

OPTIMIZATION OF THE MAIN ASPECTS OF ANATOMICAL, FUNCTIONAL AND SOCIAL REHABILITATION OF PATIENTS WITH MANDIBULAR FRACTURES**Z. K. Rakhimov, F. F. Ne'matova**

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Key words: post-traumatic osteomyelitis, fracture, lower jaw, infection, inflammation.**Таянч сўзлар:** травмадан сўнгги остеомиелит, синиш, пастки жағ, инфекция, яллиғланиш.**Ключевые слова:** посттравматический остеомиелит, перелом, нижняя челюсть, инфекция, воспаления.

Post-traumatic osteomyelitis is a very common complication of a fracture of the mandible: 10–12% of patients with fractures of the mandible develop tissue suppuration in the area of bone damage, accompanied by necrosis of the wound surfaces of the fragments with the formation of sequestrs. To solve this problem, a significant number of methods and means are used, however, the number of infectious and inflammatory processes in the post-traumatic period continues to remain high, which significantly complicates the treatment of victims.

ПАСТКИ ЖАҒИ СИНГАН БЕМОРЛАРДА АСОСИЙ АНАТОМИК, ФУНКЦИОНАЛ ВА ИЖТИМОЙ РЕАБИЛИТАЦИЯ ЖИҲАТЛАРИНИ МАҚБУЛЛАШТИРИШ**З. К. Рахимов, Ф. Ф. Неъматова**

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Жароҳатдан кейинги остеомиелит- бу пастки жағ суяги синишларида тез-тез учрайдиган асорат бўлиб, пастки жағ суяги синган беморларнинг 10-12% жароҳатланган суяк соҳасида тўқима йирингланишини ривожлантиради ва шу билан яра юзалари некрози, секвестрларнинг шаклланиши билан бирга кечади. Ушбу муаммони ҳал этиш учун жуда кўп усул ва дори воситалардан фойдаланилса ҳам травматик остеомиелитдан кейинги даврда, инфекция-яллиғланиш даволашдан кейин муаммолигича қолмоқда.

ОПТИМИЗАЦИЯ ГЛАВНЫХ АСПЕКТОВ АНАТОМИЧЕСКОЙ, ФУНКЦИОНАЛЬНОЙ И СОЦИАЛЬНОЙ РЕАБИЛИТАЦИИ ПАЦИЕНТОВ С ПЕРЕЛОМАМИ НИЖНЕЙ ЧЕЛЮСТИ**З. К. Рахимов, Ф. Ф. Неъматова**

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Посттравматический остеомиелит — весьма распространенное осложнение при переломе нижней челюсти: у 10–12% пациентов с переломами нижней челюсти в зоне повреждения кости развивается нагноение тканей, сопровождающееся некрозом раневых поверхностей отломков с образованием секвестров. Для решения этой проблемы используется значительное количество методов и средств, однако число инфекционно-воспалительных процессов в посттравматическом периоде продолжает оставаться высоким, что значительно осложняет лечение пострадавших.

Relevance. Mandibular fractures and their treatment are one of the topical problems in maxillofacial surgery. Among all injuries to the bones of the face, such fractures amount, according to different authors, from 45 to 90.9%. The frequent development of abscesses and phlegmon in the head and neck region is due to the high prevalence of chronic focal odontogenic, tonsilogenic infections, as well as infectious and inflammatory lesions of the skin and oral mucosa.

The most common form of septic inflammation is odontogenic purulent-inflammatory diseases. The high incidence of infectious and inflammatory complications in fractures of the jaw bones remains. In recent decades, interest in acute infections of the face and neck has increased due to the increase in the number of patients with these diseases and the number of severe intra- and extracranial complications [1, 4, 5, 6].

The search for new effective, pathogenetically substantiated methods of therapy for pyoinflammatory diseases (PID) of the maxillofacial region (MFR) is one of the most difficult problems of modern pediatric surgery. Features of the anatomy of childhood, poorly expressed general and local immunity to the pyogenic flora are prerequisites for the more frequent occurrence, rapid development and severe course of inflammatory diseases in comparison with adults [7].

A common task in the treatment of patients with purulent-inflammatory processes of the lower jaw is the inclusion of a set of therapeutic measures aimed at both the patient's body and pathogens.

Treatment of purulent-inflammatory processes is based on the complex conduct of surgical interventions and conservative measures. Surgical intervention, which consists in the obligatory opening of a purulent focus and their rational drainage. Opening of abscesses is carried out by incisions over the affected foci, which provides a free outflow of pus and exudate, reduces pressure in infiltrated tissues, normalizes microcirculation and early removal of necrotic tissues, and also helps to suppress microflora directly in the pathological focus and accelerates regeneration processes [2, 8].

After good drainage, the wound is repeatedly washed with solutions of antiseptics (furacilin, potassium permanganate, dimexide, exterioricide, etc.) of antibiotics, surfactants (chlorhexedine, rocal, etc.). One of the effective local methods of cleansing the wound from microbes and toxins, as well as tissue decay products, is wound dialysis, which actively affects the healing processes, improves functional results and shortens the treatment period for patients.

In order to quickly cleanse the wound, dioxidine, dimethyl sulfoxide, oxacilin, chloroaceto-phos and levomecolic ointments, proteinolytic enzymes are used topically. A common disadvantage of various ointments used in the treatment of purulent-inflammatory diseases is that they are based on fat. In this regard, the ointments do not mix with the wound exudate and cannot absorb the wound discharge, which adversely affects the processes of cleansing and healing the wound in the initial stages. Apparently in the initial stages of the inflammatory process, it is better to use drugs in the form of solutions, and after cleansing the wound and in the absence of discharge from it, use ointment preparations.

In recent years, a number of works have appeared on the successful application of a number of physical factors in local therapy, which helps to cleanse and heal wounds, and shorten the duration of treatment.

In the complex of therapeutic measures in the treatment of patients with purulent-inflammatory diseases, especially in the presence of anaerobic infection, hyperbaric oxygenation is increasingly used, the effectiveness of which is primarily associated with the acceleration of local and general hypoxia, as well as the creation of hyperoxia, which has a detrimental effect on aerobes and a number of anaerobes, at the same time increases the activity of antibiotics. The main component of the complex of general therapy is the use of antibacterial drugs. General therapy for pyoinflammatory diseases of the maxillofacial region (MFR) begins immediately after the operation with intramuscular or intravenous antibiotics.

The unsolved issues of the urgent problem of providing specialized medical care to patients with various forms of pathology of the maxillary artery were the subject of this study in order to substantiate the organizational and complex of therapeutic measures aimed at optimizing the anatomical, functional and social rehabilitation of patients with fractures of the mandible.

Materials and research methods. The present study included the results of examination and treatment of 94 people. Among them, 63 patients with a unilateral fracture and 31 patients with a bilateral fracture of the lower jaw, who were hospitalized at the Bukhara regional multidisciplinary medical center in the clinic of surgical dentistry in Bukhara in the period from 2011 to 2020.

The control group consisted of 31 people from practically healthy people of the same age. The age of the surveyed ranged from 17 to 62 years. Among them, most were men - 59 people (65%), women - 35 (35.0%). Table 1 shows the distribution of patients by sex and age (Table 1).

Patients in most cases received injuries as a result of wounds and surgical actions, which amounted to 48.9% (46 cases), then domestic injuries 19 cases (20.2%), sports injuries 13 (13.8%), transport 9 (9.5%) and occupational injuries accounted for 7.4% (7 cases).

Of all patients, 33 (35.1%) were hospitalized on the first day, within 2-3 days - 18 (19.1%), and at a later date - 8 (8.5) patients.

The terms of admission of patients to the hospital are presented in Table 2.

Of those examined, 59 patients had a unilateral fracture of the mandible, and 35 were diagnosed with a bilateral fracture of the mandible.

Table 1.

| № | | Up to 20 years | 20-29 | 30-39 | 40-49 | 50 and older | Total |
|---|-------|----------------|-------|-------|-------|--------------|-------------|
| 1 | Men | 9 | 20 | 16 | 8 | 6 | 59 (62,7 %) |
| 2 | Women | 6 | 12 | 14 | 3 | 0 | 35 (37,3 %) |
| 3 | Total | 15 | 32 | 30 | 11 | 6 | 94 (100%) |

Table 2.

Terms of admission of patients to the clinic from the moment of injury.

| № | | 1 day | 2 days | 3 days | 4 days | 5 days | Total |
|---|------------------------|-------|--------|--------|--------|--------|------------|
| 1 | Unilateral fracture LJ | 33 | 12 | 6 | 2 | 6 | 59 (62,7%) |
| 2 | Bilateral fracture LJ | 15 | 2 | 6 | 4 | 8 | 35 (37,3%) |
| | Total | 48 | 14 | 12 | 6 | 14 | 94 (100%) |

All patients were hospitalized for urgent reasons.

Analysis of the literature data and the results of our research indicate that the most common complaints of an inflammatory nature in purulent-inflammatory diseases include pain in the area of swelling, weakness, malaise, sleep and appetite disturbances, and fever.

The general condition of patients with pyoinflammatory diseases was satisfactory in 36 (38.3%), moderate in 48 (51.0%), severe in 10 (10.7%). Body temperature ranged from 36.8°C to 39.5°C.

The clinical picture in patients was characterized by the presence of an inflammatory infiltrate in the damaged area. The general reaction of the body was expressed in proportion to the spread and nature of the local purulent process.

Complaints of patients mainly consisted of general cerebral and local symptoms and amounted to pain in the area of the mandible fracture in 59 (62.7%), 59 (62.7%) - general weakness, 66 cases of irritability, which amounted to 70.2% sick (Table 3).

Table 3.

Frequency of occurrence of general and local symptoms in the examined patients upon admission

| № | Symptoms | Total | % |
|----|--|-------|------|
| 1 | LJ fracture area pain | 59 | 62,7 |
| 2 | Swelling of soft tissues | 67 | 71,3 |
| 3 | Hematoma in the area of the LJ fracture | 48 | 51,1 |
| 4 | Purulent fusion of soft tissues (abscess and phlegmon) | 79 | 84 |
| 5 | Destruction of bone tissue | 63 | 67,2 |
| 6 | Fistulas | 15 | 15,9 |
| 7 | Restriction of mouth opening | 65 | 69,1 |
| 8 | General weakness | 59 | 62,7 |
| 9 | Irritability | 66 | 70,2 |
| 10 | Rupture of the oral mucosa (OM) | 73 | 78,7 |

The main local symptoms in patients on admission were in the area of the LJ (in 100% of patients) and the presence of swelling of soft tissues (71.3%). All patients also noted difficulty in chewing food, and in 65 (69.1%) patients, mouth opening was limited due to severe pain.

Examination of the oral cavity in patients showed a rupture of the oral mucosa in 73 (78.7%) as a result of displacement of fragments; in 48 (51.1%) patients, hematomas or bruises of the mucous membrane in the area of the mandibular fracture were noted.

The main pyoinflammatory complications in the fracture of the LJ were abscess in 23 (24.4%) cases, phlegmon in 56 (59.5%) fistulas - in 15 (15.5%) cases.

On examination, all patients with phlegmon showed hyperemia of the skin, swelling and infiltration of soft tissues. From the side of the oral cavity, there is also edema and infiltration of the mucous membrane and periosteum, submucosal or subperiosteal abscesses can form. There are no radiological signs of osteomyelitis in the acute stage on radiographs of the lower jaw. Not earlier

than two weeks after the development of inflammatory phenomena in the bone, the expansion of the fracture gap with signs of osteoporosis is radiologically determined, and sequestrs of different shapes and sizes are found along the line of damage to the jaw.

The symptom of fluctuation was observed in 44 (46.8%) patients, in 46 (48.9%) - a sharp soreness of the surrounding soft tissues, pain during swallowing was observed in 4 (4.3%) patients. The study of microflora from a purulent focus in patients for aerobes was carried out in 94 patients, of whom *St. epidermidis* was sown in 63 (67, 02%), *St. aureus* in 13 (13.8%), in 15 (15.9%) cases *St. viridans* and in 13 (13.8%) cases aerobic growth was obtained.

Also, our studies have shown that the development of this complication is preceded by functional changes in the microvasculature. A decisive role in the development of post-traumatic osteomyelitis is played by infection of the damaged area of the jaw by the microflora of the oral cavity or by bacterial contamination from the outside in violation of the epithelial integument. The development of post-traumatic osteomyelitis of the jaw is facilitated by a violation of the trophism of tissues in the damaged zone, which occurs due to the possible compression of the lower alveolar nerve by bone fragments. In addition, galvanic corrosion of dissimilar metals from which intralesional fasteners are made can lead to the development of post-traumatic osteomyelitis.

In studies of the activity of hydrolytic enzymes of neutrophil lysosomes in patients with fractures of the mandible, very important shifts in the system of proteolytic activity of blood serum were established. The essence of these shifts lies in the fact that with the development of purulent-inflammatory complications in patients with fractures of the lower jaw, the activity of RNase and cathepsin D acids naturally increases (Table 4.) cathepsin is the cleavage of peptide bonds.

In addition, the protease under study is involved in the inactivation of a number of enzymes, hormones, biologically active proteins and peptides. An important role is also played by such proteolytic enzymes of neutrophil lysosomes as acid and alkaline phosphatase, DNase. These enzymes are released from microphages not only during the breakdown of these cells, but also under the action of fragments of the complement system (C3a, C5a) and immune complexes.

The purulent-inflammatory process in patients with fractures of the lower jaw was accompanied by a pronounced increase in the activity of the studied lysosomal enzymes of polymorphonuclear neutrophils. Thus, in this group of patients, an increase in the activity of acid phosphatase by 6 times, DNase by 24% was noted, on the contrary, the activity of alkaline phosphatase tended to decrease by 2.4 times. Of no small importance is also the value of medium molecular weight peptides (MMWP) in the blood of patients with fractures of the mandible. High values of the level of MMWP in patients with fractures of the mandible (FM) indicated an unfavorable clinical course of the inflammatory process, since they are toxic and thereby reduce local resistance [8].

Examining the level of immune complexes in the examined patients, we found a significant ($P < 0.05$) increase in the latter. Apparently one of the main causes of tissue damage in pyoinflammatory complications is the release of lysosomal enzymes under the action of immune complexes.

Table 1.

The nature of changes in the activity of lysosomal enzymes of neutrophils in patients with pyoinflammatory complications against the background of a fracture of the mandible.

| Indicators | Healthy faces | Patients on admission |
|---|---------------|-----------------------|
| The number of polymorphonuclear neutrophils (%) | 56.0±2.01 | 78.0±1.43 |
| Cathepsin D activity (μmol/min/g protein) | 5.5±0.51 | 10.8±0.91 |
| RNase (μmol / min/g protein) | 61.4±1.27 | 78.6±3.12 |
| DNase (μmol / min/g protein) | 121.0±2111 | 149.6±35.1 |
| Acidphosphatase (UA) | 1.1±0.09 | 6.6±0.51 |
| Alkalinephosphatase (UA) | 5.3±0.41 | 2.4±0.21 |
| Circulating immune complexes (conventional units) | 35.4±2.71 | 78.0±5.11 |
| MMWP (conventional units) | 0.28±0.06 | 0.58±0.06 |

Conclusions:

1. Intensive antibiotic therapy for purulent-inflammatory complications may be complicated by the development of toxic shock caused by the simultaneous death and decay of a larger number of microorganisms. Therefore, in the tactics of treating such patients, it is necessary to include enzyme preparations along with antibacterial therapy, as a result of which the dose of the antibiotic used will be significantly reduced and this will achieve a prolonged effect.

2. Of the examined, 59 patients had a unilateral fracture of the mandible, and 35 were diagnosed with a bilateral fracture of the mandible. The analysis of the research results showed that the most common complaints of an inflammatory nature in case of purulent-inflammatory complications of fractures of the mandible are in the first days after the injury, and after 7-10 days, the patient's condition deteriorates. an increase in symptoms of intoxication, weakness, malaise, sleep and appetite disorders, increased body temperature. Increasing pain in the area of the fracture, inflammatory infiltration of soft tissue and fracture gap. Clinical symptoms of the formation of a purulent focus in the peri-jaw soft tissues, the presence of a non-extracted tooth that prevents the release of pus into the fracture gap. From the side of the oral cavity there is edema and infiltration of the mucous membrane and periosteum, submucosal or periosteal abscesses may develop. On the radiographs of the lower jaw, there are no radiological signs of osteomyelitis in the acute stage. Not earlier than two weeks after the development of inflammatory phenomena in the bone, the expansion of the fracture gap with signs of osteoporosis is radiologically determined, and sequestrs of various shapes and sizes are found along the line of damage to the jaw.

3. Thus, in the mechanism of the described biochemical changes in pyoinflammatory complications against the background of a fracture of the mandible, the following main points can be distinguished: the formation of immune complexes, activation of the complement system, activation of lysosomal neutrophil enzymes, increased vascular permeability, and impaired microcirculation. The latter aggravates the above violations and can activate the hemostatic system.

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