

## **Clinical picture and treatment of maxillary fractures**

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**Abstract.** The article is devoted to the study of the clinic and peculiarities of the postoperative period of patients with maxillary fractures depending on the method of treatment. We treated 32 patients with maxillary fractures of different severity and clinical picture. Of these, 11 patients had an upper jaw fracture according to Le-For III, where an orthopedic method of treatment with an intermaxillary Tigerstedt splint was used. In 21 patients, there was a combined fracture of a more complicated clinical picture, with concomitant traumas of the cranial brain, where open surgical treatment was applied using osteosynthesis with titanium miniplates. Thus, the patients were conventionally divided into two groups. The aim of the study was to study the peculiarities of the course of the postoperative period and peculiarities of a particular method of treatment. In the course of treatment, we studied the peculiarities of clinical manifestations in each case and compared them with each other. We took into account the data obtained using each method and drew some conclusions. Thus, after a complete analysis of the results and comparisons, it was established that the use of open osteosynthesis with the use of titanium miniplates proved to be successful in treating jaw fractures. This is due to the fact that this method of treatment causes much fewer complications during bone fracture healing, patients can eat and gradually

put weight on their jaws, and oral hygiene is carried out without any problems. The bone wound heals much faster due to the absence of mobility of the bone fragments. The accompanying symptoms disappear more quickly than with the orthopedic method, so that the surgical method with miniplates proves to be more effective.

**Keywords:** maxillofacial surgery, jaw fractures, upper jaw fracture, Le-For, jaw injuries.

**Introduction:** Patients with facial skeletal fractures account for 30-32% of inpatients. The annual growth rate of injuries to the maxillofacial region is increasing. The number of facial bone fractures is increasing by 12-15%, which should be taken into account when organising inpatient and outpatient surgical care. It should be emphasized that jaw fractures are a significant and social problem, since the majority of this category of patients are men aged 20-40 years. This is the most able-bodied part of the population and, therefore, the issues of their treatment and rehabilitation are of great practical importance [1,2,3,4,5].

**The aim of this** study is to analyse the results of upper jaw fracture treatment over the last 5 years (from 2016 to 2020) and to substantiate the effect of the applied method.

### **Materials and Methods**

We analysed case histories of 32 patients treated at the Oral Surgery Department of the Osh Interregional Joint Clinical Hospital with traumatic upper jaw injuries. We analysed cases of isolated fractures of the maxilla only, fractures of the nasal bone and zygomatic arch were not analysed. There were 26 males and 6 females and the age distribution was as follows: 16 to 20 years old 3 persons, 21 to 30 years old 15 persons, 31 to 40 years old 9 persons, 41 to 50 years old also 3 persons, 51 and older 2 persons. Data shows that traumas of upper jaw most frequently occurred at the age of 16 to 40 years (27 patients), i.e. 84.3% of cases, the most able-bodied part of population. Patients presented to the Clinic in various states: in 21 patients anamnesis was noted: loss of consciousness with marked retrograde amnesia, nausea, vomiting, severe headaches, which described the clinical picture of craniocerebral trauma; injuries of soft tissues of various degrees of severity were registered, contusion of eye on the injured side was noted. In 11 patients the condition on admission was of moderate severity. Orthopaedic treatment in the form of fixation of the jaws with a Tigerstedt splint was used in 11 patients with a mild condition. In 21 patients who had multiple combined fractures and a relatively severe condition, surgical treatment with titanium miniplates was used. The patients were thus conventionally divided into two groups to compare the efficacy of the treatment performed and the manifestation of clinical symptoms depending on the method. In diagnosis, we were guided by well-known techniques based on objective data: presence of wounds, traumatic edema, hematomas of soft facial tissues, severity of facial fractures, the so-called

"spectacle symptom", elongation and flattening of the face, mobility of fractures in different parts, bleeding from the nose, external auditory canal, and changes in the oral cavity. The most pronounced symptom was a change in the bite, which was manifested by displacement of the fractures to the back and side, especially in patients with bilateral fractures of the maxilla. An orthopantomogram and computed tomography were used to clarify the diagnosis.

### **Results and discussion**

The scope of treatment measures, as well as their sequence was mainly determined by the patient's clinical condition, the presence of concomitant diseases and concomitant injuries, the severity of signs of craniocerebral trauma and its complications. In 11 patients, the condition was of medium severity, where an upper jaw fracture according to Le-For III (lower type) was diagnosed, emergency hospitalization in the maxillofacial surgery department was performed, and at the same hour a Tigerstedt or Vasiliev splint with intermaxillary traction was applied. Particularly severe patients (21 patients) were immediately transferred to the intensive care unit with concomitant craniocerebral injuries, skull base fractures, grade I-II shock and contusion of the eye on a particular side. Such patients were treated by the joint efforts of other specialists (intensive care specialist, neurosurgeon, ophthalmologist, etc.) to improve their general condition after 3-5 days, and they had already been treated for fractures of the upper jaw. Out of 21 severe cases, 7 patients had maxillofacial fractures of Le-For I (upper type) and 14 patients had maxillofacial fractures of Le-For II (medium type). Mini-plate osteosynthesis was used in these patients after the general condition had improved. In recent years the method of osteosynthesis with mini-bone fixation plates made of titanium, which provide rigid fixation of fractures and the possibility of functional loading in early postoperative period, has become widespread in the treatment of fractures of the jaws. The proposed plates have different design features and are made from different materials, but the way they are applied is fundamentally the same: the plates are fixed on two levels in order to eliminate the tensile forces and prevent the occurrence of diastema and violations of dental occlusion. Biomechanical, morphological and clinical techniques have shown that the use of miniature bone plates is one of the most effective ways to treat jaw fractures.

In the category of patients with splinting, the clinical picture was slightly worse due to several factors. Thus, the healing of the fracture was slightly more difficult in these patients compared to patients who used the surgical method. Clinical symptoms in 11 patients with an intermaxillary splint were evident up to 10 days after fixation of the fracture. Soft tissue

swelling persisted at discharge and during follow-up examination 10 days later. There was little tenderness on palpation. Body temperature was maintained at 37.0°C for a long time, due to the presence of mobility in the treatment of fractures with splints. At the same time, the patients were unable to maintain proper oral hygiene, which also impaired wound healing.

In the 21 patients with combined maxillary fractures and severe cases, the postoperative period was much milder in terms of symptoms and jaw function. In this category of patients, where osteosynthesis was performed with titanium mini plates, the clinic was relatively mild. After the swelling had resolved, the patients were able to exert some chewing pressure on their jaws. Body temperature normalised by day 3 and there was no mobility of the maxilla. The patients were fully able to observe oral hygiene.

In the postoperative period all patients underwent antibiotic therapy, symptom therapy individually, irrigation of the oral cavity with antiseptic solutions.

Thus, here are clinical examples of the postoperative period of patients from each group for comparison.

Clinical example of patient from the group with intermaxillary splint.

Patient B. 35 years old, admitted to the Department of Oral and Maxillofacial Surgery after an accident. His condition was relatively satisfactory and he was walking.

Local status: edema on the face, asymmetry of the face due to the position of the lower jaw and bite disorder. On the left side there is a haematoma around the eye, painful on palpation, symptom of upper jaw stress is positive. The fracture line cannot be palpated. On the oral side the bite is disturbed, the alveolar process of the upper jaw is mobile. There is a tear of the mucosa at the level of the transitional fold on the left side.

The patient was referred for further examination and after a CT scan he was diagnosed with an upper jaw fracture according to LeFor III and it was decided to apply an orthopaedic treatment with an intermaxillary Tigerstedt splint. After the splint was applied, the bite was fixed and a sling was used.

The patient had subfebrile body temperature from day one to day three, which was controlled with medication, and from day three to day seven, the body temperature was in subfebrile values. The temperature normalised only on the seventh day after the partial termination of antibiotic therapy. At the time of discharge, the patient also had mobility of the upper jaw, and the patient was scheduled for a follow-up examination in 2 weeks to assess the condition and analyse fracture healing. After 14 days there was no swelling or soreness at the follow-up examination. Oral hygiene was poor and a radiograph was taken to assess the condition of the

bone wound, where there were no particular changes and the fracture line was clearly visualised. The splint was removed one month after it had been applied.

A clinical example of a patient from the group with the surgical method, osteosynthesis with miniplates.

Patient A., 28 years old, was admitted urgently to the emergency department in a moderate condition; after X-ray examination, examination and consultation with a neurosurgeon and a traumatologist, it was decided to admit the patient to the maxillofacial surgery department. The patient had a history of domestic trauma. He was diagnosed with an upper jaw fracture according to LeFor II.

Local status of the patient: On examination he had swelling of the soft tissues of the face, positive spectacle symptom, nasal bleeding. On palpation of the right lower eyelid and anterior wall of the sinus, painful, positive loading symptom, crepitation of fragments, fracture line is not palpable due to swelling. On the oral side there is no mucosal trauma, the upper jaw is slightly mobile and there is sharp pain on loading.

After a few knocks after hospitalisation and normalisation of the patient's condition, intra-oral osteosynthesis of the upper jaw was performed using titanium mini-plates. Standard postoperative therapy with medication was administered, and the treatment prescribed by the neurosurgeon was carried out in parallel.

The patient had subfebrile body temperature from day one to day three and then normalised completely. On the fifth day postoperatively, the swelling had gone down and mouth opening had relatively improved, he was eating soft food and putting some weight on his jaw. On the oral side, the wound healed with primary tension without any complications. There was no palpation mobility of the jaw. Oral hygiene was observed without any problems. The sutures were removed on day 8 and the patient was discharged home two days later. A follow up examination 20 days after discharge was recommended.

At the time of the follow-up examination one month later, the swelling and haemorrhages had completely disappeared, periosteal phenomenon in the area of the placed plates was noted on palpation. On the radiograph, the fracture lines were visualised, no displacement was detected, no secondary deformities, and the bite was normal. The plates can optionally be removed after one year from the date of surgery.

**Conclusions:** Thus, analysis of clinical results of surgical treatment of the upper jaw made it possible to determine the following main points of bone osteosynthesis with mini plates: when using the plates as fixators, due to their design and definition of zones of their application, there is no need to create compression; in all cases, with mini-bone

osteosynthesis, an extremely accurate repositioning of fractures and intimate adhesion of fractured surfaces is necessary; the metal, from which plates and screws are made is titanium of BT-5, BT1-0, BT1-00 grades. Titanium is a material ideally suited for implants, so it can remain in the body indefinitely without causing adverse effects. If the patient has no desire to have the retainer removed, it remains implanted.

The fixed fracture fixation allows the bone to heal much more rapidly and without complications. Secondary deformities after surgery are prevented, thus eliminating the need for a second surgical intervention.

Thus, based on the analysis of clinical experience, we believe that osteosynthesis with miniplates is a more sparing method with respect to the soft tissues surrounding the bone. Its use is less likely to disrupt the extra-osseous blood supply, which plays a particularly important role in jaw fracture healing.

## References

1. Gorbons, I.A. Complications in osteosynthesis of mandibular fractures and their prevention: author. dis. ... Cand. honey. Sciences: 14.00.21 / I.A. Gorbons.-Novosibirsk, 2007 .-- 22 p.
2. Eshiev, A.M. Innovative methods, technologies and materials in maxillofacial surgery: author. dis. ... Dr. honey. Sciences: 14.01.14 / A.M. Yeshiev.-Bishkek, 2011.-42p.
3. Dracheva, E.S. Titanium mini-plates for fixation of bone fragments in orthognathic surgery / E.S. Dracheva // New methods of diagnosis, treatment of disease, and management in medicine. - Novosibirsk, 2007.- S.-217-219.
4. Sour, F.I. Experience in the use of bone osteosynthesis with mini-plates in the treatment of patients with traumatic osteomyelitis of the lower jaw / F.I. Kislykh, S.V. Brain // Tr. VI Congress STAR. - Moscow, 2010 .-- S.-309-311.
5. Malginov, N.N. Increasing the efficiency of osteintegration of titanium implants by optimizing their shape, surface structure and the use of cell technologies in the experiment: author. dis. ... dr. honey. Sciences: 01/14/14 / N.N. Malginov.-Moscow, 2011.-38p.