Clinical and Functional Assessment of the Quality of Prosthetics for Dental Implants Using Early Functional Loads

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In recent years, the interest of domestic dentists in the use of dental implants for prosthetics of dentition defects has increased. The success of dental implantation is largely ensured by the correct determination of the indications for its implementation and the choice of the optimal implant design. The most common today is the technique of intraosseous implantation.

The method of dental implantation has found wide application in the replacement of dental defects. First of all, this concerns osteointegrated implants with an axisymmetric (screw, cylindrical) intraosseous part. The term of operation of modern implants significantly exceeds 10 years. With the help of dental implants, the quality of orthopedic rehabilitation of patients with partial or complete absence of teeth increases dramatically, since implants allow the manufacture of non-removable denture structures with dastally unlimited defects of the dentition and with complete absence of teeth [1.3.5.7.9].

At the same time, practice shows a fairly large number of unsuccessful implantations in the early and, especially, long-term period of implant functioning. The analysis of such complications reveals a certain significance in the appearance of complications of such factors as the number of implants, their size, shape, surface structure; the amount of bone tissue around the implants and its architectonics; the degree of primary stability of implants; the timing of implantation surgery after tooth extraction and the beginning of prosthetics; design features of prostheses.

When planning the features of the application of the dental implantation method, it seems necessary to comprehensively assess the state of the pmgiuitates for the prevention of negative consequences. Related to the inadequate choice of tactics and strategies of orthopedic treatment of the patient using dental implants.

In this regard, it is necessary to integrate all known methods for assessing both the state of bone tissue in the field of implantation and the stability of the implant at all stages of control: before and at the time of implantation surgery, during the healing and osseointegration of the implant, at the time of the start of prosthetics, during dispensary examinations after the end of prosthetics [2.4.6.8.10].

There is a need to clarify the diagnostic and prognostic capabilities of methods that are carried out directly at the dental chair (such as visiography, periotestometry, gnathodynamometry, and especially new methods for analyzing the stability of implants, such as TORC testing and frequency resonance tests using the device in comparison with radiography data.

It is necessary to establish and study parallels between the results of these diagnostic methods, as well as clinical data and the results of biomechanical patterns according to three-dimensional mathematical modeling.

Progressive atrophy of the supporting bone of the alveolar process of the jaws is usually associated with the removal of teeth of a natural bite. The factor leading to bone atrophy is considered to be the loss of a constant intraosseous masticatory load, in connection with which the bone adapts to new

conditions by reducing its size and changing its quality.

The quality and quantity of bone tissue is one of the reliable parameters of successful orthopedic treatment of patients using dental implants. In fact, these parameters determine the processes of bone healing, and the degree of osseointegration of the implant to the jaw bone.

Thus, the problem of bone tissue restoration after the installation of implants, as well as the impact on dental implants of functional chewing loads after dental prosthetics remains relevant today.

The purpose of the study: To study the processes of bone tissue healing in области various implants from early functional load based on clinical and radiological studies

Research objectives:

1. To study the dynamics of bone tissue healing in the area of intraosseous screw implants by orthopantomometry.

2. To study the dynamics of changes in blood supply in the area of missing teeth after the installation of intraosseous implants by laser Doppler flowmetry (LDF).

3. To conduct a comparative analysis of the obtained indicators of orthopantomometry of bone tissue at various times after prosthetics with bridge prostheses based on various implants.

Research materials.

The clinical part of the work will be performed based on the examination of the following groups of patients:

group 1 – 12 patients with small defects in the dentition of the lower jaw, who had intraosseous screw implants installed.

Group 2 – 16 patients with small defects in the dentition of the lower jaw, who had dentures fixed 1 month after implantation.

The control group will consist of 10 people with intact dentitions.

Research methods:

1. Clinical and stomatoscopic

2. x-ray examinations

3. Laser Doppler flowmetry (LDF)

These methods will be carried out by us in all patients in dynamics in 1 month, 3 months, 6 months, 9 months, 12 months.

Based on the planned studies, it will be recommended to use the technique of early functional load on the intraosseous dental implant, which stimulates the processes of bone healing at an earlier time.

Clinical, radiological and functional methods for assessing the condition of the interior and bone dental implants at the time of their disclosure and after two years of operation are: hygiene index OHI-S 0.7 ± 0.5 - 1.9 ± 0.8 (satisfactory level of hygiene); gingivitis index IQ 1.5 ± 0.7 — 2.4 ± 1.1 (moderate severity); the frequency of inflammatory phenomena in periimplant tissues 0.3% — 8.3%; bone resorption in the neck of the implant more than 2 mm 0.8% - 24.9%; bone compaction along the implant 0%-36.6%; the value of the initial torc test 32.9 ± 5.2 N/ cm; indicators of periotestometry -1.0 ± 0.2 - 1.9 ± 0.9; echosteometry indicators 0.296 ± 0.011 cm/mks — 0.312 ± 0.0009 cm/mks; gnathodynamometry indicators 153.0 ± 2.4N — 234.0 ± 6.8N; frequency resonance testing indicators 60.8 ± 8.4 — 72.2 ± 9.6; M.Z. Mirgazizov's implant functioning indicator (norm) 100%-

97.6%; implantation efficiency according to Zarb, Smith criteria 90.3%-75.1.

Implants during the period of osseointegration amounted to 0.4% and 2.72% over two years of operation (mainly -79.5% — in the interval from 3 to 12 months after the end of prosthetics). The main implantation risk factors (baseline conditions) were identified and ranked: the presence of periodontal diseases in the patient, insufficient oral hygiene, short implants, two-stage implantation method, delayed loading of implants, type IV bone tissue, combining the implant with a prosthesis with natural teeth, male persons (especially smokers), lateral mandible, age group 50-60 years [11.12.13].

Diagnostic signs that make it possible to predict the possible failure of implants are: the torc test index when the implant is installed is less than 30 N / cm; bone density according to echosteometry is less than 0.300 cm /mks; the endurance of the implant to a load of less than 140N according to gnathodynamometry; the periotestometry index is about - 1.0; the stability of the implant according to frequency resonance testing below 60 ISQ units. Implants during their functioning are based on a deviation from the average values of diagnostic methods (nomograms) established for different clinical conditions and control periods. The greatest difference in the values of diagnostic tests of successful and failed implants is noted in the sequence: clinical condition of periimplant tissues, X-ray examination of bone resorption around the neck of the implant, periotestometry, gnathodynamometry, frequency resonance analysis. Echosteometry is not informative enough when identifying failed implants.

Conducting clinical and functional studies, namely, X-ray and LDF, contributes to reliable and objective diagnostics, which helps to identify patients with relative indications and planning additional therapeutic and preventive measures in order to reduce the severity of negative reactions to implantation and accelerate the healing process.

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