parathyroid gland in a 22-year-old woman. This interesting phenomenon was also found in a six-year-old boy [3]. In our case, thymic tissue was partially involuted and a portion of thymic tissue was replaced by mature fat tissue. Segni et al. [5] reported that intrathyroidal

## Ectopic intrathyroidal thymus and parathyroid

**Table 1.** Summary of the reported cases with ectopic intrathyroidal thymic tissue accompanied with intrathyroidal parathyroid gland

Author [Ref.]	Age (yrs)	Sex	Ultrasonography	Gross findings	Microscopic findings
Wu et al. [2]	22	F	N/A	A small red-purple ovoid nodule, measuring 0.7×0.5×0.2 cm, was identified in the inferior aspect of the right thyroid gland	The nodule contains parathyroid gland and ectopic thymic tissue with distinct cortex, medulla, and Hassall corpuscles
Lignitz et al. [3]	6	M	Inhomogeneous hypoechoic solid nodule (0.7×0.6×0.4 cm) in the middle of the right lobe	A solitary nodule	Ectopic intrathyroidal thymus tissue that surrounded a well-defined parathyroid gland
This case	29	F	A well-defined hyperechoic nodule in left thyroid gland	A well demarcated yellow, soft consistent nodule measuring 0.9×0.8 cm	Ectopic thymic tissue with Hassall's corpuscles and mature fat surrounding a well-defined parathyroid gland

thymus showed a stable course in most children; however it underwent involution in the oldest patient.

Benign or malignant tumors may occur in intrathyroidal thymic tissue. Malignant intrathyroidal thymic tumor was more frequent than benign tumor [4]. A few cases of ectopic intrathyroidal thymoma have been reported in adult patients [13-15].

Hassall corpuscles may accompany dystrophic concentric calcification. These concentric calcifications can be confused with psammoma bodies observed in PTC [1]. Therefore, dystrophic calcification in intrathyroidal thymic tissue may lead to misdiagnosis of the nodule as a malignancy. In our case, the ectopic thymic tissue was unchanged on ultrasonogram during a follow-up period of three years and did not contain calcific focuses. PTC is the most prevalent carcinoma among Korean women and the patient had a previous history of having PTC; therefore, if calcification was present within the nodule, metachronous PTC of the opposite lobe should be included in the differential diagnosis. Abundant fat component within the nodule may indicate regression or involution of the ectopic intrathyroidal thymic tissue after puberty.

In conclusion, ectopic intrathyroidal thymic tissue may accompany intrathyroidal parathyroid gland and form a solitary thyroid nodule in adults. Although this entity is a very rare occurrence, it can mimic PTC if dystrophic concentric calcification is superimposed on the Hassall corpuscles of intrathyroidal thymic tissue.

### Disclosure of conflict of interest

None.

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