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# Surgical Treatment of Defects Using 3D Implants

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**Annotation:** The relevance of traumatic eye socket injuries and the social significance of this problem are associated with their greatest prevalence among young and able-bodied people. This means that people who are at the most active age and who are in the workplace are at increased risk of eye socket injuries. Such injuries can have lasting effects on the physical, emotional, and social well-being of those affected, as well as cause serious economic damage to society as a whole.

**Keywords:** zygomatic-orbital complex, defects, 3D implant, surgical treatment, fracture.

Today, in the field of maxillofacial surgery, there is a need to improve the quality and effectiveness of repair of defects and deformities of the zygomatic orbital complex (SOC) of post-traumatic origin. This problem is relevant due to the complexity of the anatomy of this area, the variety of traumatic injuries and their consequences, as well as the need to achieve optimal functional and aesthetic results. Therefore, the continuous improvement of surgical methods, the introduction of new technologies and the development of individual approaches are important aspects of research in this field [7, 27, 63].

In the modern era, an urgent challenge is the increase in the frequency of injuries associated with a variety of etiological factors, such as traffic accidents, sports injuries and domestic accidents. [8, 20, 24, 63]. This negative trend is accompanied by an increase in incidents of traumatic brain injuries, including craniofacial anomalies, in which the anatomical structures of the zygomatic and orbital parts of the face are affected. According to expert data, injuries to the zygomatic-orbital complex occupy a prestigious second place in the totality of craniofacial injuries, covering from 6% to 24% of clinical cases [27, 39]. Currently, the number of victims with injuries to the maxillofacial region remains at a very high level and continues to progress. [23, 27, 48, 53].

Post-traumatic deformities (PTD) occur in patients suffering from traumatic injuries of the zygomatic orbital complex (SOC), and those who seek medical help with unacceptable delay, incorrect diagnosis, and insufficiently comprehensive treatment. This is due to the patient's serious condition, which prevents the implementation of full-fledged and simultaneous specialized treatment [12,13,31]. This problem becomes especially relevant in the context of untimely intervention, lack of an integrated approach and incorrect assessment of the patient's condition, which leads to negative consequences and further deformation of the zygomatic-orbital complex [12,13,21,31]. However, carrying out appropriate measures for timely diagnosis, adequate therapy and rehabilitation of patients with PTD can lead to an improvement in their functional state and aesthetic recovery [27,31].

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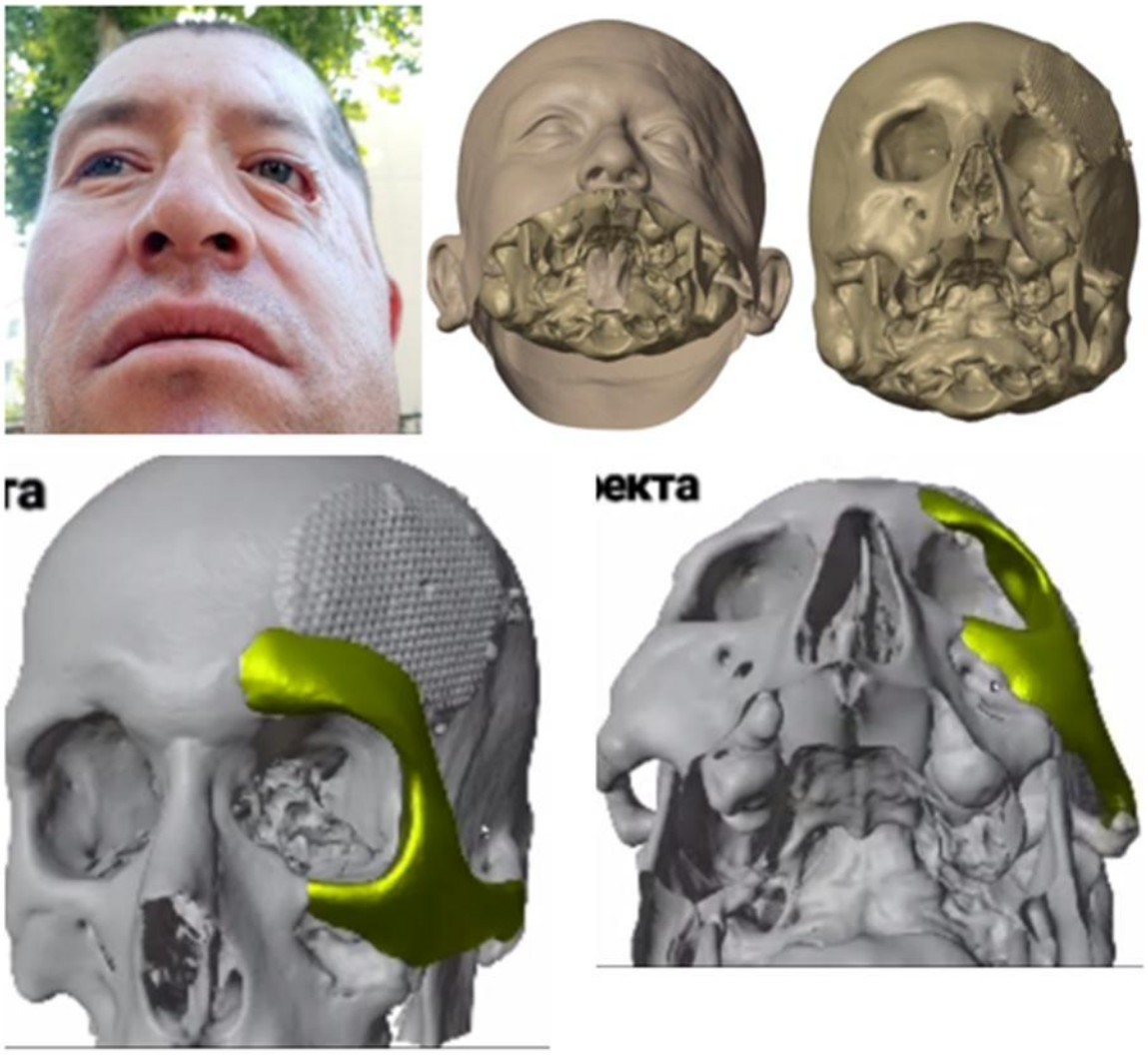

**Figure 1. Modeling of an individual implant**

Currently, there is no clear system of therapeutic and diagnostic measures for the medical rehabilitation of patients with post-traumatic stress disorders (A.C. Karayan, 2003). All researchers note the rapid growth of patients diagnosed with this type of pathology. The primary etiological factors that lead to post-traumatic stress disorders include road accidents and domestic injuries. The main factor that is highlighted in the published works is the working age of patients. This was the main reason for that is that among the examined patients was dominated by men 20-40 years (and they accounted for the majority) (Garcia-Perez O. N. Rocco, 2007; Antunes Freitas D., 2009, Rodriguez Perales, M. A., 2014; Shomurodov K. E., 2017; Baimuradov S. A., Yusupov sh. sh., 2019).

We observed 68 patients with PTD during their follow-up in the Department of Maxillofacial Surgery at the Tashkent State Dental Institute Clinic from 2019 to 2022. The patients were divided into 3 groups: at the beginning of the study, there was a group of 21 patients who underwent defect replacement using a traditional cartilage autograft. Then the group was joined by 23 patients who had standard titanium plates implanted and completed the third group of 24 patients who had their shortcomings covered up using individual implants based on bone cement. Among all surveyed men and women, the percentage is 82.2%, respectively (17.7% women), the patients were of different ages: from 18 to 60 years old. The average age of the patients was 36.5±5.35 years. (Table 4.1).

The technique that we used to treat damaged SOC and isolated traumatic injuries of the lower wall of the eye socket in 24 patients consisted of several features. It allowed surgical treatment to be performed at different rates, taking into account the severity of the defect and its location, as well as the time of surgery.

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The surgical intervention was performed taking into account the localization of the post-traumatic defect of the joint. The following stages of surgical treatment were performed with PTD SOC:

All operations were performed under general anesthesia. An aseptic treatment with 96% ethyl alcohol was performed in the surgical field. The detachment of the skin, muscles and fascia is carried out in stages: first, the skin with subcutaneous tissue departs, then the muscle with folds of fat to the bone. The muscles of the eye rise cautiously: the periorbital adipose tissue.The upper wall of the eyecup was separated from the fiber. After that, the JUICE defect is fully visualized. The defect is repaired with the help of an individual implant, fixed with special screws in the area of the lower edge of the eye socket. The soft tissues were sutured in layers with vicryl 4-0. The skin was sutured with polypropylene 6-0. Drainage was left in the wound. A rubber drain was left in the wound. Next, the crenellated wound is sutured with synthetic threads "Vikril 5-0". An aseptic agent was applied to the wound.

During the recovery period after surgery, all patients were prescribed standard anti-inflammatory therapy, and the ophthalmologist performed rehabilitation with the patient to restore eye function.

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