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ON THE BASIS OF 3D ANATOMICAL MEASUREMENT OF ZYGOMATIC BONE FRACTURE TO DETERMINE SAFE POINTS FOR FIXATION OF BONE FRAGMENTS WITH THE HELP OF MINI PLATES AND TO PREVENT DAMAGE TO THE SUBORBITAL NERVE

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Abstract:

A jaw fracture, like other fractures, is a severe injury requiring immediate treatment. The fracture violates the integrity of not only the bone, but also the surrounding tissues, blood vessels, muscle structures and nerves. In addition, a jaw fracture is often accompanied by displacement of bone structures and fragments, which entails serious consequences in case of late initiation of treatment. The proximity of the location to the brain and the large number of blood vessels in this area makes this type of injury life-threatening.

Keywords: zygomatic bone, bone fragments,mini plates, suborbital nerve

INTRODUCTION: A fracture of the zygomatic arch requires an individual type of treatment for each patient, different methods can be combined, according to the decision of the doctor. The first thing to do before visiting the clinic is to provide first aid. Cool the damaged area with ice, immobilize the jaw using bandages or cloth and provide rest to the victim. It is forbidden to try to extract the debris yourself, provoke the movement of the jaws, and take food. It is also not recommended to take painkillers on your own.

An analysis of the literature data shows that the diagnosis and treatment of injuries, complications and consequences of combined injuries to the bones of the facial skeleton (STCLS) is one of the growing medical and social problems in all countries. This is determined by a constant increase in the level of maxillofacial injuries and an increase in the severity of maxillofacial injuries and combined injuries. Fractures of the zygomatic bones and arches on average account for 7% to 19.4% of the total number of patients with facial bone injuries.

The injury of the zygomatic bone has a diverse clinical picture, since this area of the face has a complex bone structure, their damage causes a wave-like course of traumatic disease with various local symptoms of clinical manifestations.

Trauma of the middle zone is one of the most difficult problems of maxillofacial surgery. In recent decades, the structure of the injury has changed radically, and simultaneous damage to several anatomical structures has been noted. Trauma to the bones of the facial skeleton (STCLS) has recently been associated with combined injuries and this injury has increased 1.5 times, among severe injuries and ranges from 34.8 to 63.3%. The increase in the number of post-traumatic inflammatory complications makes this problem urgent. The causes of traumatic fractures of the zygomatic arch and bones can be household, sports, transport, street and industrial injuries. The degree of displacement of the fragments of the zygomatic bone can be different: having cosmetic significance (facial asymmetry); having cosmetic and functional significance (facial asymmetry, accompanied by occlusion of the eyeball, diplopia, restriction of mouth opening, violation of innervation in the area of the suborbital nerve). Therefore, in some cases, it is possible to detect a combination of a number of more or less pronounced pain, cosmetic and functional symptoms.

Patients with fractures of the zygomatic–orbital complex need timely and qualified surgical care, since not timely immobilization of mixed fragments will lead to obvious deformations of the maxillofacial region, which requires further reconstructive surgery, leading to temporary disability of patients of working age.

Thus, based on the above, this problem requires a new approach to the treatment of patients with this pathology.

THE PURPOSE OF THE STUDY: On the basis of 3D anatomical measurement of a zygomatic fracture, to determine safe points for fixation of bone fragments using mini plates and to prevent damage to the suborbital nerve.

RESEARCH MATERIALS AND METHODS: Patients with zygomatic fractures treated at the department of

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maxillofacial surgery of the city medical Association of Samarkand in the period from 2023 to 2024 were examined. The age of the patients ranged from 21 to 57 years, of which 13 were men (81.2%), 3 were women (18.8%).

We performed computed tomography (CT) of the bones of the facial skeleton in all patients with 3D measurements using electronic sources. CT examination made it possible to assess the topography and directions of the suborbital canal, the suborbital nerve and the vessel. A fracture of the zygomatic bone in many cases (67%) is accompanied by a fracture of the orbital complex and with the walls of the maxillary sinus. The fracture line of the zygomatic bone often passes in the area of the opening where the suborbital nerve and vessels exit, which causes compression of this nerve. Displacement of bone fragments, which is an indication for open osteosynthesis of bone fragments. Displacement occurs due to the severity of bone fragments in fractures of the zygomatic orbital complex. Therefore, surgeons often resort to an open method of osteosynthesis of bone fragments. The modern method of fixing bone fragments is the use of mini-plates. Often, when fixing mini plates, jaw surgeons install them approximately. Before the surgical period, we studied the topography and anatomical structure of the zygomatic fracture. CT scans of patients with fractures of the zygomatic orbital complex who installed mini-plates were studied. The topography of the suborbital canal was studied, the distances from the lower edge of the orbit to the base of the suborbital foramen and the distance from the zygomatic bone to the base of the suborbital foramen were measured.

RESULTS: The treatment of patients with injuries of the middle zone of the face had its own characteristics. The task of a surgeon who performs osteosynthesis with mini-plates is to preserve the integrity of anatomical structures, the subclavian nerve, and the vessel and restore the bone structure. The middle zone of the facial skeleton has a very complex structure, it is a complex biological intersection where the beginning of vital organs is located. This area of the facial skeleton resembles a bone mosaic, so the trauma of this area is very difficult. From this point of view, in case of injury to the middle zone of the face, simultaneous medical care is required by different specialists (maxillofacial surgeon, otorhinolaryngologist, ophthalmologist, intensive care specialist).

Treatment of trauma of the middle zone has a diverse clinical picture, since the middle zone of the face has a complex bone structure, their damage causes a wave-like course of traumatic disease with various local symptoms of clinical manifestations. Patients with fractures of the upper jaw underwent bimaxillary splinting of the jaws, manual reposition with fixation using rubber rings. After that, an individual parietal-chin cap was prepared and put on. Patients who were in serious condition hospitalized in the intensive care unit for resuscitation, after improving their general condition, i.e. restoring adequate breathing, bimaxillary splints were applied. Patients who had dislocations of bone fragments were repositioned and fixed using mini plates under general intubation anesthesia. Mini-plates were applied to the zygomatic alveolar ridge, the zygomatic maxillary suture and the zygomatic suture.

Concomitant fracture of the upper jaw according to Le FAURE 1,2,3, in 6 (37.5%) concomitant fracture of the zygomatic bone, fracture of the anterior wall of the maxillary sinus, in 8 (62.5%) patients there was a concomitant fracture of the zygomatic arch, accompanied by trauma to the soft tissues of the maxillofacial region.

Based on the study of the 3D anatomy of the injury of the zygomatic orbital complex, it was revealed that the distance from the lower edge of the orbit to the base of the suborbital foramen was 9.4 ±1.2mm, the distance from the zygomatic bone to the base of the suborbital foramen was 13.2±1.1mm.

CONCLUSION: Thus, the 3D anatomy of the injury of the zygomatic orbital complex allows us to conclude that, taking into account the study of anatomical measurements of the installation of mini-plates, fragments ensure that the subclavian nerve is not damaged and prevents various complications in the postoperative period.The use of timely complex drug therapy in patients with STCLS in the middle zone of damage makes it possible to correct the violation of cellular and humoral factors of immunity, and is a way to prevent complications.

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