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EFFECTIVENESS OF COMPLEX TREATMENT OF CHRONIC PERIODONTITIS IN PATIENTS WITH ORTHODONTIC STRUCTURES

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Abstract
The article is devoted to the analysis of the effectiveness of complex treatment of periodontal diseases in patients using orthodontic devices. The study covers patients with various degrees of periodontal pathology undergoing treatment. In the course of the work, methods of professional hygiene, antiseptic therapy and individual monitoring were used. The results showed a significant improvement in clinical indicators, such as a decrease in the depth of pockets and a decrease in inflammatory processes in the gum area. The work emphasizes the importance of a multidisciplinary approach to the treatment of patients with orthodontic structures.

Keywords: Orthodontic apparatus, chronic periodontitis, constipation, hygiene treatment.

Introduction

Orthodontic treatment is an important part of dental practice and is also seen as a risk factor for the development of iatrogenic diseases(1,4,8,13). At the same time, the problem of obesity as a metabolic disorder is gaining increasing importance in the medical community, as it negatively affects many aspects of health, including oral health. Therefore, studying the relationship between orthodontic treatment and obesity remains a pressing task. In this regard, studying the relationship between orthodontic treatment and health status in the presence of obesity is a pressing task (2,5,7,9,11).

Smile aesthetics, proper dental alignment, and health are important not only in terms of social image, but also as indicators of overall health. Considering the impact of obesity on immune and inflammatory processes in the body, studying its relationship with orthodontic treatment and iatrogenic pathology remains essential for developing comprehensive approaches to improving public health and preventing dental diseases (3,5,12).

Chronic periodontitis (CP) is an inflammatory-destructive disease that develops under the influence of infectious agents. The development and progression of such a disease can be influenced by local factors manifesting in the oral cavity, as well as by systemic somatic diseases that activate local inflammatory processes and impair the nutrition of periodontal tissues at the microcirculation level (6,8,10,13). Thus, the study of this issue is of not only medical but also social importance, emphasizing the need to integrate knowledge about metabolic health into orthodontic treatment practice (2,5,7,8,9,12).

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Taking into account the above, we set the following goal: to assess the effectiveness of complex treatment of chronic periodontitis in patients with orthodontic structures and to identify optimal methods of oral care to improve the condition of the periodontium.

Material and Methods

The study will use a prospective longitudinal design to collect data on periodontal parameters (such as pocket depth, clinical attachment level, bleeding on probing) and biochemical characteristics at baseline and after 6 months. The sample size will be calculated based on precise analyses to ensure statistical significance.

The studies were conducted from 2022 to 2024 at the Department of Orthopedic Dentistry and Orthodontics of Andijan State Medical Institute and the Tashkent State Dental Institute. When forming the groups, gender, age, and coexisting somatic pathology were taken into account. A total of 50 patients (32 women and 18 men) with various dental and jaw system anomalies were examined at the Department of Orthopedic Dentistry and Orthodontics of Andijan State Medical Institute and the Tashkent State Dental Institute. Their ages ranged from 15 to 40 years, with an average age of 23.3±7.9 years. We performed complete dental rehabilitation of the oral cavity. Pathologies of the hard tissues of the teeth were treated, professional cleaning of the teeth was performed with the removal of supragingival and subgingival tartar using the Cavitron apparatus. After professional removal of dental deposits, we polished and cleaned the teeth with toothbrushes using toothpaste to remove hard deposits. In patients with chronic injuries of the mucous membrane, the cause of the injury was eliminated, the fillings were polished and corrected. Patients with diseases of the oral mucosa were treated using generally accepted methods. Orthodontic treatment during the period patients receive SPLAT SMILEX ORTHO+ orthodontic soft toothbrush , SPLAT® Professional ACTIVE toothpaste for healthy gums, 100 ml and SMILEX ORTHO+ 3 in 1, mint flavor, 50 ml. Recommendations were given on proper motivation for using hand sanitizer and teaching hygiene skills .

Results

The high effectiveness of the treatment was observed in both comparison groups. Patients' complaints disappeared or decreased, their general condition returned to normal, unpleasant odors disappeared or became less noticeable, and most clinical symptoms significantly improved (gingival bleeding decreased, the depth of periodontal pockets (PP) and tooth mobility reduced, discharge from PP decreased or disappeared, and oral hygiene improved).

In the first control group, the gingival bleeding index (compared to bleeding before treatment) decreased by 41.89% ($P<0.01$); in the second experimental group, it decreased by 62.28% ($P<0.01$)."

After treatment, the study of the clinical characteristics of periodontal defects showed that after the completion of treatment, the average periodontal pocket (PP) score in the control group decreased by 51.76% ($P<0.01$); in the experimental group, the reduction in the PP score was 61.6% ($P<0.01$). Significant differences were observed in the treatment outcomes based on the OHI-S (Oral Hygiene Index-Simplified) and GPI (Gingival Periodontal Index) indices: the treatment results in the patients of the first group were less effective. Thus, in the first group, the average OHI-S index score decreased by 60.37% after treatment ($P<0.01$); in the second group, it decreased

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by 79.80% (P<0.01). The reduction in the average GPI index score was 52.1% (P<0.01) and 65.31% (P<0.01) in the first and second groups, respectively.

By comparing the severity of clinical manifestations of periodontal disease (PD), gingival bleeding, tooth mobility, hygiene status, gingival inflammation, and periodontal destruction, we can conclude that there is a significant difference in treatment outcomes: the treatment results were lower in the patients of the first group. The quantitative values of the reduction in the studied clinical signs of PD in the compared groups are shown in Figure 10.

One of the most important indicators of the effectiveness of ongoing complex therapy is the duration of treatment. Thus, in the first group, 6 (15.79%) patients and in the second group, 11 (28.95%) patients were treated for 10-15 days; the corresponding ratio for a treatment duration of 16-20 days was 10 (26.32%) and 12 patients (34.19%); for a treatment duration of 21-25 days, it was 11 (28.95%) and 9 (23.68%) patients; and for a treatment duration of 26-30 days, it was 4 (10.53%) and 13 (34.22%) patients. The total duration of treatment was 26.42 days in the first group and 19.27 days in the second group.

Clinical Case №1. Patient A.D., 20 years old.

Complaints: Gingival bleeding during tooth brushing, tooth mobility, and bad breath.

History: The patient has been undergoing orthodontic treatment for 3 years but has not achieved the desired results. The patient consulted an orthodontist due to the dystopic position of the teeth and the presence of clicks in the temporomandibular joint. The braces system installed on the patient had excess adhesive material around the brackets that was not removed. Additionally, the patient does not maintain proper oral hygiene. As a result, plaque has accumulated around the brackets and in the gingival area, leading to chronic inflammation of the gums.

Objective Examination: The gingival mucosa is red and hyperemic, with supragingival and subgingival calculus present. Periodontal pocket (PP) depth = 5.8 mm, pathological tooth mobility of grade I, PI (Plaque Index) = 5.1 points, recession index = 29.15%. The periodontal condition was assessed using indices, with the PMA index = 25% (chronic catarrhal gingivitis). The patient has an open bite and skeletal Class II with normal vertical growth. Protrusion of the upper and lower frontal teeth is observed (see image)

Anthropometric Data: BMI = 32.5, which corresponds to a diagnosis of first-degree obesity. Additionally, WHR (Waist-to-Hip Ratio) = 1.2, indicating an abdominal type of fat distribution.

Blood Test Results: CRP (C-reactive protein) = 0.6 mg/L, cholesterol = 7.9 mmol/L, triglycerides = 3.13 mmol/L, high-density lipoproteins (HDL) = 0.92 mmol/L, low-density lipoproteins (LDL) = 4.67 mmol/L. These indicators suggest the presence of metabolic disorders in the patient.

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General Appearance of the Oral Cavity and Teeth: The orthopantomogram (OPG) images are shown in Figures 1 and 2.

Figure 1. Mouth space general appearance #23

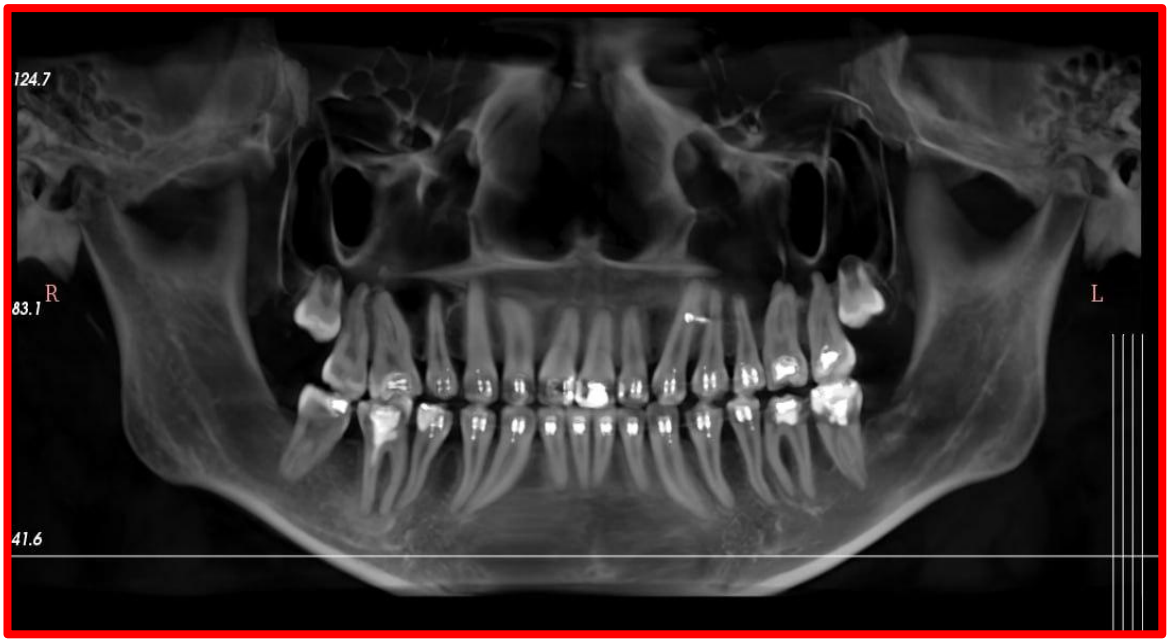

Figure 2. Orthopantomogram. Patient No. 23

Conclusion

The metabolic disorders, first-degree obesity, and lipid metabolism disturbances present in this patient are contributing factors to the development of chronic catarrhal gingivitis. To achieve maximum treatment effectiveness and improve the prognosis for the progression of chronic catarrhal gingivitis, it is recommended that this patient consult with an endocrinologist and a dietitian. This will allow for the prescription of hypoglycemic therapy and the planning of weight reduction.

A study on the effectiveness of oral hygiene improvement programs in young patients undergoing orthodontic treatment demonstrated that the use of **SPLAT SMILEX ORTHO+** orthodontic soft toothbrush, **SPLAT® Professional ACTIVE** toothpaste for healthy gums (100 ml),

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and **SMILEX ORTHO+ 3 in 1** mint-flavored mouthwash (50 ml), combined with proper motivation and hygiene education, ensured satisfactory oral health maintenance throughout the observation period. For patients with orthodontic appliances, biannual professional hygiene cleanings (with a six-month interval) are sufficient to prevent periodontal inflammatory diseases.

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