VARIABILITY OF THE BUCCAL BRANCHES OF THE FACIAL NERVE

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Abstract

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Background: The facial nerve disorders might be caused both by infectious and somatic pathogenic agents, as well as a result of failed ablation of the parotid gland tumors, failed plastic surgery, or other surgical interventions in facial region. Thus, for practitioners is very important to know the individual specific features of the buccal branches of the facial nerve. The purpose of our study was to review and evaluate the origin, number and connections of the buccal branches of the facial nerve.

Material and methods: Twenty one adult cadaveric semiheads fixed in formaldehyde solution were dissected and morphological specific features and connections of the buccal branches of the facial nerve were marked out.

Results: Predominantly, in 95% of cases, the trunk of the facial nerve divided into temporofacial branch (TFB) and cervicofacial branch (CFB). The number of buccal branches (BB) originating from the facial nerve varied from 2 to 6. In most cases each primary branch of the facial nerve divided into 2 BB, thus, in 16 cases TFB gave rise to 2 BB and in 12 cases from the CFB originated 2 BB.

Conclusions: The buccal branches of the facial nerve are variable in their origin, number and connections. Most commonly were marked out 2 BB originated from each primary branch of the facial nerve. No more than 2 BB were pointed out to originate from the CFB. Four types of the buccal branches connections were emphasized.

Key words: facial nerve, buccal branches, connections.

Introduction

Impairments of the extracranial part of the facial nerve usually are caused by pathological processes located in the last third of the facial canal. Facial nerve pathology, particularly peripheral facial paralysis, is one of the most common disorders of the cranial nerves.

Lately, along with infectious etiology many somatic disorders can induce facial nerve impairments.

Having the largest territory of innervation in the middle floor of the face, lesions of the buccal branches of the facial nerve, may occur as a result of failed plastic surgery, failed ablation of the parotid gland tumors, or other surgical interventions in the facial region.

Thus, knowledge concerning variability of origin, number and connections of the buccal branches of the facial, that is related to their location in the midface [1], a wider area of innervation, higher number of muscles that are supplied by the buccal branches, still is an open issue for researchers, essential for neurologists, but not less important for oncologists, maxillofacial and plastic surgeons, in order to diminish the risk of iatrogenic surgery.

Material and methods

Twenty one embalmed adult cadaveric semiheads fixed in formaldehyde solution were dissected at the Department of Human anatomy of Nicolae Testemitanu State University of Medicine and Pharmacy from Chisinau, Republic of Moldova.

An incision from the temporomandibular joint was made towards the angle of the mandible.

As a landmark for facial nerve trunk identification the posterior belly of the digastric muscle was used.

Applying anatomical dissection the superficial tissues of the face were removed and the number and connections of the buccal branches of the facial nerve were marked out.

The study was carried out according to the decision of the Ethics Committee of Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova.

Results and discussion

Identification of the facial nerve trunk and its branches still is a challenge for plastic surgeons, oncologists and specialists in maxillofacial surgery. Many landmarks are used for this purpose, but unfortunately none of the landmarks is highly predictable for the identification of the facial nerve trunk, due to a high variability of its course, divisions and relationship with neighboring anatomical structures.

Even many scientists are more confident of bony landmarks [2], such as the stylomastoid foramen, mastoid process, tympanomastoid fissure [3], external auditory meatus [4], zygomatic arch, angle of the mandible because these landmarks are less variable than soft tissues landmarks, the most commonly as landmarks are used: the posterior belly of the digastric muscle [5, 6], posterior auricular nerve [4] etc.

In our study as a landmark the posterior belly of the digastrics muscle was used.

At its exit through the stylomastoid foramen the trunk of the facial nerve was descending in most cases, and in fewer cases the course was horizontal, or slightly ascending. In about 95% of cases the trunk divided into two primary temporofacial and cervicofacial branches. In one case the trunk was double.

In our study the temporofacial division of the facial nerve gave rise to the temporal and zygomatic branches, and in all cases it branched into the buccal branches the number of which varied from 1 up to 4, and in 90% from 1 to 2 buccal branches originated from the cervicofacial branch.

The cervicofacial branch gave rise to a single buccal branch in 6 cases, and the temporofacial branch gave rise to a single buccal branch in 4 cases case.

In 16 cases, the temporofacial branch gave rise to 2 buccal branches and in 12 cases 2 buccal branches originated from the cervicofacial branch (Fig. 1).

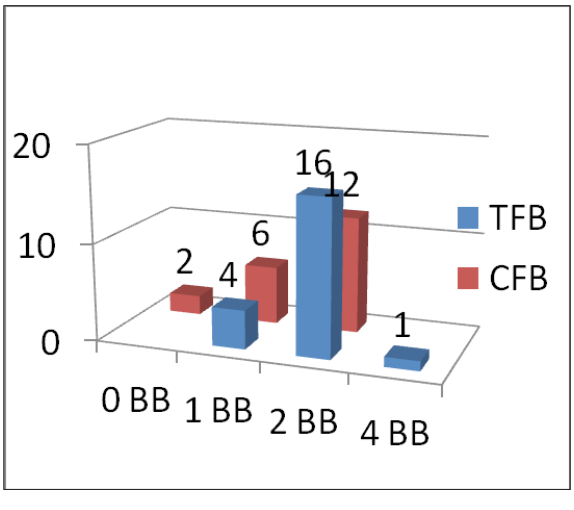

Fig. 1. Origin of the buccal branches from the temporofacial branch (TFB) and from the cervicofacial branch (CFB).

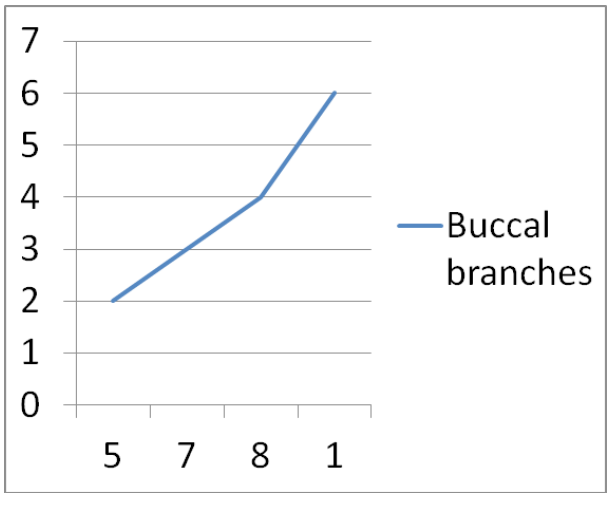

Fig. 2. Variation of number of the buccal branches.

Only two buccal branches originated from the facial nerve in 5 cases, and in one case there were accounted 6 buccal branches. Thus, the number of buccal branches varied from 2 to 6, but in the most cases 3 and 4 buccal branches, respectively in 7 cases and 8 cases were marked out (Fig. 2).

On the horizontal axis are mentioned the number of cases and on the vertical one number of buccal branches.

As it was mentioned above the buccal branches are quite variable in number, but not less in their connections.

Four main types of connections of the buccal branches have been emphasized in our study (Fig. 3 and Fig. 4).

In 12 cases (57%) were marked out linear connections, in 5 cases (24 %) the connections were loop-shape, in 2 cases (9.5%) plexiform loop-shape connections and in 2 cases (9.5%) irregular plexiform connections were marked out.

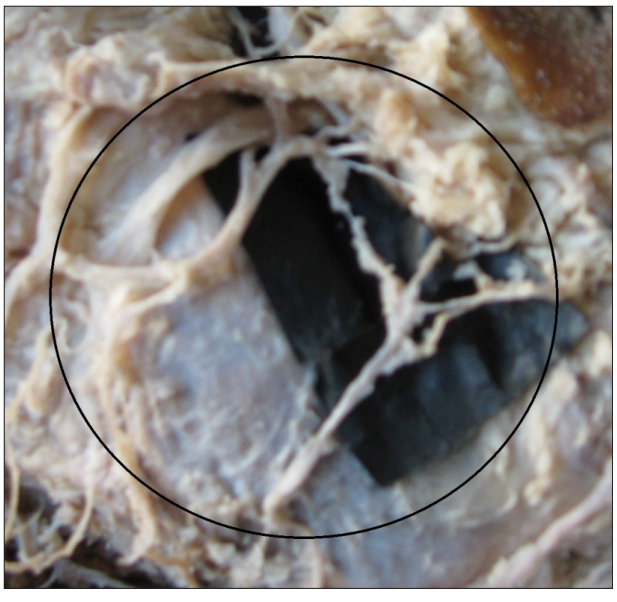

Fig. 3. Linear connections of the buccal branches. Macropreparation.

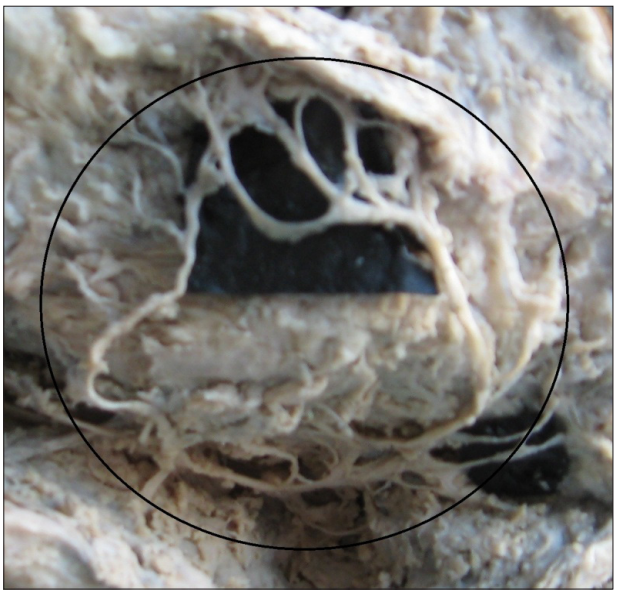

Fig. 4. Loop-shape connections of the buccal branches. Macropreparation.

Conclusions

Variation of number of the buccal branches of the facial nerve from case to case were marked out, the list number was 2 and the highest 6 branches.

Four types of connections of the buccal branches were pointed out, but among them prevails the linear type of connections.

The obtained data should be taken into consideration by plastic surgeons and maxillofacial surgeons in case of surgery in bilateral trauma of the facial region.

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