

**A COMPREHENSIVE ORTHOPEDIC APPROACH TO THE TREATMENT OF  
PATIENTS WITH COMPLETE SECONDARY ADENTIA OF ONE OF THE JAWS**

*Kuzieva Madina Abdusalimovna*  
*Asia International University*  
*kuzievamadina84@mail.com*

**The abstract**

A method of orthopedic treatment of patients with complete absence of teeth in one of the jaws is proposed, involving the use of a combination of a complete and partial removable prosthesis, which uses lingualized occlusion and volumetric modeling of the base. The effectiveness of the proposed prosthetics method has been proven by clinical and laboratory methods.

**Keywords**

Complete removable prosthesis, atrophy, dental placement, lingual occlusion, volumetric modeling.

The problem of orthopedic treatment of patients with complete tooth loss remains relevant today. Special attention should be paid to cases when teeth are completely missing on only one of the jaws. In this situation, the construction of only one complete removable denture is carried out taking into account the opposite dentition, which can be either intact or with partial defects replaced by fixed or partial removable dentures. In such cases, it is quite difficult to create a balanced occlusion, especially in conditions of hypermobility of the mandible and in the presence of deformation of the occlusal plane. Currently, the issue remains unresolved regarding the features of teeth placement in complete removable dentures on the upper or lower jaw in the presence of an antagonist dentition with a deformed occlusal surface, which does not always meet the optimal option for teeth placement in a complete removable prosthesis.

This paper provides clinical evidence of the relevance and effectiveness of the developed method of orthopedic treatment of patients who have completely missing teeth on one jaw and partial dental defects on the other, using a combination of complete and partial removable dentures. The essence of the proposed technique is that the construction of removable dentures in the absence of teeth on one of the jaws is carried out taking into account the anatomical and topographic features of the maxillary apparatus and in accordance with the rules of the dental arches, as well as an optimally modeled prosthesis within a neutral muscular zone. The use of this technique makes it possible to simulate the prosthesis according to the optimal volume of the prosthetic space and place the prosthesis in a neutral position with respect to antagonizing forces, taking advantage of the functions of the surrounding tissues to improve its fixation. The technique of volumetric modeling of all surfaces of the prosthesis base involves the use of functional samples made up of ordinary movements of the lips, cheeks, tongue and jaw.

The aim of the study is to improve the orthopedic treatment of patients with complete absence of teeth in one jaw and partial defects of the dentition on the opposite side by improving the manufacture of partial and complete removable dentures, which prevents the development of complications in the area of the supporting teeth.

In order to identify potential causes of difficulties in adapting to removable dentures, a study of diagnostic models was conducted in patients who had recently manufactured complete

removable dentures but did not use them. Diagnostic models were fixed in an articulator using a facial arch. As a result of the conducted studies, 67.5% of patients showed the absence of bilateral balanced occlusion, which, in our opinion, worsened the stabilization of removable dentures. Centric and eccentric supracontacts were noted in 45.3% of the surveyed. 37.2% of people needed orthopedic treatment for dental deformities. In patients with an intact dentition without pronounced maxillary deformities, supracontact removal was performed using selective grinding of teeth. Correction of occlusal contacts was performed using the Tekscan T-Scan® III Computerized Occlusal Diagnostic System (Tekscan Inc., USA). The patient was asked to bite the 0.3 mm thick T-Scan III sensor plate, shaped like a dental arch, with maximum effort. The signal from the strain gauge was transmitted to a personal computer processor, where it was processed in the Tekscan III v. 6.0 software environment. Data on the distribution of contact points is presented in the form of a three-dimensional bar chart that changes in real time, displaying the sequence of occlusal contacts in individual areas of the dentition. The load that fell on each tooth was expressed as a percentage relative to the maximum force of teeth compression. The time of occlusal contact and the load distribution between the right and left halves of the mandible were recorded on separate graphs. The areas of excessive load were adjusted, after which the study was conducted again. The procedure was repeated until an optimal result was achieved.

Non-removable structures for the treatment of dental deformities were made in an articulator, taking into account the diagnostic placement of artificial teeth on a toothless jaw.

The next stage of the study was performed in patients with complete loss of teeth in the upper jaw. The individuals included in the study were divided into groups, taking into account the analysis of anatomical and topographic features of the upper toothless jaw (types of toothless jaws according to Schroeder) and the dentition on the lower jaw (intact dentition, the presence of fixed or removable denture structures). Group I included patients with complete loss of teeth in the upper jaw and an intact or restored permanent denture row in the lower jaw. According to the type of toothless upper jaw, group I is divided into 3 subgroups. Subgroup A included patients with the first type of toothless maxilla according to Schroeder, subgroup B – with the second, and subgroup C – with the third type. The second group included individuals with complete tooth loss in the upper jaw and partial denture in the lower jaw, restored with a partial removable prosthesis. 3 subgroups (A, B, and C) were also identified, corresponding to the first, second, and third types of toothless maxilla according to Schroeder.

The mobility of the PSP bases on the upper jaw relative to the prosthetic bed during chewing was analyzed separately in patients of groups I and II. The majority of the examined in group I showed an increase in the mobility of the base of the maxillary spine compared with that in group II. In our opinion, this is due to the high chewing pressure that the chewing muscles develop in patients with an intact dentition or fixed dentures on the lower jaw. Significant differences in the amount of mobility of the PSP base on the upper jaw during chewing were not observed only in individuals with the first type of toothless upper jaw according to Schroeder. In subgroups B and C, patients with chewing noted an increase in the mobility of the PSP base relative to the prosthetic bed. This pattern was typical for the subjects of both groups. In subgroup C, there was significantly greater mobility of the PSP base relative to the prosthetic bed during chewing than in patients with the second type, which, in our opinion, is associated with a deterioration in anatomical and topographic conditions for the stabilization of the prosthesis. However, a decrease in the mobility of the PSP base on the upper jaw in subgroups B and C was found when using lingual occlusion in prostheses compared to PSPs made using classical balanced occlusion. This result indicates an improvement in the stabilization of the maxillary prosthesis during chewing when using lingual occlusion and volumetric modeling of

the prosthesis base in prostheses. In order to study the effect of adhesives on the stabilization of the maxillary joint, the mobility of the prosthesis base relative to the prosthetic bed during chewing was also measured. The Fixodent cream (VOZO, Germany) was used as an adhesive. In the majority of patients in both groups, the use of an adhesive reduced the mobility of the base of the maxillary prosthesis during chewing by an average of 23% compared with the mobility of the prosthesis without an adhesive, with the exception of those classified in subgroup A, in whom the use of an adhesive had almost no effect on the studied indicator. Thus, it was found that from the point of view of stabilization of the upper jaw joint in the second and third types according to Schroeder, the most effective way to set teeth is to use lingualized occlusion and volumetric modeling of the prosthesis base. In this clinical situation, the use of an adhesive significantly improves the stabilization of PSP. With complete loss of teeth in the lower jaw, a comparison of the classical and proposed prosthetics was carried out by examining the electromyographic parameters of the chewing muscles and chewing efficiency. A statistically significant correlation of the results of studies on the types of toothless mandible according to Keller was revealed. In patients with type 2, 3, and 4 of Keller's toothless mandible, who had an intact or restored dentition on the upper jaw with fixed dentures, the proposed technique for manufacturing PSP contributed to a more significant increase in the average amplitude of biopotentials in the bioelectric activity phase of M. masseter and m. temporalis, and a more pronounced decrease in the duration of periods of activity and rest of M. masseter and m. temporalis in patients of the main group compared with the control group in all study periods.

The results obtained indicate the advantages of the proposed method of manufacturing a prosthesis in terms of chewing efficiency in patients with type 2, 3 and 6 of the Keller toothless jaw. It can be stated that in individuals with type 1 toothless mandible, according to Keller, the indicators of chewing efficiency of both methods of manufacturing PSP had no statistically significant differences. However, in patients with intact or restored dentures on the upper jaw, the chewing efficiency was higher than in the examined patients who had a dentition on the upper jaw restored with partial removable dentures. The use of cast metal linings on the chewing surfaces of the molars of artificial teeth in PSP makes it possible to maintain the effectiveness of lingual occlusion for a longer time and slow down the decrease in bite height, which occurs due to the erasure of the tubercles of artificial teeth. 3 years after the application of dentures made according to the proposed method and with metal linings on artificial teeth, there is no significant decrease in chewing efficiency.

#### Conclusions:

1. According to the research results, the presence of maxillary deformities with occlusive disorders occurred in 67.2% of patients, which was the reason for the difficult adaptation to CPD. The elimination of occlusal deformities made it possible for 51.3% of people to successfully adapt to PSP. However, 49.7% noted insufficient stabilization of the upper jaw and difficulties in adapting to prostheses, due to the presence of toothless jaws with unfavorable anatomical and topographic conditions for fixing prostheses (second and third types of the upper jaw according to Schroeder, 2, 3 and 4 types of the lower jaw according to Keller).

2. It is proved that with the first type of Schroeder atrophy, there is no need to apply the technique of volumetric modeling of the prosthesis and lingual occlusion. This is evidenced by the absence of significantly significant differences in the mobility of the PSP base relative to the prosthetic bed during chewing, manufactured according to both the proposed and standard methods. Volumetric modeling of the upper jaw prosthesis and the use of lingual occlusion in dental placement is shown in the second and third types of the upper jaw according to Schroeder. This is evidenced by a decrease in the mobility of the base of the maxillary joint relative to the prosthetic bed during chewing by 1.5 times when using the proposed prosthetics technique

compared with the standard one. The use of an adhesive also helps to improve the stabilization of the maxillary joint during chewing.

3. In patients with type 2, 3, and 4 of Keller's toothless mandible and with an intact or restored permanent denture row on the upper jaw, the proposed method for manufacturing mandibular cupping contributed to a more significant increase in the average amplitude of biopotentials in the bioelectric activity phase of M. masseter and m. temporalis, and a marked decrease in the duration of periods of activity and rest of M. masseter and M. temporalis. This was also typical for patients with type 2, 3, and 4 of Keller's toothless mandible and with the dentition on the upper jaw restored with partial removable dentures.

4. In patients with intact or restored permanent structures of the dentition of the upper jaw with type 2, 3 and 4 of the lower toothless jaw according to Keller, the proposed prosthetics method after 12 months of using the prostheses provided an increase in chewing efficiency by 19, 15 and 10%, respectively (compared with the indicators obtained using the standard technique). In patients with restored partial removable dentures of the upper jaw and with type 2, 3 and 4 of the lower toothless jaw according to Keller, when using the proposed prosthetics technique, an increase in chewing efficiency was observed by 21, 17 and 11%, respectively. With type 1 of the lower jaw according to Keller, there were no advantages of the proposed technique in terms of chewing efficiency. The use of the proposed prosthetics technique in the manufacture of mandibular complete removable dentures has increased the percentage of patients who have successfully adapted to dentures from 51.3% to 97.3%.

5. The proposed technique is unique and has no analogues described in domestic or foreign scientific sources. Conducting further research that will confirm the effectiveness of the developed method and finding ways to improve it is the key to the development of dental science not only in Ukraine, but also abroad.

#### **REFERENCES:**

1. Kuzieva, M., Akhmedova, M., & Khalilova, L. (2025). MODERN ASPECTS OF CHOICE OF MATERIAL FOR ORTHOPEDIC TREATMENT OF PATIENTS IN NEED OF DENTAL PROSTHETICS. *Modern Science and Research*, 4(1), 322-333.
2. Kuzieva, M., Akhmedova, M., & Khalilova, L. (2025). GALVANOSIS AND ITS DIAGNOSTIC METHODS IN THE CLINIC OF ORTHOPEDIC DENTISTRY. *Modern Science and Research*, 4(2), 203-212.
3. Kuzieva, M. A. (2023). Clinical and Morphological Criteria of Oral Cavity Organs in the Use of Fixed Orthopedic Structures. *Research Journal of Trauma and Disability Studies*, 2(12), 318-324. 458 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 3
4. Abdusalimovna, K. M. (2024). THE USE OF CERAMIC MATERIALS IN ORTHOPEDIC DENTISTRY. (Literature review). *TADQIQOTLAR*, 31(3), 75-85.
5. Abdusalimovna, K. M. (2024). CLINICAL AND MORPHOLOGICAL FEATURES OF THE USE OF METAL-FREE CERAMIC STRUCTURES. *TA'LIM VAINNOVATSION TADQIQOTLAR*, 13, 45-48.
5. Abdusalimovna, K. M. (2024). THE ADVANTAGE OF USING ALL-CERAMIC STRUCTURES. *TA'LIM VA INNOVATSION TADQIQOTLAR*, 13, 49-53. 1286 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 6
6. Abdusalimovna, K. M. (2024). Clinical and Morphological Features of the Use of Non Removable Orthopedic Structures. *JOURNAL OF HEALTHCARE AND LIFE SCIENCE RESEARCH*, 3(5), 73-78. 800 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 4 1285 ResearchBib IF- 11.01, ISSN: 3030-3753, Volume 2 Issue 5
8. Kuzieva, M. A. (2024). CARIOUS INFLAMMATION IN ADOLESCENTS: CAUSES, FEATURES AND PREVENTION. *European Journal of Modern Medicine and Practice*, 4(11), 564-570.

7. Kuzieva, M. A. (2024). Malocclusion–Modern Views, Types and Treatment. American Journal of Bioscience and Clinical Integrity, 1(10), 103-109.
8. KUZIEVA, M. A. (2024). MODERN ASPECTS OF MORPHO-FUNCTIONAL DATA AND TREATMENT OF AGE-RELATED CHANGES IN THE MAXILLOFACIAL REGION. Valeology: International Journal of Medical Anthropology and Bioethics, 2(09), 126-131.