



ANALYSIS OF CURRENT DATA ON THE USE OF VARIOUS TYPES OF TEMPORARY STRUCTURES IN PROSTHETICS ON DENTAL IMPLANTS (LITERATURE REVIEW)

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Annotation: The article presents an analysis of current data on the use of various types of temporary structures in prosthetics on dental implants. The advantages and disadvantages of various types of temporary prostheses, such as removable and non-removable structures, as well as adhesive bridges and acrylic crowns, are considered. Attention is paid to the methods of manufacturing temporary structures, including the use of self-hardening bisacrylate composites, acrylic materials and CAD/CAM technologies. Special attention is paid to the role of temporary prostheses in the process of osseointegration, where they help restore aesthetic and functional characteristics, maintain bite height and prevent overloading of implants. The article also analyzes situations when the use of temporary structures is necessary to ensure comfortable rehabilitation of the patient during the period of osseointegration, as well as to minimize the risk of dysfunctions. The article highlights the importance of choosing optimal temporary prostheses, taking into account the clinical characteristics of each patient, as well as the need for further research in the field of temporary prosthetics on dental implants.

Key words: dental implantation, osseointegration, temporary prosthetics.

The progressive development of modern medical technologies has significantly improved the approach to the problem of early aesthetic and functional rehabilitation of patients after the installation of implants. Currently, the use of dental implantation makes it possible to achieve stable long-term results.

The treatment of patients using dental implantation methods requires the use of temporary dentures at all clinical stages — starting with tooth extraction, through the period of osseointegration and up to the creation of permanent dentures [7]. Orthopedic treatment using non-removable temporary structures fixed on implants for several hours (immediate load) or 2-3 days (early delayed load) after surgery is one of the most dynamically developing areas of dental treatment in recent decades.

The use of temporary structures helps to restore the aesthetics of the face, replacing visible defects caused by tooth loss, and also allows you to analyze the shape and color before making the final restoration [3]. An important aspect is also the psychological comfort of the patient after temporary prosthetics.

The need to use temporary prostheses is explained by the long rehabilitation time of patients during the osseointegration of intraosseous dental implants (from 3 to 8 months). Temporary dentures perform not only an aesthetic function, but also contribute to the restoration of chewing function, maintaining bite height, preventing overloading and displacement of the remaining teeth towards the defect, as well as distal displacement of the lower jaw in case of loss of chewing teeth. This, in turn, helps to avoid disruption of occlusal relationships and the development of temporomandibular joint dysfunction. In some cases, temporary prostheses can be made to correct parafunction of the tongue, hypertonicity of the soft tissues of the hyoid region, or during surgical wound healing by secondary tension [9].

According to a number of experts, orthopedic structures used for temporary rehabilitation should be called transitional prostheses rather than temporary ones. This is due to the fact that both temporary and permanent implants can be used as supports, as well as vital or devitalized teeth, which, after completion of treatment, will not necessarily serve as the basis for permanent dentures. It is important that the same teeth can be used for temporary dentures as for permanent ones. In addition, the period of transitional prosthetics may exceed the time allotted for the use of temporary structures.

The immediate load on the implants allows simultaneous functional loading with temporary prostheses. This method has become the most popular among patients, as it significantly reduces the duration of temporary prosthetics and reduces discomfort. Histological studies of biopsies obtained from the bone-implant zone, both in humans and animals, show that immediate loading promotes faster and better bone growth in the implant area than in the case when the implants are not subjected to immediate loading. These techniques are effective only if there is complete primary stability of the implant, which should be within the range of the installation force from 25 to 46 N/cm [7, 11].

It has been experimentally established that multidirectional bundles of collagen fibers form around implants during early functional loads, which contribute to the uniform distribution of the chewing load. Collagen fibers stretch and contract, the implant adapts faster to the bone, and physiological mechanical pressure accelerates the restructuring and thickening of the bone tissue of the alveolar process, providing the process of fibroosteointegration, which, due to the thinness of the fibrous capsule, is close to the process of osseointegration. Subsequently, there is a decrease in coarse-fibrous connective tissue, without signs of inflammation, and a gradual formation of bone tissue.

It has been established that temporary prosthetics on dental implants does not lead to an overload of dental implants and does not adversely affect the osseointegration of dental implants. High primary stability ensures good aesthetic and functional results of immediate temporary prosthetics [9]. The rationale for using immediate loading is not only to reduce the risk of fibrous tissue formation, leading to clinical failure of the implant, but also to minimize the formation of fibrous bone and stimulate the maturation of lamellar bone capable of withstanding occlusal loading [3,4].

Temporary fixed structures on implants can consist of two separate parts (temporary abutment and crown) or one where the temporary crown is connected to the temporary abutment. In the first case, the method of cement fixation is used, and in the second, the screw fixation of the provisional crowns. A number of authors note that the reason for the more frequent development of peri-implantitis during cement fixation, along with an increase in the micro gap between the abutment and the implant when the crowns are loaded, are cement residues along the edge of the crown in contact with the peri-implant gum, which are detected by microscopic examination of the removed crowns. Some authors suggest using temporary abutments and crowns (a method of cement fixation of crowns), others recommend the use of screw-on temporary structures (screw fixation) made of plastic or composite material.

The production of temporary crowns from acrylic plastics has become widespread [13]. Today, self-hardening bisacrylate composites with automatic kneading systems have become very popular among clinicians, which make it possible to quickly create a temporary structure. These materials are characterized by high mechanical properties such as strength and surface hardness, and have good resistance in the oral cavity. Bisacrylate resins do not contain methyl methacrylate, which ensures good biocompatibility of treated crowns and bridges. The use of CAD/CAM technologies makes it possible to create prostheses milled from plastic blocks [8].

In some cases, immediate loading of the installed implant is not possible due to insufficient primary stability of the implant or the presence of dysfunctional conditions. In such cases, temporary structures are used for the period of osseointegration of the implant.

There are several types of temporary orthopedic structures: partial removable plate prosthesis, adhesive bridge prosthesis, as well as temporary bridge prostheses made of plastic or metal [9]. If treated teeth are located next to the implantation area, most often the defect is replaced by a bridge-like structure that rests on these teeth. For temporary bridges used during implantation, the contact of the intermediate part with the mucosa of the alveolar process should be minimal in order to prevent injury to the mucosa and not interfere with wound epithelialization and hygiene procedures.

In cases where adjacent teeth are preserved or when it is impossible to manufacture a bridge prosthesis (for

example, with end defects or large defects), temporary removable prosthetics are widely used. Removable dentures are easy to adjust and provide convenience in the care of the implantation area. However, in most cases, there is no alternative to removable dentures. According to some experts, removable dentures cannot be used for a long time after surgery, as they require frequent adjustments and can exert excessive pressure on the implants, which negatively affects the process of osseointegration.

Adhesive bridges can be used as temporary structures for small defects in the dentition (no more than two teeth) or as an aesthetic prosthesis for the frontal group of teeth. Depending on the manufacturing method, adhesive bridge prostheses are divided into those that are manufactured directly in the oral cavity using fiberglass harnesses and light-curing composite materials (direct method), and into Maryland prostheses that are manufactured using the clinical and laboratory method (indirect method). One of the key features of using adhesive bridge structures in implant treatment is the restoration of aesthetics and function immediately after surgery. These prostheses can be made before surgery, either solid-cast metal or reinforced with fiberglass tape.

According to I.Y. Shirokov et al. [11], when using the two-stage implantation technique for the period of osseointegration, in order to temporarily restore aesthetics, speech and function, as well as fix temporary non-removable dentures, it is necessary to use temporary dental implants (mini-implants). Prosthetics on temporary implants can optimize the rehabilitation period, reduce the percentage of postoperative complications, and significantly improve the quality of life of patients.

Despite the high risk of loss or fracture of temporary implants, a number of authors agree that the installation of temporary implants meets the requirements of direct prosthetics, and orthopedic structures fixed on such implants provide patients with the necessary comfort and avoid removable dentures during implantological treatment [7].

The use of palatine stabilizers for fixing an immediate prosthesis is described in the event that immediately after the installation of implants on the upper jaw it is not possible to fix a non-removable prosthesis on them. The use of various types of temporary orthopedic structures is necessary to ensure that throughout the long-term treatment process during the period of osseointegration of dental implants, the patient "does not leave his usual lifestyle," retains his appearance, and remains socially active.

Thus, the analysis of publications confirms the relevance of the problem of early aesthetic and functional rehabilitation of patients after the installation of dental implants. At the same time, many issues remain unresolved related to the effect of a temporary prosthesis on the density and volume of bone tissue in the jaw and the morphofunctional state of the mucous membrane during the period of osseointegration of implants. It seems promising to further in-depth study of the problem of choosing the type of temporary prosthesis that determines the quality of life of this group of patients.

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