

Transoral robotic resection of a lingual thyroid: a novel treatment for obstructive sleep apnoea

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SUMMARY

A 34-year-old woman with a history of congenital hypothyroidism and 15 years of obstructive sleep apnoea was admitted with a left submandibular swelling secondary to a dental infection. A CT scan of the neck identified an incidental 27 mm tongue base mass and the absence of any cervical thyroid tissue. This mass was not observable on examination of the oropharynx but was seen on fine nasendoscopy while thyroid function tests showed good thyroid stimulating hormone suppression. Her acute dental infection was treated and, following multidisciplinary team discussion, she was diagnosed with an ectopic lingual thyroid. She was offered different management options including no intervention and radio-iodide treatment but opted for transoral robotic resection. The lesion was resected en bloc with clear margins and histology confirmed lingual thyroid tissue. Since the procedure, she has remained free of sleep apnoea with a significantly improved quality of life.

BACKGROUND

Sleep apnoea is a common, potentially harmful condition, with several potential underlying causes. This report describes a rare cause for this with less than 10 similar cases previously reported. It outlines appropriate investigations, management options and details a successful treatment with positive outcomes.

Ectopic thyroid tissue is a rare embryological abnormality (prevalence of approximately 1 in 100 000) that occurs when the thyroid gland fails to descend during embryogenesis. The tissue can reside anywhere along the thyroglossal trunk, but the majority are found at the tongue base causing a 'lingual thyroid'. Patients may be asymptomatic or present with respiratory issues, dysphagia or haemoptysis.

This case was picked up as an incidental finding on a CT scan but was found to be the cause of long-standing sleep apnoea. The patient had been established on long-term thyroid-stimulating hormone (TSH) suppressive doses of thyroxine. After discussing different management options, the patient underwent transoral robotic surgery, which proved to be an effective and safe method to provide curative surgery and life-changing results.

CASE PRESENTATION

A 34-year-old female with a history of hypothyroidism on long-term thyroxine replacement was admitted with a large left submandibular swelling secondary to a dental infection. During her

admission, it was noted that her hypothyroidism was congenital and that she had over 15 years chronic sleep apnoea for which a cause had not been found but prevented her from sleeping supine. The patient reported long-standing sleep-disordered breathing with both intrusive snoring and frequent apnoeic episodes at night requiring her to sleep semisupine. Oral examination showed left submandibular swelling and a tender molar although no abnormality was noted of the remaining oropharynx or tongue.

INVESTIGATIONS

As part of her investigations for her presentation, a CT scan of the neck identified a periapical collection causing the submandibular swelling. However, it also identified an incidental 27 mm enhancing midline mass at the tongue base (figures 1 and 2) and with an absence of any cervical thyroid tissue (figure 3). The tongue base mass was later observed on fine nasendoscopy of the posterior oropharynx. Given the clear history of sleep apnoea and large tongue base mass, sleep studies were considered unlikely to change management.

Blood tests confirmed T3 and T4 within the normal range.

DIFFERENTIAL DIAGNOSIS

Different diagnoses were considered for the lesion. There was nothing in the history that was suggestive of a progressively enlarging tongue base mass with no worsening of symptoms in recent years. There was also no tenderness in the tongue or any history of granulomatous or infective conditions. Importantly, no masses were found elsewhere in the oropharynx or neck.

Given the location of the lesion, the absence of any cervical thyroid tissue and the history of hypothyroidism, the most likely diagnosis from the outset was of an ectopic lingual thyroid rather than a thyroglossal duct cyst.

TREATMENT

The patient's dental infection was treated and following the CT scan results, the patient was discussed at a specialist Head and Neck multidisciplinary team meeting where the diagnosis of ectopic lingual thyroid was agreed. She was reviewed by an endocrine consultant who confirmed that she was maintaining good suppression of TSH and that further thyroxine replacement was unlikely to reduce the size of the lingual thyroid. She was, therefore, referred as an outpatient to a specialist ENT head and neck consultant who offered different



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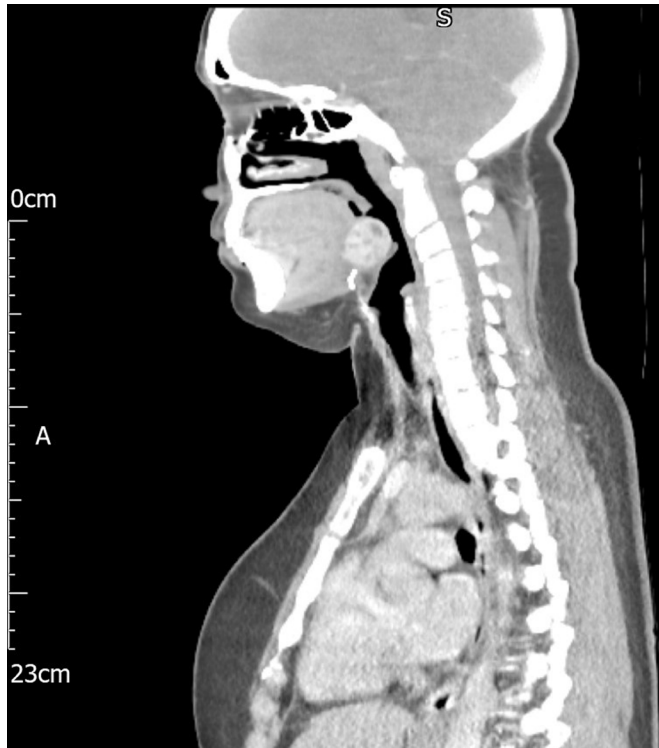


Figure 1 Sagittal CT scan showing large midline tongue base mass.

management options including no intervention, radioiodide treatment and surgical resection. However, given her difficulties with sleeping, she was keen to progress with a resection and she was, therefore, consented for robotic resection of the mass.

Using a transnasal intubation, the patient underwent a transoral robotic resection of the lingual thyroid mass, which was resected en bloc with clear margins using a Da Vinci SI robot with a 30° scope and Maryland forceps ([video 1](#)). This allowed improved access to the tongue base and visualisation of major blood vessels in comparison with conventional techniques.

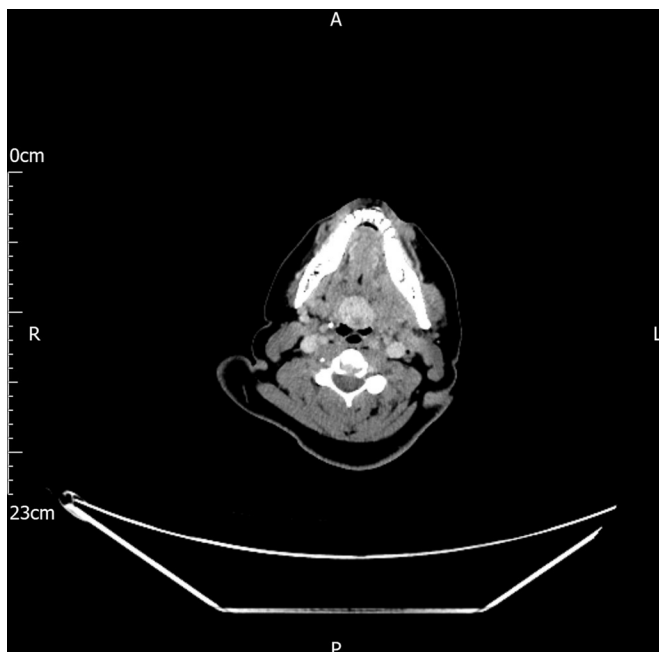


Figure 2 Axial CT scan showing large midline tongue base mass.

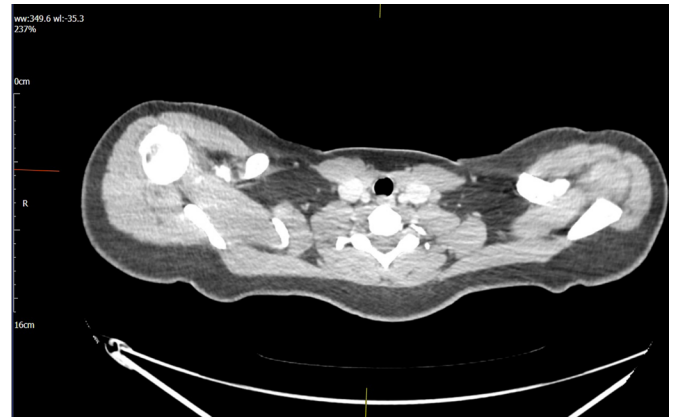


Figure 3 Axial CT scan showing absence of cervical thyroid tissue.

Floseal was applied to the tongue base to achieve haemostasis ([video 1](#)). The patient recovered without complication or post-operative airway support and was discharged 2 days after surgery.

OUTCOME AND FOLLOW-UP

Follow-up in clinic 3 months later confirmed total resolution of sleep apnoea and significantly improved quality of life. Histology confirmed lingual thyroid tissue.

DISCUSSION

Ectopic thyroid tissue is a rare embryological abnormality that occurs when the thyroid gland fails to descend during embryogenesis. The tissue can reside anywhere along the thyroglossal trunk between the foramen caecum and the thyroid isthmus but 90% are found at the tongue base.¹ Prevalence of this condition is approximately 1 in 200 000 but approximately 1 in 6000 in patients with hypothyroidism.² The incidence is also 7 times higher in women than men.³

Most patients will be asymptomatic but may develop respiratory difficulties, dysphonia, dysphagia or haemoptysis.⁴ A search of the literature found less than 10 cases of lingual thyroid causing sleep apnoea. The diagnosis may be able to be made clinically with the presence of a midline tongue mass similar to thyroid tissue or alternatively can be identified on a CT scan or radioactive iodine uptake scan. Suspicion should be raised if no thyroid tissue can be found in the anterior neck.

Patients may be able to be treated conservatively if asymptomatic or exogenous thyroid hormone may decrease the size of the gland.¹ Where conservative or medical management has been unsuccessful, surgical resection has been shown to improve



Video 1 Transoral robotic resection of the lingual thyroid.

symptoms. We found five previous studies reporting on a total of nine patients who have undergone transoral robotic resection of a lingual thyroid. In all cases, there was a substantial improvement in preoperative symptoms, however, in one study,⁵ a patient developed postoperative bleeding from the epiglottis requiring cautery and another who had a subtotal resection developed recurrence 8 months after the procedure. Overall, however, there was consistently good patient satisfaction reported and our experience supports the findings from these other studies.

Transoral robotic surgery enables excellent visualisation around the tongue base with safe and effective dissection and haemostasis. This allows safe radical resection of tongue base and oropharyngeal tumours. It is these facets of robotic surgery applied to this benign case, which allowed safe surgery to be undertaken. Alternative approaches such as transoral laser and

peroral coblation techniques do not allow the same degree of visualisation and articulation of instruments when compared with robotic surgery.

Although lingual thyroid is a rare cause of sleep apnoea, this case demonstrates that transoral robotic surgery is an effective and safe method to provide curative surgery and life-changing results. As transoral robotic surgery is increasingly becoming available for the management of head and neck cancer, we would recommend that, where possible, similar cases should be referred to a centre where transoral robotic surgery is available.

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Learning points

- ▶ Lingual thyroid is a rare condition with an incidence of approximately 1 in 100 000 but 1 in 6 000 in hypothyroidism.
- ▶ Patients may be asymptomatic but may also have sleep apnoea or other respiratory or swallowing difficulties.
- ▶ Diagnosis may be able to be made clinically with the presence of a midline tongue mass similar to thyroid tissue or can be identified on a CT scan or radioactive iodine uptake scan. Suspicion should be raised if there is no cervical thyroid tissue.
- ▶ Treatment may be conservative if asymptomatic or exogenous thyroid hormone can decrease the size of the thyroid gland.
- ▶ For lesions that are nonrefractory to medical treatment, transoral robotic surgery has proven to be an effective and safe method to provide curative surgery and life-changing results.

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