

COMPARATIVE EVALUATION OF THE EFFECTIVENESS OF ORTHOPEDIC TREATMENT OF PARTIAL DENTITION DEFECTS USING DIGITAL TECHNOLOGIES

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ABSTRACT

In a number of studies, electronic axiography and digital kinesiography were used to determine the effectiveness of various orthopedic manipulations before and after treatment [V. D. et al., 2014; Persin L. S. et al., 2019; Arutyunov S. D. et al., 2019; Mammadov A. A. et al., 2019; Dubova L. V. et al., 2020; Lebedenko I. Y. et al., 2022]. Individualized methods of using digital and traditional technologies have not been developed in assessing the effectiveness of orthopedic planning and treatment of partially toothless patients, which is the most important direction of their use in clinical practice. The most important of them include evaluating the effectiveness of orthopedic treatment, evaluating the occlusive ratio and the level of its correction, evaluating the effect of established orthopedic coatings on chewing muscles and oral microbiocenosis, determining indications for orthopedic treatment of patients with partial tooth loss. and planning tactics.

Key words: electromyographic, infrared thermometry, PMA, orthopedic treatment, loss of occlusive contacts.

INTRODUCTION

The relevance of research. Indications for the use of various types of locking fasteners of arch prostheses in the prosthetics of patients with terminal defects of the dentition in various forms of atrophy of the alveolar process have been determined.

The possibility of using adhesive technologies to fix the attachments on the supporting teeth is shown, the maximum loads that the adhesive joint can withstand are revealed. A promising area of modern dentistry is the development and use of robotic systems that allow automated manipulations in the oral cavity. If

necessary, it is considered advisable to prepare hard tooth tissues and endodontic treatment, install dental implants, perform reconstructive operations in the maxillofacial system [Ivashchenko A.V. et al., 2020; Trunin D. A. et al., 2022; Mshayo R. et al., 2021]. Thus, despite the widespread introduction of digital technologies into clinical practice, there are still few scientific publications devoted to the comparative assessment of the effectiveness of orthopedic structures made using traditional technologies, 3D printers and milling tools. Quite contradictory opinions can be seen in the data on the comparative accuracy of measurements of prostheses obtained using digital and traditional technologies. Data on the marginal and internal fit of fixed prostheses made using both technologies, the steppe of restoration of occlusive relationships, the effect on the gingival margin and the microflora of the pocket require clarification.

The purpose of the study. A study of the advantages of digital technologies in the treatment of partial dental defects and a comparative assessment of the effectiveness of orthopedic treatment

Research objectives:

1. Conducting a comparative analysis of the internal and marginal compatibility of artificial bridge-like coatings made using traditional and digital technologies.

2. Clinical evaluation of the indicator of loss of occlusal contacts and the effectiveness of correction and use of dental occlusion in artificial bridge coatings made using traditional and digital technologies;

3. Analysis of the results of electromyographic and microbiological examination of the oral cavity in patients of research groups and the study of the state of the subprosthetic mucosa using infrared thermometry;

4. Economic justification of the use of orthopedic structures obtained using traditional and digital technologies.

5. Conducting a comparative analysis of the effectiveness of digital technologies in the production of non-removable prostheses.

Materials and methods of research. The work was based on the results of a survey of 51 people aged 30 to 69 years with bilateral terminal defects of the dentition of the lower jaw who applied for orthopedic treatment, of whom there were 5 men and 46 women.

We divided all the studied patients into two groups, depending on the type of removable prostheses used. The first group consisted of 12 patients whose orthopedic treatment was carried out with removable partial (plate) prostheses made using the technology of the Valplast thermal injection system based on

nylon. The second group consisted of 39 patients who were prosthetics with arch prostheses with clamp fixation according to the classical method.

The second group of patients was also conditionally divided into two subgroups. In the second group, similar clinical signs were the periodontal condition of the supporting teeth, the height of the clinical crowns and the crowned supporting teeth. The difference according to which the distribution by subgroups took place was similar to the first group - the relief of the alveolar ridge in the area of the dentition defect, we used the Elbrecht classification to determine the shapes of the alveolar ridge. To study the effect of arc and elastic prostheses, we used:

To achieve this goal, we conducted research at various stages of orthopedic treatment of patients of all groups:

1. Before prosthetics
2. In the coming days after the application of the prosthesis in the oral cavity
3. One month after the end of orthopedic treatment
4. After one year of using the prosthesis

Clinical research methods:

1. Determination of the condition of the hard tissues of the supporting teeth (the presence of caries lesions, the size and condition of fillings, the presence of non-caries lesions).
2. Determination of the size of the clinical crown.
3. Determination of the condition of the cheap edge in the area of the supporting teeth (color, density, soreness, swelling, hypertrophy or atrophy).
4. Determination of the state of hygiene.
5. Determination of the Muleman bleeding index.
6. The presence and size of the dentoalveolar pockets in the area of the supporting teeth.
7. Determination of the mobility of the supporting teeth.
8. The condition of the toothless alveolar process in the area of the defect (size and form of atrophy).

When analyzing radiographs, we evaluated the following parameters: 1. The condition of the periaspeal tissues of the supporting teeth (the presence of foci of chronic infection).

2. The quality of root canal fillings (in cases where the teeth were previously depulped or treated for complicated caries).
3. The degree of destructive changes in bone tissue in the area of the supporting teeth.

Laser Doppler flowmetry (LDF) was performed using a domestic device "LAKK-01" (laser analyzer of capillary blood flow) equipped with a helium-neon laser (LGN-207B) with a laser radiation power at the output of a fiber optic cable of at least 0.3 MW.

To determine the possible full characteristics of microcirculation, record readings LDF was performed from the vestibular surface in the area of the marginal gum, the attached gum and the transitional fold on the supporting teeth, and in the area of the attached gum and the transitional fold in the prosthetic bed.

The results of the study and their discussion. A comparative assessment of the internal and marginal compatibility of artificial bridge-like coatings made by different methods has been carried out;

Based on clinical and functional studies, the relationship and effectiveness of the use of occlusal contact points against the background of treatment with artificial bridge coatings prepared in various ways were evaluated. For the first time, an analysis of dysfunctional conditions in the masticatory muscles caused by contact surfaces changed under the influence of artificial bridge-like coatings prepared in various ways, in addition, the effect of coatings on microbiological parameters. on the condition of teeth and gums, as well as on the condition of the subprosthetic mucous membrane using infrared thermometry;

Based on the results of the above studies, the economic efficiency of using orthopedic structures obtained using digital technologies is justified;

Conclusions.

1. Deterioration of periodontal microcirculation of the supporting teeth was determined in patients with uneven toothless atrophy the alveolar part.
2. Deterioration of microcirculation of toothless areas The alveolar part was found in patients with a uniform form of atrophy of the toothless alveolar part during prosthetics with elastic prostheses.
3. According to clinical and X-ray studies, no manifestations of functional overload of the supporting teeth were found in the orthopedic treatment of patients with a uniform form of atrophy of the toothless alveolar parts, depending on the design of the prostheses and their supporting elements.
4. When studying the long-term results of prosthetics in patients with an uneven shape of the toothless alveolar part, the greatest clinical manifestations of functional overload of the supporting teeth were revealed.
5. Orthopedic treatment of patients with terminal defects of the dentition with removable dentures based on nylon can be used under the condition of high, intact supporting teeth and uniform atrophy of the toothless alveolar part.

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