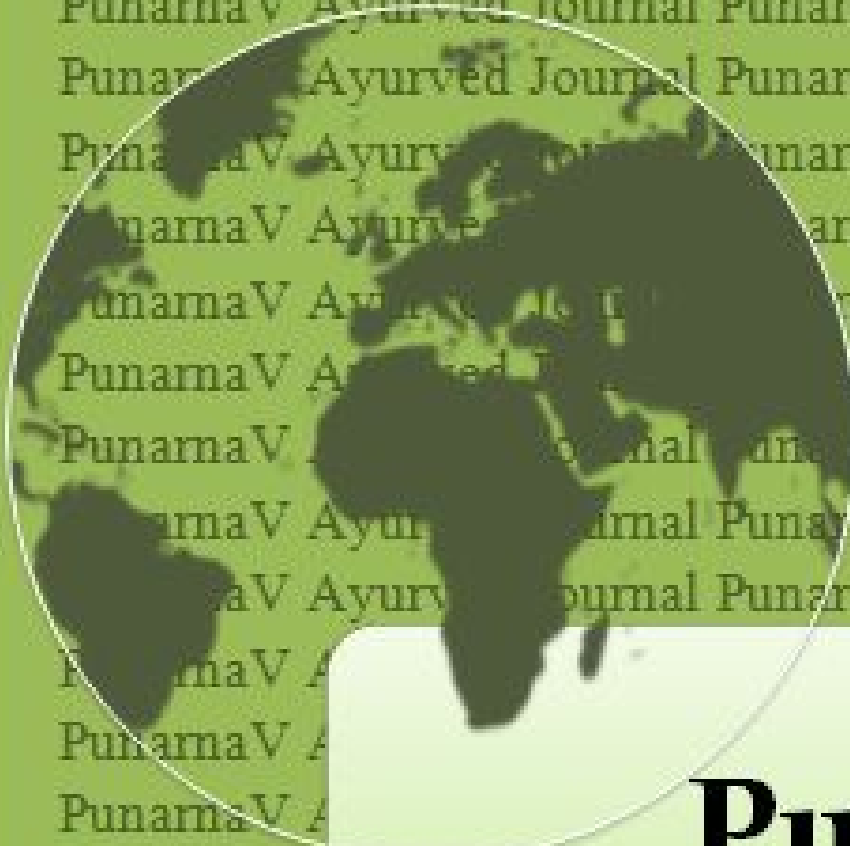


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TITLE

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CASE STUDY: VARIATION IN STRUCTURE OF THYROID GLAND FOUND IN CADAVERIC DISSECTION

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ABSTRACT:

In Ayurveda, the book Sushruta Samhita was written about 1500 BC mentioned the disease goitre (disease of thyroid gland) as 'Galaganda' along with its treatment. Thyroid gland is brownish-red butterfly-shaped gland situated anteriorly in the lower neck, from fifth cervical to the first thoracic vertebrae and consists of right and left lobes connected by isthmus. The isthmus connects the lower parts of the two lobes. The lobes are approx conical in shape with their ascending apices diverge laterally to the level of the oblique lines on the laminae of the thyroid cartilage, and their bases on fourth or fifth tracheal cartilages. A fibrous or fibromuscular band, the levator of the thyroid gland, musculus levator glandulae thyroideae, sometimes descends from the body of the hyoid to the isthmus or pyramidal lobe.

Keywords : Thyroid gland, Pyramidal lobe, musculus levator glandulae thyroideae.

INTRODUCTION

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In Ayurveda, the book *Sushruta Samhita* was written about 1500 BC mentioned the disease goitre (disease of thyroid gland) as '*Galaganda*' along with its treatment but he didn't name the structure¹. In modern times, the thyroid was first identified in 1656 by the anatomist Thomas Wharton. In 1656 Thomas Wharton named the gland the thyroid, meaning shield, as its shape resembled the shields commonly used in Ancient Greece².

Thyroid gland is brownish-red butterfly-shaped gland which lies deep to sternothyroid and sternohyoid muscles. It is situated anteriorly in the lower neck, from fifth cervical to the first thoracic vertebrae. Its weight is approx 25 mg. It is enclosed by the pretracheal layer of deep cervical fascia and consists of right and left lobes connected by isthmus. The isthmus connects the lower parts of the

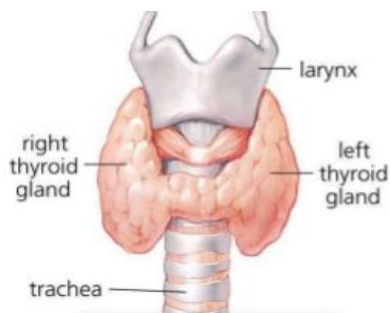
two lobes. Measure 1.25 cm transversely and vertically and is usually anterior to the second and third tracheal. The lobes are approx conical in shape with their ascending apices diverge laterally to the level of the oblique lines on the laminae of the thyroid cartilage, and their bases on fourth or fifth tracheal cartilages. Each lobe is usually 5 cm long, its greatest transverse extend is 3 cm and anteroposterior is 2 cm. A lateral thyroid ligament attaches posteromedial aspect of lobes to the side of cricoid cartilage³.

Capsules: False capsule is thickening of pretracheal fascia which also suspends the gland by ligaments of Berry. True capsule is the condensation to the connective tissue of the gland. The capillary plexus is situated deep to the true capsule of the gland⁴.

Surfaces and relations⁵:

Isthmus- Anterior surface: sternothyroid, sternohyoid, omohyoid muscles, fascia, skin **Posterior Surface:** 2nd and 3rd tracheal rings, **Upper border:** Anastmosis between ant. Branches of right and left superior thyroid arteries, **Lower border:** inferior thyroid veins.

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Lobes- Apex: situated upward and laterally upto the oblique line of thyroid cartilage, **base:** up to 4th and 5th tracheal ring

At the surface of lobes- Laterally: sternocleidomastoid, sternohyoid, superior belly of omohyoid, sternothyroid, **medially:** trachea, esophagus, cricoids cartilage with external laryngeal nerve, inferior constrictor with recurrent laryngeal nerve **posteriorly:** carotid sheath.

At the border of lobes- Anteriorly: Anterior branch of superior thyroid artery, **posteriorly:** inferior thyroid artery, anastomosis between sup. And inf. Thyroid arteries, parathyroid gland and thoracic duct only on left side

Vascular supply and lymphatic drainage⁶:

Arteries- The thyroid gland is supplied by the superior and inferior thyroid arteries and sometimes by an arteria thyroidea ima from the brachiocephalic trunk or aortic arch.

Veins- The venous drainage of the thyroid gland is usually via superior, middle, and inferior thyroid veins; usually they form thyroid plexus of veins on anterior surface of thyroid gland and the trachea.

Lymphatics- Thyroid lymphatic vessels communicate with the tracheal plexus, and pass to the prelaryngeal nodes, to the pretracheal and paratracheal nodes

Innervation- The thyroid gland receives its innervation from the superior, middle and inferior cervical sympathetic ganglia⁷.

Variations:

There is occasionally a third lobe present called the pyramidal lobe of the thyroid gland. The pyramidal lobe is also known as **Lalouette's pyramid**. It is a remnant of the fetal thyroid stalk, or **thyroglossal duct** which often ascends towards the hyoid bone from the isthmus or lobe. It is occasionally detached or in two or more parts. A fibrous or fibromuscular band, the levator of the thyroid gland, musculus levator glandulae thyroideae, sometimes descends from the body of the hyoid to the isthmus or pyramidal lobe. Small detached masses of thyroid tissue may occur above the lobes or isthmus as accessory thyroid glands. This narrow lobe and fibromuscular band develop from remnant of the epithelium and connective tissue of the thyroglossal duct. Vestiges of the thyroglossal duct may persist between the

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isthmus and the foramen caecum of the tongue, sometimes as accessory nodules or

cysts of thyroid tissue near the midline or even in the tongue^{8,9}.

Anomalies of shape of thyroid gland¹⁰

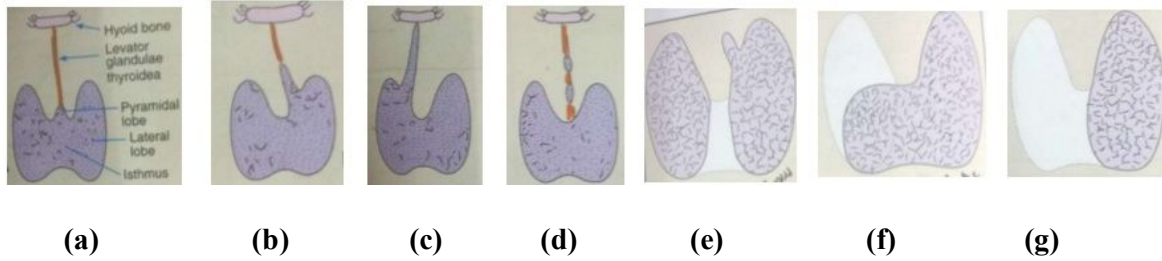


Fig.1. The pyramidal lobe may arise from isthmus (a), or from one of the lobe (b)(c), or no connection with rest of thyroid (d), isthmus may be absent (e), one of the lobe may be small or absent (f)(g).

Jaipur, variation of thyroid gland in the neck region was observed. Pyramidal lobe arising from the left lobe of thyroid not from isthmus and a fibro-muscular band connecting the pyramidal lobe with the hyoid bone was founded. Band is known as musculus levator glandulae thyroidea.

CASE REPORT:

During routine anatomy dissection of neck region in National Institute of Ayurveda,



A.

B

Fig.2. Dissection of the neck showing musculus levator glandulae thyroideae, a fibro muscular band connecting pyramidal lobe to the hyoid bone. Colour presentation (A), actual picture (B)

MATERIALS AND METHODOLOGY

MATERIALS

For literary study:-

1. Available literature regarding thyroid gland from Modern texts.
2. Research Journals or papers presented on the relevant topic.
3. Confirmed World Wide Web sources.

For cadaveric dissection Study:-

1. Cadaver: female- age 52, Height 5'2", Weight 60 kg
2. Dissection kit

METHODOLOGY

*Literature Study: All the information regarding thyroid gland was collected from modern texts, research journals or papers presented on the relevant topics and authentic internet sources.

*Cadaveric Study: - Cadaveric dissection was done in the dissection hall of department of *Sharira Rachana* of NIA, Jaipur. While studying the dissected cadaver, photo images were taken with the help of digital camera.

Dissection of the Neck region was done on cadaver by using dissection kit;

Cunningham's manual of practical anatomy, Grant's Dissector, Frank H. Netter and B. D. Chaurasia's Human Anatomy for understanding the variation in structure of thyroid gland of neck region.

DISCUSSION

Commonly, this case of variation of the thyroid gland is not found in dissection. But the evidence of this unforeseen type of variation was observed and verified with the crucial investigation. Among many variations of thyroid gland this case study has found that a pyramidal lobe ascends towards the hyoid bone from the left lobe and is connected by a fibrous or fibromuscular band, the levator of the thyroid gland, **musculus levator glandulae thyroideae**, to the body of the hyoid.

Conclusion: Knowledge of such type of variation is helpful in performing surgery like thyroectomy, tracheostomy and also helpful in developmental anatomy and congenital anomaly

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