

REHABILITATION OF PATIENTS WITH COMBINED FACIAL FRACTURE

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Abstract. Based on the literature data, the issue of the timing and scope of surgical intervention remains under discussion. The key focus of the surgical technique is to restore the integrity and function of the damaged bone surgically, regardless of whether the injury is isolated or combined. The timing and scope of surgical treatment are still debatable. One of the important factors that can affect the healing of a mandibular fracture is the development of infectious and inflammatory complications in the post-traumatic period.

Key words: combined trauma, craniofacial trauma, midface, hemorheology, osteoreparation, computed tomography, 3D reconstruction.

РЕАБИЛИТАЦИЯ БОЛЬНЫХ С СОЧЕТАННЫМ ПЕРЕЛОМОМ ЛИЦЕВОГО ЧАСТ

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Аннотация. Исходя из данных литературы, остаётся обсуждаемым вопрос о сроках и объёмах оперативного вмешательства. Ключевым

направлением хирургической методики является восстановление целостности и функции повреждённой кости хирургическим методом независимо от того, изолированная травма или сочетанная. Вопросы сроков и объема оперативного лечения до сих пор остаются дискуссионными. Одним из важных факторов, которых могут повлиять на заживление перелома нижней челюсти, является развитие инфекционно-воспалительных осложнений в посттравматическом периоде.

Ключевые слова. сочетанная травма, черепно-лицевая травма, травма средней части лица, гемореология, остеорепарация, компьютерная томография.

This is due to changes in people's living conditions – stratification of incomes, an increase in unemployment, the use of alcoholic beverages; the continued growth of large cities, an increase in the number of road vehicles, high-speed movement; non-compliance with the usual safety regulations, especially in private enterprises. The frequency of damage to the bones of the facial skeleton in combination with traumatic brain injury is about 6-7% of all types of injuries [11]. As evidenced by numerous works by domestic and foreign authors, there is a significant increase in the frequency and severity of injuries to the maxillofacial region and combined injuries, along with an overall increase in injury cases [2, 5, 8, 17]. Victims with maxillofacial injuries account for 30 to 40% of patients treated in hospitals providing dental care and up to 21% of all inpatient trauma patients [1, 7, 13]. As the analysis of modern literature data has shown, the leading place among the causes of injuries is occupied by: household - 83%, transport - 12%, industrial - 4.5%, as well as sports injury - 0.5% [6, 16]. Based on statistical data, it was found that head and neck injuries are observed in 54% of victims of car accidents.

Experts of the World Health Organization (WHO), traumatologists, surgeons have recorded a change in the specific value of injuries in the overall mortality structure. The first place in terms of mortality due to injuries indicates the emergence of a major problem in the medical and social sphere, the significance of which is worsened by the fact that young and middle-aged people die or become disabled [9, 10].

During this period, the number of patients with craniofacial trauma in our country is huge and continues to grow every time, mainly due to road traffic injuries [1]. Representatives of related specialties provide first aid and comprehensive treatment to this group of patients, these are neurosurgeons, traumatologists, maxillofacial surgeons, ophthalmologists, but not always in stages and effectively. The choice, stage-by-stage and succession of surgical interventions performed by specialists of a narrow profile practically does not correspond to the degree and volume of damage. The

refusal of reconstructive interventions is often motivated only by the fact of brain damage (concussion, brain contusion). All these reasons lead to the formation of persistent deformities of the facial bones, condemning patients to long-term multi-stage surgical treatment with far from always satisfactory results. In fractures of the zygomatic bone with injuries to the anterior wall of the maxillary sinus, according to the assumption of a number of authors [2, 18], it is customary to call "zygomatic fractures", and in case of a fracture of the zygomatic bone and the orbital wall, this is called zygomatic fractures. With such fractures, as F.I. emphasizes. According to Tarasov, with injuries to the zygomatic bone, damage always occurs to the anterior wall of the maxillary sinus, the lateral and lower walls of the orbit with damage to the eyeball. Zygomatic orbital injury is proposed to be called fractures of the zygomatic bone, arch and orbital wall with damage to the eyeball [3, 8]. Therefore, an interdisciplinary approach to this issue is necessary during the provision of first specialized care to patients with combined fractures of the facial bones. One of the important methods of examining victims with combined fractures of facial bones is the X-ray method. Determining the main, most informative methods of X-ray examination of victims can significantly simplify and facilitate the diagnostic process itself. Standard digital radiography in various projections can reveal deformities of the facial bones, fractures, incorrect standing of fragments, destruction in bones, as well as foreign bodies, but despite the fact that it is widespread, it is often uninformative, especially in traumatic injuries of the bones of the middle and upper zones of the face. The development of computed tomography technology has improved the quality of diagnosis of craniofacial injuries and planning of surgical intervention. As evidenced by everyday clinical practice, computed tomography, along with clinical data, is currently the "gold standard" for diagnosing fractures of the zygomatic bone, arch, orbit, upper jaw, naso-orbital region, etc. [4, 5, 14].

Modern possibilities of computed tomography, especially multithispiral computed tomography (MSCT), have been discovered in the diagnosis of zygomatic-maxillary fractures, which occupy the main place in injuries of the middle zone of the face. A large number of maxillofacial surgeons, traumatologists and neurosurgeons believe that MSCT provides significant information for traumatic injuries, while clinical data and conventional radiography are uninformative. According to R.B. Stanley [14], in the last decade, advances in radiation diagnostics have contributed to the development of improved approaches for the reconstruction of the zygomatic-maxillary complex, which provide more informative and accurate restoration of destroyed bone structures with tissue grafts and implants.

. With extensive fractures of the lower wall of the orbit, in most cases, a slit-like defect is diagnosed with prolapse of the periorbital fatty tissue in the maxillary sinus and infringement of soft tissue structures, as well as a slit-like defect with prolapse of

the soft tissues of the orbit, but without their infringement [8,9]. Considering fractures of the mandible, the use of MSCT is most often indicated for fractures of the condylar process, in particular with high, i.e. intraarticular injuries. When diagnosing high articular fractures, the possibility of damage to the head of the lower jaw from two sides is assumed, the nature of its fracture, the degree and direction of displacement of the fragments are also revealed. A detailed description of the injury of the mandibular head in most cases determines the correct choice of treatment method, i.e. whether it is necessary to perform head replantation followed by osteosynthesis [12, 13]. According to the literature data of foreign and domestic sources, in recent years a huge number of various methods of surgical treatment of facial bone fractures have been considered and described. When reviewing conservative methods of treatment, these include orthopedic devices such as apparatuses and splints, various kinds of rods that are fixed to a head cap or hoop, dental plastic and metal splints, dental-gingival splints and devices made in a non-laboratory way. There are also lab-made dental and dental-gingival splints. [1, 3, 4, 13]. Surgical methods for the treatment of fractures of the mandible include various methods of direct and indirect osteosynthesis. The direct type includes intraosseous osteosynthesis (spokes, rods, screws, pins), bone osteosynthesis (circular ligatures, bone plates, staples and frames, grooves), intraosseous osteosynthesis (bone suture, bone sutures in combination with staples, spokes, plates). The method of percutaneous osteosynthesis in the treatment of multi-fractured fractures allows for closed fracture reposition and stable fixation for the period of treatment. To date, there are many both spoke and rod external fixation devices. The choice of various design options for the external fixation device and methods of fixation is carried out taking into account biomechanical conditions (localization, fracture plane, type and direction of displacement of fragments), and the condition of soft tissues (inflammatory infiltrates, wounds, scars) [3, 7, 12].

According to supporters of the conservative position, specialized treatment should be started no earlier than 7-10 days after the injury [6]. Proponents of more aggressive tactics recommend earlier surgical intervention for mild traumatic brain injuries - in the first 2 days [8]. Other authors recommend starting surgical measures after 14 days from the moment of injury, when the ossification process is activated. The fourth point out that the immobilization of the bones of the facial skeleton should be carried out no later than 36 hours from the moment of injury [9]. Their frequency, despite the success in the treatment of victims, ranges from 9 to 40%. There is no doubt that the development of purulent-inflammatory complications in a fracture is determined not only by the quality of fixation of fragments, but also by their anatomical and physiological features, both of the lower jaw itself and the surrounding soft tissues, as well as the presence in the oral cavity of a huge amount of conditionally pathogenic microflora. At the same time, the main causes that contribute to the development of

complications are traditionally considered to be the late treatment of patients in specialized medical institutions, as well as incorrect diagnostic and therapeutic tactics in the prehospital and early hospital periods. It is necessary to confirm the fact that it is not individual adverse factors that contribute to this, but, as a rule, their combination [1, 3, 4]. Therefore, one of the important tasks at the moment is to create a unified and optimal operational tactics to solve the problem of reducing the incidence of complications. Infection of the bone wound directly with the contents of the oral cavity and disorders of hemomicrocirculation in the area of injury play an important role in the pathogenesis of inflammatory complications. At the moment, there is no doubt that the main link in the pathogenesis of traumatic osteomyelitis is circulatory disorders in the injured bone [12]. The identification of the intensity of reparations in a bone wound is one of the important factors determining the direction of scientific research. The bone as a labile system reacts in response to damage with widespread phenomena of restructuring, the area of which is determined by the degree of traumatic factors. At the same time, the clinical result of reparative osteogenesis in fracture in most cases depends on the bone's ability to repair and the degree of stability of the fragments. Under unfavorable local conditions, such as diastasis of bone fragments, their excessive instability and insufficiency of regional blood circulation, which create obstacles to the formation of an intermediate bone callus, which at the same time causes prerequisites for the development of complications [2, 5, 9]. According to literature data, in fractures of the facial skeleton, one of the important mechanisms of the pathogenesis of purulent-inflammatory complications are violations of blood rheology, the cause of the first of which is damage to the endothelium of the vascular wall and a decrease in its antithrombogenic properties. In addition, infectious agents, as factors inducing thrombogenesis, can lead to a slowdown in blood circulation due to toxic damage to the endothelium of the vessel wall, changes in blood composition, and activation of the hemostasis system. [9, 13,]. In isolated research papers, it is said that violations of the rheological properties of blood play a huge role in the pathogenesis of the inflammatory process, while they do not show a relationship between the aggregation and deformability of erythrocytes and the antithrombogenic activity of the vascular wall. Thus, functional damage to the vascular wall is an important component of the development of the inflammatory process [7, 10].

At the same time, violations of the antithrombogenic activity of the vessel wall, vascular-platelet, coagulant links of the hemostasis system, components of the fibrinolysis system and rheological properties of blood in fractures of facial bones and their complications, such as suppuration of a bone wound, traumatic osteomyelitis, etc., remain poorly studied. [9, 12].

Thus, changes in the level of the microcirculatory bed in patients after injury in the fracture area, after surgery, as well as in the early stages after complex treatment

have not been sufficiently studied. The study of the relationship between changes in the coagulation properties of blood and the effect of altered hemorheology on the microvascular module in the post-traumatic as well as in the postoperative period is one of the urgent problems of medical rehabilitation of this category of patients, which requires further research.

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