

*Prikaz slučaja /
Case report*

DIREKTNA SUTURA TRANSECIRANIH
PERIFERNIH GRANA FACIJALNOG
NERVA: *Prikaz slučaja*

DIRECT SUTURE OF TRANSECTED
PERIPHERAL BRANCHES OF FACIAL
NERVE: *A case report*

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Conflicts of interest

The authors declare that there are
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Ključne reči

povreda ličnog živca, posttraumatska para-
liza lica, House-Brackmann skala, transek-
cija nerva, neurosutura

Abstract

Introduction: Traumatic injuries of the peripheral facial nerve fibers result in the paralysis of the mimic muscles which could be devastating to the patients. The clinical presentation of the facial nerve injury depends on the portion of the injured nerve. During the first 72 hours after the trauma, direct neurosutura of the identified nerve ends results in the best overall restoration of the nerve function. **Case report:** The male patient was admitted to the Emergency room for the cutting wound in the right parotidomasseteric area. Clinical examination revealed the impaired facial expression due to the palsy of the marginal and buccal branches of the right facial nerve. The patient was submitted to the urgent surgery in general anesthesia. The wound was surgically explored, proximal and distal ends of the cut off main buccal branches and the marginal branch of the right facial nerve were detected, and end-to-end facial nerve anastomosis was admitted using 8-0 polyglactin sutures under microscopic or direct visualization. Five months after the trauma function of the right facial nerve was almost completely restored, and just discrete paresis of the right marginal branch was monitored **Conclusion:** A direct end-to-end anastomosis of the transected proximal and distal ends of facial nerve, provide the best overall opportunity for restoration of facial expression.

INTRODUCTION

The peripheral branches of facial nerve (FN) carry motor fibers to the muscles of facial expression. Peripheral facial nerve palsy may be primary or idiopathic (Bell's palsy) or secondary due to detectable causes, which is less prevalent (1). Peripheral facial nerve palsy results with the paralysis of the mimic muscles, which is defined as the complete absence of all voluntary movements in the region innervated by affected nerve fiber. Because of importance of facial expression in human communication, loss of facial expression could be devastating to the patients.

Injuries to the buccal and parotid region of the face along, with cosmetic defects, can produce injury to the facial nerve, parotid gland or its duct and vascular structures(2). Etiology of injuries to the terminal motoric fibers of FN is various, including stab wounds, traffic accidents, bone fractures and iatrogenic injuries secondary to surgical proce-

dures (3-5). The clinical presentation of the FN injury depends on the portion of the injured nerve, thus injury to the main trunk results with upper and lower facial paralysis while injuries distal to the pes anserinus result with inability to move muscles innervated by injured nerve fiber (1,6).

Depending on the pathological changes, the time of injuries and degree of damage of FN various types of surgical interventions are performed: decompression, direct anastomosis, neuroanastomosis with other nerves, neuroplastic, plastic and reconstructive surgical interventions (1). In first 72 hours following the trauma, identification of nerve ends, direct neurosuture or primary reconstruction with a nerve graft results with best overall rehabilitation of nerve function(7).

Accurate identification of the injured facial nerve is the key step of facial nerve exploration and anastomosis to prevent permanent facial paralysis(2). In cases of traumatic

injuries to FN the cut ends of nerve fibers can be difficult to identify during surgical exploration even for the experienced surgeon (2).

The aim of this report is to present the case of immediate facial nerve exploration and anastomosis of transected buccal and mandibular facial nerve fibers following traumatic soft tissue injury in parotid region.

REPORT OF A CASE

The patient was admitted to the Emergency room because of the cutting wound in the right parotidomasseteric area of the face inflicted with a knife by an unknown person. The patient was received in good general condition. Clinical examination showed lacerocontusive wound in the parotid region on the right side in the length of 8 cm, with no foreign content in it, as well as shallow lacerocontusive wound laterorbitally on the left. The examination showed the impaired facial expression due to the paralysis of the right marginal and buccal branches of the right facial nerve. Patient was unable to close the mouth, to drop or to elevate the right corner of the mouth or wrinkle nose, but he was able to close and wink the eye and wrinkle forehead, the spasm of facial muscles on the right side was present (III degree of FN injury on House – Breckmann scale). The intraoral finding was uneventful. The medical history of the patient was without accompanying diseases. Radiological and clinic examinations showed no fractures to the face bones.



Figure 1. Direct neurosuture of transected buccal and mandibular branches of right facial nerve. A. Lacerocontusive wound in the right parotidomasseteric area; B. Retrograde approach used to identify main trunk of the facial nerve; C. Sutured buccal and mandibular branches of right facial nerve

The patient was urgently operated in general anesthesia. The wound was surgically explored. The distal ends of the cut off main buccal branches and the marginal branch of the right facial nerve were detected (Fig. 1). Then, in the retrograde manner, through the tissue of the parotid gland main trunk of the FN was identified, and resected proximal portions of buccal and mandibular nerve visualized. After resected ends of facial nerve branches were found, end-to-end facial nerve anastomosis was performed using 8-0 polyglactin sutures under microscopic or direct visualization. The parotid duct was not harmed. After all injured facial nerve branches had been repaired, the wound was closed in layers and a compression bandage was used. Patient was treated with antibiotics postoperatively and received tetanus protection. Postoperative check-up after 7 days revealed discrete palsy of right buccal and mandibular branches of FN (Fig. 2). Five months following trauma the function of right FN was almost completely restored, and discrete paresis of right marginal branch was noticed (Fig. 3).



Figure 2. Postoperative control following 7 days. (A-C) Assessment of facial nerve function shows palsy of buccal and mandibular branches of right facial nerve; D. Sutured wound in the right parotidomasseteric area



Figure 3. Postoperative control following 35 days. A-D. Discrete palsy of mandibular branch of right facial nerve

DISCUSSION

Recovery of FN function is slow, while inevitable post-operative sequelae. Neurotmesis of peripheral nerves always lead to incomplete recovery due to the formation of connective tissue that creates a mechanical barrier in the process of axonal regeneration(6). Despite the various surgical methods of treatment of peripheral nerve injury, they are followed by reduced functionality and delayed recovery (7,8). The goal of FN rehabilitation is to restore and reestablish facial expression.

The choice of the method of surgical treatment depends on: the height of the nerve lesion, the time elapsed from the moment of injury, the integrity of the distal and proximal nerves, the size of the defect, the age of the patient, the presence of degenerative and vascular diseases, as well as the patient's desire (1,2,7). Techniques for facial reanimation are classified as neural, muscular, static and facial plastic procedures (7). Neural procedures provide best overall chance for optimal FN rehabilitation when performed in first 72 hours after trauma, and involve direct neuroanastomosis, crossover grafts and free tissue transfer (8).

A direct end-to-end anastomosis of transected proximal and distal ends of FN provide best overall chance for return of facial expression (2,8). Epineural and perineural suturing are the most widely used techniques for nerve repair. Tension free repair by epineurial or perineurial sutures is essential in order to prevent formation of the scar tissue(8). Intraoperative use of nerve monitoring system could help surgeons to achieve rapid and accurate identification of the cut ends of facial nerves during surgical facial nerve exploration for traumatic nerve injury (2). Studies on animal models on regeneration of peripheral nerves suggest that the combination of neurosuture with platelet rich plasma or neural induced mesenchymal stem cells leads to faster and more complete return of function of facial muscles than neurosuture alone (9,10).

Combination of neurosutures and coating of anastomosis with polyethylene and collagen tubes as a nerve conduits to guide axon regeneration results with lesser fibrosis and foreign body reactions^(11,12). Recent studies suggest use of fibrin adhesives for sutureless repair of facial nerve transections, especially in the complex anatomical sights⁽¹³⁾.

When tension free reconstruction could not be achieved nerve grafts should be used. For this purpose the great auricular nerve and sural nerve are commonly used as an interposition grafts^(7,8). When proximal segment of facial nerve is not available for reconstruction use of other cranial nerves as an crossover graft is indicated in the first 6 months to 2 years⁽⁸⁾. For this purpose hypoglossal nerve is usually used with satisfactory results⁽⁸⁾. However, this technique is followed by significant synkinesis and donor disability (tongue atrophy, difficulties in speech and swallowing),⁽¹⁴⁾.

CONCLUSION

Peripheral facial nerve palsy results with the paralysis of the mimic muscles. Because of importance of facial expression in human communication, loss of facial expression is devastating to the patients. Early assessment of facial nerve function is essential for proper management. When transection of facial nerve is occurred, identification of nerve ends and direct neurosuture results with best overall rehabilitation of nerve function.

Sažetak

Uvod: Traumatske povrede perifernih vlakna facijalnog nerva rezultuju paralizom mimičnih mišića koja je zbog uloge mimike u svakodnevnoj komunikaciji jako teška po pacijente. Klinička slika povrede facijalnog nerva zavisi od mesta povređenog nerva. U prvih 72 sata nakon traume, identifikacija nervnih krajeva i direktna neurosutura rezultuje optimalnom rehabilitacijom nervne funkcije. **Prikaz slučaja:** Muški pacijent je primljen u Centar za hitnu pomoć zbog rasekotine u desnom parotidomasetičkom području. Klinički pregled pokazao je poremećaj mimike usled paralize marginalnih i bukalnih grana desnog facijalnog živca. Pacijent je hitno operisan u opštoj anesteziji. Rana je hirurški eksplorisana, a detektovani su i proksimalni i distalni završeci rasečenih bukalnih i marginalnih grana facijalnog nerva nakon čega je učinjena direktna neurosutura. Pet meseci nakon traume, funkcija desnog facijalnog nerva je gotovo potpuno rehabilitovana uz prisutnu diskretnu parezu desne marginalne grane. **Zaključak:** Direktna anastomoza presečenih proksimalnih i distalnih krajeva facijalnog nerva obezbeđuje najbolju opštu šansu za rehabilitaciju funkcije nerva.

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