



ORIGINAL RESEARCH PAPER

Anatomy

ANOMALOUS ORIGIN OF THYROLINGUAL TRUNK AND ITS CLINICAL RELEVANCE

KEY WORDS: Thyrolingual Trunk, Superior Thyroid Artery, Lingual Artery, Common Carotid Artery.

Vijisha Phalgunan*

MBBS ,MD (Anat), Professor & H.O.D., Department of Anatomy, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry, India. *Corresponding Author

Baskaran. S

DNB(medicine), DNB(Cardiology), Consultant Interventional Cardiologist Sri Venkateswara Medical College and Hospital, Puducherry.

ABSTRACT

Aim: To Study Branching pattern of External Carotid Artery in carotid triangle .

Materials And Methods: This study was conducted in the department of Anatomy at Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry, for a period of four years in 30 formalin-preserved cadavers during routine neck dissection for the first year medical undergraduates .A careful dissection was done and all the branches of external carotid artery in the carotid triangle were separated .Anomalous branching pattern is reported here.

Results: The branches of external carotid artery in the carotid triangle namely superior thyroid artery and lingual artery were seen originating from a single trunk as thyrolingual trunk. This variation was seen two cadavers out of 30 dissected ones. The incidence of thyrolingual trunk was found to be 6.6 % (2/30).

Conclusion: The embryological basis of the occurrence of Thyrolingual trunk is unknown and it is considered as a rare arterial variation in the neck. Hence ,the knowledge will have important clinical implications for surgical procedures and radiologic examinations in the regions of the head and neck.

INTRODUCTION:

The cornerstone of surgery is a good anatomical knowledge. Thyrolingual trunk is considered as a rare arterial variation in the neck. The knowledge of its variation decreases the risk of vascular accidents during surgery and during various intra-arterial chemotherapies. Anatomical variations in the point of bifurcation and branching pattern of CCA are known and documented by several authors.

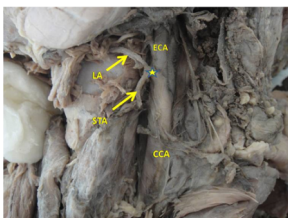
MATERIALS AND METHODS:

This study was conducted in the department of Anatomy at Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry, from 2016-2020. During routine neck dissection in 30 formalin-preserved cadavers, the branches of external carotid artery was carefully dissected and variability in branching pattern was noted.

RESULTS:

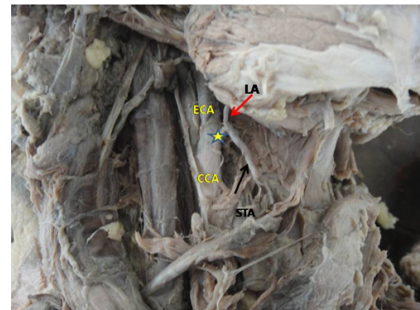
Out of the 30 cadavers dissected two cadavers showed presence of thyrolingual trunk unilaterally. Both were male cadavers. This Thyrolingual trunk gave rise to superior thyroid artery and lingual artery. The incidence of TL trunk was found to be 6.6 % (2/30).

Specimen A - Thyrolingual trunk was observed in a male cadaver as a branch of external carotid artery 10mm above the carotid artery bifurcation (Figure 1) on left side .The arteries were carefully dissected and photographed. Common trunk measured 5mm in length first runs upwards and medially, dividing into lingual and superior thyroid arteries. Superior thyroid artery runs towards the superior pole of thyroid gland. Lingual artery runs obliquely upwards and medially to reach the posterior border of hyoglossus muscle.



Specimen A- CCA – Common Carotid Artery, ECA – External Carotid Artery, Yellow Asterix – Thyrolingual Trunk, LA – Lingual Artery, STA – Superior Thyroid Artery

Specimen B - In the next cadaver occurrence of thyrolingual trunk was observed on the right side, where the thyrolingual trunk was found at the level of bifurcation of common carotid artery, which was only 5mm in length . Superior thyroid artery runs obliquely and medially to reach at the superior pole of lobe of thyroid gland and Lingual artery courses upwards.



Specimen B - CCA – Common Carotid Artery, ECA – External Carotid Artery, Asterix (Yellow) – Thyrolingual Trunk, LA – Lingual Artery, STA – Superior Thyroid Artery

DISCUSSION:

The radical neck dissection, thyroidectomy, reconstruction of aneurysm and intervention radiology being commonly carried out necessary procedures, profound knowledge of the anatomy and variations of Superior thyroid artery is of immense importance for clinicians to avoid iatrogenic injuries and postoperative complications [1].

A rare variation of the origin of lingual artery from right CCA is reported in a male cadaver along with high bifurcation of right CCA was reported by Surekha G [2] . Anatomical variations in the CCA are known and documented by several authors. It may provide one or more branches usually derived from the external carotid artery. Examples are superior thyroid artery, thyroidea ima, and cases have been reported in which a vertebral, inferior thyroid, occipital or ascending pharyngeal as a branch of CCA. Rarely, the CCA may be absent or it may not bifurcate but provide branches usually derived from the external carotid as it ascends in the neck [3]. Gupta et al. conducted an angiographic study of 25 STAs of cadavers and identified their pattern of origin. In their study, in one case only, the STA emerged from the ICA and rest was from the ECA, CB, CCA [4].

The lingual artery may arise either below or under cover of posterior belly of digastric is the second branch arising anteriorly from the external carotid artery [5]. It was reported that the origin of lingual artery from the thyrolingual trunk was rare when compared to its origin from the linguofacial trunk which was reported occurring in 10-20% of cases. [3]. It was observed in a study that the thyrolingual or linguofacial trunk gave rise to superior thyroid artery, lingual artery and facial artery together or these arteries emerged independently .83.3% of the STAs (25/30) arose independently from the major artery (ECA, CB, and carotid artery), while 16.7% of the cases (5/30) arose from the thyrolingual or linguofacial trunk. But their actual occurrence between the linguofacial and thyrolingual trunk was not reported and stated [6]. In another study the occurrence of thyrolingual trunk was found only 2.5% when compared with 7.5% from linguofacial trunk [7].

In a study done by Madan K the thyrolingual trunks were observed in two out of 21 cadavers. The incidence of TL trunk was found to be 9.5% ., the trunk was observed unilaterally on right side. Thyrolingual trunks were seen directly arising from common carotid artery and at the carotid bifurcation [1].

Ergur and Icke reported thyrolingual trunk arising unilaterally, 7.6 mm from the carotid bifurcation [8]. An anomalous origin of thyrolingual trunk 2 cm below the carotid bifurcation in one case during the dissection of 200 cadavers from right common carotid artery was also reported [9]. The origin of thyrolingual trunk from external carotid artery has been reported with an incidence of range from 0.7-3% [10,11].

Arthur Thomson in his notes on unusual variations described the unusual case of origin of the superior thyroid, lingual and facial from the common carotid by a common trunk [12]. Babu [9] and Budhiraj and Rastogi [13] reported variant origin of thyrolingual trunk from right and left CCA, respectively.

CONCLUSION:

The knowledge of such variations is vital for the exact identification of the neck vessels during surgery to avoid a fatal mix-up. Knowledge of this variation would be helpful for the clinicians planning surgeries in this region to minimize the complications. The knowledge of anatomical variation is necessary during intra-arterial chemotherapy and to prevent haemorrhagic accidents during intraoperative procedures.

REFERENCES:

1. Madan Kapre, Ashutosh S. Mangalgi, and Devendra Mahore. Study of Thyro-Lingual Trunk and its Clinical Relevance. Indian J Otolaryngol Head Neck Surg. 2013 Apr; 65(2): 102-104.
2. Surekha D Jadhav, Manoj P Ambali and Raosaheb J Patil. Anatomical variation of the origin of the right lingual artery. IJAV 2011; 4: 75-76.
3. Bergman RA, Afifi AK, Miyauchi R. Illustrated Encyclopedia of Human Anatomic Variation: Opus II: Cardiovascular System: Arteries: Head, Neck, and Thorax. Common Carotid Arteries. <http://www.anatomyatlases.org/AnatomicVariants/Cardiovascular/Text/Arteries/CarotidCommons.html> (accessed June 15th, 2010)
4. Gupta P, Bhalla AS, Thulkar S, Kumar A, Mohanti BK, Thakar A, Sharma A. Variations in superior thyroid artery: a selective angiographic study. Indian J Radiol Imaging 2014; 24: 66-71.
5. Hollinshead WH. Anatomy for Surgeons. Vol. 1. 3rd Ed., Philadelphia, Harper and Row. 1982; 374-375.
6. Sung-Yoon Won Anatomical considerations of the superior thyroid artery: its origins, variations, and position relative to the hyoid bone and thyroid cartilage. Anat Cell Biol 2016; 49: 138-142
7. Ozgur Z, Govsa F, Celik S, Ozgur T. Clinically relevant variations of the superior thyroid artery: an anatomic guide for surgical neck dissection. Surg Radiol Anat 2009; 31: 151-9.
8. Ergur KI, Icke C. A case with thyrolingual trunk originating from the common carotid artery. Dokuz Eylül Üniversitesi Tıp Fakültesi Dergisi. 2004; 18(3): 256-259
9. Babu BP. Anomalous origin of thyrolingual trunk from right common carotid artery - a case report. J Anat Soc India. 2001; 50: 47-48.
10. Adachi, B. (1928) : Das Arterien system des japaner. BD2. Kyoto : Maryzen. p 86.
11. Lippert, H; Pabst, R. Arterial variations in man. Classification and frequency. JF Bergson variag: Munchen. : p 83. (1985).
12. Thomson A. Notes on some unusual variations in human anatomy. Anat Physiol. 1885; 19: 328-332.
13. Budhiraja V, Rastogi R. Variant origin of thyrolingual trunk from left common carotid artery. International Journal of Anatomical Variations. 2010; 3: 44-45.