

CASE REPORT

Bilateral variation of facial artery: a case report

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Abstract

Dissection of a 65-year-old male cadaver revealed bilateral anomalous facial artery. The right facial artery taking origin from the external carotid artery did not make any loop in the submandibular region, entered the face by winding round the lower border of mandible, and terminated as the inferior labial artery. The upper part of the right side face in this case was supplied by various branches of transverse facial artery, infra orbital artery and dorsal nasal artery. The origin, course and branching pattern of the left facial artery was normal except the inferior labial artery was missing from it. The venous drainage of the face was normal on both sides. This case may provide useful information for clinical applications in different fields of oral and maxillofacial surgery.

Keywords: facial artery, external carotid artery, inferior labial artery.

Introduction

The facial artery normally arises from the external carotid artery, just above the lingual artery, at the level of greater cornu of hyoid bone in the carotid triangle. It then passes upwards and forwards medial to the ramus of the mandible. 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. In the face, it runs upwards and forward, laterals to angle of the mouth, and terminates as angular artery at medial angle of eye [1, 2]. Its branches in the face include; inferior labial artery – to the lower lip, superior labial artery – to the upper lip, lateral nasal artery – to supply the ala and dorsum of the nose. The reported variations of the facial artery include; its intra parotid origin [2], arising as a common trunk with the lingual artery as linguo-facial trunk [3, 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].

Materials and methods

The study involved the head and neck dissection of a 65-year-old male cadaver of South Indian origin in the Department of Anatomy, Kasturba Medical College, Manipal, India. The dissection of head

and neck was carried out according to the instructions by *Cunningham's Manual of Practical Anatomy*. The dissections took place during the year 2006–2007. The body was preserved by the injection of a formalin-based preservative (10% formalin) and stored at -4°C.

Results

The specimen revealed anomalous facial artery on both sides of the face. The right facial artery was seen to arise from external carotid artery above the greater cornu of the hyoid bone. During its course, it did not make any loop around the submandibular gland and keeping its course straight crossed the lower border of the mandible just anterior to the anterior border of the masseter. From this point after taking a tortuous and slight ascending course, crossing the midpoint between right angle of mouth and lower border of mandible, and taking a steeper ascending course terminated at the midpoint of lower lip just below vermilion border as inferior labial artery (Figure 1).

There were only few smaller muscular branches from the artery. Other usual branches of facial artery observed normally were not traceable. On the left side, the course of the facial artery was normal in both neck and face. However, there was no inferior labial artery and remaining branches i.e., superior labial, lateral nasal and angular arteries were normal but more prominent (Figures 2 and 3).

The venous drainage of the face was normal on both sides.

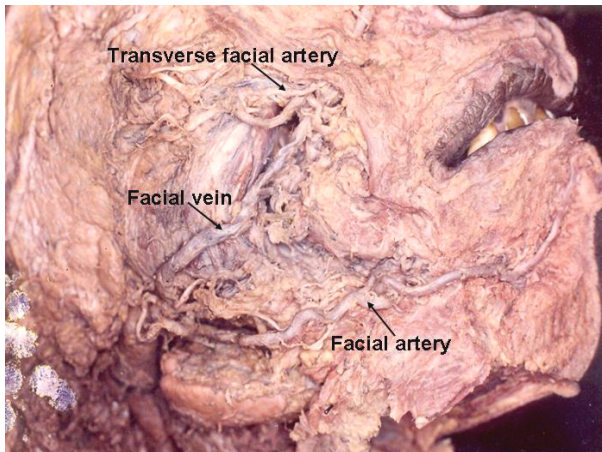


Figure 1 – Right side facial artery

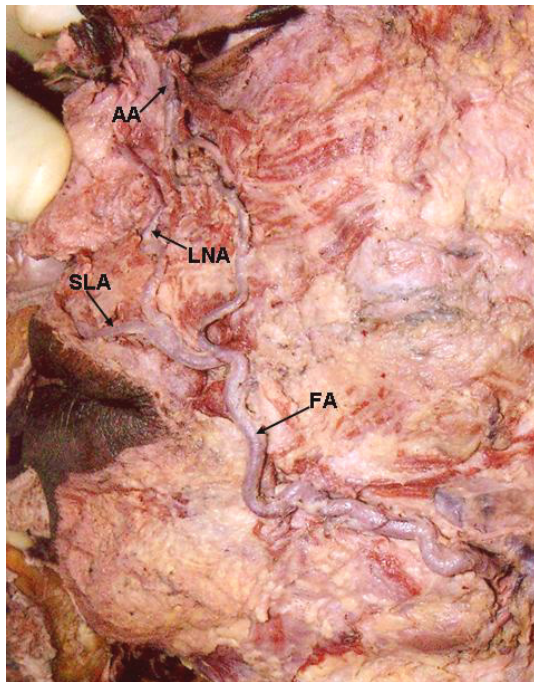


Figure 2 – Facial artery on the left side: FA, facial artery; SLA, superior labial artery; LNA, lateral nasal artery; AA, angular artery

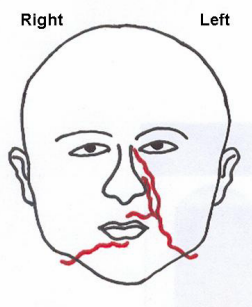


Figure 3 – Schematic diagram showing bilateral anomalous facial artery

Discussion

The facial artery is subject to variations in its size, and in the extent to which it supplies the face. The upper part of the face is usually supplied by facial artery. In case of variation, the blood supply is taken care of by

various branches of transverse facial artery, infra orbital artery and dorsal nasal artery [1, 3].

In the present case, also the transverse facial artery gave many branches to the adjacent area normally supplied by facial artery. Keeping in mind the variation of the facial artery it will be advisable to do arterial Doppler study prior to the ipsilateral cheek and lip flap surgery.

The anatomic study of the facial artery and its branches has two aspects of interest: that of surgical anatomy, in reparative 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 tumors by embolization.

According to a study of 40 facial arteries by Midy D *et al.* (1986), the facial artery has terminated as angular artery in 27.5% cases, labial (superior) in 40%, nasal in 30% cases and abortive artery in only one case [4]. When the facial artery terminated before reaching the lower lip, it has been called abortive artery.

Examination of 284 hemifaces by Loukas M *et al.* (2006) showed five types of facial artery termination labeled “A” through “E”. Type A (135 cases, 47.5%): facial artery terminated by bifurcating into superior labial artery and lateral nasal; Type B (110, 38.7%): facial artery terminating as superior labial artery and lateral nasal and lateral nasal continuing as superior alar artery; Type C (24, 8.4%): facial artery terminating as superior labial artery; Type D (11, 3.8%): facial artery ending as superior alar artery; Type E (4, 1.4%): facial artery terminating as a rudimentary twig without providing any significant branches [7].

The present case may be considered similar to the Type E of the above study, the difference being in our case the facial artery is providing branches to the lower lip.

Understanding of the anatomy of the facial artery is necessary not only because it can be used as a pedicle for some flap, such as nasoabial skin and oral mucosal flaps [8, 9], but because it is involved in other types of facial surgery such as rhinoplastic and orofacial surgery [10, 11].

The very rich vascularization of the face permits the construction of numerous facial flaps. The reconstruction of lip defects using the Abbe flap and other lip flap procedures involves surgical manipulation of one of the major branches of the facial artery, specifically the superior labial artery [7].

Recently, the facial artery musculo-mucosal (FAMM) flap was introduced by Pribaz J *et al.* (1992), and has been widely used for different purposes [12], such as reconstruction of oronasal fistulas [13] and closure of soft tissue defects in the mandibular vestibule [14].

Although the FAMM flap has many advantages with its long rotational arc, its use is limited by variations in the course of the facial artery. Therefore, knowledge about the precise course and branching pattern of the facial artery is required. In cases where the facial artery terminates as the inferior labial artery, as in the present case, surgical planning of FAMM flap should be limited.

☐ Conclusions

The anatomic understanding of the facial artery and its branches is necessary since most of the surgeries take place in the face region for cosmetic purposes. The present case may provide useful information for clinical applications in different fields of oral and maxillofacial surgery.

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