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UNIQUE ANATOMICAL VARIATIONS IN THE BUCCAL BRANCH OF FACIAL NERVE ON BOTH SIDES OF A MALE CADAVER

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ABSTRACT

The pattern of ramification of the facial nerve is an example of highly complex neural anatomy. Usually the extracranial facial nerve divides into temporofacial and cervicofacial divisions within the substance of parotid gland. The temporofacial division gives two terminal branches as temporal and zygomatic and the cervicofacial divides into buccal, marginal mandibular and cervical branches to regulate the constrictor and dilator muscles over the face. Anatomical variations in branching pattern of facial nerve increases the risk of injury during surgery on face. We report unique variations in the buccal branch of the facial nerve in a male cadaver on right and left side of face. Clinicians should have precise knowledge of these anatomical variations in facial nerve to avoid injury and complications during parotid surgery, facial lift surgery, rhytidectomy and cross face nerve grafts.

KEYWORDS: facial nerve, variation, parotid surgery, facial lift surgery.

INTRODUCTION

According to standard anatomical textbooks, usually facial nerve traverses through the stylomastoid foramen to exit cranium. The extracranial facial nerve divides into temporofacial and cervicofacial divisions within the substance of parotid gland. The temporofacial division gives two terminal branches as temporal and zygomatic and the cervicofacial divides into buccal, marginal mandibular and cervical branches to supply muscles of face.[1,2,3] The facial nerve is liable to be injured in its extra-temporal course as a result of facial trauma, laceration, parotid gland surgeries and face lift procedures particularly in presence of anatomical variations.[2,3,4] The dysfunction of facial nerve may lead to facial asymmetry, oral incontinence and limited eye closure.[2,4,5,6] Hence, identification and preservation of branches of the facial nerve is important and essential during surgery over face.[2,3] Herein, we report unique variations in the branches of facial nerve on right and left side of a male cadaver.

CASE REPORT

During routine cadaveric dissection for medical graduates, variations in the branching pattern of facial nerve were observed bilaterally in a 50-year-old male cadaver. The dissection was performed in layers, removing the skin, superficial fascia and subcutaneous fat. Then, the parotid duct and facial nerve branches were exposed. Facial nerve branches were identified and variation in number of branches were documented and photographed.

On the right side of face: The trunk of facial nerve is dividing into temporo-facial and cervico-facial subdivisons. The buccal branch is further ramifying into upper branch and lower branch. Upper branch is running superficial and in close relation to the parotid duct. Along the anterior border of masseter muscle the two divisions of buccal branch were reuniting and then traversing a short distance before further ramifying to supply the muscles (fig. 1).

On left side of face: The buccal branch of facial nerve is formed by bundle of nerves. As many as six small nerves were joining to form buccal division of facial nerve in superior relation of the parotid duct. The inferior most nerve twig is traversing superficial to the parotid duct to join the main trunk of buccal branch. The buccal branch is traversing for a short distance before ramifying to supply the muscles. The unique relation of the inferior most branch from main trunk of facial nerve has a great clinical significance as it was traversing superficial to the anterior part of parotid duct and is liable to injury during surgeries of parotid duct (fig 2).

To the best of our knowledge peripheral branches of facial nerve and unique pattern of formation of buccal nerve are interesting features with great surgical significance.

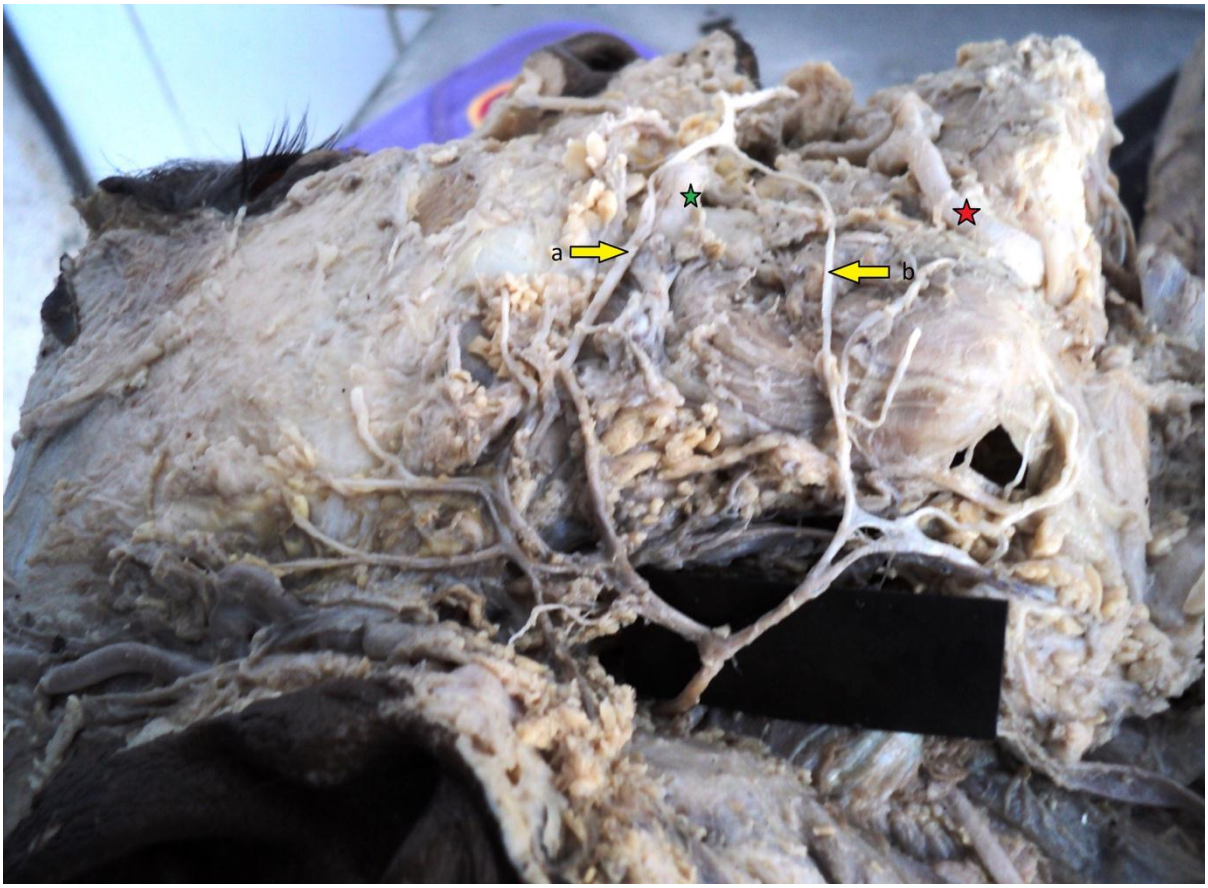

Figure 1: Right side: The trunk of facial nerve is dividing into temporo-facial and cervico-facial subdivisions. The buccal branch is further ramifying into upper branch (yellow arrow a) and lower branch (yellow arrow b). Upper branch (yellow arrow a) is running superficial and in close relation to the parotid duct (green star). Along the anterior border of masseter muscle two divisions of buccal branch are reuniting and then further ramifying to supply the muscles. Facial artery is marked as red star.

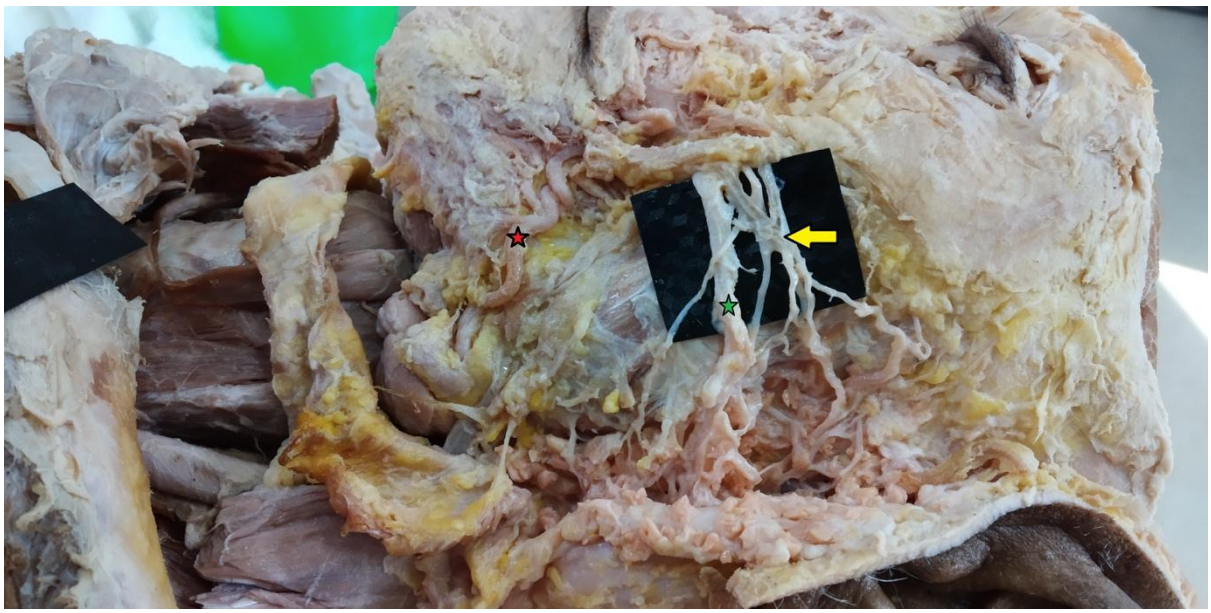

Figure 2: Left side: The buccal branch of facial nerve is formed by bundle of nerves (yellow arrow). As many as six small nerves are joining to form buccal division of facial nerve in superior relation of the parotid duct (green star). The inferior most nerve twig is traversing superficial to the parotid duct to join the main trunk of buccal branch. The buccal branch (yellow arrow) is traversing for a short distance before ramifying to supply the muscles. Facial artery is marked with red star.

DISCUSSION

Inspite of development of advanced micro-surgical technologies still the incidence of facial nerve palsy during parotid surgery is up to 21%.[9] Henri Laccoureye et al observed in their study that 70.2% developed postoperative facial palsy, of which 64.6% were transient and 5.6% permanent.[10] The branching pattern of the facial nerve varies among individuals.[1,2,4,5,6,7,8,9] There are several studies and classification systems for facial nerve branch patterns (Davis et al., 1956; Katz and Catalano, 1987; Gataa and Faris, 2016) but our findings about the branching of buccal nerve is not reported in literature.[7,9,10,11]

These reported anatomical variations of buccal branches of facial nerve has a great clinical significance because of close relation to the parotid duct. The reported superficial relation of buccal nerve to the parotid duct should be taken care of by surgeons during parotid duct surgery to avoid inadvertent facial nerve palsy.

CONCLUSION

We report new variations in the buccal branch of facial nerve. Intraoperative nerve monitoring and careful dissection are important to avoid intraoperative facial nerve injury particularly in patients with a facial nerve anomaly. Knowledge of the anatomical variations is mandatory for surgeons and neurophysicians to preserve facial nerve and perform safe and uncomplicated procedures along this region.

CONFLICT OF INTEREST

The authors does not declare any financial or personal conflict of interest.

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