



## Case Report

# A hitherto unreported disruption of cervical branches of facial artery

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### ABSTRACT

According to its course, the branches of the facial artery are arranged under two headings; cervical component (branches in the digastric triangle) and facial component (branches on the face). Variations in the branches of the facial component of the facial artery have been frequently studied and reported. However, variations in the cervical component are rare. A hitherto unreported variant of the cervical component of the facial artery was observed in a 55-year-old male cadaver during routine undergraduate dissection. The facial artery was arising from the external carotid artery as a common trunk with the lingual artery in the right carotid triangle and its ascending palatine and tonsillar branches were arising from the external carotid artery. It is important for surgeons and radiologists to be aware of the normal anatomy of the facial artery and the external carotid artery. Herein, we describe the detailed anatomical features of the variant branching pattern of the right facial artery and its clinical implications. © IJAV, 2011; 4: 49–51.

**Key words** [facial artery] [external carotid artery] [ascending palatine artery] [tonsillar artery] [maxillofacial surgery]

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### Introduction

The facial artery (FA) normally arises from the external carotid artery (ECA), just above the lingual artery, at the level of greater horn of hyoid bone in the carotid triangle. It then passes obliquely upwards beneath the posterior belly of digastric and stylohyoid muscles sheltered by the ramus of the mandible lying medial to the bone. Here it passes deep to the superficial part of the submandibular salivary gland making a characteristic loop, winds around the base of the mandible to enter the face at antero-inferior angle of the masseter muscle. On the face, it runs upwards and forwards, lateral to the angle of the mouth and terminates as angular artery at medial canthus of eye [1]. The branches of FA can be divided into cervical and facial groups. Its cervical branches are ascending palatine, tonsillar, glandular branch(es) to the submandibular gland and submental artery, and its facial branches are inferior labial, superior labial and lateral nasal arteries [2].

The reported variations of the facial artery include; its intra-parotid origin [3], arising as a common trunk with the lingual artery as linguo-facial trunk [2,4], its function being taken over by maxillary artery, transverse facial artery or the nasal branch of ophthalmic artery when absent, its termination as submental artery, labial artery or lateral nasal artery [5] and a case of duplex artery [6]. Rao et al. reported a high

origin of facial artery and branching of glandular branch for submandibular gland from the external carotid artery [7].

It is important for oral and maxillofacial surgeons and radiologists to be aware of the normal anatomy of the facial artery and its branches. It is equally essential to be aware of anatomical vascular variations, to ensure these anomalies are not overlooked in the differential diagnosis.

### Case Report

During the first year medical undergraduate dissection study, a rare anatomic variant was encountered in the right carotid triangle of a 55-year-old male cadaver, in the Department of Anatomy, Sri Guru Ram Dass Institute of Medical Sciences and Research, Amritsar, India. We came across an unusual case of disruption of cervical branches of facial artery along with the variant course of the facial artery in the neck region.

The common carotid artery bifurcated normally at the level of upper border of thyroid cartilage. After giving the superior thyroid artery, the ECA gave origin to the FA in common with the lingual artery as the linguo-facial trunk at the greater horn of hyoid bone in the carotid triangle. Then the facial artery followed a straighter course along the posterior aspect of submandibular salivary gland, partially sheltered by the mandible. The artery passed between the

submandibular gland and the inner surface of the body of the mandible without grooving the gland. It gave glandular and submental branches before winding up the lower border of the mandible at the antero-inferior angle of masseter to enter the face.

The tonsillar and ascending palatine branches arose directly from the ECA at a distance of 1.2 and 1.5 cm respectively from the origin of the linguo-facial trunk. The rest of the branching pattern of ECA was found to be as usual.

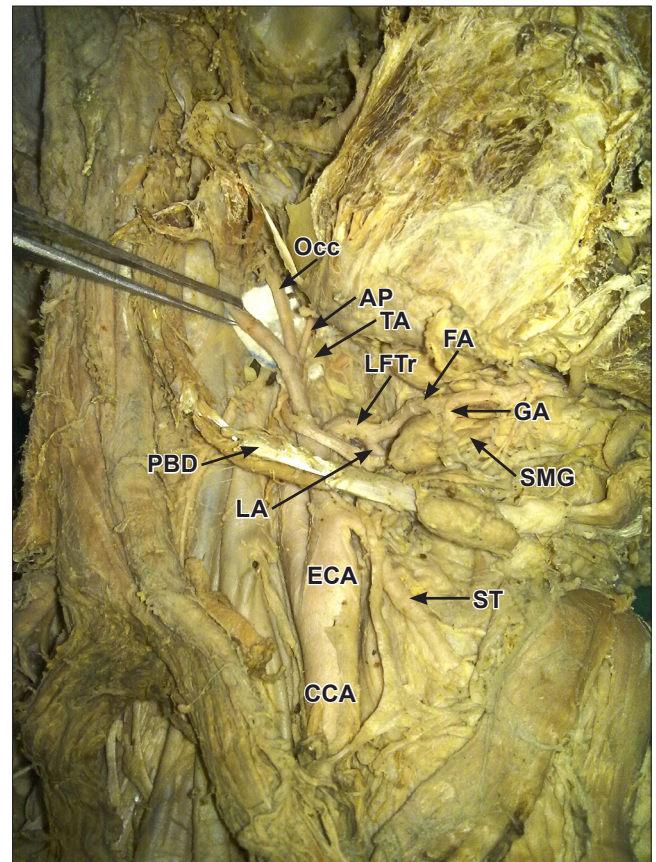
However, the branching pattern of the facial artery on the right side was normal and other vascular variations were not observed.

### Discussion

The anatomic study of the facial artery and its branches has two aspects of interest: that of surgical anatomy, in reparative surgery (cosmetic surgery) of the face and lip and in the surgery of malignant disease; that of radiologic anatomy, associated with the field of malignancy in the treatment of certain facial tumours by embolization. An extensive review of the literature made us arrive to the conjecture that the variant patterns of the course and branches of the facial component of the facial artery have been extensively researched and reported. It helps to provide detailed information for flap designing before plastic surgery and for preoperative evaluation for microvascular surgery.

A bilateral variation of the facial artery is reported [8] where the right facial artery terminates as inferior labial artery and the left facial artery has a normal course on the face with a missing inferior labial branch. In a 16-slice spiral CT angiographic study of the facial artery [9], the left facial artery ended below the angle of the mouth in 12 cases (26.67%), between the angle of the mouth and the nasal wing in 7 cases (15.56%), and above the nasal wing in 26 cases (57.77%). The right facial artery ended below the angle of the mouth in 7 cases (15.56%), between the angle of the mouth and the nasal wing in 12 cases (26.67%), and above the nasal wing in 26 cases (57.77%), and the lingual artery and facial artery sharing the same trunk arising from the external carotid artery was less common and the facial arteries were found occasionally to run below the submandibular gland (11 cases on the left and 9 on the right out of 45 cases). The premassteric branch has been studied in detail to help craniofacial surgeons in transposition operations to correct facial palsy, benign masseteric hypertrophy; or neurectomy-induced atrophy of the muscle [10]. An anatomical study of the facial artery discussed the termination of the artery as an angular facial artery in 34 (68%), a lateral nasal vessel in 13 (26%), and a superior labial vessel in 2 (4%); in 1 (2%) the facial artery terminated at the alar base [11]. A detailed observation of variations of the facial artery, with emphasis on the superior labial artery has been done for the reconstruction of lip defects [12].

Extensive literature review makes us conclude that there is dearth of reports of the variants of its cervical component. The present case report is an attempt to highlight the variations of



**Figure 1.** Dissection of the digastric triangle of the neck illustrating the right external carotid artery and the facial artery. Note that facial artery is arising from the common linguo-facial trunk at the greater horn of hyoid bone. Also, the ascending palatine and tonsillar branches are originating from the external carotid artery instead of facial artery. (FA: facial artery; ECA: external carotid artery; PBD: posterior belly of digastric; LFT: linguo-facial trunk; LA: lingual artery; AP: ascending palatine artery; TA: tonsillar artery; Occ: occipital artery; GA: glandular branch to submandibular gland; SMG: submandibular gland; ST: superior thyroid artery; CCA: common carotid artery)

the cervical branches of the facial artery. Also, the variations of the cervical component of FA are intertwined with those of the ECA. Knowledge of possible anatomical variations of ECA and FA is especially important in facio-maxillary and neck surgeries. This knowledge is also important for the radiologists in the image interpretation of the face and neck regions. The neck region has a great vital value; its variations and known micrometric values are accepted as important orientation points during surgical intervention [7]. Hence it is essential to be aware of the possible variations and minor details about the branches of ECA in the neck.

Also, the knowledge of the variation in the origin of ascending palatine and tonsillar branches of facial artery from the external carotid artery is important in surgical intervention of parotid tumors, maxillofacial surgeries and radiological investigations.

So this is an attempt to share the variant anatomy of facial artery as a thorough knowledge of vascular anatomy is essential for the understanding and interpretation of

diagnostic and interventional vascular procedures, as well as performing surgical procedures.

## References

- [1] Hollinshead WH. *Anatomy for Surgeons. Vol. 1, 3rd Ed., Philadelphia, Harper and Row Publishers. 1954; 302.*
- [2] Standring S, Ellis H, Healy JC, Johnson D, Williams A, Collins P, eds. *Gray's Anatomy: The Anatomical Basis of Clinical Practice. 39th Ed., London, Elsevier, Churchill Livingstone. 2005; 543–547.*
- [3] Nayak S. Abnormal intra-parotid origin of the facial artery. *Saudi Med J. 2006; 27: 1602.*
- [4] Midy D, Mauruc B, Vergnes P, Caliot P. A contribution to the study of the facial artery, its branches and anastomoses; application to the anatomic vascular bases of facial flaps. *Surg Radiol Anat. 1986; 8: 99–107.*
- [5] Bergman RA, Thompson SA, Afifi AK, Saadeh FA. *Compendium of Human Anatomic Variation. Baltimore–Munich, Urban & Schwarzenberg. 1988; 85.*
- [6] Koh KS, Kim HJ, Oh CS, Chung IH. Branching patterns and symmetry of the course of the facial artery in Koreans. *Int J Oral Maxillofac Surg. 2003; 32: 414–418.*
- [7] Rao KGM, Rodrigues V, Shajan K, Krishnasamy N, Radhakrishnan AM. Unilateral high origin of facial artery associated with a variant origin of the glandular branch to the submandibular gland. *International Journal of Anatomical Variations (IJAV). 2008; 2: 136–137.*
- [8] Marx C, Kumar P, Reddy S, Vollala VR. Bilateral variation of facial artery: a case report. *Rom J Morphol Embryol. 2008; 49: 399–401.*
- [9] Jiang GH, Yan JH, Lin CL, Huang Y, Wen H, Li WM. Anatomic study of the facial artery using multislice spiral CT angiography. *Nan Fang Yi Ke Da Xue Xue Bao. 2008; 28: 457–459.*
- [10] Magden O, Cocmen-Mas N, Senan S, Edizer M, Karacayli U, Karabekir HS. The premasseteric branch of facial artery: its importance for craniofacial surgery. *Turk Neurosurg. 2008; 18: 45–50.*
- [11] Niranjana NS. An anatomical study of the facial artery. *Ann Plast Surg. 1988; 21: 14–22.*
- [12] Loukas M, Hullett J, Louis RG Jr, Kapos T, Knight J, Nagy R, Marycz D. A detailed observation of variations of the facial artery, with emphasis on the superior labial artery. *Surg Radiol Anat. 2006; 28: 318–324.*