



## OSSIFICATION OF THYROID CARTILAGE - A CADAVERIC STUDY

### Anatomy

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### ABSTRACT

Ossification of thyroid cartilage begins after second decade and completed by the end of sixth decade of life. In our routine undergraduate teaching in head & neck dissection it was observed two cases of complete ossification of thyroid cartilage. This study was carried out on about 100 cadavers were dissected out of which seventy were male cadavers and thirty were female cadavers. Only two ossified thyroid cartilages were found in male cadavers and none were found in female cadavers. Knowledge of this variation could be helpful in early detection of pathological conditions.

### KEYWORDS:

Ossification, Calcification, Thyroid Cartilage

### INTRODUCTION

Thyroid cartilage consists of 2 laminae of hyaline cartilage that meet in the mid line in the prominent V angle of the Adam's apple. The posterior border of each lamina is drawn upwards into superior cornu & drawn downward into inferior cornu. On the outer surface of each lamina oblique line is present for the attachment of thyrohyoid & inferior constrictor muscles [1, 2]. Thyroid cartilage, cricoid cartilage & greater part of arytenoid cartilages consists of hyaline cartilage that undergo calcification & ossification as part of the ageing process. Premature calcification of cartilage in both larynx and trachea is rare [1, 9, 10]. The degree and frequency of ossification of thyroid and cricoid cartilage were lower in the females than in males especially in the anterior part of the cartilages [3, 4, 5]. The variability of ossification of the laryngeal cartilages makes prediction of a pathological condition from plain films unreliable. frequently the partial ossified cartilage creates a diagnostic problem for radiologist examining for foreign bodies. within the laryngeal complex, the superior margin of the cricoid laminae often ossifies early before the signet portion of the cricoid. This linear ossification is often mistaken for a foreign body [6, 7, 8].

### CASE STUDY

A study on 100 cadavers was conducted. Two sets of ossification of thyroid cartilages were observed out of 100 specimens, out of which 70 were males and 30 were female cadavers of unknown age. Specimens were removed after head and neck dissection and were examined. Out of 70 male cadavers, two ossified thyroid cartilages were found. The ossified specimens were cleaned and dried and photographs were taken. They are depicted below in Fig. 1 & 2. It was observed that parts of the thyroid cartilage i.e., superior horns, inferior horns, laryngeal prominence and laminae except a small central part were ossified in both the specimens.



**Fig.1: Ossified Thyroid – Anterior view**



**Fig.2: Ossified Thyroid – Anterior view**

### DISCUSSION

Although thyroid cartilage frequently shows ossification after 20 years of age it is not rare to see ossification before that age. Ossification commences about 25th year in thyroid cartilage and latter in cricoid and arytenoid cartilages. By 65th year these cartilages may be completely converted into bone [11]. Four different ossification patterns were described by Vonglass and Pesch – a) horizontal-caudal, b) vertical-lateral, c) vertical-medial & d) oblique. They proposed that ossification of laryngeal cartilages occur because of their deformation by the muscles of larynx [6]. Worning differentiated a male from a female type of ossification on the basis of window formation [12].

In the present study, we have seen only two cases with complete ossification of thyroid cartilage. In this study, we have not seen ossification of other laryngeal cartilages. As our study was cadaveric study hence cannot correlate with radiographic studies conducted by other authors.

### CONCLUSIONS

Ossification of thyroid cartilages observed in this study are rare which may not be detected until there is symptomatic changes in the neck region. Abnormal ossification may compress recurrent laryngeal nerve which in turn causes difficulties in respiration. Calcified laryngeal cartilages may mimic the abnormal findings in the X-rays. Hence, Knowledge of these anomalous calcification of thyroid cartilages would be useful for the ENT surgeons and Radiologists in diagnosing the lesions related to the neck region.

### REFERENCES:

- [1] Snell RS. (2008), "Clinical Anatomy by Regions," 8th ed. New Delhi: Wolters Kluwer/Williams & Wilkins, pp-308.
- [2] Gray's Anatomy. (1995), "The Anatomical basis of Medicine and Surgery," 38th ed. Edinburgh: Churchill Livingstone, pp-1638-1641.
- [3] Jurik AG. (1984), "Ossification and calcification of the laryngeal skeleton." *Acta Radiol Diagn.* 25:17-22.
- [4] Galline J, Marsot-Dupuch K, Bigel P, Lasjaunias P. (2005), "Bilateral dystrophic

- ossification of the thyroid cartilage appearing as symmetrical laryngeal masses." *AJNR Am J Neuroradiol* 26(6): 1339-41.
- [5] Rubin MM, Krost BS. Calcification of the thyroid cartilage mistaken for an aspirated tooth. *J Oral Maxillofac Surg* 1991;49,745-6.
- [6] Von Glass W, Pesch HJ. Zum. (1983), "Ossification principle of the laryngeal skeleton of the human and mammals. Comparative anatomic studies." *Acta Anat (Basel)* 116(2): 158-67.
- [7] Kirsch T, Claassen H. (2000), "Matrix vesicles mediate mineralization of human thyroid cartilage." *Calf Tissue Int* 66: 292-297.
- [8] Salman RA, Kinney LA. (1990), "Calcified thyroid cartilage." *Oral Surg Oral Med Oral Pathol* 70: 806-807.
- [9] Mupparapu M, Vuppapapati A. (2005), "Ossification of laryngeal cartilages on lateral cephalometric radiographs." *Angle Orthod* 75(2): 196-201.
- [10] Goldbloom RB, Dunbar JS. (1960), "Calcification of cartilage in the trachea and larynx in infancy associated with congenital stridor." *Pediatrics* 26: 669-673.
- [11] Gray's Anatomy. (1995), "The Anatomical basis of Medicine and Surgery." 38th ed. Edinburgh: Churchill Livingstone, pp-1642.
- [12] Worning B. (1934) *Acta radiol Stockh*, 15, 8.