

Study on Incidence and Clinical Importance of Premasseteric Branch of Facial Artery

Sudhakara Babu Chelli¹, Dnyaneshwar B Patil², Manjunath Halagatti³, Channabasanagouda⁴

¹Assistant Professor, Department of Anatomy, MediCiti Institute of Medical Sciences, Hyderabad.

²Associate Professor, Department of Anatomy, BIMS, Bidar.

³Associate Professor, Department of Anatomy, KIMS, Koppal.

⁴Professor & HOD, Department of Anatomy, KIMS, Koppal.

Received: 07-12-2022 / Revised: 30-12-2022 / Accepted: 20-01-2023

Corresponding author: Dr. Sudhakara Babu Chelli

Conflict of interest: Nil

Abstract

Facial artery is the principal artery of face. Premasseteric artery is the posterior branch of facial artery that runs along the anterior border of masseter muscle to supply it and the adjacent tissue. This observational study included 25 (50 hemi-faces) adult cadavers which were dissected as per instructions given in volume-3 of Cunningham's manual of practical Anatomy. Fine dissection was done to find out the branch on both sides. Variations were noted and photographed. In our study the incidence of the artery was observed in 6 (24 %) cadavers. The artery had a normal course after its origin from the point of entry of facial artery on face. It was not observed in remaining 19 cadavers. The incidence of premasseteric artery was less in our study. If present may interfere with other surrounding structure which is of surgical interest.

Keywords: Premasseteric Artery, Facial Artery, Hemi-Faces, Masseter Muscle, Facial Palsy.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Rich blood supply of the face is by facial artery, transverse facial artery and infraorbital artery. Facial artery is the chief artery of face which is tortuous in nature that allows free movements of mandible, lips and cheeks. It ends at the median angle of eye as angular artery. Susan Standring [1], Vasudha TK, D'Sa DS, Gowda S [2], Vishram Singh [3] and Tansatit T, Apinuntrum P, Phetudom T [4] described the above course of the facial artery and premasseteric artery. Variations in origin, course, branching pattern and termination of

facial artery is common which was reported by many authors earlier.

Masseteric branches of facial, maxillary & transverse facial artery supplies masseter muscle as described by Orhan Magden *et al* [5]. Susan Standring [1] described premasseteric branch of facial artery as small inconstant branch that passes upwards along the anterior border of masseter to supply adjacent tissue. Bordes *et al* [6] It is a variable posterior branch of facial artery that is related to masseter muscle anterior border .

Premasseteric branch is prone for injury during maxillofacial surgeries. Surgical procedures involving masseter muscle and adjacent structures, a thorough knowledge about the normal and abnormal anatomy is needed.

Materials and Methods

This observational study is carried out in Department of Anatomy, KIMS, Koppal. This study was done in 25 adult cadavers (50 hemifaces) which are kept for dissection for MBBS phase-1 students. Facial artery was dissected on both the sides by giving incisions as per Cunningham's practical manual. Pre-

masseteric branch was traced on face at the point of entry of facial artery on face. Variations were noted and photographed. This work was carried out after getting institutional ethics committee approval.

Results

In present study premasseteric artery was found arising from the point of entry of facial artery on face. The artery had normal course on the anterior border of masseter (Figure-1). Premasseteric was observed in 12 hemifaces (24 %) in our study. It was absent in remaining 38 hemi-faces (Figure-2).



Figure 1: Premasseteric artery



Figure 2: Absence of pre-masseteric artery

Discussion

The variations about the premasseteric branch of facial artery are less in literature. First it was described by Adachi [7]. Its pivot role in reconstructive surgeries of lower and upper lip defects was described by Kawai K *et al* (2004). Orhan Magden *et al* [5] carried out micro dissection in 14 cadavers and found that in 3 % cases premasseteric branch had larger diameter than facial artery. In their study premasseteric branch gave perforator branches for the masseter muscle in 22.22 % cases . When present premasseteric artery may compress important structure like parotid duct and facial vein as stated by Kumar *et al* [9] .

Padur AA and Kumar N [10] reported a case where premasseteric branch was large that took origin from left facial artery which terminated below parotid duct, supplying adjacent tissue. The facial artery which was tortuous had terminated as superior labial branch . This observation is coinciding with our findings which had similar pattern of course and termination. Vasudha T *et al* [11] carried out dissection in 50 adult hemifaces and observed 6 % of premasseteric branch of facial artery . Kolte VS *et al* [12] reported small premasseteric branch on right side that was given off from facial artery . Somanath D [13] observed premasseteric branch over master which passed upwards and terminated as lateral, medial and intermediate branches .

Vijayalakshmi M *et al* [14] in their study on premasseteric branch, that was carried out on 21 adult cadavers (42 hemi-faces) observed its presence in 28.5 % specimen. These findings are close to our study where the incidence of artery we observed was 24 %. Kataria DS *et al* [15] reported a case where the facial artery after entering the face gave premasseteric branch and submental branch and terminated as inferior labial artery. Ariji Y *et al* [16] used color Doppler to find normal and pathological changes in arteries surrounding masseter muscle through sonography. In their study inferior part of muscle showed two anatomical

variations of which 22.4 % was masseteric branch and 77.6 % was facial artery itself. Out of several masseteric branches given off for masseter muscle, branch from deep temporal and external carotid arteries were smaller while larger branches were from transverse facial artery as observed by Won SY *et al* [17] in their study. In their study premasseteric branch observed was 56 %. Bordes SJ [18] stated the importance of artery during maxillofacial procedures that may result in hemorrhage without knowledge of anatomy of master muscle with adjacent structures.

Conclusion

The frequency of occurrence of premasseteric branch in present study was 24%. Facial palsy can be corrected by using masseter muscle. A thorough knowledge on vascular variations on branches of premasseteric artery is required for maxillofacial and craniofacial surgeons before any surgical procedures to avoid post-operative complications. This information along with the described variations may be of interest to vascular surgeons and plastic surgeons.

References

1. Susan Standring. Gray's anatomy. The anatomical basis of clinical practise. 49th edition, Elsevier limited : 2008; 446-447,490.
2. Vasudha TK, D'Sa DS, Gowda S. A study on course and variations of facial artery on the face. *Int J Anat Res.* 2018; 6:4928-32.
3. Vishram Singh. Textbook of Anatomy- Head, neck and brain. Reed Elsevier India Private Limited, 3rd edition, 2018; Volume 3, pg-60.
4. Tansatit T, Apinuntrum P, Phetudom T. A typical pattern of the labial arteries with implication for lip augmentation with injectable fillers. *Aesthet Plast Surg.* 2014; 38:1083-9.
5. Orhan Magden, Nuket Gocmen Mas, Sevda Senan *et al* . The premasseteric branch of

- facial artery: Its importance for craniofacial surgery. Turkish neurosurgery .2009; Vol:19; No.1,pg- 45-50.
6. Bordes S J, Zarrintan S, Iwanaga J, et al. The Premasseteric Branch of the Facial Artery: A Review and Translation of Adachi's Work. *Cureus* . 2020; 12(9).
 7. Adachi B. *Arteriensystem der Japaner. Band I*, Kyoto, Verlag der Kaiserlich-Japanischen Universitat zu Kyoto. 1928;73-7 (Japanese).
 8. Kawai K, Imanishi N, Nakajima H, Aiso S, Kakibuchi M, Hosokawa K. Arterial anatomy of the lower lip. *Scandinavian journal of plastic and reconstructive surgery and hand surgery*.2004; Jan 1; 38(3):135-9.
 9. Kumar N, Nayak SB, Shetty S, Guru A. Unusual posterior (premasseteric) branch of facial artery—a case report. *IJAV*. 2011; 4:161-3.
 10. Padur AA, Kumar N. Unusual branching pattern and termination of facial artery and its clinical implications for facial operations. *J Vasc Bras*. 2019; 18: e20190021.
 11. Vasudha T, D'Sa D, Gowda S. A study on course and variations of facial artery on the face. *Int J Anat Res*. 2018; 6(1.2):4928-32.
 12. Kolte VS, Khambatta S, Ambiye MV. Bilateral anatomical variation in the arterial supply of face involving the facial and transverse facial artery. *Int J Anat Res*. 2014; 2(1):256-8.
 13. Somanath D . Variation In the Branching Pattern of Facial Artery: Premasseteric Artery. *Int J Anat Res*. 2015; 3: 828-30
 14. Vijayalakshmi M, Premavathy D, Thenmozhi MS. Incidence of the premasseteric branch of the facial artery—a cadaveric study. *Drug Invention Today*. 2019; Aug 1;11(8).
 15. Kataria DS, Ranjan RK, Sharma N. Bilateral variation of facial artery and its implication for facial surgery: A. *International J. of Healthcare and Biomedical Research*. 2015; Apr; 3(03): 77-81.
 16. Ariji Y, Kimura Y, Gotoh M, Sakuma S, Zhao YP, Ariji E. Blood flow in and around the masseter muscle: normal and pathologic features demonstrated by color Doppler sonography. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*. 2001 ;Apr 1; 91(4): 472-82.
 17. Won SY, Choi DY, Kwak HH, Kim ST, Kim HJ, Hu KS. Topography of the arteries supplying the masseter muscle: using dissection and Sihler's method. *Clinical anatomy*. 2012; Apr;25(3):308-13.
 18. Bordes SJ, Zarrintan S, Iwanaga J, Loukas M, Tubbs RS. The Premasseteric Branch of the Facial Artery: A Review and Translation of Adachi's Work. *Cureus*. 2020; Sep;12(9).