



CHOOSING THE OPTIMAL METHOD OF PROSTHETICS ON IMPLANTS, BASED ON THE INDIVIDUAL CHARACTERISTICS OF THE PATIENT

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Annotation

Today, dental implantation is one of the most modern methods of treating patients with partial and complete adentia. At the same time, orthopedic aspects of implantology are described little in the available literature, while more attention is paid to the surgical part of implantology. In this regard, in this review, special attention is paid to prosthetics with support on implants.

Keywords: dental implantology, screw fixation, non-removable fixation of an orthopedic structure with support on implants.

Currently, the lack of teeth is an urgent problem for all mankind. Adentia accounts for 15% of the total pathology of the dental system. In 40% of patients over 60 years of age, the absence of teeth was revealed. Most often, patients lose their chewing teeth, mainly the first molars. Defects of dentition in the frontal area are 8.55%; in the area of lateral teeth – 63.19%. Included defects of dentition make up 71.74% of adentia; terminal defects – 28.26%.

Today, dental implantation is actively used for the rehabilitation of patients with partial and complete adentia. This is explained by the fact that prosthetics based on an implant provides the most complete restoration of the masticatory efficiency of the dental system, speech function and high aesthetics in comparison with other types of orthopedic treatment. Moreover, it definitely guarantees a faster adaptation of patients to prostheses. In this regard, partial and complete removable plate prostheses are now recognized as a kind of sign of the impotence of dentists.

Nevertheless, the question of choosing the most rational design based on dental implants still remains unresolved.

Today, the dental market offers a wide range of dental implants. The abundance of their structural elements rather than simplifies, but complicates prosthetics and the choice of the most optimal design. Hence, there is a need to conduct clinical studies and analyze the effectiveness of the use of new and already traditional connecting elements and methods of fixation of orthopedic structures with support on implants.



In the last decade, with the realization of the fact that most of the implants on the market are capable of osseointegration, the focus has shifted from the question of the duration of functioning to more likely complications associated with prosthetics and excessive load on the components of the implantation system.

Prosthetics of the dentition is the final stage after implantation. In this regard, in some particularly difficult clinical situations, the orthopedist has to neutralize the shortcomings of an implantation operation that was not completely successful. Sometimes there are problems when at the surgical stage it was not possible to put the implant head in the intended place. In this case, difficulties arise in the manufacture of a rational design of prostheses on these dental implants. Therefore, an orthopedic dentist should carry out not only prosthetics and subsequent corrective measures, but, if possible, together with the surgeon, take part in drawing up a treatment plan.

When prosthetics, it is necessary to take into account the requirements regarding the implantation procedure itself and proceed from the real technical capabilities of dental prosthetic laboratories.

Today, in the manufacture of structures based on implants, the same basic principles are used as in prosthetics based on natural teeth. First of all, it concerns the choice of the optimal design of the prosthesis, the most appropriate to the features of the clinical situation, the requirements for the accuracy of fixation, as well as the implementation of the physiological concept of occlusion.

At the same time, prosthetics on implants has a number of its own features. A review of the literature shows that each implant design corresponds to a specific denture, its production technique and method of fixation.

First of all, it is necessary to determine how to fix the external structure: on separate, non-interconnected implants (using attachments with spherical heads, telescopes, magnets, etc.), or on rigid structures connecting them (balls or bridges) that better distribute the load. In practice, the choice of the type of connection depends on the experience and preferences of the dentist and dental technician.

Orthopedic surgeon can make a variety of dentures using installed implants as supports. The problem of restoring the integrity of the dentition can be solved by prosthetics according to clearly defined orthopedic indications, taking into account one of the most important criteria for differential diagnosis of dentition defects, which is the clinical condition of teeth preserved on both sides of the defect (with included dentition defects) or teeth preserved on one side (with terminal defects).

Thus, all prosthesis designs with support on implants can be combined into the following groups according to the principle of their fixation: fixed (fixation with cement), removable (screw attachment) and removable prostheses.

If one tooth is missing, the most optimal solution is to manufacture a single crown with the support of an implant.

Here the question arises about the submucosal localization of the implant shoulder and the determination of the angle of inclination of the abutment. Many authors recommend placing the transition boundary between the shoulder of the implant and the edge of the crown below



the gum level at a depth of 0.5 to 1.0 mm. The choice of the angle of inclination of the abutment depends on the specific clinical situation and conditions in the patient's oral cavity (the nature of the defect of the dentition, the shape of the dental arch, the position in which the implant was installed, etc.).



Fig. 1. Angular abutments

In the case when the abutments are displaced sagittal or transversally with respect to the typical position of the tooth, it is difficult to give the orthopedic structure an aesthetic appearance when using straight suprastructures. In this situation, the following solutions to the problem are possible: sharpening the suprastructure to the required angle of inclination, which often weakens them; manufacturing complex collapsible structures of prostheses using a large number of occlusal screws and attachments (requires a high technological level and large financial costs); the use of angular suprastructures, which allows to obtain excellent results and accuracy of the prosthetic design based on any number of natural teeth and implants at minimal cost. Currently, virtually all companies that produce dental implants have such angular suprastructures in their arsenal.

The advantage of using implants as a support for fixed prostheses is indisputable when the teeth limiting the defect of the dentition are absolutely healthy or minimally damaged, and for the preparation of supporting crowns for bridge prostheses they would need to be dissected, and in some cases de-pulped. This is important to take into account, because according to the literature, the number of defects limited to two vital teeth (55.03%) prevails over the limited two devitalized teeth (15.46%).

To prevent overloading of implants, there are several types of structures. These include crushers and load absorbers. In fact, these are semi-flexible locking fasteners or detachable connecting elements with screw or lock fixation, combining parts of a non-removable prosthesis and providing some mobility of one of its parts. The only disadvantage is that the manufacture of dentures with crushing loads is technically difficult and requires expensive equipment.



The same role, in fact, can be played by the use of conditionally removable structures. The threaded connection, as a rule, leaves some mobility of the fixed prosthesis fixed on the implant. Due to this, the risk of its overload is largely compensated. When the chewing load is transferred along the implant axis, the pressure is distributed to the bone tissue and prevents atrophy of the alveolar process. It has been proved that the magnitude of stresses in the jaw under non-removable dentures on implants is comparable to the stresses during the functioning of the natural dentition.

Summing up, we can say that prostheses made for natural teeth and implant heads can be fixed with soft and hard cement, screws, lock fasteners, latches, attachments.

Conditionally removable prosthetics is carried out in the case when only implants are used as a support for a dental prosthesis. In this case, the use of plate implants is contraindicated. The exceptions are cases when the latter are an additional support and are included in a single prosthetic structure together with screw or cylindrical implants.

As an alternative intermediate option for prosthetics on implants and the inability to install the right amount of them, it is possible to manufacture orthopedic structures with a combined support on the oral mucosa, natural teeth and implants.

Prosthetic rehabilitation of a toothless upper jaw is often a challenge in terms of meeting the patient's expectations and achieving a long-term stable result. A removable prosthesis with support on a beam and telescopic crowns is one of the possible solutions that allows you to provide older patients a compromise between function, aesthetics and, very importantly, good access for hygienic care.

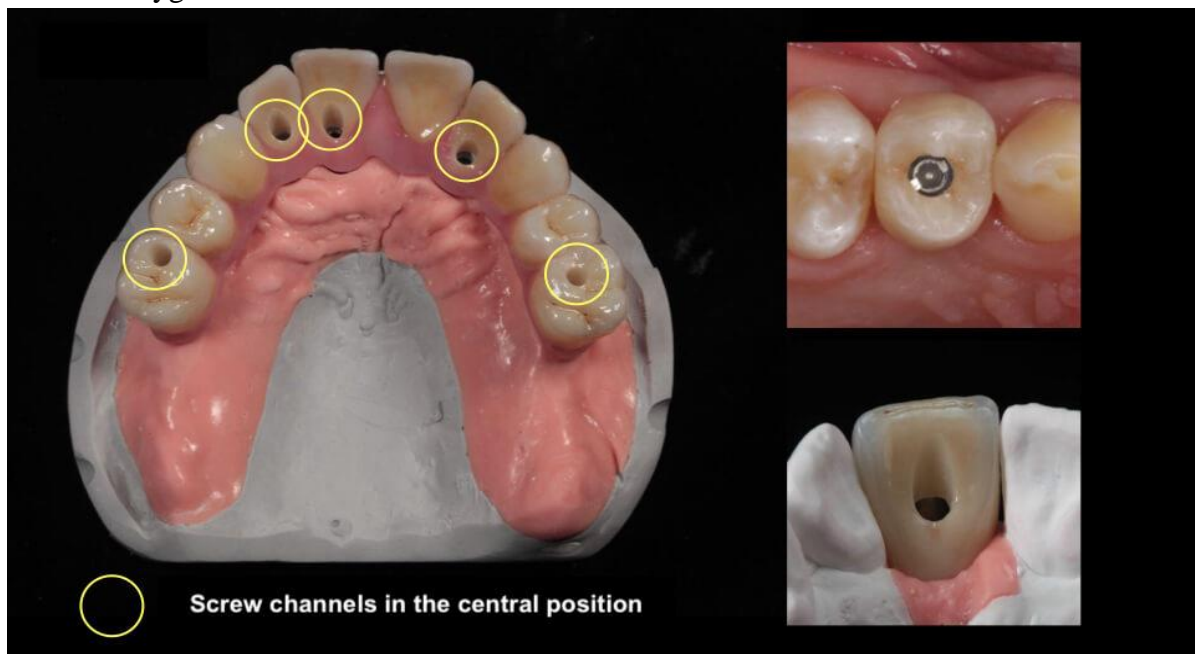


Fig. 2. Conditionally removable prosthetics on implants (screw type of fixation)

Thus, implantation can quite reasonably be considered the "golden" standard of treatment of included defects limited to healthy teeth, regardless of the number of missing teeth, as well as terminal defects and complete adentia. In all these cases, implantation is the only possible



theoretical and practical alternative to removable and non-removable prosthetics. The screw type of fixation of orthopedic structures with support on implants makes it possible to level the chewing load, facilitates work with structures on implants in case of need for repair and repair, and also simplifies as much as possible the conduct of professional oral hygiene in patients with dental implants.

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