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Dental Implantation Planning: Instrumentation and Medication Support

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Abstract: *Dental implantation is widely recognized as a modern and effective treatment method for severe tooth loss. This article examines scientific approaches to planning dental implantation procedures, focusing on the techniques, instrumentation, and medication support involved. It highlights the importance of considering individual patient characteristics, utilizing advanced diagnostic methods, selecting appropriate tools, and integrating pharmaceutical support throughout the process. The study provides recommendations aimed at enhancing the efficiency and outcomes of dental treatment procedures.*

Keywords: *dental implantation, planning, instrumentation, medication support, diagnostics, dental treatment.*

An important point in planning dental implantation is an individual approach. This approach to complex surgical and orthopedic treatment of adentia involves the use of various types of implants based on a preliminary analysis of the anatomical and topographic features of the patient's dental system. The objectives of treatment planning are:

- ✓ determining the optimal prosthetic option;
- ✓ determination of the type, size and number of implants that will allow for rational prosthetics;
- ✓ development of tactics for conducting surgical and orthopedic stages of treatment.

Compliance with the principles and solution of the problems of implantation planning can be carried out only after analysis of the anatomical and topographic and functional features of the dental system, based on results of clinical and radiological examination. The choice of an implant of one or another design depends on the conditions in the oral cavity, is determined by its future function as a support for dentures. An orthopedic surgeon and a surgeon select an implant or implants, their diameter, length and make a plan for surgical and orthopedic treatment. Examination and determination of anatomical and topographic conditions for implantation At the preoperative stage, it is extremely important to correctly determine the size of the alveolar process of the upper jaw or the alveolar part of the lower jaw, the type of edentia, identify the degree of atrophy of the bone tissue of the jaws, assess its architectonics and density to solve the main problems of planning dental implantation and predicting treatment.

Since practitioners solve problems different in clinical situations, it is necessary to study various diagnostic methods, standardize the patient examination scheme for bone-reconstructive surgery in case of bone tissue deficiency. This will allow choosing the most optimal surgical method, determining the amount of biomaterial 38 and deciding on the stage of operations. This position should be used in each individual case of plastic surgery in case of bone tissue deficiency, which will determine different surgical options and the preventive focus of complex treatment of patients to reduce the percentage of complications. Therefore, unified approaches are required in diagnostics and development of

differentiated reconstruction methods in case of bone tissue deficiency on the alveolar process, when performing dental implantation surgery and methods for preventing complications. The dental status is assessed based on the data of clinical examinations of the oral cavity, as well as additional research methods (dental orthopantomography , visiography , tomography), which make it possible to obtain information about the bone volume, create a spatial model of implants. The use of radiation diagnostic methods in planning dental implantology allows choosing the optimal tactics of surgical treatment of patients, and their dynamic implementation in the postoperative period makes it possible to promptly identify developing complications and correct them for successful subsequent dental implantation. The main radiation technique in dental implantology is orthopantomography. At the stage of planning the operation, it is used to assess the condition of the dental arches, the bone structure in the area of the defect of the dental arch. Orthopantomograms are used to determine the height of the alveolar ridges, assess the distance to the upper walls of the mandibular canals and mental openings on the lower jaw, and on the upper jaw - the condition of the lower sections of the maxillary sinuses.

The orthopantomogram is used to determine the condition of the remaining teeth and the height of the bone tissue at the site of the proposed implantation. The height of the bone tissue is understood to be the distance from the crest of the alveolar process to the boundaries of anatomical structures: the bottom of the maxillary sinuses, the pyriform opening, or the mandibular canal. In the frontal section of the lower jaw - from the upper edge of the alveolar process to the lower edge of the jaw. If the patient is in an incorrect position during the examination or 39 the operating mode of the orthopantomograph is disrupted , distortions (increase in size) can reach 32% vertically and 50-70% horizontally. To clarify the size of the bone tissue, the topography of the maxillary sinuses and mandibular canals, lateral radiography of the jaws in oblique projections, lateral cephalography , and computed tomography can be additionally performed. Contact radiography in oblique projections, compared to orthopantomography, provides a more accurate idea of the vertical and horizontal dimensions of the jaws. Lateral Cephalography conveys the dimensions of the jaw bones close to the real ones, allows to establish the contour of the alveolar processes in the frontal sections of the upper and lower jaws, as well as the anatomical and topographic picture of the relationship of both jaws and the proportions of the face with the facial section of the skull. Computer tomography is one of the most informative methods of X-ray examination. With a high degree of reliability, it allows to determine the height and width of the bone, the topography of the mandibular canals and maxillary sinuses, and the features of the architectonics of various sections of the jaws. The most valuable information about the anatomy of the jaws is provided by vertical sections. Their images, obtained using step-by-step, 2-3 mm tomography, allow us to judge the real height and thickness of the bone at the site of the planned installation of implants and display the real picture of the architectonics of the jaw bones. Conducting horizontal step-by-step sections provides information mainly on the width of the bone tissue. But with the help of such sections it is possible to carry out computer reconstruction and establish with sufficient accuracy the vertical dimensions of the bone, the nature of the inclination of the alveolar processes, the relationship of the jaws and the external contours of the facial part of the skull.

In addition, the use of marking marks allows you to plan the installation site of future implants. Orthopantomography is also widely used in the postoperative period, including for the diagnosis of early or late complications. Computer tomography (multispiral CT or dental volumetric tomography), currently used as an additional method, allows you to significantly expand the diagnostic capabilities 40 of orthopantomography . The method makes it possible to measure not only the height but also the width of the alveolar processes, reliably determine the densitometric characteristics of the bone structure of the jaws, assess the course of the mandibular canals, the condition of the mucous membrane of the maxillary sinuses, and identify concomitant diseases. With the help of modern specialized computer tomography programs, it has become possible to create anatomical and three-dimensional models of the jaws, which allows you to correctly plan the implantation operation in complex situations, select the

optimal implants and mathematically calculate the places of their installation. When planning dental implantation, it is necessary to correctly select the implant installation site, the type of implantological system, and estimate the possible number of implants to be installed. Of decisive importance is the bone structure of the jaws, the reliable condition of which can only be judged by the results of radiological examination methods.

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