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A PROSPECTIVE STUDY ON MORPHOLOGICAL VARIATIONS OF THYROID GLAND IN TAMIL NADU POPULATION

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ABSTRACT **INTRODUCTION:** The morphological variations of thyroid gland have been reported from different parts of the world1. The thyroid gland is the most common endocrine organ which gets operated throughout the globe. A wide range of morphological variations and developmental anomalies of the thyroid have been reported in literature which can have numerous clinical and surgical implications[2]. The aim of the present study, is to study about the possible morphological variation of thyroid gland among the Tamil Nadu population. This study was conducted for a period of 36 months (3 years) in the department of Anatomy, Government Medical College, Omandurar Government Estate, Chennai-2, between September 2016 - September 2019 by dissection method in 30 adult cadavers(30- right & 30- left sides) . Then results were noted, tabulated and interpreted.

KEYWORDS : Pyramidal lobe, Levator Glandulae thyroideae, Agenesis, isthmus, thyroid gland

INTRODUCTION:

Thyroid gland is the first endocrine gland to develop in the embryo. It is well known for its developmental anomalies ranging from common to rare[3]. It is also associated with diverse clinical manifestations and pathophysiologies but only a few studies have gone into depth of anatomic anomalies and their clinical implications[4]. The thyroid gland is a palpable endocrine gland which is brownish red and highly vascular placed anteriorly in the neck and its position extends from the fifth cervical to first thoracic vertebrae. It is covered by pre-tracheal layer of deep cervical fascia. It consists of a median isthmus and two lateral lobes. The two lobes are connected by a narrow median isthmus. The isthmus measures 1,25 cms vertically and transversely. The isthmus is placed anterior to the second and third tracheal cartilages in the midline. The dimension of each lateral lobes are 5cm x 3cms x 2cms (Len x Trans x AP diameter). The embryological remnant of the caudal end of the thyroglossal duct commonly known as pyramidal lobe often ascends from the isthmus or adjacent part of either lobe (more often from the left side) towards the hyoid bone. The upper end of the pyramidal lobe often ascends from the isthmus or adjacent part of either lobe(more often from the left side) towards the hyoid bone[5]. The upper end of the pyramidal lobe continues as a fibromuscular strand called the lavatory Glandulae Thyroideae (LGT) attached to hyoid bone. When the pyramidal lobe is absent, LGT may attach to the upper part of the isthmus[6]. The developmental anomalies not only distort the morphology of the thyroid gland. It may also cause clinical functional disorders. In addition, they can pose as challenges to diagnostic procedures or as difficulties in non-invasive and invasive airway management during emergency and planned surgical interventions[7].

OBJECTIVES:

The aim of the study was to asses any anatomical variation isthmus of thyroid gland among the Tamil Nadu population.

MATERIALS AND METHODS:

After complete approval from Institutional Ethics Committee for the research protocol. About thirty adult cadavers (24 males and 6 females) aged between 50 - 75 years, were dissected in the department of Anatomy, Government Medical College , Omandurar Government Estate,Chennai-2. The adult cadavers were received from body donation after written informed consent. The cadavers were embalmed through femoral artery perfusion.

The methodology prescribed by Cunningham`s Manual of dissection[5] was carried out for the exposure of thyroid gland[8].

OBSERVATIONS:

Table: 1 Morphological Variations In Either Sex

Sex	Morphological variations	Normal anatomy
Male	6	18
Female	--------	6
Total	6	24

Table: 2 Different Types Of Morphological Variations And Sex Distribution

Morphological Variations	Male	Female	Total	Percentage
Pyramidal lobe	3	--------	3	10%
Presence of levator glandulae thyroideae	2	---------	2	6.66%
Absent Isthmus with left levator glandulae thyroideae	1	-------	1	3.33%

In 10% of specimens (3/30), the pyramidal lobe was attached to the left side of the isthmus and in the 6.66% of specimens (2/30), LGT was extending from the apex of the pyramidal lobe to hyoid bone.

In 3.33% of specimen (1/30) absent (Agenesis) of isthmus along with left sided levator glandulae thyroideae (extending from the pyramidal lobe to hyoid bone) was identified. The individual right and left lobes were supplied by branches of superior and inferior thyroid arteries with no accessory thyroid arteries. The anterior branch of superior thyroid artery anastomosed with ascending branch of inferior thyroid. Along the posterior border, posterior branches of superior thyroid artery anastomosed with inferior branches of inferior thyroid artery. There was anastomosis between arteries of right and left side.

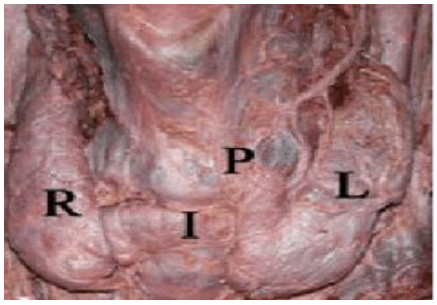
DISCUSSION:

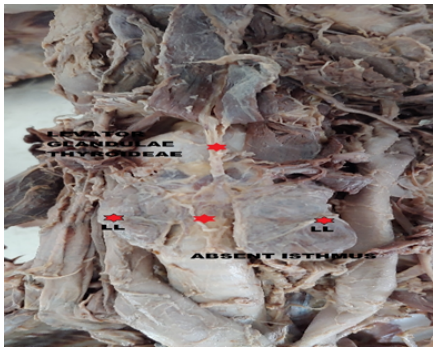
Quoting Authors	Pyramidal Lobe	Levator glandulae thyroideae	Agenesis of Isthmus
Ranada AV et al [9].,	58%	49.5%	33%
Nurunnabi ASM[10] et al.,	41%	20%	--------
Begum M[11] et al .,	26.7%	15%	----------
Joshi S.D[12] et al.,	37.8%	30%	16.7%
Kulkarni .V[13] et al.,	-------	30%	10%
Veerahanumaiah.S[14] et al.,	46%	41%	9%
Rathod S. Mansingh[15] et al.,	58%	--------	13%
Anan Jyoti Rajkonwar[1]	38.75%	18.75%	21.25%
Present study	10%	6.66%	3.33%

CONCLUSION:

With the advent of minimally invasive video assisted thyroidectomies, developed by Miccoli et al., popularly known as MIVAT, is most widely accepted endoscopic technique as the access to the thyroid bed is relatively easy with adequate creation of the working space through the minimal skin incision(s) with better cosmesis and faster recovery. At present decade, the da Vinci S surgical robot system (Intuitive Surgical, Sunnyvale, CA, USA initially described by Kang et al) was developed to address the limitations of conventional endoscopic

surgery as it avoids, the use of neck incision is becoming trendy in recent years and coming into vogue[17]. The surgeons need to be aware of the associated morphological variations of thyroid gland during such surgeries.





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