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Original Research Article

A CADAVERIC STUDY ON LEVATOR GLANDULAE THYROIDEAE IN SOUTH INDIAN POPULATION

Vijaianand M *[1], Ramamurthi KS [2].

[*1] Assistant Professor, Department of Anatomy, Karpagam Faculty of Medical Sciences & Research, Othakkalmandapam (Po), Coimbatore, India.

[2] Associate Professor, Department of Anatomy, Karpagam Faculty of Medical Sciences & Research, Othakkalmandapam (Po), Coimbatore, India.

ABSTRACT

Introduction: Thyroid gland is the first among the endocrine gland to develop in the antero-inferior aspect of the neck, and any alterations in morphology leads to functional disturbances and various anomalies.LGT is considered to be due to persistence of thyroglossal duct.

Aims and Objectives: To find out any variations in the Thyroid gland such shape,position,extent and the presence or absence of Levator Glandulae Thyroideae in cadavers.

Observation and Results: Dissection was carried out routinely in 30 cadavers of both sexes over a period of 4 years for 1st MBBS students, in which 2 cadavers found with Levator Glandulae Thyroideae extending between left pyramidal lobe to hyoid bone, and the other between isthmus and hyoid bone accounting for an incidence of 7% and both the variations were noted in male cadavers. Thorough knowledge regarding thyroid gland and its variations is needed particularly while performing Head and Neck surgeries, and while enumerating differential diagnosis which always should not be overlooked.

Conclusion: The presence of thyroid anomalies such as partial or complete absence of isthmus,pyramidal lobes either uni or bilateral and the occurrence of Levator Glandulae Thyroideae is considered essential, while dealing with Surgeries in the neck region[Tracheostomy,Thyroidectomy].Prevention or minimal occurence of complication depends how the experts make use of various domains[Cognitive,Affective and Psychomotor] when they come across with such cases.

KEY WORDS: Thyroid gland, Levator Glandulae Thyroideae[LGT], Thyroglossal duct, Isthmus, Pyramidal lobe, Hyoid bone.

Address for Correspondence: Dr. Vijaianand M, Assistant Professor of Anatomy, 7, Tarun kudil, IK garden, Gokul Nagar Annexe, Chinnathirupathi, Salem-636008. Tamil Nadu, India.
Mobile: (0) 9655246467 **E-Mail:** dr.vijaitarun7474@gmail.com

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INTRODUCTION

Thyroid is a highly vascular, brownish-red and being the first among other endocrine glands to be recognized, so as to start its development by 24th day of the human gestational period. It lies against C5-T1 vertebral levels in the lower anterior aspect of the neck with two symmetrical lobes connected by means of an isthmus, which is placed in front of the 2nd,3rd and 4th tracheo- cartilaginous rings by crossing the body's median plane. Thyroid gland is embraced with an inner adherent true capsule and a outer false capsule. In both sexes it weighs about 25

gms, and a slightly higher weight gain occurs during pregnancy and lactation. The volume of the thyroid does not show any significant rise in both males and females until 15 years of age[1].

Levator Glandulae Thyroideae is a conical finger-like projection, that arises either from the isthmus or from pyramidal lobes and ascends to reach the hyoid bone. It may be fibrous or fibro muscular, also designated as Muscular Levator Glandulae Thyroideae due to the presence of muscle fibers contained in it and innervated by external laryngeal nerve[2]. Disturbance in Organogenesis is considered as one the causation for morphological variations[3].

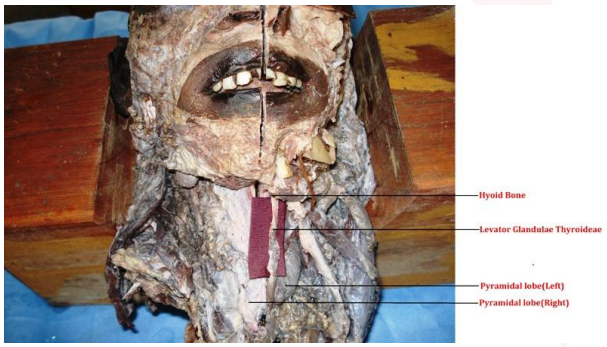
MATERIALS AND METHODOLOGY

The study was carried out in 30 well preserved Human Cadavers belonging to both sexes over a period of 4 years in the Dept.of Anatomy, Karpagam Faculty of Medical Sciences and Research-Coimbatore, during routine dissection hours for first MBBS students.

As per Cunningham's Dissection Manual, the midline structures of the neck were dissected in layers and finally Thyroid gland was exposed by separating the strap muscles[4] and the same was examined macroscopically with great care, and variations if any was looked and later the results was statistically made out.

OBSERVATIONS AND RESULTS

Fig. 1: Showing the Levator Glandulae Thyroideae attached to the left pyramidal lobe.

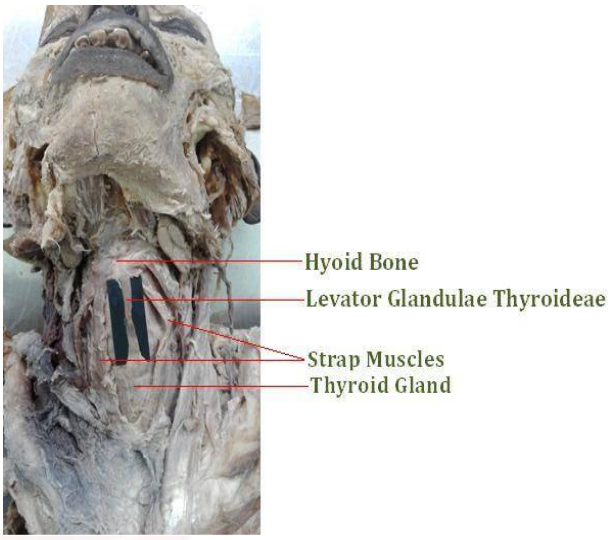


Out of 30 cadavers observed(17 male and 13 female) for this present study, the Thyroid gland of 2 cadavers found to possess Levator Glandulae Thyroideae which accounted for 7% of the incidence.

In one male cadaver aged around 55,the Levator Glandulae Thyroideae was found seen to be attached to the left Pyramidal lobe just adjacent to the isthmus and the other end is attached to the lower border of the body of Hyoid bone(Fig.1).

In another male cadaver aged around 45,Levator Glandulae Thyroideae was found extending between the middle of isthmus traversing along the midline of the neck to the lower border of the body of Hyoid bone. Another interesting feature noted in this cadaver, the Levator Glandulae Thyroideae along its entire extension is made up of muscle fibers (Fig.2).

Fig. 2: Showing the Levator Glandulae Thyroideae along its entire extension is made up of muscle fibers.



Agenesis or Hemi agenesis of isthmus and absence of either of the pyramidal lobes was not seen in any of the cadavers. None of the female cadavers in our study showed variations in any form.

DISCUSSION

Views given by various authors regarding the morphology of Thyroid gland and its anomalies with Levator Glandulae Thyroideae in particular, provokes much interest. By fourth week of development [on Day 24] during embryonic period the thyroid gland appears first as a median thickening, which is soon converted into a solid cellular cord-like structure between the 1st and 2nd Pharyngeal pouches and is named the so called 'Thyroglossal duct'. The lower end of the duct bifurcates and forms Right and Left Pyramidal lobes which is later united by a bridge crossing the midline called as 'Isthmus', and simultaneously the upper end degenerates [5].

Agenesis of isthmus is likely to occur in cases where the thyroglossal duct undergoes a slightly higher division[7,8].Larochelle contributed from his side that alterations in thyroid morphology and its functional disturbances has a close association with developmental anomalies[8]. Genes such as TITF1,PAX8,FOXE1 and TITF2 are involved in thyroid development, and mutations in any of these genes may lead to developmental anomalies[9,10].

Standring, Hamilton & Mossman, and Bergman et al from their studies documented that LGT is a fibrous or fibro muscular band which extends either from the upper border of the isthmus or from the pyramidal lobe usually on the left side[11,12,13].Studies from Joshi et al, Blumberg, Begums and Eneyetullah strongly suggested LGT is more common in the left lobe[14,15,16,17].Deepa's contribution regarding Levator Glandulae Thyroideae is, it occurs commonly in left as compared with right lobe with a ratio of 3:1[18].However, Manisha and Abhijeet Yadav from their studies made out Levator Glandulae Thyroideae in right lobe[19,20].

In this present study, we observed 2 cadavers with LGT that accounts for 7% of the total incidence.

a)In one cadaver, LGT extends between left pyramidal lobe and lower border of the body of Hyoid bone, this attachment is similar to the study made by Abhijeet Yadav, but the incidence reported by him is three times more than our study.

b)In another cadaver, LGT was found extending between isthmus to the lower border of the body of Hyoid bone, which coincides with the study reported by Veena Kulkarni as far as attachment concerned, and the incidence reported by her was 10% Levator Glandulae Thyroideae on the left[2 out of 20 cadavers],10% LGT on the right[2 out of 20 cadavers] and 5% LGT along midline[1 in 20 cadaver] and more over this incidence almost coincides with our incidence except, the Levator Glandulae Thyroideae on the right we have not reported from our study.

Further from our studies we found that only male cadavers presented with this unusual forms of thyroid which was found similar to the study recorded by Abhijeet Yadav regarding the attachment concerned, various earlier studies done by many authors, the Levator Glandulae Thyroideae from left pyramidal lobe is more common as compared with right, and one among our two cadavers we found similar attachment.

CONCLUSION

Advanced imaging techniques such as Scintigraphy, Magnetic Resonance Imaging, Computed Tomography, Ultrasonography, etc. is found available to study the Thyroid gland and its anomalies in depth, and the studies contributed from several authors regarding the morphology of thyroid gland, its anomalies such as complete or partial agenesis of isthmus, its lobe pathology, and the presence or absence of LGT alarms the Physicians, Radiologists and Surgeons to further sharpen their views in their respective fields while dealing with these patients in their day-to-day clinical practice.

Conflicts of Interests: None

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