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A CADAVERIC STUDY OF THYROID ARTERIES OTHER THAN SUPERIOR AND INFERIOR THYROID ARTERY IN WESTERN INDIAN POPULATION

Anatomy

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ABSTRACT

Background: To assess the incidence and site of origin of Thyroidea ima artery and accessory thyroid arteries and their course in the neck region.
Material & Method: The study was carried out on 104 cadavers of known age and sex. Thorough dissection was performed in neck region on both sides of the thyroid gland.
Result: in present study, out of 104 cadavers, Thyroidea ima artery was found in one cadaver (incidence is 0.96%) that originated from Brachiocephalic trunk and in 5 cadavers accessory thyroid arteries arising from tracheal and esophageal arteries were found which were supplying medial and deep surface of thyroid gland.
Conclusion: The information will be useful as reference for surgical procedures such as –tracheostomy, surgeries in suprasternal fossa, various types of lobectomy and others like catheterization and intervention radiology. It will be helpful to prevent complications such as profuse bleeding during surgical procedures.

KEYWORDS

Thyroid gland, Thyroidea ima artery, thyroid surgery, variation.

INTRODUCTION

Thyroid gland is the largest endocrine gland and plays an important role in the maintenance of the basal metabolic rate of the body and is highly vascular endocrine gland. Main arteries that supply thyroid gland are Superior thyroid artery and Inferior thyroid artery. Arteria Thyroidea Ima (Artery of Neubauer) is an inconstant but important artery of thyroid gland. It is an accessary artery that supply thyroid gland and presents occasionally.

Krudy et al stated that an additional midline artery to the thyroid posing a threat in cervico surgical operations was first described by Neubauer in 1772 and so was named Neubauers artery [1].Apart from thyroid gland, the artery may also supply the thymus gland and neck viscera [2]. It may emerge from brachiocephalic trunk, the arch of aorta, the subclavian artery, right common carotid artery or internal thoracic artery [3].

Hollishead (1962) described an accessory artery replacing the inferior thyroid artery as thyroid ima artery [4]. The knowledge of thyroid ima artery plays a significant role in neck surgeries [5].

Identification of arterial variation related to the thyroid gland is of immense importance in formulating planned surgical approaches to the thyroid gland in alerting the surgeons to avert inadvertent injuries to the vital anatomical structures in this area.

This study was undertaken in an attempt to know the incidence of thyroidea ima artery and accessary thyroid arteries in western indian population and to compare with similar work done by others.

MATERIALS AND METHOD

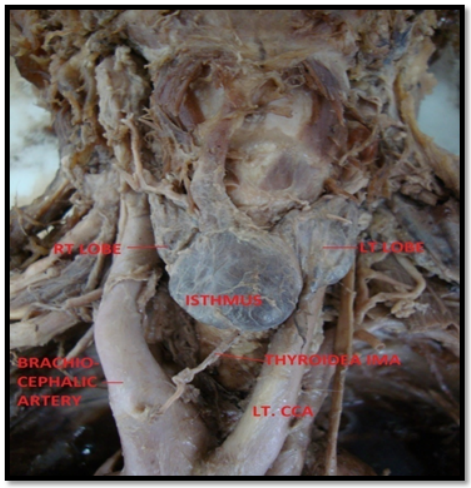
This study was conducted on 104 cadavers of known age and sex in the dissection laboratory, department of anatomy, Government Medical College, Pali, Rajasthan and Government Medical College, Baroda, Gujarat. The cadavers were embalmed through carotid arterial perfusion or femoral arterial perfusion. The specimens were studied by gross anatomical dissection. The body was in supine position with neck slightly extended.

A skin incisions made from chin to sternum in midline, the flap of skin reflected infero-laterally and platysma reflected upward. The fat and fascia removed from the superficial surface and margins of the sternocleidomastoid. Now the sternocleidomastoid retracted and the deep fascia removed from the anterior belly of diagastric to expose the infrahyoid muscles. Following reflection of infrahyoid muscles,

Sternocleidomastoid muscle was displaced laterally and thyroid gland was exposed. Fascia removed from the lobes of the thyroid gland, exposing its arteries and veins. Fat and carotid sheath removed to expose common carotid artery and internal jugular vein. Arch of aorta and its branches dissected as well as assessed carefully for presence of thyroidea ima artery and accessary thyroid arteries.

OBSERVATION

An anomalous artery (Thyroidea ima artery) was observed in front of trachea, ascending upwards to reach the isthmus of thyroid gland. On further exposure of thorax and tracing the artery to its origin, it was noticed that this slender artery arose from the brachiocephalic trunk and coursed towards isthmus without giving any branch.In present study the thyroidea ima artery was found in 0.96 % cases (in 1 out of 104 cadavers) and in 5 cadavers accessory thyroid arteries arising from tracheal and esophageal arteries were found which were supplying medial and deep surface of thyroid gland.



DISCUSSION

The thyroid ima artery is the inconstant third artery that supplies blood to the isthmus of the thyroid gland. The caliber of thyroid ima artery may be as large as the inferior thyroid artery or merely a small twig. Accessory thyroid arteries arising from tracheal and esophageal arteries supply medial and deep surface of thyroid gland.

Many studies shows marked degree of variability in the frequency, the site of origin and the size of thyroidea ima artery. The incidence varies from 1.5 to 12.2% [6] but In present study the incidence of thyroidea ima artery is 0.96% and it originated from brachiocephalic trunk. The commonest site of origin of the thyroidea ima artery is from the

innominate artery [1.9 to 6%] followed by right common carotid artery in 1.4% to 1.7 % [7]; from the arch of aorta on left side in 0.36%[4] . Bilateral thyroid ima arteries have been reported by Gruber[7].

Gruber has also reported the origin of thyroidea ima artery from between the brachiocephalic and left carotid, from between the right subclavian and right carotid, from between the left carotid and subclavian, from the internal thoracic artery, right subclavian artery, in one from the right inferior thyroid, and in one from the transverse scapular artery[7].

Morrigyl and strum[8] during their routine dissection of an 89 year old cadaver found both Inferior Thyroid Artery and left Superior Thyroid Artery to be absent and a lowest thyroid artery arose from the left internal thoracic artery.

The embryological basis of the development of a thyroideaima artery still remains largely unknown. A recent report by Vasovic L et al. claims that the thyroideaima artery probably represents an example of the arterial self-differentiation and induced differentiation of the arteries of the aortic arch [9].

However, according to another theory proposed by Robinson et al, the thyroideaima artery is the principal embryonic blood source to the third and fourth pharyngeal pouches. As a result, anomalous or late morphogenesis of the third and fourth pharyngeal pouches may favour the persistence of a thyroidea ima artery to adulthood [10].

Accessory arteries other than thyroidea ima artery have also been reported. Sara Doll[11] reported a case in which she found two accessary thyroid arteries in one cadaver. In present study accessary thyroid artery found in five cadavers.

CONCLUSION

Knowledge of variations in Anatomy is important to anatomists, radiologists, anesthesiologists and surgeons, and has gained more importance due to wide use and reliance on computer imaging and in the diagnostic medicine.

In present study the incidence of thyroidea ima artery is 0.96% that is lower than incidence (1.5 to 12.2% [6]) of thyroideaima artery that is published by other researchers and incidence of accessary thyroid artery is 0.05% that arose from tracheal and esophageal arteries were found which were supplying medial and deep surface of thyroid gland. So this study is suggestive of lower incidence of thyroideaima artery in western indian population than other indian population and international population.

The knowledge of the course of the thyroid ima artery and other accessary thyroid arteries is important for surgeons as the possible existence of this anomaly is important in neck surgeries especially in surgical procedures involving suprasternal fossa, tracheostomy. If unrecognized it can be a source of brisk uncontrolled bleeding during or after surgery. This is especially true if this vessel is large. The knowledge of this artery is necessary in angiography done as a preoperative requisite in the thyroid and parathyroid surgeries, which could be missed if this artery is not selectively injected. Description of arterial variations, especially if they are of rare occurrence is important for interpretation within the scope of modern imaging techniques.

CONFLICTS OF INTEREST: None

REFERENCES

1. Krudy AG, Doppman JL, Brennan F: The significance of the thyroid ima artery in angiographic localization of parathy¬roid adenomas Radiology, 1980; 136: 51-55.
2. Kimmel DL: Anterior mediastinal origin of the thyroideaima artery. Anatomical Records, 1949; 103: 544 Abst No:270.
3. Chummy S. Sinnatamby. Last's anatomy, regional and ap¬plied Churchill living stone.11th ed. 2006; P 352.
4. Hollinshead WH; Head and Neck In: Anatomy for surgeons (vol.1). 1st edn.Hoberand Harper, Newyork, 1962: PP: 520-533.
5. Nanka O, Sedy J, Vitkova I , Libansky P, AdamekS.Surgical anatomy of parathyroid gland with emphasis on parathy¬roidectomy. Prague Med. Rep. 2006; 107: 261-272
6. Faller A, Scharer O: Uber die variabilitat der arteriaethy¬roideae. ActaAnatomica, 1947; 4: 119-122.
7. Gruber W. Ueber die thyroideaima Archives of pathology Anatomic und physiologie u Klin medicine. 1872; 54: 445- 484.
8. Morrigyl B, Sturm W, Absence of three regular thyroid arteries replaced by an unusual lowest thyroid artery: A case report. Surg Radiol Anat 1996;18:147-50
9. Vasovic L, Arsic S, Vlajkovic S, Zdravkovic D (2004) Morphological aspect of the Thyroidea Ima artery in human fetuses. Ital J Anat Embryol, 109: 189–197
10. Robinson HB JR (1975) DiGeorge's or the III-IV pharyngeal pouch syndrome: pathology and a theory of pathogenesis. Perspect Pediatric Pathol, 2: 173–206.
11. Sara Doll, A rare occurrence of an accessory thyroid artery. International Journal of Anatomical Variation (IJAV), 2009; 2: 71–72.