

MEDICAL SCIENCES

RESULTS OF THE APPLICATION OF OVERDENTURES

Mammadova S.

Doctor of Philosophy in Medicine

Department of Orthopedic Dentistry Assistant

Gurskaya N.

Doctor of Philosophy in Medicine Assistant

Department of Orthopedics Dentistry

Azerbaijan Medical University,

Baku, Azerbaijan

Mammadova J.

Dentist

Sumgait Azerbaijan

<https://doi.org/10.5281/zenodo.15220761>

Currently, dental prosthetics continue to evolve, largely due to the integration of various types of dental implants into clinical practice, as well as the ongoing development of dental materials and prosthetics technologies. Modern prosthetics have certain features, mainly due to the increasing use of dental implants. To ensure the reliability of orthopedic treatment, proper preparation of the dental implant site is necessary. Modern endodontic procedures have enhanced the reliability of orthopedic treatments.

In the mid-1970s, with the development of new dental treatments, it became possible to more widely use preserved single teeth, particularly their roots, for dental prosthetics. This led to the emergence of various fixed and removable dentures, in which the remaining roots of teeth served as support. One of the most common orthodontic constructions that emerged during this period was the overdenture. The development of dental implants and the introduction of new approaches to the design of overdentures with implant supports significantly contributed to the improvement of the overdenture prosthetics technology, leading to their more frequent use in clinical practice.

Overdentures are hybrid prostheses, consisting of both fixed and removable parts. The defining feature of these prostheses is the base of the fixed elements of the construction, which are supported by the roots of teeth or implants (Fig. 1). Implants can also serve as support elements for the prosthesis base. These prostheses were designed with the features of the dental status in mind, aiming to slow down or prevent the inevitable atrophy of the alveolar ridge that occurs after tooth extraction. This remains the primary indication for choosing this type of construction [5,6].

Preserved Roots Provide Support and Retention, Enhancing the Fixation and Stabilization of Overdentures

Preserved roots serve as support and retention elements, allowing for better fixation and stabilization of overdentures compared to full removable dentures [1-8]. Additionally, periodontal receptors are maintained, which play a critical role in the neuromuscular function of the masticatory system. As a result, the adaptation process to the prosthesis is significantly facilitated [1,4,5,7,8].

The use of such prostheses aims to improve functional efficiency, shorten adaptation times, and create a favorable psychological environment for the transition to full removable dentures. With the use of dental implants in edentulous jaws, it is possible to transition to overdentures.

The accumulated clinical experience with overdentures requires clarification on several fundamental issues.

Objective of the Study:

Clarification of terminology and classification, as well as the peculiarities of prosthetic treatment with overdentures.

Results:

The term "overdenture" (synonym: "covering denture") encompasses several design variations. It is noted that while overdentures resemble full removable dentures in their external structure, there are significant differences. The external similarity between overdentures and full removable dentures lies in the removable part, which consists of a base, artificial gums, and teeth. However, in the overdenture design, there may be additional elements to interact with the fixed part.

The main distinction is biomechanics. When a full removable denture is used, the chewing pressure from the structure is transferred only to the mucous membrane and then to the bone, which is considered a non-physiological mechanism. In contrast, with an overdenture, the chewing load is distributed through the mucous membrane, the periodontal ligament of the tooth, and the implant to the bone. Thus, the mechanism of transferring chewing pressure is semi-physiological (Fig. 3). Therefore, the biomechanics of overdenture prosthetics have certain advantages in terms of a more physiological transfer of chewing pressure.

Advantages and Disadvantages of Overdentures Compared to Full Removable (Total) Dentures:

When evaluating the features of orthopedic treatment using overdentures, several fundamental disadvantages should be noted:

- The complexity of motivating the patient by the dentist for this type of prosthetics;
- Multi-stage and complex preparation for prosthetics (endodontic treatment, surgical correction of the gums, hemisection of the tooth, etc.);

- Technological complexity in the fabrication of prostheses (use of different fixation methods: telescopic fixation, lock attachments, etc.);
- Higher cost of orthopedic treatment;
- Certain difficulties in prosthesis and oral hygiene care.

Disadvantages of Overdentures Compared to Full Removable Dentures:

In contrast to full removable dentures, overdentures have the following disadvantages:

- Without the removable part, the bite height becomes non-fixed, which leads to a range of problems, the most common of which is temporomandibular joint dysfunction.
- The cost of overdenture prosthetics is significantly higher.
- Maintaining the functioning of the overdenture requires more effort from both the dentist and the patient.

Advantages of Overdentures:

Overdentures have several advantages, which include:

- They help slow down the atrophy of the alveolar ridge by reducing pressure on the mucosa.
- They improve the fixation of removable prostheses in cases of severe alveolar ridge atrophy, thanks to better stability and retention.
- They enhance functional efficiency by transferring pressure to the supporting teeth, offering better stability and retention.
- They allow for a reduction in the size of the prosthesis base, especially on the upper jaw, where the palate can be partially open.
- They require a shorter adaptation period.

Advantages Over Full Removable Dentures:

Thanks to the distribution of chewing load on the mucosa and the periodontal ligaments of the teeth, overdentures offer several advantages over full removable dentures:

- Functional stabilization due to the preservation of the alveolar ridge contours.
- Improved fixation, especially when using attachments.
- Enhanced chewing efficiency due to improved fixation and stabilization.
- Reduced pressure on the mucosal membrane.
- The ability to shorten the base border of the prosthesis (especially the distal border on the upper jaw), which is often psychologically important for the patient.
- Accelerated adaptation, facilitated by all of the aforementioned factors.

Dental Status for Using Overdentures:

There are four main approaches to using these prostheses:

1. **Dental Implantation – Especially in Terms of Social Rehabilitation:** This group includes prosthetics for edentulous jaws using conditionally removable constructions.
2. **Significant Tooth Loss in the Jaw:** This includes prosthetics in cases where only the roots remain in the jaw.
3. **Severe Pathological Tooth Wear.**
4. **Periodontal Disease (Stages II-III).**

Conclusion and Recommendations:

Advances in the improvement of orthopedic treatment using overdentures allow for a broad clinical application. The use of dental implants to support overdentures has become especially relevant in clinical practice. Dental implantation for subsequent overdenture prosthetics enhances the effectiveness of orthopedic dental care. This type of dental prosthesis can be recommended for practical clinical use, including in social medicine.

References:

1. Adaeva I.A. Comparative Characteristics of Overdentures with Different Methods of Fixation and Stabilization: Thesis for Candidate of Medical Sciences. – Smolensk, 2003. – 142 p.
2. Kodjaev M.F., Vorobieva M.V. Use of Single-Standing Tooth Roots in Overdentures // Bulletin of the Medical Internet Conference. – 2014. – Vol. 4, No. 12. – P. 1331.
3. Dembitsky A.V. Indications for the Preservation of Roots and Teeth Suitable for Prosthetics // World of Medicine and Biology. – 2010. – No. 1. – P. 84-86.
4. Dembitsky A.V., Kulginsky E.A. Feasibility of Using Overdentures in the Complex Treatment of Extensive Defects in Dental Arches // World of Medicine and Biology. – 2011. – No. 4. – P. 86-89.
5. Zagorsky V.A. Overdentures. – Moscow: Binom, 2012. – 216 p.
6. Matveev A.P., Sharagin N.V., Chistokhvalov V.V., Kabanov V.Yu. Feasibility of Using Overdentures in the Complex Treatment of Generalized Periodontitis // Dental South. – 2010. – No. 8 (80). – P. 45-47.
7. Sadikov M.I., Nesterov A.M. Use of Overdentures in Cases of Few Teeth on the Jaws // Institute of Dentistry. – 2011. – No. 2 (51). – P. 54-55.
8. Carlsson G.E. Implant and Root Supported Overdentures – A Literature Review and Some Data on Bone Loss in Edentulous Jaws // J. Adv. Prosthodont. – 2014. – Vol. 6, No. 4. – P. 245-252.