

**IMPROVING METHODS FOR PREVENTING COMPLICATIONS
ARISING IN PERIODONTAL TISSUES DURING ORTHODONTIC**

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Abstract: The scientific article is devoted to a topic that is relevant for modern dentistry - inflammatory complications that arise in periodontal tissues when using braces. The problems of this study are based on the fact that brace systems are widely used in modern dentistry, and the consequence of their use can be inflammation of periodontal tissue caused by a number of factors, among which the main one is the deterioration of natural oral hygiene.

Keywords: Periodontium, braces system, method, orthodontic treatment.

INTRODUCTION

Currently, one of the priority and widespread treatment methods in orthodontics is the use of braces. Orthodontic devices of this type are distinguished by their versatility, relative ease of use and high efficiency. The method allows the patient to move teeth comfortably in any direction. It is indicated and effective in the treatment of both anomalies in the position of individual teeth and their groups, and violations of occlusal relationships and can be successfully used in children and adults [1-2].

MATERIALS AND METHODS

One of the types of complications when using brace systems is the danger of periodontal damage, which arises due to deterioration of the processes of natural oral hygiene and changes in the composition of the microflora of the mucous membranes of the gums, local immunity and disruption of metabolic processes due to restructuring in the tissue and the bone complex of periodontal tissues. The infectious and inflammatory process that arose against this unfavorable background is characterized by a tendency toward constant chronicity and is characterized by a persistent course that is difficult to treat [1]. Considering that, structurally and functionally, periodontal tissues (soft and bone structures) represent a single whole, it can be assumed that the results of orthodontic treatment depend on its condition. However, to date, the pathophysiological mechanisms of the influence of the inflammatory process in periodontal tissues on the results of orthodontic treatment using braces have not been sufficiently studied. There is no data on the effect of this complication on the timing of tooth movement, the completeness of the reconstruction of bone structures, the duration of the retention period in general, etc.

We examined 48 patients with anomalies in the position of the teeth and anomalies of the dentition, the closure of the molars was physiological, aged from 18 to 32 years (on average 24.5 ± 1.2 years). Of these, 29 (60.4%) patients were female and 19 (38.6%) were male. All subjects were without somatic pathology and practically healthy in general medical terms. The study included individuals with intact teeth and periodontium.

RESULTS AND DISCUSSION

The initial data that characterize the clinical condition of the gum mucosa in both groups turned out to be identical. The examination did not reveal signs of inflammation of the marginal periodontium in all patients before the start of

orthodontic treatment. The hygiene index in the analyzed patients ranged from 0.6 to 2.0 and averaged 1.4 ± 0.3 , which indicated good hygienic care for the oral cavity. The bleeding index was negative and corresponded to pale pink gum, normal density and anatomical size.

Regardless of the type of orthodontic pathology, already one to two months after the application of braces, 22 patients showed a deterioration in oral hygiene, the appearance of bleeding gums, a violation of the natural color of the gingival tissue (cyanosis), and in some cases an increase in their size, due to tissue swelling. The occurrence of marginal inflammation in the periodontal tissues in these patients served as the basis for their inclusion in group II of the study. The identified changes in the gingival tissue in patients of group II, as shown by further studies, were associated with changes in the microbiocenosis of the periodontal sulcus and local immunity, most likely due to a sharp deterioration in the hygiene index. Thus, in patients of group II the highest value of hygiene indices was determined (from 1.8 to 3.0), on average (2.47 ± 0.24), while in representatives of group I the analyzed indicator at this stage of the study was practically not subject to dynamic changes and corresponded to the level of the accepted norm. This difference in the hygienic state of the oral cavity in patients of group I was due to the preservation of the biocidal properties of the mucous membrane of the gingival tissue, as evidenced by their slightly reduced sIgA and IgM levels. At the same time, in group II of patients, a significant decrease in the production of these immunoglobulins was observed after one to two months and occurred against the background of unsatisfactory oral hygiene (Table 1). Apparently, the hygienic state of the oral cavity and the functioning of local immune defense factors in patients with braces are interconnected. It was subsequently established that the identified changes in the concentration of sIgA in mixed saliva reflect the development of the inflammatory process in the marginal periodontium and, in all likelihood, they lead

to disturbances in the microbiocenosis of the gingival sulcus and the formation of a bacterial plaque on the hard tissues of the teeth.

Table 1

The importance of the hygiene index, bleeding and local immunity indicators in the process of treating orthodontic pathology in patients of groups I and II

Indicators studied	Survey groups	
	Group I patients	Group II patients
Hygiene index (standard units)	1,26 ± 0,2	2,47 ± 0,24*
Bleeding index (arbitrary units)	0,24 ± 0,02	2,18 ± 0,2*
sIgA (g/l)	0,88 ± 0,03	0,23 ± 0,02*
IgG (g/l)	0,46 ± 0,02	0,68 ± 0,02*
IgM (g/l)	0,28 ± 0,02	0,31 ± 0,03

Note: *p<0.05 is significant in relation to the indicators of group I patients.

And so, the presented data are convincing evidence that the development of inflammatory complications in the marginal periodontium is associated with changes in the hygienic state of the oral cavity, caused by a deficiency of local immune defense factors and profound changes in the microflora of the periodontal sulcus, which is manifested by a decrease the ecological significance of symbiops (lactobacteria) and an increase in the frequency and density of colonization of the gingival econiche by streptococci, Staphylococcus aureus and fungi of the genus Candida.

At the next stage of the study, the influence of inflammatory complications in the marginal periodontium on the results of orthodontic treatment of anomalies of

individual teeth and dentition was studied. An analysis of the changes that occurred in the dentofacial apparatus was carried out according to clinical and radiological indicators in comparison with those on the obtained anatomical models in patients from different observation groups.

CONCLUSION

1. The development of gingivitis when using fixed orthodontic equipment, including braces, occurred against the background of deterioration of the hygienic condition of the oral cavity, profound changes in the microflora of the periodontal sulcus, which is manifested by a decrease in the environmental significance of symbiotics and their replacement with strepto - and staphylococcal flora, and is also due to a decrease in the bactericidal capacity of the gingival tissue mucosa.
2. A long-term generalized chronic inflammatory process in the marginal periodontium determines the acceleration of tooth movement when using brace systems for 2-3 months, but at the same time helps to slow down the restructuring of the bone structures of the alveolar process and lengthen the retention period by 4-5 months.

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