

**EXPERIENCE OF RECOVERY OPERATIONS ON THE FACE WITH IRREVERSIBLE LESION OF THE FACIAL NERVE****MEDEUBEKOV U.SH., MURADOV M.I., MUKHAMEDKERIM K.B., BAIGUZEVA A.A., KAZANTAYEV K.E., KOSHKARBAEV D.ZH., SAGATOV I.Y.\***

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*Received 29/02/2018; accepted for printing 22/09/2018***ABSTRACT**

*Among the causes of facial nerve lesions, iatrogenic injuries have currently the highest incidence in extensive surgical interventions of the tumor removal.*

*It should be noted that the majority of patients with tumors in the anatomical location of the facial nerve undergo operation at the stage of pronounced clinical manifestations, when the tumor is of a considerable size and the preservation of the facial nerve is a difficult and sometimes impossible task.*

*In our practice, we conducted 1 clinical observation of a 59-year-old patient hospitalized with a diagnosis of the long-term effects of left facial nerve traumatic injury. Transposition of the temporal muscle on the round muscles of the eyes and mouth on the right half of the face, as a consequence of microsurgical removal of the right cochlear nerve neurinoma under the neuro-monitor, performed under 2.5 x magnification. The postoperative period was uneventful, a good aesthetic result was obtained.*

*To evaluate the results, May and Drucker classification was used: 1- bad (drooping corner of the mouth on the paralyzed side); 2 - unsatisfactory (the corners of the mouth were not symmetrical); 3 - satisfactory (discreet smile, pulling up the corner of the mouth); and 4 - good (patient smiles voluntarily with exposure of the teeth). Three independent observers evaluated the photographs, and then the authors averaged their score.*

*All of the participants had the same preoperative score of 1 because the corner of the mouth on the paralyzed side drooped in all of the patients before surgery. The average postoperative score of all 4 cases was 2,9.*

**KEYWORDS:** *plastic surgery, facial nerve paresis, reconstruction.***INTRODUCTION**

Among the causes of facial nerve lesions, iatrogenic injuries have currently the highest incidence in extensive surgical interventions of the tumor removal.

Paralysis of the facial nerve (FN) causes not only a gross cosmetic defect, but also concomitant severe changes in the eyes and chewing, phonation as well as swallowing impairments. This often leads to long-term disability and social maladjustment of patients, causes severe mental trauma, reduces the quality of life. Reanimation of a paralyzed face has been one of the biggest surgical

problems for centuries. Despite the existence of many methods for restoring a paralyzed face, there is no gold standard that would allow to completely restore the normal function of the face.

It should be noted that the majority of patients with tumors in the anatomical location of the facial nerve undergo operation at the stage of pronounced clinical manifestations, when the tumor has reached a considerable size and the preservation of the facial nerve is a difficult and sometimes impossible task [Paches A.I., 2000].

The frequency of facial nerve injuries in the surgical treatment of head and neck tumors ranges from 0.2 to 10%, and the first facial reanimation method for facial paralysis were described by Gillis at 1934 [Gillies H., 1934; Gao M.H. et al., 2000].

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Having the high level of general injury and the tendency to its growth, the problem of FN traumatic injury is relevant and socially significant. [Byrne P.J. et al., 2007; Sidle D.M., Fishman A.J., 2011]. The goal of this work is to demonstrate the result of the surgery in a patient with irreparable injury of the facial nerve.

Over 2 years 4 patients were operated on with the consequences the facial nerve injuries, who underwent a static facial correction at the department of plastic and reconstructive microsurgery of the NSCS named after A.N. Syzganov. Of these, 3 patients were female and 1 male, aged 36 to 65 years. All patients complained of paresis of the face after surgery.

In addition to general clinical examination methods, electromyography (EMG) according to the indications, as well as consultations of narrow specialists were performed.

#### CLINICAL CASE

A 59-year-old patient was hospitalized with a diagnosis of long-term effects of the right facial nerve traumatic injury. Transposition of the temporal muscle on the round muscles of the eyes and mouth on the right half of the face (December 6, 2017) as a consequence of microsurgical removal of the right cochlear nerve neurinoma under the neuromonitor (February 10, 2017), performed under 2.5 x magnification. The patient complained of sensitivity disorders, asymmetry of the right half of the face and neck, omission of the right lower eyelid, speech disorder.

The patient described dizziness, recurrent headaches, general weakness, numbness of the tongue, hearing loss which occurred since the spring of 2016. In January 2017, an MRI of the brain was performed, and a neuroma of the right vestibulocochlear nerve (VIII pair) was revealed. The microsurgical removal of the right cochlear nerve neurinoma under the neuromonitor was performed in the city clinical hospital №7 on 10.02.2017 (discharge number 2212). Histology result (No. 4264-4273 of 02/14/2017): neurinoma of type A and type B combination. Patient noted sensory disturbances, asymmetry of the right half of the face and neck, omission of the lower right eyelid, speech disorder after operation. Independently appealed to the NSCS after A.N. Syzganov. The patient was

consulted by a microsurgeon and hospitalized. Locally: Asymmetry of the face due to ptosis of the soft tissues of the face on the right, mask-like face, smoothing of the nasolabial fold. Inability to wrinkle the forehead, to close eyelids (Bell's symptom), inability to inflate cheek (Fig. 1). Before the operation the degree of the injury was assessed by the test without inflated cheeks (Fig.1 A) and by the test with inflated cheeks (Fig.1 B).

The operation was performed under the endotracheal anesthesia. Skin and underlying tissues were opened along the contour of the auricle. At revision: the facial nerve is throughout compressed by scars. Blunt and sharp decompression of the facial nerve was performed. Temporal muscle was dissected, divided into 3 portions (Fig. 2).

The divided tendon was stitched to the first two portions of the zygomatic muscle, then, with the help of a conductor, two longitudinal incisions along the upper and lower eyelids were drawn in a longitudinal incision medial to the inner corner of the eye and cross-stitched to the ligament (Fig. 3). Throughout the nasolabial fold spindle-shaped skin flap excised. At the level of the nasolabial triangle to the right, the skin was opened by longitudinal incisions above the upper and below the lower lip, the circular muscle of the mouth was highlighted. With the help of a conductor (Rosov), the tendon insertion was transposed into the position of the round muscle of the mouth (Fig. 4) and to achieve full symmetry, the right upper eyelid blepharoplasty was performed.

In the postoperative period - the patient was under observation, receiving antibacterial and anti-inflammatory therapy. Postoperative wounds healed by primary intention (Fig. 5). On the 7th day after the operation, as it is seen on the picture that the post-operative suture is on the right side of the face and the right corner of the mouth is raised up.

#### DISCUSSION

With the development of modern diagnostic methods, operational support (anesthesia, micro-instruments, neurophysiological monitoring capabilities, endoscopic assistance), the emergence of stereotactic radiation therapy, the struggle to save the patient's life, despite the frequent complications of surgery of the facial nerve paresis, pa-



FIGURE 1. Assessment of the degree of the injury before the operation



FIGURE 2. On the inner surface of the right forearm, the hand flexor tendon was taken.



FIGURE 3. The tendon of the long palmar flexor of the right hand

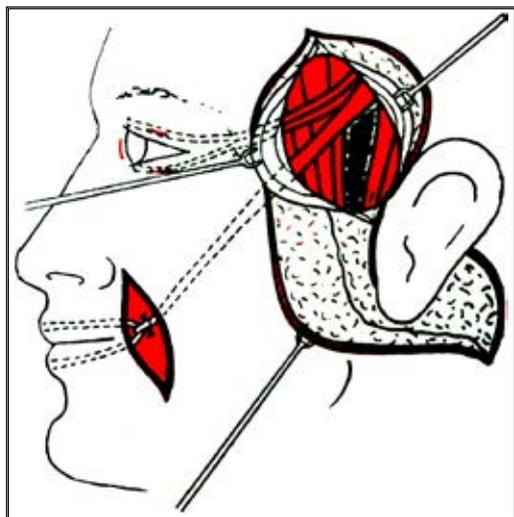


FIGURE 4. Transposition illustration of the temporal muscle (František B. Atlas of plastic surgery, 1967)



FIGURE 5. In the postoperative period on the 7-th day after surgery.

tients' desire to maintain a quality of life still remains high [Akard W. et al., 2009; Esquia-Medina G.N. et al., 2009; Xing H.S. et al., 2015]. Postoperative monitoring ranged from 3 to 9 months. Surgical results were assessed by comparing photographs before and after surgery [Segal B. et al., 1995; Brach J.S. et al., 1997; Diels H.J., Combs D., 1997; Diels H.J., 2000; Cronin G.W., Steenerson R.L., 2003; Bray D. et al., 2010]. To evaluate the results, we used the May and Drucker classification [May M., Drucker C., 1993; Shindo M., 2000; Boahene K.D. et al, 2011]: 1- bad (drooping corner of the mouth on the paralyzed side); 2 - unsatisfactory (the corners of the mouth were not symmetrical); 3 - satisfactory (discreet smile, pulling up the corner of the mouth); and 4 - good (patient smiles voluntarily with exposure of the teeth). Three independent observers evaluated the photographs, and then the authors averaged their score.

All of the participants had the same preoperative score of 1 because the corner of the mouth on the paralyzed side drooped in all of the patients before surgery. The average postoperative score of all 4 cases was 2.9.

**CONCLUSION**

The transposition of the temporal muscle with the tendon insert (palmar flexor of the hand) utilization is an effective method of treatment for the irreversible lesion of the facial nerve. This technique is simple and shows good results directly, allowing patients to maintain a level of life quality.

## REFERENCES

1. Akard W, Tubbs RS, Seymour ZA, Hitselberger WE, Cohen-Gadol AA. Evolution of techniques for the resection of vestibular schwannomas: from saving life to saving function. *Journal of Neurosurgery*. 2009;110(4):642-647.
2. Boahene KD, Farrag TY, Ishii L, Byrne PJ. Minimally invasive temporalis tendon transposition. *Arch Facial Plast Surg*. 2011;13(1):8-13.
3. Brach JS, Van Swearingen J, Lenert J, Johnson P. Facial neuromuscular retraining for oral synkinesis. *Plast Reconstr Surg*. 1997;99(7):1922-1931.
4. Bray D, Henstrom DK, Cheney ML, Hadlock TA. Assessing outcomes in facial reanimation: Evaluation and validation of the SMILE system for measuring lip excursion during smiling. *Arch Facial Plast Surg*. 2010;12(5):352-354.
5. Byrne PJ, Kim M, Boahene K, Millar J, Moe K. Temporalis tendon transfer as part of a comprehensive approach to facial reanimation. *Arch Facial Plast Surg*. 2007;9(4): 234-241.
6. Cronin GW, Steenerson RL. The effectiveness of neuromuscular facial retraining combined with electromyography in facial paralysis rehabilitation. *Otolaryngol Head Neck Surg*. 2003; 128(4): 534-538.
7. Diels HJ, Combs D. Neuromuscular retraining for facial paralysis. *Otolaryngol Clin North Am*. 1997; 30(5): 727-743.
8. Diels HJ. Facial paralysis: is there a role for the therapist? *Facial Plast Surg*. 2000; 16(4): 361-364.
9. Esquia-Medina GN, Grayeli AB, Ferrary E, Tubach F, Bernat I, Zhang Z, Bianchi C, Kalamarides M, Sterkers O. Do facial nerve displacement pattern and tumor adhesion influence the facial nerve outcome in vestibular schwannoma surgery? *Otology and Neurotology*. 2009;30(3):392-397.
10. Gao MH, Mao QD, Gao MH, Zou F. Clinical analysis of facial nerve palsy in middle ear and mastoid surgery in 23 cases. *Lin Chuang Er Bi Yan Hou Ke Za Zhi*. 2000;14(12):556-557.
11. Gillies H. Experiences with fascia lata grafts in the operative treatment of facial paralysis: (section of otology and section of laryngology). *Proc R Soc Med*. 1934;27:1372-1382.
12. May M, Drucker C. Temporalis muscle for facial reanimation. A 13-year experience with 224 procedures. *Arch Otolaryngol Head Neck Surg*. 1993;119:378-382.
13. Paches AI. [Head and neck tumors] [Publish in Russian]. Moscow: Meditsina, 2000.
14. Segal B, Zompa I, Danys I, Black M, Shapiro M., et al. Symmetry and synkinesis during rehabilitation of unilateral facial paralysis. *J Otolaryngol*. 1995; 24(3): 143-148.
15. Shindo M. Facial reanimation with microvascular free flaps. *Facial Plast Surg*. 2000;16:357-359.
16. Sidle DM, Fishman AJ. Modification of the orthodromic temporalis tendon transfer technique for reanimation of the paralyzed face. *Otolaryngol Head Neck Surg*. 2011;145:18-23.
17. Xing HS, Wang SX, Wang Z, Cao PC, Ma YQ, Wang ZW. Protection of Facial Nerves During Acoustic Neuroma Surgery. *Cell Biochemistry and Biophysics*. 2015;72(1):73-76.