

PROSPECTS FOR THE TREATMENT OF NEURITIS IN FRACTURE OF THE LOWER JAW

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ABSTRACT

The article presents data on neuritis of the lower alveolar nerve after a fracture of the lower jaw and its consequences. 100 patients were studied in the Department of Maxillofacial Surgery and the Rehabilitation Room of patients undergoing outpatient treatment on the basis of the Central Bank of the SSMO in Samarkand. The results of complex treatment of patients based on histological analyzes of the pulp are given.

KEYWORDS: *Mandibular Fracture, Inferior Alveolar Nerve (IAN), Histological Examination Of The Pulp, Ethylmethylhydroxypyridine Succinate And Combilipene.*

INTRODUCTION

In the last decade, there has been an increase in the number of patients in maxillofacial hospitals with severe fractures of the facial skeleton, due to combined and multiple injuries (Kopetsky I.S., Prityko A.G., Polunina N.V., IANibulin A.M. , 2009). Injury to the lower alveolar nerve occurs due to bruising, sprain, compression by bone fragments of the lower jaw, resulting in sprain in 70.1% of cases, contusion (bruise) in 16.8%, incomplete rupture - 12.5% or complete rupture - 0.6% of cases (Sabalis G.I., Karlov V.A. 1992; Timofeev A.A., Lesnukhin V.L., 2009; R. Brusati, L. Fiamminghi, E. Sesenna 1981; Politoun A.M., Znachkova Y.A., Kostyuk T.M. 2013).

Untimely diagnosis, delayed immobilization or indicated surgical treatment, ineffective drug therapy, non-compliance by the patient with recommendations and lack of desire for a healthy lifestyle contribute to irreversible changes in IAN, which leads to impaired consolidation of bone fragments, the development of inflammation, loss of sensitivity and muscle movement in area of nerve innervation. [1]

Purpose of the study: To improve the effectiveness of drug therapy in patients with a mandibular fracture with damage to the inferior alveolar nerve.

Materials and methods of research. Under observation were 100 men aged 19 to 63 years. The subjects were admitted to the hospital on the first day after the injury. The criterion for inclusion in the study group were patients with uncomplicated unilateral mandibular fractures in the area

of the angle with symptoms of damage to the inferior alveolar nerve, of varying severity. Using the classification of the severity of damage to the IAN, proposed by Korzh A. A. in 1989, the patients were divided into three subgroups according to the severity of the damage to the NAS: the first - with a mild degree of damage to the IAN, the second - of moderate severity, the third - medium-severe and severe degree. [2]

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 the IAN, a CT scan was performed to diagnose the rupture. [3]

Drug therapy included ethylmethylhydroxypyridine succinate and combilipen. 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 chosen 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. [4]

Research results. The main clinical symptom was pain in all patients. Neurological symptoms are manifested in the form of paresthesia, hyper- (7%) and hypesthetic (93%) disorders, and tactile sensitivity was impaired in 30.6% of cases, deep sensitivity was impaired in 3.77%. Assessment of patients' need for analgesics and pain sensations were determined at the time of admission, on the 3rd and 10th day of treatment. [5]

On the first day of admission, the intensity of pain in patients averaged 2.6 ± 0.14 points.

TABLE 1 ASSESSMENT AND DYNAMICS OF PAIN ON THE 1ST, 3RD AND 10TH DAYS OF TREATMENT

Groups	1st day points
1st day points	2,6±0,14
3rd day, points	1,9±0,29
10th day, points	1,2±0,07

On the 3rd day of treatment, the intensity of pain in patients significantly decreased to 1.9 ± 0.29 points. It was possible to completely arrest the pain syndrome in 97.6% 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 (64.8%), 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. [6]

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. [7]

However, in 35.8% of patients in the control group and in 36.1% 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).

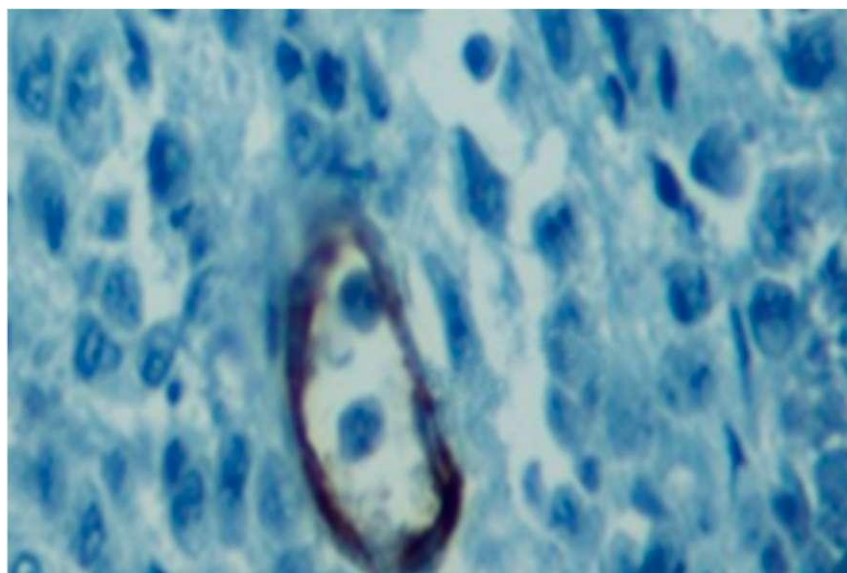


Figure 1 - Blood vessels with enlarged erythrocytes. CD34 stain, magnification 400

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 fine reaction with CD34 in endothelial elements, without granularity or the presence of vacuolization. Edema of the perineural space was not determined (Figure 2). [8]

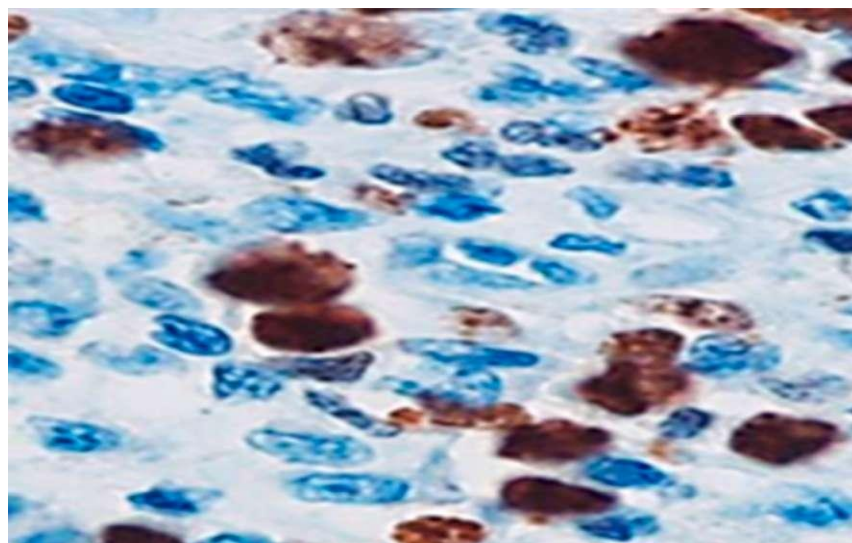


Figure2 - Proliferative activity of odontoblasts. Coloring Ky67, magnification 600

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. [9]

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. [10]

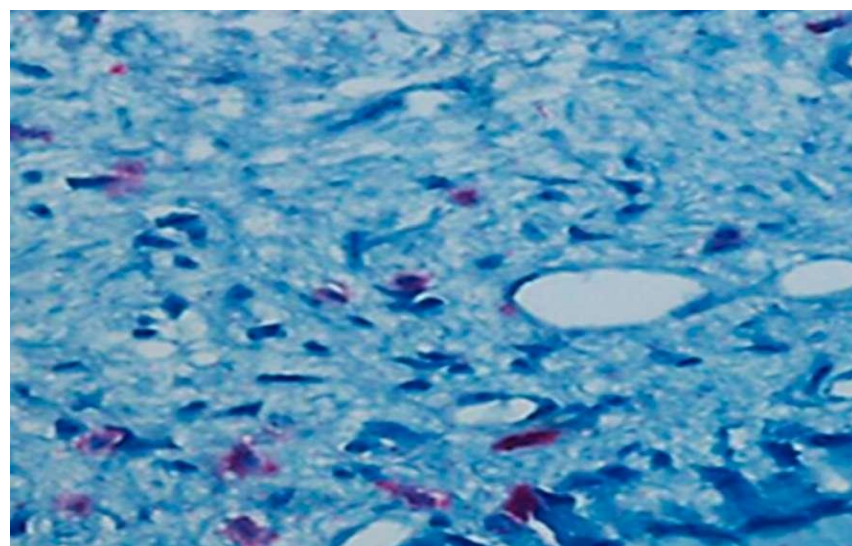


Figure 3 - Uniform decrease in the number of CD3 elements (main group). CD3 stain, magnification 600

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). [11,12]

CONCLUSIONS

In patients with fractures of the lower jaw in 87.6% 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 IAN, 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 rate of formation and improvement of the structure of tertiary dentin during complex treatment with the inclusion of preparations of ethylmethylhydroxypyridine succinate, which leads to a decrease in the intensity of pain and sensory disturbances, an improvement in the parameters of electrical excitability, electroodontodiagnostic indicators, positive dynamics of histological changes, accelerates the processes of regeneration of the nerve fiber and shorten the recovery period. [13-15]

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