

Unusual Endolaryngeal Extension of a Large Thyroglossal Duct Cyst

H M Quah,*^{MBChB (UK), MRCS (Edin)}, D T H Lim,**^{FAMS, FRCS (Edin), M Med (Surg)}

Abstract

Introduction: Thyroglossal duct cysts account for approximately 70% of congenital neck abnormalities. Hoarseness of voice and the extension of the cyst into the larynx are very uncommon. **Clinical Picture:** We present a patient with a long history of a large thyroglossal cyst who developed progressive hoarseness of voice. The cyst had protruded into the larynx producing the appearance of a laryngeal neoplasm. Computed tomography (CT) clearly demonstrated the nature of the cyst and its encroachment into the larynx. **Treatment:** This was safely excised with a Sistrunk procedure and a temporary tracheostomy to maintain a secure airway, in view of the possibility of post-operative supraglottic oedema. **Conclusion:** Endolaryngeal extension of the thyroglossal duct cyst is rare. Evaluation of unusual large midline neck masses should include a CT scan. The intralaryngeal component of the cyst can be easily dissected off from the neighbouring structures during dissection in the Sistrunk procedure. A tracheostomy may be needed.

Ann Acad Med Singapore 2002; 31:238-40

Key words: Hoarseness, Larynx, Sistrunk procedure, Tracheostomy

Introduction

Thyroglossal duct cysts are the most common non-odontogenic cysts that occur in the neck.¹ They can be complicated by infections and fistulae. They account for approximately 70% of congenital neck abnormalities.² Most (61%) thyroglossal duct cysts are located in the thyrohyoid region; however, 24% are suprahyoid, 13% are suprasternal, and 1% to 2% are intralingual.¹ However, despite their close proximity to the larynx, only 7 cases have been reported in which these cysts extended into the larynx.³⁻⁷ The purpose of this paper was to present a patient with a large thyroglossal duct cyst which protruded into the larynx, in which intralaryngeal examination suggested that a laryngeal neoplasm was present and to discuss the management of these unusual cases.

Case Report

The patient, a 42-year-old man, presented with a large anterior neck lump of 1 year's duration, which was gradually increasing in size (Fig. 1). Over the last 6 months, he developed progressive hoarseness of voice. He was also a smoker for many years. On examination, a prominent midline neck swelling of 5 cm diameter was noted. The swelling moved upwards on protrusion of the patient's tongue, confirming it was a thyroglossal duct cyst. There was no enlargement of the cervical lymph nodes on

palpation. However, fiberoptic laryngoscopy revealed a submucosal mass in the right supraglottic region, displacing the mucosa and narrowing the airway. This could account for the hoarseness of his voice.

A computed tomography (CT) scan of the neck was done to evaluate the swelling. The scan showed a large bilobed, low-density cystic structure with a larger component extending into the pre-epiglottic space and the right piriform fossa. The smaller component lay within the infra-hyoid strap muscles at the level of the thyroid notch (Fig. 2). The cyst measured 5.2 x 4.0 x 3.5 cm. It had caused moderate narrowing of the supraglottic airway and displaced the right vocal cord.

Hence, a Sistrunk operation was performed. Intra-operatively, a large, dumbbell-shaped thyroglossal duct cyst was found to arise between the hyoid bone and the thyroid cartilage with the internal component extending into the larynx, with no erosion of the cartilage structure. The hyoid bone was divided between the body and the horns bilaterally. The cyst was easily dissected out with the central body of the hyoid bone (Fig. 3). The intralaryngeal component could be peeled off the laryngeal mucosa without disruption of the supporting cartilage, but in view of the degree of laryngeal manipulation, a prophylactic tracheostomy was done. The patient recovered uneventfully after the operation and was decannulated with both a good

* Medical Officer

** Consultant Surgeon

Department of General Surgery

Singapore General Hospital

Address for Reprints: Dr Dennis T H Lim, Department of General Surgery, Singapore General Hospital, Outram Road, Singapore 169608.

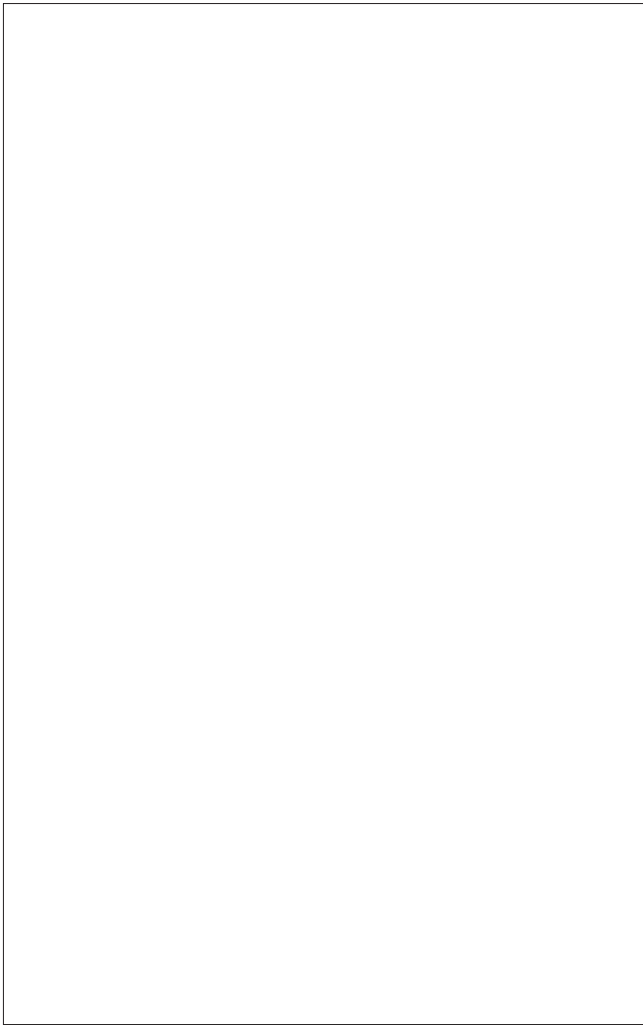


Fig. 1a. Large anterior midline neck mass.

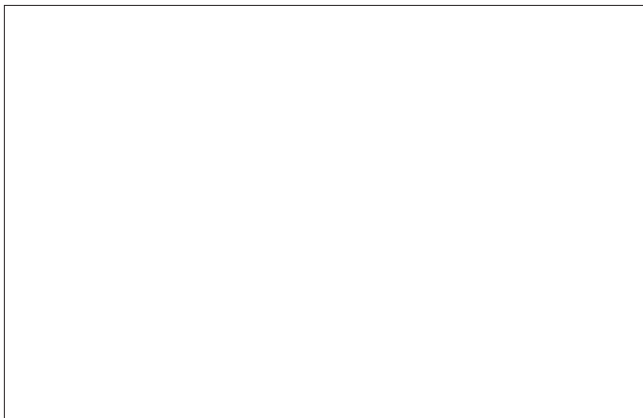


Fig. 1b. Lateral view of the midline neck mass.

airway and voice. Histopathological examination revealed a smooth, thin-walled, cystic structure containing a gelatinous yellowish-green substance. Microscopically, the wall was composed of fibro-adipose tissue and lined by epithelium which ranged from flattened cuboidal to

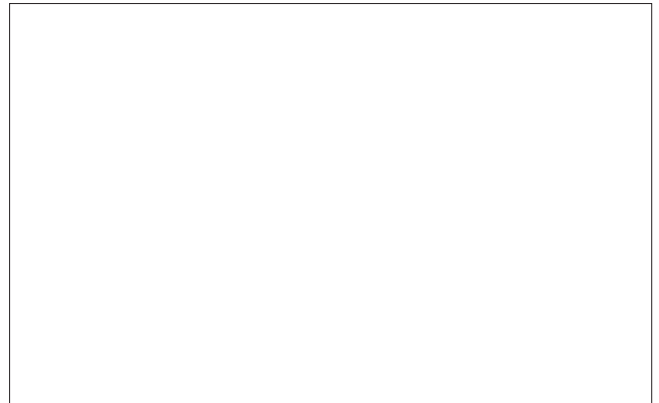


Fig. 2a. A bilobed, well-circumscribed, low-density cystic structure with a larger component projecting into the pre-epiglottic space immediately below the hyoid bone. The smaller component is seen within the infra-hyoid strap muscles at the level of the thyroid notch.

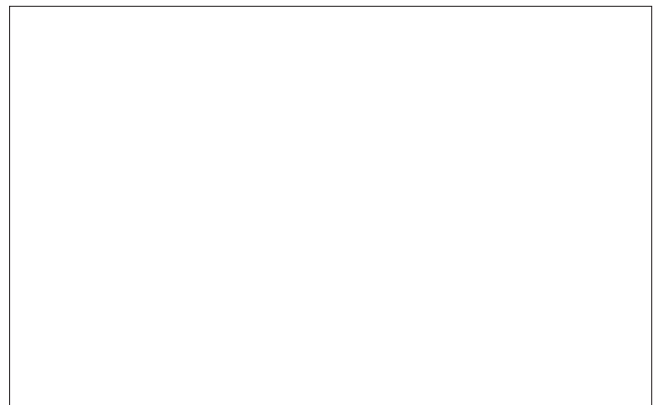


Fig. 2b. This scan reveals the degree of narrowing of the supraglottic airway. The right vocal cord is displaced by the cyst.

Fig. 2. Axial post-contrast CT scans.

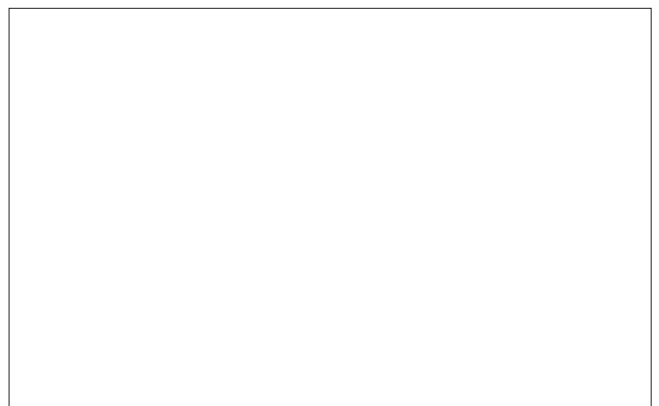


Fig. 3. Intraoperative picture showing the thyroglossal duct cyst dissected out with the central body of the hyoid bone.

pseudostratified ciliated columnar, to squamous in nature. A few residual thyroid follicles were also noted. It was diagnosed as a thyroglossal duct cyst.

Discussion

Embryologically, the thyroid gland develops from the region of the foramen caecum at the base of the tongue, and

as the gland develops, it descends to its definitive location in the anterior neck. Remnants of this developmental tract may persist, producing a thyroglossal cyst. The thyroglossal duct cyst may be present in any part of the thyroglossal tract. The common locations are beneath the hyoid, in the region of the thyroid cartilage and above the hyoid bone.

Thyroglossal duct cyst typically presents as a midline neck mass. Hoarseness of voice is a rare symptom and may suggest an intralaryngeal extension. Despite the close proximity of the thyroglossal duct to the larynx, only 7 cases have been described in the literature in which the cyst protruded into the pre-epiglottic space and presents as an intralaryngeal lesion.³⁻⁷ Out of the 7 cases, 5 patients complained of hoarseness of voice. CT scan showed the cyst displacing the vocal cords with narrowing of the airway explaining the symptom of hoarseness in each case. Rarely, it can compromise the upper respiratory airway.^{8,9}

CT studies are useful in the assessment of these atypical cases. The characteristic CT appearance of the thyroglossal duct cyst is that of a well-circumscribed, low-density lesion with a peripheral rim enhancement that is closely related to the hyoid bone.¹⁰ CT imaging is able to determine the site and the exact relationship of the cyst with other surrounding structures, as well as evaluating the thyroid cartilage framework.

The excision of the thyroglossal duct cyst that extends into the larynx, including our patient presented here, can be safely performed with the classic Sistrunk procedure.¹¹⁻¹³ The slow expansile growth of the thyroglossal duct cyst maintains the normal tissue planes between the cyst wall and the laryngeal structures. Hence, the intralaryngeal component of the cyst can be easily dissected off from the mucosa without disruption of the supporting cartilage.

In our case, the intimate relationship of the cyst with the larynx revealed in the CT scan also raised the possibility of the potential problem of supraglottic oedema after intraoperative laryngeal manipulation. A temporary tracheostomy was required in our case to provide a secure airway while allowing the oedema to settle after surgery. Hence, preoperative CT scan helps with the planning and counselling of these patients.

CT scan may also show the presence of thyroid cartilage destruction from long-standing pressure erosion. Three patients have been reported to have this destructive findings.^{3,4,7} There was only 1 patient with thyroid cartilage and thyroid perichondrium destruction; removal of the cyst resulted in collapse of the glottic mucosa,

hence, requiring laryngeal reconstruction. In the other 2 patients, reconstruction was not necessary because the thyrohyoid membrane and thyroid perichondrium were preserved, providing an adequate framework to support the airway.

In conclusion, in patients with thyroglossal duct cyst, the presence of hoarseness of voice suggests the involvement of the larynx. Endolaryngeal extension is rare but possible. Evaluation of these unusual midline neck masses should include a CT scan, which can prove to be a valuable aid in management. CT imaging also provides an accurate determination of the size as well as its relationship to the surrounding structures enabling subsequent planned surgical excision. Its typical slow growth maintains normal tissue planes meaning it can usually be dissected off from the neighbouring structures during dissection. Tracheostomy may be needed to avoid postoperative complication of airway embarrassment.

REFERENCES

1. Allard R H. The thyroglossal duct cyst. *Head Neck Surg* 1982; 5: 134-46.
2. Thomas J R. Thyroglossal duct cyst. *Ear Nose Throat J* 1979; 58: 512-4.
3. Slotnick D, Som P M, Gielbfried J, Biller H F. Thyroglossal duct cysts that mimic laryngeal masses. *Laryngoscope* 1987; 97:742-5.
4. Cumberworth V L, Bradley P J. Atypical thyroglossal duct cyst. *Clin Rec* 1989; 103:700-3.
5. Ward P H, Strahan R W, Acquarelli M, Harris P F. The many faces of the thyroglossal duct. *Trans Am Acad Ophthalmol Otol* 1970; 74:310-18.
6. Ward R F, Stelfe R W, St. Louis L, Bowling D. Computed tomography and the thyroglossal duct cyst. *Otolaryngol Head Neck Surg* 1986; 95:93-8.
7. Shaari C M, Ho B T, Som P M, Urken M L. Large thyroglossal duct cyst with laryngeal extension. *Head Neck* 1994; 16:586-8.
8. Brown E G, Albernaz M S, Emery M T. Thyroglossal duct cyst causing airway obstruction in an adult. *Ear Nose Throat J* 1996; 75:530-4.
9. Strachan D, Wengraf C. An unusual thyroglossal cyst causing upper airway obstruction. *Br J Clin Pract* 1996; 50:472-3.
10. Reede D I, Bergeron R T, Som P M. CT of thyroglossal duct cysts. *Radiology* 1985; 157:121-5.
11. Sistrunk W E. Technique of removal of cysts and sinuses of the thyroglossal duct. *Surg Gynecol Obstet* 1929; 46:93-8.
12. Josephson G D, Spencer W R, Josephson J S. Thyroglossal duct cyst: the New York Eye and Ear Infirmary experience and a literature review. *Ear Nose Throat J* 1998; 77:646-51.
13. Maddalozzo J, Venkatesan T K, Gupta P. Complications associated with the Sistrunk procedure. *Laryngoscope* 2001; 111:119-23.