

Bilateral linguofacial trunk - a case report

¹Shankreppa D Desai, ²Ashwini B Nuchhi, ³Santoshkumar B Karjagi

¹Professor of Anatomy, ²Post Graduate of Anatomy, ³Registrar of Anaesthesia

Shri BM Patil Medical College, BLDE University, Bijapur, Karnataka.

Abstract : During routine dissection of an adult male cadaver, a unique case of anomalous origin of linguofacial trunk from both the right and left external carotid arteries with no looping of lingual artery in its course and relative higher division of right common carotid artery at C3 vertebral level was observed. Although variations in the external carotid artery origin and branches are not uncommon it is necessary to document as these variations may increase the risk of accidental vascular trauma during head and neck surgeries. And this knowledge is also important for radiologists in the image interpretation of carotid arterial system.

Key Words : *lingual artery, facial artery, common trunk, external carotid artery.*

Introduction

Carotid arteries provide major source of blood to head and neck region. Even though the origin of Common Carotid artery varies on both sides, it normally divides at the upper border of thyroid cartilage at junction of C3-C4 vertebrae into internal and external carotid arteries in the carotid triangle. External carotid artery then runs upwards up to a point just behind the neck of mandible. External carotid artery gives 8 branches. They are- ascending pharyngeal, superior thyroid, lingual, facial and occipital arteries in carotid triangle, posterior auricular in digastric triangle, maxillary and superficial temporal within parotid gland as terminal branches. The lingual artery before passing beneath hyoglossus muscle forms a loop with upward convexity to facilitate free movement of hyoid bone and hypoglossal nerve crosses it superficially¹.

The common carotid artery may bifurcate at a higher or lower level than usual, higher bifurcation is very much common. The bifurcation is as high as the level of hyoid bone or styloid process or as low as the level of cricoid cartilage. The branches of external carotid artery were found to share common trunks between them such as linguofacial trunk, thyrolingual trunk, thyrolinguofacial trunk and occipitoauricular trunk. Thus it becomes very much essential to be aware of anatomical vascular variations, to ensure these anomalies are not overlooked in the differential diagnosis².

Variations in the bifurcation point of common carotid artery and origin and branching pattern of external carotid artery such as linguofacial trunk may increase the accidental vascular trauma during surgical procedures such as extra oral ligation of lingual artery, catheter insertion of common carotid artery for various procedures, carotid endarterectomy, plastic and reconstructive surgeries of face and lip³.

Case Report

During routine dissection of head and neck region of an adult male cadaver in the Department of Anatomy, Shri BM Patil Medical College, Bijapur we found the linguofacial trunk on both sides with variable level of bifurcation of common carotid artery.

Observations

The variations on right side were-the relative higher bifurcation of common carotid artery 20mm above the upper border of thyroid cartilage at C3 vertebral level. Linguofacial trunk was arising anteromedially from external carotid artery 42mm above the bifurcation point of common carotid artery just below the tip of greater cornua of hyoid bone. Length of linguofacial trunk was

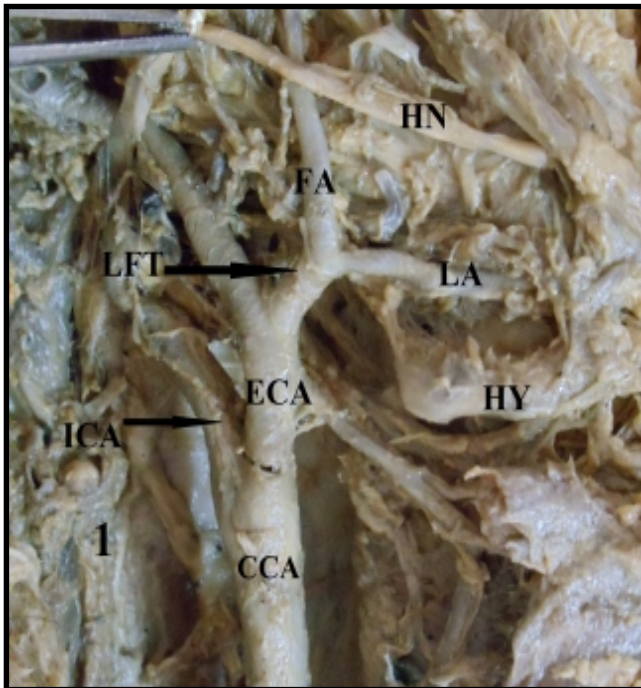


Fig 1-Variations on right side of neck.

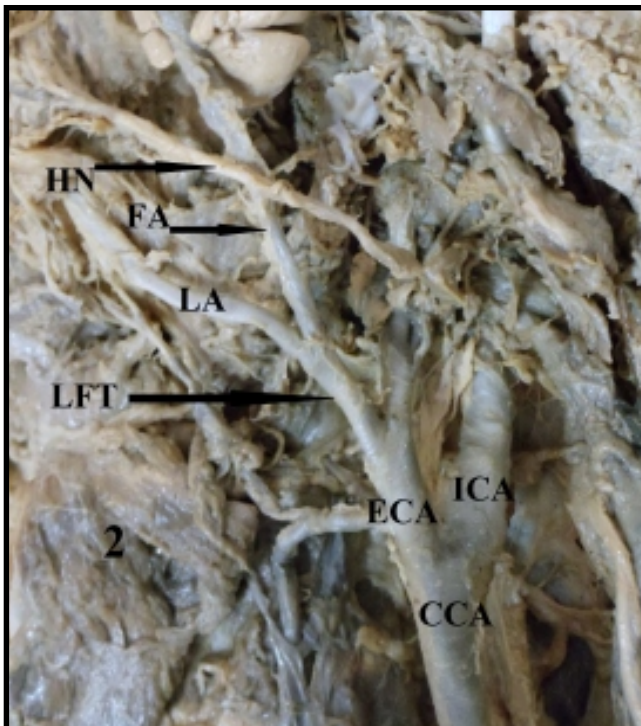


Fig 2 - Variations on left side of neck.

Abbreviations :

CCA-Common carotid artery; ICA-Internal carotid artery; ECA-External carotid artery; LFT-Linguofacial trunk; LA-Lingual artery; FA-Facial artery; HN-Hypoglossal nerve; HY - Hyoid bone.

22mm, and then it was running upwards forwards and medially later dividing into facial and lingual arteries. There was no looping of lingual artery before passing beneath hyoglossus muscle. Further course and branches of lingual and facial arteries were normal. (Fig. 1)

The variations on left side were- the common carotid artery was bifurcating 8mm below the upper border of thyroid cartilage at C4 vertebral level. The linguofacial trunk was arising anteromedially from external carotid artery at the upper border of thyroid cartilage. It was 30 mm in length, ascended upwards forwards and medially later dividing into facial and lingual arteries. The hypoglossal nerve was crossing superficially to the facial artery on both the sides. Further course and branches of lingual and facial arteries were normal. (Fig-2).

Discussion

Bifurcation of common carotid artery varies as high as hyoid bone or styloid process or as low as cricoid cartilage. Thwin et al in their study revealed common carotid artery bifurcates at C3 vertebral level in 50% cases on right side, 55% on left side, at C4 level in 40% cases on right side and 35% cases on left side, at C2 level in 10% on right side and at C5 level in 1% on both sides².

Anangwe et al in their study on Kenyans found bifurcation of common carotid artery at C3 vertebral level in 38% cases, C3-C4 junction in 25% cases, higher than C3 in 25% cases and pattern of bifurcation on both sides was also variable⁴.

The Angiographic study by Smith and Larsen revealed a higher bifurcation of common carotid artery on right side seen in 50% cases and on left side-22% cases⁵.

Sanjeev et al-found branches from external carotid artery arose separately in 56.76% cases and in remaining cases branches were found to share common trunk, Linguofacial trunk-19%, thyrolinguofacial trunk-2.7% occipitoauricular trunk-3.5%³.

Zumre et al in their study on human fetuses found that branches of external carotid artery share the common trunks such as linguofacial trunk in 20% cases, thyrolingual trunk-2.5%, and thyrolinguofacial trunk-2.5% occipitoauricular trunk-12.5%⁶.

Asymmetrical pattern of bifurcation of common carotid artery on both sides may pose clinical challenges as they may predispose to angiographic data misinterpretation & surgical complications⁵. A high common carotid artery is at a higher risk of impingement by intra-articular screws during procedures on vertebrae⁷.

In our case right common carotid artery was bifurcating at C3 level and left at C4 level. Linguofacial trunk was found to arise from external carotid artery on both sides. In the available literature we could not find bilateral linguofacial trunk.

Variations in the bifurcation point of common carotid artery and origin and branching pattern of external carotid artery such as linguofacial trunk may increase the accidental vascular trauma during surgical procedures such as extra oral ligation of lingual artery, catheter insertion of common carotid artery for various procedures, carotid endarterectomy, plastic and reconstructive surgeries of face and lip. The knowledge of this is also important for selective arterial embolisation and intra arterial chemotherapy in the treatment of tumors and in image interpretation of carotid arterial system by radiologists^{2, 7, 8, 9}.

Conclusion

Variations in the branching pattern of external carotid artery such as linguofacial trunk and bifurcation point of common carotid artery on both sides are rare findings and impart important knowledge for surgeons to avoid accidental vascular trauma and in the image interpretation of carotid arterial system by the radiologists.

References

- 1) Standring S. Head and Neck. In : Standring S, Borley NR, Collins P, Crossman AR, Gatzoulis MA, Healy JC et al. (eds.) Gray's Anatomy - The anatomical basis of clinical practice. 40th ed. Elsevier Churchill Livingstone. Edinburgh, 2008:444 - 447.
- 2) Thwin SS, Soe MM, Myint M, Than M. Variations of the origin and branches of the external carotid artery in a human cadaver. Singapore Med J. 2010; 51(2): 40-42.
- 3) Sanjeev IK, Anita H, Ashwini M, Mahesh U, Rairam GB. Branching pattern of external carotid artery in human cadavers. JCDR. 2010; 4: 3128-3133.
- 4) Anangwe D, Saidi H, Ogeng'o J, Awori KO. Anatomical variations of the carotid arteries in adult Kenyans. East Afr Med J. 2008; 85: 244-247.
- 5) Smith D, Larsen J. On the symmetry and asymmetry of the bifurcation of the common carotid artery. A study of bilateral Carotid angiograms in 100 adults. Neuroradiol. 1979; 17: 245-247.
- 6) Zumre O, Salbacak A, Cicekcibasi AE. Investigation of the bifurcation level of the common carotid artery and variations of the branches of the external carotid artery in human fetuses. Ann. Anat. 2005; 187: 361-369.
- 7) Currier BL, Todd LT, Maus TP. Anatomic relationship of the internal carotid artery to the C1 vertebra: A case report of cervical reconstruction for chordoma and pilot study to assess the risk of screw fixation of the atlas. Spine. 2003; 28: E461-467.

Address for communication :

Dr. Shankreppa D Desai,

Professor of Anatomy,

Shri.B.M.Patil Medical College,

BLDE University, Bijapur, Karnataka - 586 103.

e-mail ID : drdesaisd@gmail.com

Mobile : 09448210445