

# Dual Ectopia of the Thyroid

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## Abstract

Dual thyroid ectopia is an uncommon manifestation of thyroid ectopia. A single ectopia is the most common manifestation of a failed migration of the thyroid anlage. A total of 11 cases have been reported. Three more cases are presented in this study. Unusual presentation in our study was the association of mental retardation in one and early manifestation of the defect in a small child which was noticed from birth. None of the patients needed surgical intervention and there was no evidence of any neoplastic changes. All patients were clinically euthyroid. One patient had biochemical hypothyroidism.

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## Introduction

It is extremely rare to have two ectopic foci of thyroid tissue, and there have been only eleven previously reported cases of multiple thyroid ectopias. We present 3 cases of dual ectopia which were detected on Tc-99m pertechnetate thyroid scans.

## Case reports

### Case 1

A 9 years old girl presented with a swelling in the upper part of the neck in the mid-line for the past several years, which was gradually increasing in size. Apart from the swelling she was asymptomatic.

On examination the swelling was firm in consistency, measuring about 1.5x2 cm in size and moving well with

deglutition. Her physical growth was stunted for her age. She was marginally handicapped with an IQ of 75 and scholastically backward, studying in the 1<sup>st</sup> standard along with 5 year old children. Her thyroid hormone profile was as follows: Total T3=203 ng/ml (N=70-180 ng/ml), Total T4 = 8.2 µgm/ml (N= 4.5-11.5 µgm/ml), and TSH was 5.3 µ units/ml (N=0.35-5.5 µ units/ml).

US of the neck showed a well defined rounded mass with homogeneous echo texture consistent with thyroid parenchyma in the anterior midline of the neck measuring 1.7x1.7x1cms. The lobes of the thyroid and isthmus were not visualized at the normal anatomic location in the neck. FNAC of the midline nodule revealed features of a colloid goiter. Other investigations like routine blood count, urine and chest X-ray were normal.

Tc-99m pertechnetate scan of the neck revealed absent thyroid in the thyroid bed, uptake of radio tracer by the thyroglossal mass and another discrete focus of radio tracer uptake at the base of the tongue (Figure 1).

### Case 2

A 12 year old girl presented with two small swellings in the upper part of neck and below the lower jaw in the midline which were growing slowly over the past 3 years. She had no significant complaints. Her physical and mental growth was normal. She had not attained menarche and her scholastic progress was average.

Her thyroid hormonal profile was found to be within euthyroid limits. An ultrasound of the neck region revealed absence of normal thyroid tissue in the usual thyroid bed and a midline mass measuring 4x4x3.5 cm with a homogeneous echo texture near the upper part. Additionally a smaller mass with heterogeneous echo texture was also noted in the sublingual region measuring 1x1x1.2cm.

A Tc-99m Pertechnetate thyroid scan revealed active uptake of radio tracer in the thyroglossal cyst, as well as in the sublingual mass lesion. The pertechnetate uptake in the cyst was 2.2%, which was within normal limits.

### Case 3

A 4 year old boy presented with a midline swelling in the front of the neck, which was present since infancy and was slowly progressing in size. He was asymptomatic, His

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mental and physical milestones were normal. He was attending kindergarten and was studying well. Clinically he was euthyroid.

US examination of the neck revealed absence of normal thyroid tissue in the usual anatomic location in the neck. His serum biochemistry revealed a raised level of TSH, which was  $7.8 \mu$  units/ml.

A Tc-99m pertechnetate thyroid scan revealed functioning thyroid tissue in the midline swelling at the upper neck (thyroglossal cyst) and an additional focus of tracer uptake at the base of the tongue, which was consistent with a sublingual thyroid. Tc-99m pertechnetate uptake by the functioning thyroid tissue in the thyroglossal cyst was 0.3% which was low.

The patient was subsequently subjected to a FNAC and about 1ml of yellowish fluid was aspirated from the mass. However the size of the mass remained unchanged and no abnormal cells were seen in the cytological examination.

Based on the clinical presentation, Tc-99m pertechnetate scan and biochemical profile all the three patients were diagnosed to have dual thyroid ectopia in the form of thyroglossal cyst and sublingual thyroids.

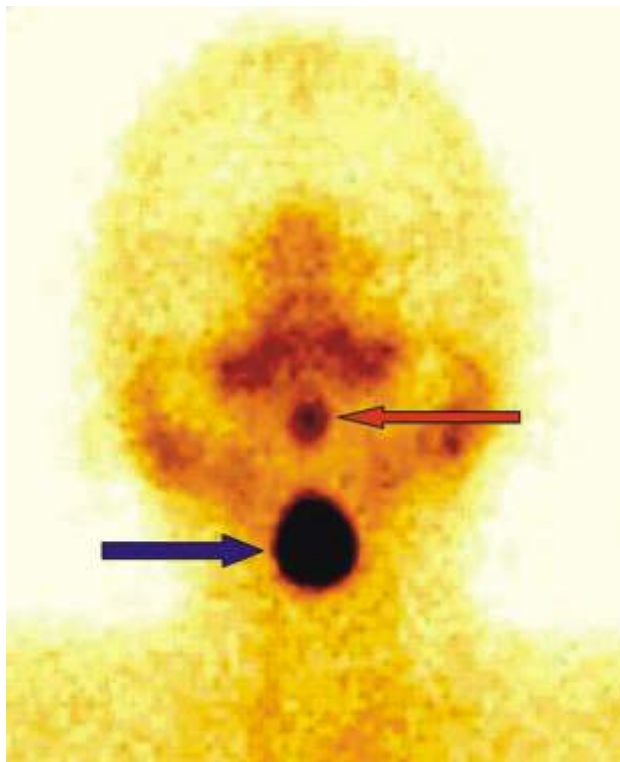
## Discussion

The commonest congenital anomalies of thyroid consist of abnormal or arrested migration, enzyme deficiencies and persistent remnants of the thyroglossal duct (1). The thyroid gland develops in the embryo as an epithelial outgrowth of the pharyngeal floor between the tuberculum impar and the copula, at the foramen caecum (2,3). Migration of the embryological thyroid from the tongue base to the pretracheal location in front of the hyoid bone and the laryngeal cartilage at the level of the second tracheal cartilage is completed by the 7th week of gestation (2,3). The most common ectopic location of thyroid tissue is related to failure of descent and persistence at the foramen caecum, the lingual thyroid which is observed in 70-90% of the cases (1, 4, and 5). The sublingual thyroid gland is located in the midline just below foramen caecum, between the geniohyoid and mylohyoid muscles.

Arrest of thyroid gland migration may occur just above or below the hyoid bone (1,5). Unusual sites of thyroid tissue have been described in mediastinum, heart, oesophagus, larynx, liver and trachea (1,5,6,7,8). There are rare case reports of thyroid ectopia lateral to the midline in the submandibular region (9).

All three of our cases have revealed ectopia in the lingual/sublingual and the thyroglossal region.

US is characteristic with failure to visualize thyroid glandular tissue in the normal pretracheal region and demonstration of thyroid tissue in the sites of ectopia. US appearances of the ectopic thyroid tissue show variegated patterns from a heterogeneous echotexture secondary to colloid degeneration or homogeneous echoes of normal



**Figure 1.** Tc-99m Pertechnetate scan of the head and neck showing absence of radio tracer concentration at the normal thyroid bed in the neck. Alternately, intense radio tracer uptake is noted by the thyroglossal mass in the upper part of neck in the mid line (Blue Arrow). Another discrete focus of radio tracer uptake is noted at the base of the tongue (Red Arrow).

thyroid tissue or a fluid filled cyst.

In our series one patient showed normal thyroid echo texture, one a fluid filled cyst and the third showed heterogeneous echoes with hypoechoic changes. However thyroid scintigraphy remains the most definitive and important noninvasive technique for establishing the diagnosis of thyroid ectopia (Figure 1).

Cross-sectional imaging can be done when contemplating surgery to assess the relationship with anatomical structures in the neck and for evaluating nodal status (10). The multi-planar capability of magnetic resonance imaging facilitates differentiation of ectopic lingual thyroid tissue from intrinsic tongue muscles (1, 4). None of our cases had either a CT or MRI done as no surgical procedure was contemplated. Fine-needle aspiration cytology may exclude malignancy and elucidate the cause of ectopic thyroid glandular enlargement and non-homogeneity (1, 4, and 8). The potential for malignant degeneration of ectopic and eutopic thyroid tissue is similar (11, 12). Papillary carcinoma appears to be the dominant histological subtype of malignancy found in ectopic thyroid tissue, occurring in 80% to 95% of cases. In our cases FNAC did not show any evidence of malignancy. Normal follicular cells and colloid were reported.

Clinical presentations can be varied. One report shows a patients with Graves' disease and unilateral exophthalmos

and large masses (11). Patients can be hypothyroid (12, 13) or euthyroid and the age at presentation can be at any time starting with very young age to late teen (1, 13, 14, 15), and with symptoms of an enlarged mass in the neck leading to dysphasia and odynophagia or totally asymptomatic (2, 4). The size of the mass in the midline can also vary from 1-8 cm in diameter (15). Predominance of the abnormality is in females but males also have been reported to exhibit the defect (15). Familial occurrence has also been reported (16).

The age of our patients ranged from 4-12 years. The youngest was a boy. All the cases at presentation were clinically euthyroid. Subclinical hypothyroidism was present in the boy, one showed an elevated T3 and the third showed no abnormality. There were no pressure symptoms in any one of the children. One girl had manifest mental retardation with scholastic backwardness and also physical retardation of growth. There was no family history of retardation and no other obvious congenital defects. All the patients were given thyroxine to suppress the enlarged thyroid tissue. Long term follow up is awaited.

### Conclusion

Dual thyroid ectopia is uncommon and the etiology is not clear. Three cases observed during investigation of cases presenting with midline swelling in the neck in young children are presented.

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