

## NEURITIS OF THE LOWER ALVEOLAR NERVE AND ITS TREATMENT

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### ANNOTATION

This paper provides data on the results of a study of the effectiveness of the treatment of neuritis of the lower alveolar nerve, after a fracture of the lower jaw, patients admitted on the first day after injury. 100 patients were examined in the Department of Maxillofacial Surgery and the Rehabilitation Room of Patients on Outpatient Treatment at the Central Bank of the SSMO in Samarkand for the period 2020-2022. According to the survey, in the complex treatment of neuritis with the help of "Nucleo CMF forte", the effectiveness is higher than with conventional treatment.

**Keywords:** mandibular fracture, inferior alveolar nerve (IAN), histological examination of the pulp, ethylmethylhydroxypyridine succinate and combilipen, "Nucleo CMF forte".

### RELEVANCE

Neuritis developing against the background of various injuries often leads to long-term consequences. Ramli R et al. (2009) noted that the IAN was often crushed or torn. When examining 40 patients with fractures of the lower jaw, Wittwer G. et al. (2006) it was found that sensitivity disorders were detected in 39 patients, and in 16 of them severe, when it did not recover for 1 year or more.

Regardless of the nature of the injury to the peripheral nerve, neurotrophic changes are noted in the tissues that this nerve innervates (Baker B. et al., 2003; Razukevicius D. 2010; Avedov Yu. B., 2009, Rabinovich S.A., Krasnogolov V.A., Prikuls V.F. 2011; Arsakhanov G.A. 2017). Also, the damaged nerve, not infrequently, is drawn into the scar during tissue healing, which is clinically manifested by sharp pains and trophic disorders (Karlov V.A. 2001). Quite often, with a peripheral nerve injury, dystrophic changes in the bone, osteoporosis and surrounding tissues are manifested, which is characterized by a delay in teething, the formation of trophic ulcers of the oral mucosa (Yakovleva V.I., Trofimova T.P., Davydovich T.P. 1994).

Inflammatory processes localized in its area, which occur when the surrounding tissues are damaged and are accompanied by the release of toxins, can have an impact on the state of the IAN (Gerasimenko M.Yu., Zhdanov E.V., Lazarenko N.N. et al. 2009, Vilkitskaya K.V., Pokhodenko-Chudakova I.O., Popova I.I. 2012, 2013). Also, nerve trauma can predetermine the formation of neuromas, which can lead to aggravation of the nature of trophic disorders in the area of callus formation (Barry S. E. et al., 2008).

In 12% of cases, according to domestic and foreign authors, trigeminal neuropathy is caused by damage to the maxillary fossa (Puzin M.N., 2005; J. N. Blau, M. Harris, S. N. Kennett 1999; 156. Bryan Bell R., 2013). The most common manifestation of nerve neuropathy is pain syndrome, which prevails over the phenomena of paresthesia and becomes the dominant manifestation of this pathology (N. Cohenca, I. Rotstein 1996; Korzh G. M., 1989; Lepilin A. V., Bakhteeva G. R. et al., 2012).

Many authors consider the limitation of function as a global problem existing in medicine, which occurs due to a violation of bone tissue regeneration (Aleksandrov N. M., Arzhantsev P. Z., 1986; Baker V. et al., 2003). Therefore, understanding the pathophysiology of bone regeneration contributes to the use of various types of impact on the fracture area, which are aimed at improving metabolic processes in bone tissue (Korotkikh N. G. et al., 2008; Tarasenko S. V., 2014).

The above data indicate the need for timely detection and treatment of IAN.

### OBJECTIVE OF THE STUDY

To optimize drug therapy for damage to the inferior alveolar nerve in mandibular fractures.

Materials and research methods. Under observation were 100 men aged 19 to 60 years. The criterion for inclusion in the study group of patients was uncomplicated unilateral mandibular fractures in the area of the angle with symptoms of damage to the lower alveolar nerve, of varying severity. Patients were divided into three subgroups using the classification of the severity of damage to the NAS, proposed by Korzh A.A. in 1989: the first - with a mild degree of damage to the NAS, the second - moderate severity, the third - moderately severe and severe.

All patients underwent the following examination methods:

- Collecting an anamnesis to determine the causes of injury, complaints (special attention was paid to the presence of neurological symptoms - numbness of the skin of the face, paresthesia, severe pain, and other symptoms),
- External examination of the maxillofacial area, with an assessment of edema, soft tissue hematomas, malocclusion
- Load tests to determine the location of the fracture
- Histological analysis of the pulp.
- Instrumental method: X-ray examination of the dentoalveolar system in direct and lateral projections. In the presence of symptoms of damage of moderate and severe severity of IAN, a CT scan was performed to diagnose the rupture.

Drug therapy included the drug "Nucleo CMF forte". The choice of drugs for drug therapy aimed at enhancing the regeneration of the damaged area of the IAN and reducing the clinical symptoms that occur when the lower alveolar nerve is damaged was selected in accordance with the standard for providing specialized medical care to patients with lesions of the facial nerve (Order of the Ministry of Health of December 24 .2012 No. 1497n), it is recommended to use vitamins B1 and B6, B12 in complex therapy.

### RESEARCH RESULTS

The main clinical symptom was pain in all patients. Neurological symptoms are manifested in the form of paresthesia, hyper- (8%) and hypesthetic (92%) disorders, and tactile sensitivity was impaired in 30% of cases, deep sensitivity was impaired in 4.0%. Assessment of patients' need for analgesics and pain sensations were determined at the time of admission, on the 3rd and 10th day of treatment.

On the first day of admission, the brightness of pain in patients averaged  $2.6 \pm 0.14$  points.

Table 1 Assessment and dynamics of pain on the 1st, 3rd and 10th days of treatment

Days	points
1st day	$2.6 \pm 0.14$
3rd day	$1.9 \pm 0.29$
10th day	$1.2 \pm 0.07$

On the 3rd day of treatment, the intensity of pain in patients significantly decreased to  $1.9 \pm 0.29$  points. It was possible to completely stop the pain syndrome in 98.0% of patients by the 10th day.

In the analysis of pulp sections obtained from intact teeth of patients with a mild degree of damage to the IAN, in most cases (64.0%), a classic picture of healthy pulp tissues was noted. It was a loose fibrous connective tissue rich in nerve fibers and blood vessels; along the periphery of the pulp, a layer of cylindrical odontoblasts was visualized with clearly visualized processes: the outer one, which penetrated into the dentinal tubules, and the inner one, located in the pulp matrix, surrounded by processes of fibroblasts.

The pulp of patients consisted of fibroblasts, a few mast cells, which were concentrated near the walls of blood vessels, single histiocytes and small lymphocytes, a reduced number of eosinophilic leukocytes, elements of the histiocytic-macrophage series. In most cases, there were no signs of inflammatory infiltration in the pulp, a uniform distribution of single small lymphocytes in the matrix was noted, and CD20-positive elements prevailed.

However, in 36.0% of patients in the control group and in 38.0% of the main group with a mild degree of damage to the IAN, histological preparations showed moderately pronounced inflammatory changes, which manifested themselves in the form of cubization of the endothelium and slight swelling of the vessel walls. In this regard, uneven expression of CD34 and Podoplanin markers on endothelial elements was determined (Figure 1).

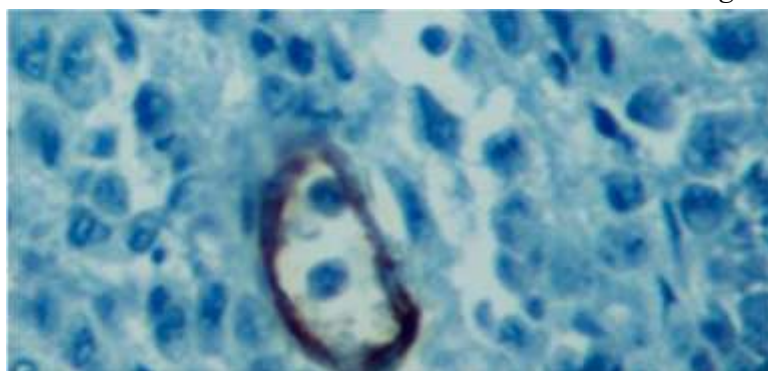


Figure 1 - Blood vessels with enlarged erythrocytes. CD34 stain, magnification 400

After treatment, patients had numerous newly formed blood and lymphatic vessels with endothelium without accumulation of excess intracytoplasmic fluid in them, which manifested itself in a finely dispersed reaction with CD34 in endothelial elements, without granularity or the presence of vacuolization. Edema of the perineural space was not determined (Figure 2).



Figure 2 - Proliferative activity of odontoblasts. Coloring Ky67, magnification 600



The synthesis of collagen by fibroblasts and its early physiological compaction of bone tissue were also noted, along with a decrease in pulp infiltration by macrophages and a decrease in the density of lymphohistiocytic infiltrate.

All patients with moderate severity had impaired migration and proliferation of fibroblasts, remodeling of the connective tissue and metaplastic changes. In addition, there was a significant decrease in the rate of formation of tertiary dentin during treatment.

In histological preparations of patients before treatment, it was noted that macrophages colonized the pulp in a large volume, had signs of vacuolization of the cytoplasm. The collagen that was synthesized had a low degree of maturity and was defined as a structureless, weakly eosinophilic substance randomly located in the intercellular space of the pulp.



Figure 3 - Uniform decrease in the number of CD3 elements (main group). CD3 stain, magnification 600

In 87.3% of the histological materials of severe patients after the treatment, the severity of the inflammation reaction decreased, which was manifested in the prevalence of the exudative form of inflammation over the productive one. This manifested itself in a persistent inflammatory infiltration of the pulp, but which had a tendency to reduce the number of cellular elements, which manifested itself in a uniform decrease in the number of CD3/CD20 - positive elements (Figure 3).

### CONCLUSIONS

In patients with fractures of the lower jaw in 88.0% of cases, damage to the IAN of varying severity was noted. In patients with a histological examination of the dental pulp at all degrees of damage to the NAS, there was a decrease in the intensity of inflammation, an increase in the proliferative index of cellular elements and nerve fibers, a lower number of microcirculation disorders, an increase in migration and proliferation of fibroblasts, and an increase in the speed of formation and improvement of the structure of tertiary dentin during complex treatment with the inclusion of the drug "Nucleo CMF forte", which leads to a decrease in the intensity of pain and sensitivity disorders, an improvement in the parameters of electrical excitability, electroodontodiagnostic indicators, positive dynamics of histological changes, accelerates the processes regeneration of the nerve fiber and shortens the duration of the rehabilitation period.

## REFERENCES

1. Baker, B. Intra-alveolar distraction osteogenesis in preparation for dental implant placement combined with orthodontic/orthognathic surgical treatment: A case report / B. Baker, S. Gibbons, M. Woods // Australian Dental Journal. - 2003. - № 48. - P. 65-68.
2. Davron B. J. et al. Elimination Of Perforation Of The Bottom Of The Maxilla Jaw Sinus With Application Of Osteoplastic Material //CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES. – 2021. – Т. 2. – №. 1. – С. 162-166.
3. Ramli, R. The effect of ultrasound on angiogenesis: an in vivo study using the chick chorioallantoic membrane / R. Ramli, P. Reher, M. Harris, S. Meghji // J. Oral Maxillofac. Implants. - 2009. - Jul-Aug. 24. - P. 591-596.
4. Razukevicius D., Inferior alveolar nerve sensitivity changes after mandibular trauma / Razukevicius D., Kubilius R., Sabalys G., Lukosiunas A., Grybauskas S. // Medical Health and Science Journal. 2010. Т. 4. № 4. P. 1-7.
5. Wittwer, G. Treatment of atrophic mandibular fractures based on the degree of atrophy experience with different plating systems: a retrospective study / G. Wittwer, W. L. Adeyemo, D. Turhani, O. Ploder // J. Oral Maxillofac. Surg. - 2006. - Feb. 64. - P. 230-234.
6. Аведов, Ю. Б. Неврологические аспекты одонтогенных поражений системы тройничного нерва : автореф. дис. ... канд. мед. наук : 14.00.13 / Аведов, Юрий Борисович - М., 2009. - С. - 25.
7. Арсаханова Г.А Основные аспекты диагностики повреждений периферических нервов /Арсаханова Г.А.// Вестник Чеченского государственного университета. 2016. № 1 (21). - С. - 55-57.
8. Бузрукзода Ж. Д. и др. УСТРАНЕНИЕ ПЕРФОРАЦИИ ДНА ВЕРХНЕЧЕЛЮСТНОГО СИНУСА С ПРИМЕНЕНИЕМ ОСТЕОПЛАСТИЧЕСКОГО МАТЕРИАЛА //Интернаука. – 2021. – №. 7-1. – С. 25-27.
9. Карлов, В. А. Неврология лица / В. А. Карлов. - М., 2001. - 285 с.
10. Ризаев Ж. А. и др. Персонифицированная терапия генерализованного пародонтита на основе интегральной оценки клинико-лабораторных показателей // Журнал «Проблемы биологии и медицины. – 2021. – №. 3. – С. 120.
11. Яковлева, В. И. Диагностика, лечение и профилактика стоматологических заболеваний : учебник / В. И. Яковлева, Е. К. Трофимова, Т. П. Давыдович. - М., 1994. - С. - 493.