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Features of Orthopedic Rehabilitation of Patients with Maxillofacial Defects and Post-Covid Complications of the Upper Jaw

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Abstract: One of the current tasks in dentistry is to improve the principles of providing orthopedic care to patients with the consequences of various injuries and surgical interventions on the tissues of the maxillofacial region. The importance of this issue is justified by the annual increase in the number of patients who have suffered from road traffic accidents, industrial accidents and catastrophes, as well as those who have undergone surgical interventions for neoplasms, deformities, and defects of the maxillofacial region caused by acute purulent and inflammatory diseases due to COVID-19.
Keywords: COVID-19, SARS-CoV-2, oral cavity, dental status.

Introduction

It is important to note the clinical manifestations of acute purulent-inflammatory diseases of the upper jaw. They are diverse and depend on the initial localization of the inflammatory focus, its prevalence, predominantly developing form and direction, and morphological structure. In some cases, the symptoms may resemble regular sinusitis or may not occur at all [1].

Treatment of acute purulent-inflammatory diseases of the upper jaw is a complex problem for several reasons:

- complex anatomical structure;

- proximity to vital organs;

- severity of the body's general condition;

- functional and cosmetic defects after surgery.

Currently, there are many treatment regimens used for acute jaw osteomyelitis. Based on modern views on the pathogenesis of jaw bone osteomyelitis, I.I. Yermolayev proposed a treatment scheme for this disease, taking into account the phases of the pathological process [2], [3]. In the acute phase of inflammation (the initial stage of the development of the purulent-necrotic process), it is necessary to: reduce the "tension" of the tissues and drain the inflammatory foci, prevent the development of infection and the formation of necrosis along the periphery of the inflammatory focus, preserve microcirculation, reduce vascular permeability and the formation of vasoactive substances, reduce the overall intoxication of the body, create peace for the affected organ, reduce neurohumoral shifts and reduce pathological reflexes, and carry out symptomatic treatment [4], [5], [6].

The nature of the treatment measures and the sequence of their implementation are determined by the severity of the disease, the nature and localization of the inflammatory process.

With a satisfactory general condition, normal or slightly elevated body temperature, and the presence of subperiosteal abscesses localized within the alveolar process, patients can be treated in a polyclinic setting, releasing them from work and prescribing bed rest.

If the patient's condition is unsatisfactory, general weakness, high body temperature in focal or diffuse jaw osteomyelitis, especially complicated by phlegmon, the patient must be immediately hospitalized in a specialized maxillofacial hospital [7].

Methodology

Early surgical intervention in the early stages of the disease is crucial for eliminating the purulent-inflammatory focus in the bones and surrounding soft tissues in acute osteomyelitis. However, with significant spread of the inflammatory process to the body of the mandible, significant impairment of microcirculation in the bone tissue is observed, which is revealed during rheography and comparative impedance imaging. In these cases, several perforated holes are made with boron using a bormashine from the outer cortical plate of the mandibular body.

In addition, it is necessary to open the accompanying abscesses and phlegmons.

Antibacterial therapy is prescribed: initially, broad-spectrum or osteotropic antibiotics (linkomycin), and after clarifying the nature of the microflora and its sensitivity to antibiotics, the most effective one is selected.

Result and Discussion

Sulfonamides are prescribed in combination with antibiotics.

To reduce vascular permeability, 10 ml of 10% calcium chloride solution is administered intravenously [8], [9].

Antihistamines (desensitizing therapy) - dimedrol, suprastin, diazolin, etc.

Detoxification therapy.

Symptomatic therapy: pain-relieving, fever-reducing.

Operations are performed in two ways: using a conventional scalpel and electro-surgical [10], [11], [12], [13].

A large defect formed in the oral cavity after the resection of the upper jaw is washed with antiseptics, and hemostasis is performed. The defect is tamponed with a iodoform swab and fixed with a surgical obturator manufactured the day before the operation. An aseptic dressing is applied. In the postoperative period, prevention of pneumonia, oral care, and rational nutrition of the patient are necessary. The next day after the operation, patients are allowed to sit in bed, and on the third day - to walk around the ward [14]. Every day, the doctor should rinse the wound in the oral cavity with antiseptics. Feeding the patient is carried out using a watering can with small amounts (350 g) of liquid or porridge-like food, but frequently (six to eight times a day). The first change of the tampon under a pre-prepared separating plate is carried out after 6-8 days. Frequent swab replacement prevents wound epithelialization. After 2 weeks, further orthopedic rehabilitation begins [15], [16], [17].

Due to the peculiarities of this group of patients, in the elimination of extensive defects arising after radical removal of maxillary sequestra, the orthopedic method has become widespread, where functional and cosmetic defects are eliminated in a relatively short time. These methods are described in the works of I.M. Oxman, V.Yu. Kurlyandsky [18]. Currently, a three-stage prosthetic method is used:

Stage 1 - before the operation, a direct prosthesis is made - a protective plate (surgical obturator/separating plate), which is fixed to the teeth of the upper jaw on the healthy side

immediately after the end of the operation. This plate serves as a kind of bandage in the oral cavity, protecting the wound from contamination and injuries. It also helps the patient take food by separating the oral cavity from the surgical area and holding the tampon [19].

Stage 2 - on the 10th-15th day after maxillary resection, a forming prosthesis is made. The task of this stage is to improve chewing, swallowing, speech formation, prevent the development of scar deformation of the face, and create a bed for the obturating part of the permanent prosthesis.

Stage 3 - on the 30th day, the final prosthesis is made. The tasks of the third stage of prosthetics are to restore the lost functions of the oral cavity (chewing, swallowing, speech), to preserve, if possible, the patient's normal appearance. (R.K. Gasymov, V.V. Agapov) The cause of the formation of a defect in the upper jaw can also be the incorrect course of radiation therapy, the occurrence of radiation osteomyelitis, and consequently, the formation of a bone defect [20], [21], [22].

Acquired defects in the maxillary region can be localized within the alveolar part, within the bony and soft palate, or may be combined. In this case, the defects of the maxilla are isolated or communicate with the maxillary sinus, there may be the absence of one half of the maxilla or the absence of both halves of the maxilla during its complete resection. Providing orthopedic care to such patients presents particular difficulties [23].

The multitude of etiological factors, clinical and topographic-anatomical situations of dentofacial defects, to some extent hinder the creation of a comprehensive and universal classification of this pathology [24].

Currently, there are several classifications: acquired maxillary defects according to V.Yu. Kurlyandsky, depending on the presence or absence of supporting teeth; postoperative maxillary defects according to M.A. Slepchenko, reflecting the most typical types of functional and cosmetic disorders of the maxillofacial region, indicating the presence or absence of supporting teeth and the relationship of the maxillary defect to the defects of adjacent organs and tissues, supplemented by M.Z. Mirgazizov with the following features: etiology, localization, topographical features and defect volume, the nature of previous surgical treatment, and prosthesis fixation conditions [25], [26].

According to the classification of acquired maxillary and mandibular defects according to L. V. Gorbanova-Timofeeva, supplemented by B.K. Kostur and V.A. Minayeva, this pathology is considered depending on the severity and degree of defect or deformation, taking into account the nature of fusion or non- fusion of mandibular fragments.

The authors propose considering 7 classes of acquired maxillary defects, namely:

1. Alveolar portion defects without penetration into the maxillary sinus.
2. Alveolar portion defects with penetration into the maxillary sinus.
3. Bone palate defects: anterior, middle, lateral parts that do not extend to the alveolar part of the jaw.
4. Bone palate defects involving the lateral part of the alveolar part of the jaw on one side, involving the alveolar part on two sides, involving the anterior part of the jaw.
5. Defect of the bony palate and soft or only soft palate.
6. A defect formed after resection of the right or left upper jaws.
7. Defect formed after resection of both upper jaws

A similarly successful principle of defect systematization is presented by J.S. Brown in the clinical classification of upper jaw post-rejection defects, which takes into account four classes of vertical

(surgical) and three subclasses of horizontal (dental) defect components, based on the increasing complexity of surgical and orthopedic reconstruction in each subsequent class and subclass [27].

M.A. Aramany proposed a classification based on the relationship of the upper jaw defect to the remaining teeth, including 6 classes of defects:

1. One-sided defect along the middle line of the palate

2. One-sided lateral defect with preservation

3. Defects of the hard palate

4. Defects passing along the central line of the palate affecting most of the upper jaw

5. Bilateral defects with intact anterior group of teeth

6. Defects of the frontal jaw region with preserved chewing groups of teeth

Conducting plastic restorative surgeries presents significant difficulties due to poor tissue healing due to the abundance of scars after surgery, impaired tissue trophism, the presence of concomitant pathologies in internal organs, or reduced immunity.

Conclusion

The most widespread method in the CIS countries and abroad for closing extensive defects of the maxillofacial region is the orthopedic method, in which the restoration of cosmetic defects can be carried out in a shorter time. Providing patients with temporary and permanent maxillofacial prostheses, taking into account their functional capabilities, reduces the appearance of the face after surgery and allows for the restoration of oral cavity function.

Domestic and foreign researchers [Gadzikuliev A.A.- 2000, Zhulev E. N..2008, Cheng A.S.2004, Davison S.P. 1998,] in their works devoted to the issues of dental rehabilitation of patients with jaw defects note the need for timely manufacturing of dental prostheses and redistribution of functional load. The authors indicate the need for early orthopedic intervention, which will subsequently successfully replace jaw defects and facilitate patient adaptation to dentoalveolar prostheses.

Upper jaw defects are quite diverse in size and shape, which explains the use of various methods for manufacturing prostheses and obturators, the creation of a large number of therapeutic dentofacial and maxillofacial apparatus designs.

When eliminating aesthetic and functional disorders accompanying jaw defects, it is often necessary to resort to both complex surgical treatment and auxiliary orthopedic measures.

Thus, many authors recommend using implantation as a way to increase the effectiveness of complex treatment in patients with maxillary defect. and note that the optimal method for fixing maxillary dental prostheses is a beam structure on implants. But often these events are not available due to the high cost of holding them.

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