

A Mass at Laryngopharynx: A Pressure Effect of the Superior Cornu of the Thyroid Cartilage that Resulted from Thyroid Mass

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Abstract

The superior cornu of the thyroid cartilage is a versatile structure and any anatomical variation may result in different clinical presentations. We present a case of a medialised superior part of the thyroid cartilage due to the pressure effect from a huge thyroid mass, which was found on a laryngoscopy before thyroidectomy. CT scan of the neck revealed an elongated and medially displaced superior cornu of the right thyroid cartilage which was pushed by the right thyroid mass. There was no consideration for the surgical intervention about the medialised superior thyroid cornu as the patient remains asymptomatic and refused surgical intervention.

Keywords: Thyroid Cartilage; Laryngeal Cartilage; Thyroid Nodule.

Introduction

The thyroid cartilage is the largest in the larynx. Superior cornu is the upwards projection of the posterior part of the thyroid cartilage. It is an elongated narrow structure that curves upwards, backward, and medially. It is also the weakest part of the thyroid cartilage, therefore, factors such as trauma and intubation may result in the anatomical variant of the thyroid cartilage. The patient often presents with odynophagia and foreign body sensations. Hereby, we report a case of asymptomatic medialised superior thyroid cornu that is due to the mass effect of an associated thyroid lesion.

Case Report

A 49-year-old gentleman was referred to the otorhinolaryngology clinic for indirect laryngoscopy before thyroidectomy for a thyroid colloid nodule. He denied a history of odynophagia, dysphagia, globus sensation, hoarseness, neck pain, intubation, or neck trauma before the current presentation. On neck examination, there was a huge anterior neck swelling with no neck tenderness. The mass had pushed the trachea toward the left. Flexible nasopharyngolaryngoscopy noted a well-defined protruding mass arising from the right lateral laryngopharyngeal wall. The mass was covered by a smooth pharyngeal mucosa, without any irregularity or ulceration (Figure 1). The possible differential diagnoses of the protruding mass include a variant or dislocated superior cornu of the thyroid cartilage, or either a variant, fracture, or dislocated greater horn of the hyoid bone. A computed tomography scan (Figure 2) with a 3-dimensional reconstruction (Figure 3) of the neck revealed a huge, 6.6x8.2x9.8 cm, well-defined cystic lesion in the right thyroid lobe that displaces the superior cornu of the thyroid cartilage towards the medial side. The length of the superior thyroid cornu from the scan is 5 mm for the right side and 54 mm for the left side. The protrusion is the result of the mass effect of the huge thyroid mass as seen from the CT scan. The final histopathology of the thyroid mass was nodular hyperplasia with cystic degeneration. Post thyroidectomy, the patient remained asymptomatic, follow up scope revealed a lesser protrusion of the right superior thyroid cornu at the laryngopharynx. The patient refused surgical removal of the superior cornu of the thyroid cartilage and subsequently defaulted to follow-up.

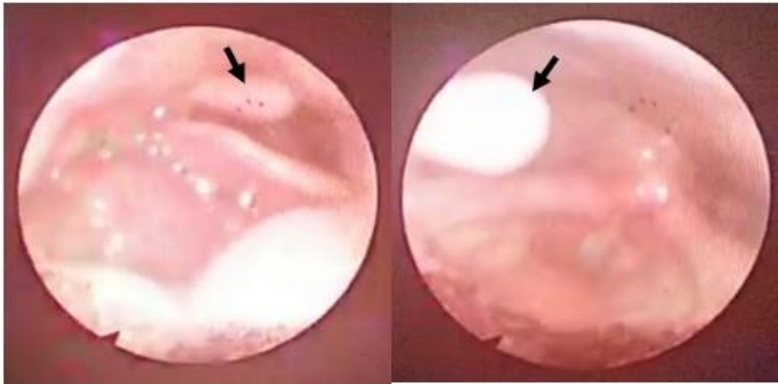


Figure 1: Black arrow showed a well-defined, smooth surface protruding mass seen at the right laryngopharyngeal wall, at the level of epiglottis.

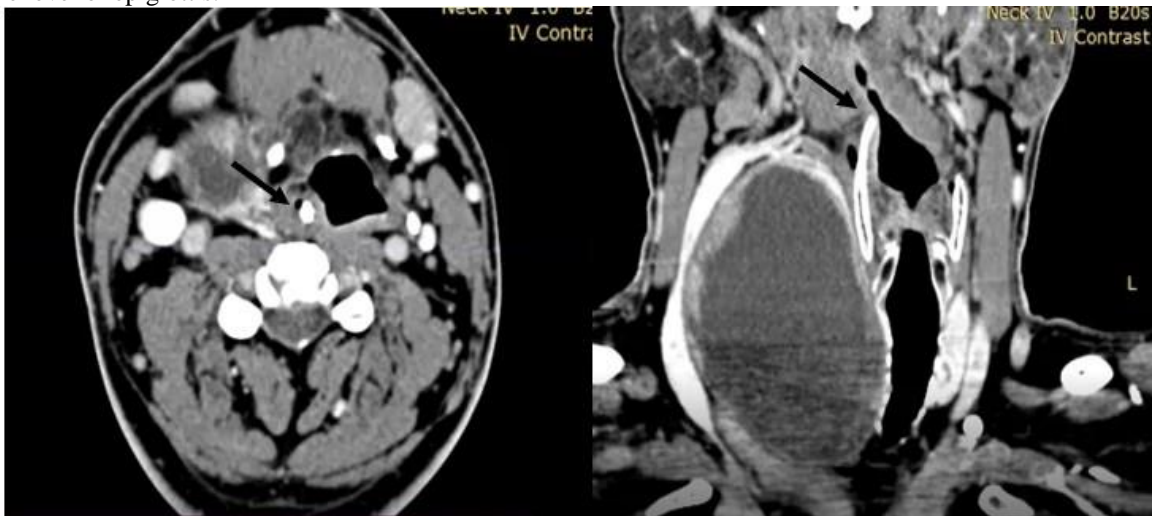


Figure 2: A CT-scan of the neck from axial and coronal view showed a well-demarcated cystic lesion at the right thyroid lobe that pushes larynx and trachea to the left superior.



Figure 3: A 3-dimension reconstruction CT scan revealed that the laryngeal framework is pushed to the left side with a black arrow.

Discussion

The thyroid cartilage is the largest cartilage found in the larynx. It is also one of the hyaline cartilages in the laryngeal framework, apart from cricoid and arytenoid cartilages. It articulates with the greater cornu of hyoid via the superior cornu and the lateral thyrohyoid ligament. Ossification of the thyroid cartilage may begin as early as the age of 18 to 20 years old and usually starts at the posterior aspect of the thyroid cartilage¹. The superior cornu is a long, narrow structure that curves upwards, backward, and medially and it ends in a conical apex. On contrary, the inferior cornu is short and thick, and curves down and slightly anteromedially. The average length of the superior cornu is approximately 14.5 – 14.9 mm as seen in the dissection of 28 cadavers to determine the normal measurement of the laryngeal framework by Eckel H et al². It may elongate further to become abnormally long or medial cornu.

Superior cornu is undoubtedly the weakest point in the thyroid cartilage. Hence, trauma including road traffic accidents, strangulation, traumatic intubation, and sports injury may distort the thyrohyoid complex, resulting in the medial displacement of the contralateral superior cornu³. It is postulated that the displaced superior cornu may be congenital in an atraumatic patient due to abnormal development of the fourth brachial arch. However, it is unclear as to why certain patient becomes symptomatic at older age⁴.

This patient denied any trauma to the larynx; however, he had a huge benign thyroid mass. The most plausible explanation of having the anatomical variant of the right superior cornu in this patient is because of the mass effect of the thyroid mass that pushes the right superior cornu medially, coupled with the elongation of the right superior cornu as seen from the CT scan, thus causing the indentation and protrusion of the right superior cornu medially. In addition, this is the first case report of an anatomical variant of superior thyroid cornu that is caused by thyroid gland mass.

A variant of thyroid cartilage anatomy had been reported in the literature as early as the 1980s by Counter RT 1980⁵, whereby he described a patient with the superior thyroid cornu syndrome that is caused by the anatomical variant of the right superior cornu that passes posteriorly, instead of normal variant which is vertical that is detected during neck exploration. The patient is pain-free following a successful excision of the superior cornu.

Anatomical variations of the thyroid cartilage, be it congenital or acquired may cause unpleasant symptoms and clinical problems to patients and medical practitioners, especially when dealing with airways. Most of the patients with anatomical the variant of superior cornu experienced symptoms including odynophagia, dysphagia, ear pain, baseline throat pain, globus sensation, clicking of the throat, constant choking, and throat clearing. They usually will show symptoms at the average age of 54.6 years with a range of 44 to 58 years old as documented by Mortensen M et al in a clinical case series of 12 patients⁶.

Patients with the medially displaced or elongated superior horn of thyroid cornu may complain of globus sensation, odynophagia, and coughing, which may cause aspiration due to hindered food passage through recesses piriformis, and eventually, the food will enter laryngeal inlet^{7,4}. Superior cornu of the thyroid that deviated medially and posteriorly may reach prevertebral fascia thus causing ulceration due to direct contact injury, it may even reach up to the arytenoid and may trigger cough and pharyngeal reflex⁸. This patient is asymptomatic, and only presented to the otolaryngology clinic for preoperative evaluation of the vocal cord before thyroid surgery.

In patients undergoing intubation or general anesthesia, the presence of an anatomical variant of the superior cornu of the thyroid may cause difficulty or even obstruct the access of the larynx, therefore, may fail intubation. Bowning et al described a case of failed intubation due to the presence of cornu abnormality⁹. Fortunately for this patient, he had no issue with intubation for the thyroid surgery as an experienced anesthetist intubated him. There is no mention in the literature yet regarding the association of difficult intubation due to the prominent superior thyroid cornu.

A flexible endoscope is often a useful resource however it might be helpful to proceed with a CT scan to confirm the diagnosis. CT scan with 3-dimensional reconstruction is useful to diagnose patients with an anatomical variant as well as determining the relationship among the laryngeal structures¹⁰.

Although the disease is benign, treatment options for symptomatic patients should be explained and offered to them. The most common treatment of the symptomatic patient is a local injection of steroids at the painful site as described in the literature. These patients may also benefit from physical therapy, triamcinolone 40mg injection at the painful site, lidocaine 10mg injection at the painful site, and surgical reduction via the transcervical approach of hyoid and thyroid cartilages as proposed by Dewan et al¹⁰. In a case study by Dewan et al regarding the treatment of the symptomatic patient, all of the patients had tried at least two of the treatment above, 56% of the patient underwent bilateral surgical reduction of hyoid and thyroid cartilages and they stated complete resolution of the anterior cervical pain symptoms in one month, meanwhile, those patients who opted for triamcinolone or lignocaine injection only showed a temporary relief of the symptoms¹⁰. Dewan at all did not elaborate in detail regarding the method of delivering the injections. There is a paucity of data regarding the role of conservative versus surgical management for anterolateral cervical pain syndrome as the study done by Dewan et al has a small sample size and no literature studies the effectiveness of conservative management. As the patient in this case report is asymptomatic, he refused medical and surgical intervention for the medialised superior thyroid cornu. He also defaulted clinic appointment post thyroidectomy.

Conclusion

Thyroid mass should be considered as one of the factors for the medialised superior thyroid cornu, apart from known laryngeal trauma.

Disclosure

The authors declared no conflicts of interest.

Acknowledgments

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References

1. Mupparapu M, Vuppapapati A. Detection of an early ossification of the thyroid cartilage in an adolescent on a lateral cephalometric radiograph. *Angle Orthodontist*. 2002;72:6:576-578.
2. Eckel H, Sittel C, Zorowka P, Jerke A. Dimensions of the laryngeal framework in adults. *Surgical and radiologic anatomy*. 1994;16:31-36
3. Nadik SK, Uppal S, Back GW, Coatesworth AP, Grace ARH. Foreign body sensation in the throat due to the displacement of the superior cornu of the thyroid cartilage: two cases and a literature review. *The Journal of Laryngology and Otology*. 2006;120:608-609.
4. Lin D, Fishbein N, Eisele DW, Odynophagia secondary to variant thyroid cartilage anatomy. *Dysphagia*. 2005;20:232-234.
5. Counter RT. A superior thyroid cornu anomaly: a report of a case. *The Journal of Laryngology & Otology*. 1980;94(09):1087-1088.
6. Mortensen M, Ivey CM, Iida M, Woo P. Superior thyroid cornu syndrome: an unusual cause of cervical dysphagia. *Annals of Otology, Rhinology & Laryngology*. 2009;118:833.
7. Karaman E, Saritzali G, Albayram S, Kara B. An unusual cause of foreign-body sensation in the throat: a displaced superior cornu of the thyroid cartilage. *Ear Nose Throat J*. 2011;90:22-24
8. Smith ME, Berke GS, Gray SD, Dove H, Harnsberger R. Clicking in the throat: cinematic fiction or surgical fact? *Arch Otolaryngol Head Neck Surg*. 2001;127:1129-1131.
9. Browning ST, Whittet HB, Williams A. Failure of insertion of a laryngeal mask airway caused by a variation in the anatomy of the thyroid cartilage. *Br J Anaesthesia*. 1999.
10. Dewan K, Yang C, Penta M. Anterior cervical pain syndrome: risk factor, variations in hyolaryngeal anatomy, and treatments. *The Laryngoscope*. 2019;00:1-4