



Research Article

ASSESSMENT OF MORPHOLOGICAL AND FUNCTIONAL STATE OF PARODONTAL TISSUES OF PERSONS RECEIVING ORTHODONTIC TREATMENT

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ABSTRACT

Dental anomalies belong to the group of major dental diseases and are characterized by a high prevalence. Currently, the prevalence of dental anomalies in children and adolescents in the CIS countries is 50-80%, while 37% of the population needs specialized orthodontic care (L.S. Persin, 2014).

KEYWORDS

Dental health index, periodontal disease, taste analyzer, chronic generalized periodontitis.

INTRODUCTION

The introduction of new technologies and materials into dentistry makes it possible to

achieve optimal functional and aesthetic results in the process of orthodontic treatment using

fixed appliances (Arsenina O.I., 2018; Alexander W., 2018; McLaughlin R., 2015; Proffit W., 2013). If previously removable devices were used in 90% of cases, they are currently used only in 16% of cases. Today, 84% of patients are treated using fixed equipment (N.M. Shulkina, V.A. Uskova, M.V. Shulkin, 2019).

However, despite the undeniable advantages of using a bracket system, brackets fixed on the teeth, rings, arcs, wires, ligatures, springs significantly complicate oral hygiene, which leads in 32.7% of cases to damage to the hard tissues of teeth, mostly immune to caries. surfaces, and in 92% there is an unfavorable condition of the periodontium. The percentage of complications (discoloration of the tooth enamel around the braces, the formation of white spots and enamel defects, the development of inflammatory periodontal diseases - gingivitis, periodontitis) detected during orthodontic treatment remains high - from 32.7 to 50% (Kiselnikova L.P., Ramm H.L, 2016, Medvedovskaya N.M., 2017).

Violations of the occlusion of the dentition increase the risk of other dental diseases and complicate the process of preparing food for digestion and assimilation, create aesthetic and related psychological problems. Actual or

imaginary cosmetic flaws that accompany anomalies in the structure of the dental system can become a source of moral suffering and inferiority complexes for a person.

The prevalence of inflammatory periodontal diseases remains at a high level (Domasheva N.N., 2018; Bodet C., Chandad F., Grenier D., 2017), while the clinical picture of chronic catarrhal gingivitis, as well as the early stages of chronic generalized periodontitis, is characterized by low-manifest and latent course, which complicates timely diagnosis and, therefore, delays the start of adequate therapeutic and rehabilitation measures. The prevalence and intensity of dental diseases in people with orthodontic structures is more pronounced than in patients who do not use them.

Studies on the prevention of dental diseases during orthodontic treatment are numerous, but there are still no clear criteria for assessing the condition of periodontal hard tissues, the complexes of preventive measures necessary to maintain the health of periodontal tissues in different age groups using non-removable orthodontic equipment have not been differentiated.

In this regard, the development and improvement of methods for early diagnosis and prevention of initial forms of dental caries and inflammatory diseases of periodontal tissues during orthodontic treatment is one of the urgent tasks that need to be resolved. At the same time, this problem, as well as information about the means of preventing pathological changes that occur in the oral cavity during treatment with bracket systems, remain insufficiently studied.

The purpose of this study is to study the morphological and functional state of periodontal tissues during orthodontic treatment.

Modern orthodontic structures in the form of removable and non-removable structures have become more and more widely introduced into dental practice in the treatment of various dentoalveolar anomalies.

Among orthodontic structures, non-removable orthodontic equipment has become much more often used, which has expanded the possibilities for correcting dentoalveolar anomalies. According to V. Ressi (2016), a dentist often treats patients as part of a comprehensive treatment involving other dental specialties and specialties of related areas, while excellent results of

orthodontic treatment of dentoalveolar anomalies are noted both in adolescents and in adults.

MATERIAL AND RESEARCH METHODS

To study the morphological and functional changes in periodontal tissues, an in-depth dental examination of persons with periodontal diseases, who are undergoing orthodontic treatment in the regional dental clinic in the amount of 38 people - the main group, as well as 20 patients who do not have dentoalveolar anomalies, was carried out. They were taken as a comparison group.

RESULTS AND DISCUSSION

Orthodontic treatment, which is aimed at correcting irregularly located teeth, their crowding, normalizing the ratio of teeth, can be the cause of periodontal disease as a result of changes in the state of the tissues that surround the teeth.

Dental anomalies are characterized by serious violations of the ratio of teeth, expressed in a decrease in the effectiveness of the functions of the temporomandibular joint, in the development

of the pathology of the masticatory apparatus, as well as in the appearance of cosmetic defects, which reduces the mental balance of patients, which leads to the appearance of complexes, isolation, etc.

Treatment of developed dentoalveolar anomalies and deformities of the maxillofacial area today is carried out both with the help of removable orthodontic structures (ROS) and fixed orthodontic structures (FOS).

We conducted a marketing survey to find out the demand of people for the proposed dental services (correction and normalization of bite). According to a marketing survey, scientists came to the following conclusion: more than half of the respondents have no idea about the word "braces"; for the sake of cosmetic well-being and healthy teeth, 72% of respondents, mostly female respondents, agreed to endure inconvenience, but a very small contingent of the population agree to pay for this large finances; the population has come to terms with the fact that the use of braces when necessary is of great importance for the dental health of the oral cavity and the beauty of the teeth, and most of them think that this is necessary; almost 45% of those surveyed think

that even bite and beautiful teeth have nothing to do with being beautiful.

Bleeding gums, the presence of plaque, shallow periodontal pockets in young people who do not observe oral hygiene, especially in people with orthodontic appliances, and who do not receive appropriate medical care, lead for several years to severe and persistent periodontal diseases (periodontitis), requiring long-term and complex treatment.

If the microbial flora of the oral cavity in healthy people has a relative constancy, which is considered normal, and this symbiotic microflora also acts as a barrier, preventing the development of pathogenic microorganisms in the oral cavity from the external environment, then a violation of this ratio leads to an increase in the total number of microorganisms and vegetation in the mouth area of strains of microorganisms that are not characteristic of this area of the human body. Decreased immunity in this case can lead to the occurrence of inflammatory processes in the oral cavity.

Orthodontic treatment suppresses the factors of local immunity of the oral cavity, manifested by a decrease in the activity of lysozyme (by 99.8%,

26.6%, 10.89% and 53.5%, 10.09%, 4.08%, respectively) and the concentration of slgA in mixed saliva (by 129.09%, 62.29%, 22.89% and 83.51%, 34.42%, 14.59%, respectively) in groups 1 and 2 on day 7, after 1 and 3 months after fixation of non-removable equipment.

During orthodontic interventions, accompanied by prolonged use of appropriate equipment, overload of individual teeth, severe complications from the periodontium often develop, tissue nutrition is disturbed due to compression and thrombosis of blood vessels and venous circulation disorders. Orthodontic appliances contribute to the retention of food residues of plaque. The oral surface of the gingival faye suffers most often, especially when using plates with vestibular arches that compress the gum tissue, injuring them during prosthesis microexcursions.

The functional state of the periodontium is heterogeneous in the process of orthodontic treatment of crowded teeth. The decrease in these parameters in the future is due to the adaptation of the support-retaining apparatus of the tooth to the applied load, which is consistent with the data in the works of Lobanov Yu.S. (2014).

Thus, one of the main factors that play an important role in the occurrence of periodontal disease in persons using orthodontic appliances is the very presence of this appliance, as well as poor oral hygiene, which leads to an increase in the contamination of the oral cavity with various opportunistic microorganisms, which, in turn, can be causative agents of inflammatory processes in this area.

That in children with dental anomalies and deformities at the stages of instrumental treatment, when using removable and non-removable devices, an imbalance of the immune system develops.

The decrease in the effectiveness of preventive measures and remedies in children with dentoalveolar anomalies and deformities is due to the development of periods of immunological stress when using a bracket system.

A study of the state of the periodontium in the process of orthodontic treatment of crowded teeth in patients aged 13-18 years, conducted by Pankratova N.V. and A.B. Slabkovskaya A.B. (2016) made it possible to establish that the incorrect position in the dentition reduces the

endurance of their periodontium to horizontal load.

The dynamics of indicators of cellular and humoral immunity at the stages of orthodontic treatment is associated with the type and duration of instrumental treatment. In children with dentoalveolar anomalies and deformities treated with removable appliances, periods of immunological discoordination occur 5 and 15 months after the fixation of orthodontic appliances. Children with dento-maxillary anomalies and deformities who are being treated with a bracket system have the same periods of immunological stress, but the signs of imbalance are more pronounced in them.

Orthodontic treatment using removable and non-removable appliances has a negative impact on the tissues of the oral cavity. Children with dental anomalies and deformities treated with removable and non-removable appliances differ from children with dental anomalies and deformities without orthodontic treatment in the dynamics of clinical indicators of the state of the cavity mouth.

At the stages of orthodontic treatment (after 15, 24, 36, 48 months), they have higher values of

hygiene indices, PMA, KPU(h) and KPU(p) indices, a higher rate of growth of dental caries, a higher value of the TER test, a greater prevalence of caries in the stain stage.

Orthodontic treatment contributes to a decrease in the level of oral hygiene by 26.8% on the seventh day after the fixation of fixed equipment.

The complexity of dental treatment and prevention is, according to the timing data: the course of treatment of periodontitis is 3.1 hours, gingivitis is 1.08 hours, the manufacture of an occlusal splint is 0.86 hours by a doctor and 1.08 hours by a dental technician, the application of a composite filling is 0.60 hours, making a ceramic inlay 1.10 hours at the doctor's and 2.5 hours at the dental technician, endodontic treatment with restoration of the tooth with a light composite 1.47 hours (with revision of the sealed root canals 2.1 hours) (with the restoration of the ceramic inlay of the tooth during the primary and repeated endodontic treatment 1.56 hours and 2.36 hours at the doctor and 2.5 hours each at the dental technician), tooth extraction 0.58 hours, professional hygiene at the dental hygienist 0.99 hours, remtherapy 1.23 hours, dispensary examination 0.31 hours.

Thus, morpho-functional methods for determining changes in the state of the periodontium in individuals. Being on orthodontic treatment, which is an economical, non-invasive method for assessing bacterial contamination of the oral mucosa, is recommended for use in the practice of orthodontists.

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