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Case Study
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UNILATERAL LINGUOFACIAL TRUNK: A RARE CASE REPORT

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Abstract

The common carotid arteries are the major source of blood supply to the region of head and neck. Normally external carotid artery gives eight branches in the region of neck. All of them arise independently as separate branches. In the present case, we found lingual and facial arteries arising from a common trunk i.e. linguofacial trunk from the front of external carotid artery on the right side. While on the left side, lingual and facial arteries were arising separately from external carotid artery. Such anatomical variations of external carotid artery are important for surgeons in surgeries of head and neck region and also for radiologists in the image interpretation of the face and neck region.

Key words: External Carotid artery, Linguofacial trunk, Variations

Introduction

The common carotid arteries (CCA) are the major source of blood supply to the region of head and neck. The right CCA originates from the brachiocephalic trunk and the left CCA arises from the arch of aorta. CCA normally divides into external carotid artery (ECA) and internal carotid artery (ICA) at the level of upper border of thyroid cartilage (Williams *et al.,* 1995). It is important for the surgeons to differentiate between ECA and ICA to ensure that the artery being ligated is ECA, as the ligation of ICA may result in hemiparesis (Thwin *et al.,* 2010). Variations of CCA and ECA may be asymptomatic and therefore care must be taken during routine surgeries of head and neck (Kishve *et al.,* 2011). Itrogenic lingual artery injury during tonsillectomy has been reported because of the presence of liguofacial trunk (Fred, 2013).

The facial artery normally arises from the front of ECA just above the tip of greater cornua of hyoid bone in carotid triangle. The lingual artery is usually the second branch of ECA arising from its front, opposite the tip of greater cornua of hyoid bone (Williams *et al.,* 1995). Sometimes facial and lingual arteries may arise from a common trunk (linguofacial trunk) (Bergam *et al.,* 2013). Anatomical studies reveal the presence of liguofacial trunk bilaterally in 4.8% (Fazan, 2009) and unilaterally in 20% of population (Hayashi, 2005; Lucev, 2012). Knowledge of variations of ECA, especially linguofacial trunk is essential for surgeons to ensure accurate arterial ligation during oral and faciomaxillary surgeries. This knowledge is also essential for radiologists to understand and interpret the carotid system imaging (Kishve *et al.,* 2011).

Case report

During routine dissection in the Department of Anatomy, Jawaharlal Nehru Medical College, Belgaum, a unique anatomical variation involving right ECA was found in a 70 year old male cadaver. The lingual and facial arteries were originating from the front of ECA as the common linguofacial trunk on the right side and coursed upwards towards the mandible for about 1.2 cm and then divided into facial and lingual arteries. The superior thyroid artery originated from the front of ECA below the tip of greater cornua of hyoid bone. The occipital artery arose from the posterior aspect of ECA opposite the origin of linguofacial trunk and coursed upwards and backwards. The posterior auricular artery arose above the level of occipital artery from ECA. The ascending pharyngeal artery took its origin from the medial side of ECA. On the left side, the branching pattern of ECA was found to be normal. The lingual and facial arteries were originating separately from the front of ECA (Fig. 1and Fig 2).

Fig. 1: Branches of External Carotid artery on left side
1. Common Carotid, 2. External Carotid, 3. Internal Carotid, 4. Superior Thyroid, 5. Lingual, 6. Facial Artery, 7.Hypoglosal Nerve

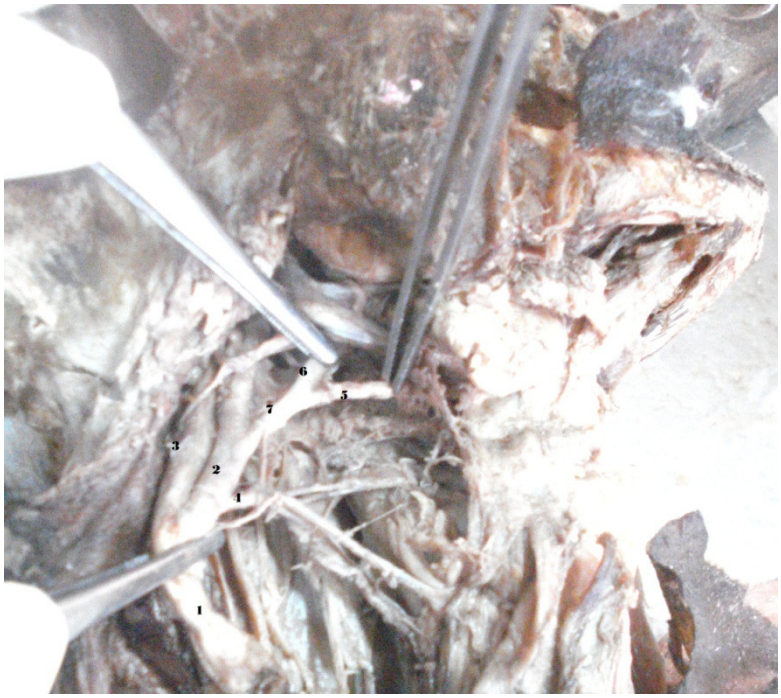

Fig. 2: Linguofacial Trunk on right side
1. Common Carotid, 2. External Carotid, 3. Internal Carotid, 4. Superior Thyroid, 5. Lingual, 6. Facial Artery, 7. Linguofacial Trunk

Discussion

The CCA and its branches provide the major source of blood to the region of head and neck. The CCA bifurcates at the level of upper border of thyroid cartilage (Williams *et al.,* 1995; Skandalakis *et al.*,1994).Variations in the branching pattern of carotid system is not uncommon. A study done by Zumre *et al*.(2005) on human fetuses found a thyro-lingual trunk in 2.5%, a thyrolinguo-facial trunk in 2.5% and linguofacial trunk in 20% (Zumre *et al.,* 2005). According to a study done by Bergman et al. facial artery may replace lingual artery and supply the sublingual gland**.** Similarly origin of linguo-facial trunk bilaterally also reported (Kishve *et al.,* 2011). But in the present study, linguo-facial trunk was found unilaterally and was on found the right side.

Unusual case of origin of the superior thyroid and lingual arteries was described by Thomson A in his notes on unusual variations (Thomson, 1885). A right sided ECA branched into superior thyroid, lingual and occipital arteries directly at its origin as observed (Gluncic *et al.,* 2001). In the present study superior thyroid artery originated from the front of ECA below the tip of greater cornua of hyoid bone. The occipital artery arose from the posterior aspect of ECA opposite the origin of linguofacial trunk. Mahendrakar reported unilateral agenesis of lingual artery (Mahendrakar, 2007). Some author reported that ascending pharyngeal and occipital arteries arose from internal carotid artery and no specific ECA was found in some cases (Kanako *et al.,* 1996).

Superior thyroid artery and lingual artery were arising from a common trunk about 30mm beneath the carotid bifurcation on right side as noted (Lemaire *et al.,* 2001). Variation in branching pattern of ECA on both the sides are rare findings which impart useful knowledge for the surgeons while operating on the face and neck regions (Kishve *et al.,* 2011).

The anomalous branching pattern of common linguofacial trunk may have implications in the surgical field and it may tend to have a more medial course or a more medial origin. This brings the facial and/or lingual arteries in close proximity to the tonsillar fossa, thereby increasing the risk of iatrogenic injury (Fred, 2013). According to Toshinori Iwai *et al*. (2013), prior to superselective intra-arterial catheterization or microsurgical reconstruction for head and neck cancer, it is important to recognize an anatomic variation like linguofacial trunk (Toshinori *et al.,* 2013)

Conclusion

For reconstruction purposes, the Facial Artery Musculo-Mucosal (FAMM) flap has been recently introduced. It is being used widely now for reconstruction of oronasal fistulas and closure of soft tissue defects in the mandibular vestibule. Therefore, precise course and branching pattern of facial artery is required for construction of FAMM flap and its successful utilization. The anatomical knowledge of facial and lingual arteries is thus necessary for most of the cosmetic surgeries since most of the times they take place in the region of head and neck. The present case thus would provide useful information for various clinical and surgical applications.

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