SURGICAL AND ORTHOPEDIC ASPECTS OF PROSTHETICS OF PATIENTS WITH SUPPORT ON IMPLANTS IN COMPLETE SECONDARY ADENTIA

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Abstract: The choice of the design of a prosthesis supported by implants involves following the biomechanical principles that operate in the suprastructure-implant-bone system. The paper presents ways of practical solution of this clinical problem, including a comprehensive clinical examination. A clinical and pathogenetic substantiation of the effectiveness of using this technique in the postoperative period of the surgical stage of detailed implantation is carried out.
Keywords: complete edentia, prosthetics for edentia, implant, bone stress, resorption, mathematical modeling, prosthetic bed.

INTRODUCTION

In case of complete secondary edentia, a comprehensive assessment of the clinical condition of the oral cavity, taking into account individual characteristics, as well as the possibility of developing local and systemic reactions of the patient's body, allows choosing the optimal type of treatment. In the case of prosthetics with support on implants, the technical features of the installation of implants, as well as the quality and nuances of the spatial placement of the installed dentures are of decisive importance for comfortable, long-term wearing of the prostheses and the service life of the abutments that take on chewing and occlusal loads [1].

MATERIALS AND METHODS

The equilibrium state of the kinematic system, which is essentially a masticatory apparatus, is achieved by bringing into correspondence between the curvatures of the articular paths and the masticatory surfaces of the artificial dentition, as well as the height of the tubercular and incisor overlaps with the distribution of the masticatory load along the vertical axis of the implant. The choice of the design of the prosthesis on implants is carried out taking into account the available clinical and morphological data, as well as the state of natural occlusion. In this case, the consequence of an incorrect clinical decision can be the destruction and loss of periimplant bone tissue [2]. In conditions of intact dentition, a significant part of the masticatory load is absorbed by the hard tissues of the tooth, the structures of the periodontium and bone formations in the jaws, being distributed to the periodontal ligaments, the cementum of the roots of the teeth, the internal cortical plates, as well as the spongy substance of the jaw and cranial bones. However, the conditions of complete contact between the implant and the bone exclude the possibility of cushioning due to the above-mentioned elements of the masticatory apparatus, therefore, in the case of overloads, areas of high pressure and impaired blood circulation are subject to the process of bone resorption [4].

RESULTS AND DISCUSSION

In order to achieve good clinical results when performing prosthetics with support on implants, the following mandatory conditions were met:

– the vertical axis of the implant, similar to the extracted tooth, takes on the load from the superstructure, distributed in the plane that is perpendicular to the prosthetic.

– several implants are combined with a prosthesis of a beam, bridge, removable overlapping or combined design.

– the part of the implant immersed in bone tissue always exceeds the length of the free section intended for fixation of the superstructure, and the optimal ratio of the length of the immersed and free parts of the implant is considered to be 2:1.

– the minimum permissible distance between adjacent implants is 5 mm, provided that the thickness of the bone tissue around the circumference of the installed implant is at least 2 mm.
– the most successful results are the bicortical implantation technique, both with one-stage and two-stage implant installation.
– blocking of lower jaw movements by means of the superstructure is not allowed; the dimensions of the tubercle and incisor overlap must be identical.
– the architecture of the chewing prosthetic surfaces implies consistency of the occlusal balance in the sagittal and transverse directions.
– simultaneous prosthetics on the right and left is a mandatory condition that allows preventing overloading of individual sections of the structure.
– the chewing surface of the molars of the diagnostic acrylic prosthetic model must be reduced to 70% while maintaining minimal contacts in the area of the protective tubercles to reduce the load on the implant.
– the fields of functional forces localized in the area of the second premolar and first molar take on the greatest chewing loads, and therefore, the choice and technique of installing implants in this area require special care.
– when calculating the number and location of the implants to be installed, it is necessary to strive for maximum compliance with the number, position and direction of the lost teeth.
– the design of the superstructure must ensure unimpeded implementation of hygienic manipulations. The successful outcome of dental implantation, as well as the service life of the superstructure and prostheses, directly depend on the nature of the stress distribution, on chewing loads and their effect on the surrounding bone tissue. Therefore, the choice of the required number and configuration of implants, their topical and spatial localization in the bone was a primary task for a specialist during the specified type of prosthetics. Of decisive importance in this regard is the idea of the biomechanical relationships between the superstructure and bone formations that act as the foundation of the prosthesis [2, 3]. To create an optimal topographic implantation map, mathematical modeling using the finite element method was conveniently used. In this case, the calculations took into account the biophysical properties of the jaw bones, hard tissues of the tooth and periodontium, as well as the parameters characterizing the implant samples.

CONCLUSION

The biomechanical relationships in the superstructure-implant-bone system are of decisive importance in the implementation of the above-mentioned aspects of prosthetics. In this regard, high-quality osseointegration is the result of establishing optimal interaction between the bone and the implant surface, being a mandatory, but not the only condition for long-term and successful use of the prosthesis. It is also important to observe the topography of the implant location, the technology of their installation, and to correctly select the superstructure model taking into account the individual biomechanical picture of the masticatory apparatus.

REFERENCES:

1. Ginali N.V., Utyuzh A.S., Badebkin E.I. Our experience in treating patients with implants in the area of missing lower jaw molars. International Conference: "Actual Problems of Dental Implantation". Minsk, 2018. P. 46–47.
2. Doroshina I.R., Kristal E.A., Mikhailova M.V., Yumashev A.V. Changes in the chemical composition of dental alloys during casting // Blank production in mechanical engineering. 2014. No. 5. P. 41–44.
3. Zagorsky V.A., Sevbitov A.V., Zagorsky V.V. Effect of threaded implants on bone tissue // Dental South. 2011. No. 6. P. 18.
4. Zekiy A.O. Analysis of inflammation and osteoresorption markers in oral fluid to assess adaptation to dental implants // Bulletin of the Volgograd State Medical University. 2015. No. 4(56). P. 63–66.