CASE REPORT

Lingual thyroid in a young female: role of imaging

Pokhraj Prakashchandra Suthar, Shivani Mahajan, Prakash Jagdishchandra Rana, Narottam Ambavibhai Patel

Department of Radiodiagnosis,
Medical College Baroda,
Vadodara, Gujarat, India

Correspondence to

Dr Pokhraj Prakashchandra,
pokhraj_suthar@yahoo.co.in

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SUMMARY

A 12-year-old girl presented with dysphagia and a feeling of fullness in the throat. On examination a midline smooth, rubbery and reddish mass was seen at the base of the tongue, which moved with deglutination and protrusion of the tongue. A thyroid function test was within normal limits. On ultrasonography, absences of thyroid gland in its normal position with a smooth-contoured, round-shaped nodular mass at the tongue base with internal vascularity within. The mass was hyperdense and homogeneously enhancing on postcontrast. A clinical diagnosis of ectopic lingual was made based on the ultrasonography and CT scan features.

BACKGROUND

Normally, the thyroid gland lies at the level of the cricoid cartilage in the midline of the neck.^{1 2} Lingual thyroid (LT) is a rare developmental thyroid anomaly caused by the failure of the gland to descend from the foramen caecum. It is common in females with a female-to-male ratio ranging from 4:1 to 7:1.³ Oropharyngeal obstruction, dysphagia, dyspnoea and dysphonia are the main presenting symptoms. The lesion is usually smooth and vascular. Palpation of the neck, which is necessary, reveals the absence of the thyroid gland in its normal position. The patient's thyroid status is mostly euthyroid. Ultrasonography demonstrated absent thyroid tissue in the normal location. However a CT, MRI and thyroid scan not only confirmed the diagnosis but also identified the presence of any thyroid tissue elsewhere in the neck.

CASE PRESENTATION

A 12-year-old girl presented with dysphagia, a feeling of fullness in the throat and dysphonia. The dysphagia was progressive and more for solid foods. Her medical history was unremarkable. There was no history of maternal medication during pregnancy by the patient's mother.

On physical oral cavity examination, it was noticed that the patient had an approximately 4 cm×4 cm sized midline smooth, rubbery and reddish mass at the base of the tongue (figure 1). This mass moved with deglutination and protrusion of the tongue. Neck examination revealed neither a palpable thyroid gland nor any other palpable masses. The cardiovascular, respiratory, central nervous and gastrointestinal system examinations were normal.

INVESTIGATIONS

On routine investigation, haemoglobin was 10.1 g%, total white cell count was 8300 cell/mm³ and the

Figure 1 The clinical photograph showing a well-defined, round, midline smooth, rubbery and reddish mass at the base of the tongue (white arrow).

erythrocyte sedimentation rate was within normal limits. The thyroid function test was within normal limits and the patient is euthyroid.

Neck ultrasonography was performed with a linear 12 MHz transducer, which revealed the absence of the thyroid gland in the neck in the normal position anterior to the trachea. Strap muscles of neck were directly overlying anterior to the trachea. A 31×31 mm sized smooth-contoured, well-defined, round-shaped, nodular mass containing hypo areas within that were noted at the tongue base was better visualised by a curved 5 MHz transducer. The mass lesion showed internal vascularity within on application of Doppler (figures 2–4).

Non-contrast CT of the neck revealed a well-defined, round, hyperdense lesion at the base of the tongue with the absent thyroid gland in its normal position. On postcontrast the mass lesion was homogeneously enhancing (figures 5 and 6).

DIFFERENTIAL DIAGNOSIS

LT must be differentiated from fibromas, lymphangiomas, lipomas, hypertrophic lingual tonsils, salivary gland tumours, thyroglossal duct cysts, midline branchial cysts, and epidermal or sebaceous cysts.

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Figure 2 Ultrasonographic neck images with a linear 12 MHz transducer revealed the absence of the normal thyroid gland in midline at the cricoids region anterior to the trachea. Strap muscles of the neck lying directly anterior to the trachea. The bilateral common carotid artery and internal jugular vein appear normal. CCA, common carotid artery; IJV, internal jugular vein.

TREATMENT

Surgical removal was performed through the transoral approach. Postoperative levothyroxine supplementation has been started.

OUTCOME AND FOLLOW-UP

The patient is on a routine follow-up outpatient visit and is on levothyroxine supplementation. She is well and has no more symptoms.

DISCUSSION

The thyroid gland is one of the largest endocrine glands in the body; it lies at approximately the same level as the cricoid cartilage in the midline of the neck anterior to the trachea.^{1 2} LT is a rare developmental thyroid anomaly, caused by the failure of the gland to descend from the foramen caecum at the base of the tongue, early in the course of embryogenesis. The prevalence rates of LT vary from 1 in 100 000 to 1 in 300 000, with the female-to-male ratio ranging from 4:1 to 7:1.³ Hickmann recorded the first case of LT in 1869.

Early in the embryogenic development process, the thyroid gland appears as a proliferation of the endodermal tissue in the floor of the pharynx between the tuberculum impar and the hypobranchial eminence.⁴ These area is latter on from the foramen caecum. The thyroid gland normally descends along a path from the foramen caecum in the tongue, passes the hyoid bone and moves to the final position in the front of and lateral to the second, third and fourth tracheal rings by 7 weeks gestation. During this descent, thyroid tissue retains its communication with the foramen caecum. This communication is known as the thyroglossal duct. Once the thyroid reaches its final destination, the thyroglossal duct degenerates.⁵ Persistence of the thyroglossal duct even after birth leads to the formation of the thyroglossal cyst. This pathway of the descent may arrest anywhere. The ectopic thyroid is any functioning thyroid tissue that is found outside of the normal thyroid location.⁶ It is usually found along the normal path of development, but ectopic thyroid tissue has also been found in the mediastinum, heart, oesophagus and diaphragm. LT is the result of the failure of the descent of the

Figure 3 Ultrasonographic neck images with a curved 5 MHz transducer placed at the junction of the mandible to the neck in midline revealed a well-defined, smooth contoured, round-shaped, nodular hyperechoic mass noted at the tongue base.

Figure 4 Ultrasonographic neck images with a curved transducer placed at the junction of the mandible to the neck in midline revealed a 31×31 mm sized well-defined, round hyper-echoic mass lesion with internal vascularity within on application of Doppler.

Figure 5 (A) Axial non-contrast CT image at the level of tongue showing well-defined, round, hyperdense mass lesion with similar density to that of the normal thyroid gland is seen at the base of tongue (white arrow); (B) the axial non-contrast CT image at the level of the cricoids cartilage showing the absence of the normal thyroid gland anterior to the trachea in midline.

Figure 6 (A) The axial postcontrast CT image at the level of the tongue showing an intensely enhancing well-defined, round mass lesion at the base of the tongue. (B) The coronal postcontrast CT image showing an intensely enhancing well-defined, round mass lesion at the base of the tongue (white arrow).

thyroid anlage from the foramen caecum of the tongue, but the reasons for the failure of descent are unknown.⁷

Most of the patients presented with symptoms related to oropharyngeal obstruction, dysphagia, dyspnoea and dysphonia, as well as a feeling of fullness in the throat and sleep apnoea. About 33% of the patients show hypothyroidism findings.⁷ LT presents itself as a midline nodular mass at the base of the tongue.^{4 8 9} The surface of the lesion is usually smooth and vascular. Palpation of the neck, which is necessary, reveals the absence of the thyroid gland in its normal position. Investigations include thyroid function tests often normal. Histologically, the LT gland resembles normal thyroid tissue.

A general differential for a posterior midline neck mass includes: lingual tonsil, thyroglossal duct cyst, malignancy, haemangioma and dermoid.

Ultrasound is only of use in demonstrating absent thyroid tissue in the normal location, which is the case in the majority of cases. Only occasionally do patients have thyroid tissue at the tongue base and elsewhere in the neck.

CT demonstrates a hyperdense soft tissue mass, of the same attenuation as normal thyroid tissue. It is hyperdense on account of the accumulation of iodine within the gland. Following contrast administration, the entire gland demonstrates prominent homogeneous enhancement (again just like the normal thyroid gland). There are occasional case reports of inhomogeneous contrast enhancement.¹⁰ In MRI, LT is isointense to hyperintense to the muscle in T1-weighted image (T1WI), variable intensity in T2WI and shows homogeneous or heterogeneous contrast enhancement.

A thyroid scan is excellent at not only confirming the diagnosis but also identifying the presence of any thyroid tissue elsewhere in the neck.

Often, no treatment is required. However, surgical excision can be considered, followed by levothyroxine therapy.⁹

Learning points

- ▶ To explain the imaging features of ultrasonography (USG), CT and MRI in the diagnosis of lingual thyroid.
- ▶ USG is the non-invasive primary modality of investigation due to its advantage of rapid scanning time, cost-effectiveness and lack of radiation exposure.
- ▶ CT revealed a hyperdense mass in the region of the tongue base and shows homogeneous enhancement.

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Competing interests None.

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