



**NEW PERSPECTIVES IN RESEARCH ON THE USE OF
IMPLANTATION MATERIALS IN ORAL SURGERY AND
MAXILLOFACIAL SURGERY (IN THE EXAMPLE SURGICAL
DENTISTRY).**

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The Annotation: The aim of the work is to analyze the data of literature on the use of implantation materials in surgical dentistry and maxillofacial surgery our days, identify the list of unresolved issues and determine the main directions for further research. The analysis of the literature containing information about implantation materials, technology of application and known methods of predicting the results of their use is carried out. The list of analyzed sources of special literature includes: periodicals for the last 10 years. The descriptive method is used for the analysis. Today, specialists have a wide "range" of osteoplastic materials that are constantly updated and refined . Research is conducted in three areas. The first is the development of new and improvement of known osteoplastic materials.

The second is to improve the operational technique of setting and using these tools to compensate for bone defects. The third is the scientific substantiation and implementation of auxiliary tools that have a positive impact on the processes of reparative regeneration of jaw bone tissue and bone remodeling in general. At the same time, in the specialized literature there is no coherent scheme of differentiated approach to the use of osteoplastic materials for



the compensation of jaw bone defects and dynamic monitoring of the patient using both oral fluid indicators and data from acupuncture diagnostic systems. The identified unresolved issues in the use of implantation materials in surgical dentistry and maxillofacial surgery and the identification of ways to resolve them will help to reduce the number of complications, the level of disability and provide cost savings. All this will help to improve the quality of life of patients and increase the level of dental care to the population.

Keywords: implantation materials, acupuncture diagnostic systems, oral fluid, physical and biochemical parameters.

Introduction: At the present stage, the improvement of known and the development of new methods for predicting the results of using and optimizing the processes of osseointegration of implant materials in surgical dentistry and maxillofacial surgery have not lost their relevance and social significance [1, 2].

This is due to a number of factors. First, the prevalence of traumatic injuries of the bones of the facial skeleton [3]. According to the World Health Organization (WHO), injuries are the causes of permanent disability and disability of patients in more than 7 million cases [4]. At the same time, recent years have been marked by a trend towards an increase in the number of injuries of the maxillofacial region from 3% to 8% [5, 6]. According to a number of authors, the proportion of traumatic mandibular fractures in the Russian Federation and countries of the Commonwealth of Independent States (CIS) was 67–92% and 12.2–70.2% in non-CIS countries [4, 7]. Fractures of the upper jaw range from 2% to 6% of the total number of fractures of the bones of the facial skeleton. Recent years have revealed an increase in the indicator to 8–9% [8]. At the same time, the issue of effective treatment of traumatic fractures of the jaw bones is still far from a final decision [9]. Secondly, the number of patients diagnosed with neoplasms affecting the bones of the maxillofacial region continues to increase [10, 11]. According to the literature, out of the total number of cavity formations



of the jaw bones, cysts are diagnosed in 80–95% of cases [12, 13, 14].

The situation is aggravated by the long-term asymptomatic course of the disease, which results in a significant loss of the volume of the jaw bone tissue and the formation of an extensive defect [12, 15]. In addition, cystic formations are distinguished by a high recurrence rate, which, according to various authors, varies from 7% to 56%. Thirdly, there is no tendency to reduce the number of reported facts of both systemic osteoporosis [18, 19] and osteoporosis of the jaw bones.

Fourth, given the aging of the population as a whole, including in the Republic of Belarus [20], there is an increase in the rates of degenerative age-related changes in the skeletal system, including those affecting the maxillofacial region. All of these facts contribute to a significant increase in the number of jaw bone defects and make research aimed at their effective compensation one of the priority areas in dentistry. Purpose of the work: after analyzing the literature data on the use of implant materials in surgical dentistry and maxillofacial surgery at the moment, to identify a list of unresolved issues and determine the main directions for further research. An analysis of the literature containing information about implant materials, application technology and known methods for predicting the results of their use was carried out. The list of analyzed literature sources includes periodicals for the last 10 years. A descriptive method was used to carry out the analysis. Today, specialists have a wide "spectrum" of osteoplastic materials, which are constantly updated and improved, for which very significant financial resources are spent. Work is being carried out in three global areas. The first of these is the development of new and improvement of known osteoplastic materials. The second direction is represented by a sufficient number of studies on the improvement of the operational technique of setting and using the indicated means for compensating bone defects. The third direction includes works devoted to the development, scientific substantiation and implementation of auxiliary



agents (drugs, physical and / or physiotherapeutic effects, as well as their possible combinations) that have a positive effect on the processes of reparative regeneration of the jaw bone tissue and bone remodeling in general. At the same time, the issues of optimizing the use of already known and well-proven ones.

Much less attention is paid to the literature review of osteoplastic preparations, and only a few publications are devoted to predicting the results of their use. Separately, it should be emphasized that, based on the information available in domestic and foreign literature, to date, no attempts have been made to solve the problem of personalizing the use of osteoplastic agents available in the arsenal of medical specialists. The oral fluid at the present stage is one of the promising biological environments for research in terms of diagnosis , prediction and course of pathological processes, as well as for evaluating the effectiveness of therapeutic and rehabilitation measures and dynamic monitoring of the patient's condition. This indicates the possibility of using known biophysical and biochemical tests of the specified biological environment of the human body to monitor the effectiveness of postoperative treatment of patients who have used osteoplastic materials, as well as to predict the development of inflammatory and destructive complications in this variant of rehabilitation care. There are a number of publications in the literature containing information on the dynamic changes in the biochemical and immunological parameters of blood, physico-biochemical parameters and immunological parameters of the oral fluid during damaging effects on the jaw bones. There is information about the dynamics of some biochemical parameters of the oral fluid in the dynamics of the treatment of defects in the jaw bones using bioresorbable membranes . At the same time, in the annals of the scientific literature there is no information on the presence or absence of a correlation dependence of the physical and biochemical parameters of the oral fluid, reflecting the processes of bone remodeling and reparative bone regeneration with the data of reflexotherapy diagnostic systems, a comparative



assessment of their effectiveness when used for the purpose of forecasting has not been carried out. In the available scientific literature at the present stage, there is no coherent scheme of a differentiated approach to the use of osteoplastic materials in the compensation of jaw bone defects and dynamic monitoring of the patient using both oral fluid indicators and data from reflexotherapy diagnostic systems.

Each of these facts, as well as all of them together, testify to the need and expediency of conducting research in this direction, confirm the relevance of the chosen topic and make it undoubted. Conclusion Identified unresolved issues in the use of implant materials in surgical dentistry and maxillofacial surgery, determining ways to resolve them will help reduce the number of complications, reduce the level of disability , and save financial resources spent on the rehabilitation of persons with jaw bone defects. All of the above will help improve the quality of life of patients and improve the level of dental care for the population. Conflict of interest. The authors declare that there is no apparent or potential conflict of interest related to the publication of the article. Financing. The study was not sponsored.

Changes in the socio-economic situation in the Nizhny Novgorod region have led to an increase in the number of patients with severe traumatic injuries of the bones and soft tissues of the face and their complications. The organization of the provision of specialized assistance to victims with craniofacial trauma in the Nizhny Novgorod region, the staff of the department, headed by prof. I.D. Kinyapina , began to study in the late 90s, but problems in the healthcare system did not allow this difficult task to be completed. Development of high-tech assistance and the organization of a specialized department for the treatment of victims of road accidents in the Nizhny Novgorod region on the basis of the Design Bureau named after Semashko was given the opportunity to organize the provision of specialized surgical care to patients with craniofacial trauma at the



modern level, with the involvement of the proper number of related specialists, appropriate emergency examination and treatment, and rehabilitation of patients.

Among the variety of fractures of the bones of the face and their consequences, injuries of the middle zone of the face occupy a special place. With fractures of the zygomatic bone, in 39% of cases there is damage to the orbit in the form of small-comminuted fractures, leading to the prolapse of the entire contents of the orbit, including the eyeball, into the maxillary sinus, leading to infringement of the eye muscles and the development of diplopia. Currently, this global problem is being studied in the doctoral dissertation of N.E. Khomutinnikova . The use of high technologies in the diagnosis and planning of reconstructive treatment of traumatic injuries of the maxillary fossa contributed to the new scientific direction of the department - the development, together with the firm "REPER NN" (Nizhny Novgorod), of a new method for the treatment of fractures of the zygomatic orbital complex and new polymer implants for plasticity of the lower wall of the orbit. Based on the results of this work in 2013, a grant was received from the Nizhny Novgorod region in the field of science and technology. In continuation of the work on the rehabilitation of patients and the development of new modern polymeric materials, the staff of the department, together with the firm "REPER NN", developed and introduced a new polymeric membrane. YES. Mochalova data of an experimental study confirmed the effectiveness of the developed polymer membrane for closing open wound defects in the oral cavity. The author pointed to the activation of early regenerative processes of damaged tissues due to the active construction of granulation tissue and the formation of connective tissue fibers, which led to a significant reduction in the boundaries of the resulting defect and accelerated healing and epithelialization of the wound. It should be noted that scientific research in the field of increasing the efficiency of regeneration of the bone tissue of the jaws and soft tissues of the maxillofacial region and oral cavity is currently a priority



research work for the staff of the Department of Surgical Dentistry.

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