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**RESTORATION OF THE FUNCTIONAL AND
ANATOMICAL STATE OF THE DENTOFACIAL SYSTEM
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ABSTRACT

Orthopedic dentistry is a branch of medicine that includes the diagnosis, treatment, and prevention of defects of the dental system. The primary goal of an orthopedic dentist is to restore dental function and aesthetics through prosthetics. The aim of our study was to evaluate the clinical efficacy of modern orthopedic treatment methods for partial tooth loss and their impact on the functional state of the dental system. We examined and treated 140 patients with various dental defects. The results demonstrated the high efficacy of modern fixed and removable orthopedic appliances, which contribute to improved functional and aesthetic outcomes.

**ВОССТАНОВЛЕНИЮ ФУНКЦИОНАЛЬНОГО И АНАТОМИЧЕСКОГО
СОСТОЯНИЯ ЗУБОЧЕЛЮСТНОЙ СИСТЕМЫ МЕТОДАМИ
ОРТОПЕДИЧЕСКОЙ СТОМАТОЛОГИИ****Набиев Рахмонжон Ахаджон угли**Ассистент кафедры Хирургической и ортопедической стоматологии
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Ортопедическая
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несъемные протезы,

ABSTRACT

Ортопедическая стоматология раздел медицины, в который входят диагностика, лечение и профилактика дефектов зубочелюстной системы. Основная цель стоматолога ортопеда восстановление функции и эстетики зубов с помощью протезирования. Цель нашего исследования – оценить клиническую эффективность современных ортопедических методов лечения при частичной потере зубов и их влияние на функциональное состояние зубочелюстной системы. Проведено обследование и лечение 140 пациентов с различными



IF = 9.2

*съемные
денальная
реабилитация.*

протезы,

дефектами зубных рядов. Результаты исследования показали высокую эффективность современных несъемных и съемных ортопедических конструкций, способствующих улучшению функциональных и эстетических показателей.

Introduction. Restoring the dental system using orthopedic dentistry methods includes comprehensive prosthetics to restore chewing efficiency, aesthetics, and speech function. The main methods are divided into fixed prosthetics (crowns, bridges, veneers, inlays), removable prosthetics (full and partial dentures), and implant-supported prosthetics [1, 2].

Partial and complete tooth loss remains one of the most common dental problems worldwide. Missing teeth lead to impaired chewing function, changes in occlusal relationships, overloading of the remaining teeth, deterioration of facial aesthetics and a decrease in the quality of life of patients [3-5].

Modern prosthetic methods allow not only to restore lost teeth, but also to ensure full restoration of chewing efficiency, aesthetics and quality of life for patients [6, 7].

Modern orthopedic dentistry offers a wide range of methods for restoring dental arches, including fixed dentures, removable structures, and implant-supported prosthetics. [8]. Despite significant technological progress, issues of assessing the functional effectiveness of various types of prosthetics remain relevant [9].

A comprehensive assessment of the results of orthopedic treatment allows us

to improve the quality of dental care provided and optimize the choice of treatment tactics [10].

Purpose of the study. To evaluate the effectiveness of modern orthopedic treatment methods and their impact on the anatomical and functional state of the dental system of patients with dental defects.

Materials and methods. The study was conducted at a dental clinic in Fergana between 2023 and 2025 and included an examination of 140 patients aged 30 to 70 years who required orthopedic treatment for partial or complete tooth loss. The average age of the patients was 52.4 ± 1.8 years. Of the patients, 78 were women (55.7%) and 62 were men (44.3%).

Depending on the clinical situation, the patients were distributed as follows: partial tooth loss was diagnosed in 92 patients (65.7%), terminal defects of the dentition – in 31 patients (22.1%), and complete edentia – in 17 patients (12.2%). To comparatively evaluate the effectiveness of various treatment methods, all patients were divided into three groups. The first group included 55 patients who received fixed metal-ceramic restorations. The second group consisted of 48 patients who received metal-free ceramic restorations. The third group included 37 patients who



IF = 9.2

were treated using removable partial or full dentures.

Before treatment, all patients underwent a comprehensive clinical and instrumental examination. This included collecting complaints and anamnesis, a physical examination, assessing the condition of the dentition and periodontal tissues, analyzing occlusal relationships, determining the degree of alveolar atrophy, and performing radiographic examinations. To assess the functional state of the dental system, chewing efficiency was determined using the Rubinov method. Patients' quality of life was assessed using the international OHIP-14 questionnaire. Additionally, photographs were taken of the clinical situation before and after treatment.

A follow-up examination was performed six months after completion of orthopedic treatment. Chewing efficiency, occlusal stability, aesthetics, adaptation to the orthopedic appliances, and patient satisfaction with the treatment results were assessed.

Statistical processing of the obtained data was performed using the SPSS Statistics 26.0 software package. Arithmetic means and standard errors of the mean ($M \pm m$) were calculated. The Pearson correlation coefficient (r) was used to determine the relationship between the studied parameters. Differences were considered statistically significant at a significance level of $p < 0.05$.

Results and discussion. The analysis showed that the use of modern orthopedic devices significantly improves the functional state of the dental system and enhances patients' quality of life. Just six months after

completion of treatment, most patients reported restoration of proper chewing, improved diction, and increased confidence in social communication.

The average chewing efficiency increased from $58.4 \pm 2.1\%$ to $87.6 \pm 1.8\%$ ($p < 0.001$), indicating a significant restoration of the functional activity of the masticatory system. At the same time, a significant decrease in the OHIP-14 quality of life index score was observed from 34.8 ± 1.6 to 14.7 ± 1.2 points ($p < 0.001$), reflecting a reduction in the negative impact of dental problems on patients' daily lives.

Following orthopedic treatment, improvements in occlusal relationships were noted. The occlusal disorder index decreased from 5.6 ± 0.3 to 1.8 ± 0.2 points ($p < 0.001$). Patients also rated the rehabilitation results highly: satisfaction with treatment more than doubled to 8.9 ± 0.3 points, compared to 4.2 ± 0.4 points before treatment ($p < 0.001$).

Particularly pronounced positive changes were recorded in patients in the first and second groups who received fixed prosthetics. This category of patients demonstrated higher chewing efficiency, better aesthetic results, and a shorter adaptation period compared to patients who used removable dentures.

An analysis of aesthetic parameters revealed a significant improvement in the appearance of the teeth and smile. The average aesthetic score increased from 5.1 ± 0.3 to 9.1 ± 0.2 points ($p < 0.001$). Most patients noted a restoration of the natural appearance of their teeth and increased psychological comfort.

After completion of orthopedic treatment, most patients experienced significant improvement in the



functional parameters of their dental system. The most pronounced positive changes were observed in patients who received fixed restorations (Table 1).

Table 1

Main clinical and functional indicators of patients before and after treatment (M±m)

Indicator	Before treatment	After treatment	p
Chewing efficiency, %	58,4±2,1	87,6±1,8	<0,001
OHIP-14 Quality of Life Index, points	34,8±1,6	14,7±1,2	<0,001
Occlusal Error Index, points	5,6±0,3	1,8±0,2	<0,001
Satisfaction with treatment, points	4,2±0,4	8,9±0,3	<0,001
Aesthetic assessment of a smile, points	5,1±0,3	9,1±0,2	<0,001

The data obtained demonstrate a statistically significant improvement in functional and aesthetic outcomes after treatment.

Strong positive correlations were established between the restoration of

chewing function, aesthetic results, and patient quality of life (Table 2).

Table 2

Correlation between clinical indicators (r, p)

Indicator	r	p
Chewing efficiency and quality of life	0,76	<0,001
Occlusion stability and treatment satisfaction	0,71	<0,001
Aesthetic results and quality of life	0,68	<0,01
Adaptation period and patient's age	0,49	<0,05
Precision of prosthetics and chewing efficiency	0,73	<0,001

Correlation analysis revealed a strong positive relationship between chewing efficiency and patients' quality of life (r=0.76; p<0.001), confirming the important role of functional rehabilitation in improving patients' overall well-being. A high correlation was also established between occlusal stability and treatment satisfaction (r=0.71; p<0.001), as well as between the accuracy of orthodontic fabrication and the level of restoration of chewing function (r=0.73; p<0.001).

The results obtained indicate the high clinical effectiveness of modern methods of orthopedic treatment and confirm the need for their widespread

use for the comprehensive rehabilitation of patients with dentition defects.

The study showed that modern orthopedic treatment methods effectively restore the anatomical integrity of dental arches and the functional state of the dental system. The highest efficacy rates were observed with fixed orthopedic appliances, which provide better occlusal stabilization and a shorter adaptation period.

Restoring dental defects significantly improved chewing efficiency, smile aesthetics, and patient quality of life. The results are consistent with current domestic and international



IF = 9.2

research in the field of orthopedic dentistry.

Of particular importance is an individual approach to the selection of an orthopedic structure, taking into account the patient's age, clinical situation and functional state of the dental system.

Conclusions:

1. Modern orthopedic treatment methods allow for the effective restoration of the anatomical integrity of dental arches and the function of the dental system;

2. After orthopedic treatment, a significant increase in chewing efficiency and an improvement in the quality of life of patients is observed;

3. Fixed orthopedic structures demonstrate the highest functional and aesthetic results;

4. A strong positive correlation has been found between chewing efficiency and quality of life ($r=0.76$; $p<0.001$);

5. Comprehensive diagnostics and individual selection of orthopedic structures are the basis for successful dental rehabilitation of patients.

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