

## INNOVATIVE METHOD FOR TREATING PERIODONTAL DISEASES USING PLASMOLIFTING

**Salohiddinov Mirzobek Bahodirovich**

*1st year clinical resident*

*PhD, associate professor*

**Ortikova Nargiza Khairullayevna**

*Department of Orthopedic Dentistry*

*Samarkand State Medical*

*University, Samarkand, Uzbekistan*

**Abstract:** In order to find new effective ways to treat chronic generalized severe periodontitis, we carried out complex conservative treatment of 34 patients, which, in addition to standard therapy, included the following combination: hardware removal of dental plaque and Plasmolifting technology. The absence of clinical signs of inflammation, a stable level of hygienic indices during the entire observation period and a reduction in the depth of the periodontal pocket confirmed the high effectiveness of conservative therapy for severe periodontitis with the developed therapeutic complex.

**Key words:** inflammatory periodontal diseases, severe periodontitis, oral hygiene, tartar.

The issues of diagnosis and treatment of chronic inflammatory diseases of periodontal tissues are and remain the focus of attention of researchers. Periodontal diseases are among the most common in dental practice today and affect patients of all age groups. A sharp increase in the prevalence of periodontal diseases, the loss of a large number of teeth, disturbances in chewing and speech, the impact on the general condition of the body and a decrease in the quality of human life force us to consider periodontal diseases as a special branch of dental science, and the problem is made not only general medical, but also social. Periodontitis is the most complex nosological entity among periodontal diseases.

This pathology is extremely difficult to treat, and it is almost impossible to eliminate the further development of the disease, and this requires the introduction of new treatment methods into dental practice.

One of these methods is the injection method using platelet autoplasm (TAP), which received the original name Plasmolifting. The prevalence of inflammatory periodontal diseases among the adult population in the world remains at a high level and does not tend to decrease. Today, the role of microflora in the initiation and progression of periodontitis has been clearly proven.

**Purpose of the study:** the purpose of this work is to evaluate the treatment of chronic inflammatory diseases of periodontal tissues using plasma lifting.

**Materials and methods of research:** To determine the study groups, an analysis of the prevalence of chronic generalized periodontitis was carried out. At a dental appointment, after analyzing clinical data and based on the results of the examination, 34 patients suffering from chronic generalized periodontitis of mild severity (CGPLST) aged from 37 to 58 years were examined, of which 13,5 (46.85%) were men and 14,2 (54.14%) % women who were treated with platelet-rich autoplasm. To make a diagnosis, we analyzed data on the development of the disease, the presence of complaints, as well as additional examination methods. For the study, the dental status of each patient was taken into account - persons with orthodontic pathology and concomitant pathology were not included in the work. All patients were examined at the regional dental clinic. Plasmolifting is a method of obtaining and using an injectable form of platelet autoplasm, based on the fact that the growth factors contained in platelets: platelet-derived growth factor (PDGF-aa, PDGF-bb, PDGF-ab), transforming growth factor (TGF-b1, TGF-b2), vascular endothelial growth factor (VEGF). To obtain platelet autoplasm, the patient's own blood is used. Venous blood was collected using standard technology into special Plasmolifting vacuum tubes containing the anticoagulant sodium heparin and a special separation gel that allows plasma filtration and erythrocyte clot fixation. After blood collection, the tube was placed in an EVA 20 centrifuge (Germany) and centrifuged at 3800 rpm for 10 minutes, resulting in  $4.0 \pm 1.5$  ml of plasma, which is located in the upper part of the tube, followed by a separation

gel, separating the erythrocyte clot. Insulin needles were used for injections. Areas of administration according to the recommendations of the authors of the method: in the area of dentogingival papillae and marginal gums at the rate of 0.1-0.2 ml per 3 mm<sup>2</sup> and in the area of the transitional fold 0.3-0.5 ml per 1-2 teeth. On the first visit, injections were performed in two segments on the right side (1st and 4th), and on the second visit, 7-14 days later, on the left (2nd and 3rd). For each patient, the procedure was performed 4 times: 1st and 2nd after basic therapy (2-4 weeks from the start of treatment), 3rd and 4th – 6 months after subgingival therapy. The criteria for excluding patients from further research were: diabetes mellitus type I or II, the presence of osteoporosis and various infectious diseases, patients whose professional activities are associated with physical and chemical factors harmful to the body, the presence of a burdened allergic history, pregnancy, the presence of neoplasms, taking various medications drugs, which influence the level of bone resorption and gum hypertrophy.

In accordance with the objectives of this work, clinical, practical and statistical research methods were used. A questionnaire, survey, and medical history analysis were conducted. Analysis of hygienic indices: GAME according to J.C.Green -J.R.Vermillion (OHI-S), analysis of periodontal indices: CPITN Index, Muhleman H.R. Index, RMA Index.

**Results of the study:** During the initial examination of the patients, the following complaints predominated: the presence of bad breath, bleeding of the gums when brushing teeth and eating solid foods, discoloration of the gums, the presence of plaque (tartar), exposure of the necks of the teeth, the presence of ulcerative discs separated from the gums. Based on clinical data, a diagnosis of CHPLST was made (K05.31 according to ICD-10). (*Fig.1*)



***Fig.1 Before the plasma lifting procedure***

All patients underwent comprehensive periodontal treatment: training and control of proper oral hygiene, selection of individual hygiene products, general and local antibacterial, anti-inflammatory, desensitizing therapy, vitamin therapy, local and general immunocorrection, herbal medicine (oral baths with decoctions of chamomile, sage, oak bark, etc.), removal of decayed teeth, physiotherapeutic treatment. The patients underwent professional oral hygiene using the Vector apparatus (Germany). Objectively, in all patients of both groups, the gingival papillae and gingival margins were cyanotic, there was no mobility, there was bleeding, a loose gum consistency, the presence of a gingival papilla and serous-purulent exudate. There was a significant amount of plaque and tartar, mostly subgingival. When checking oral hygiene, the API index and PHP index showed an insufficient level of hygiene. (**Fig.2**)



***Fig.2 After the plasma lifting procedure***

Index assessments were performed before treatment, on day 3, after 6 days, after 1 month, after 6 months and after 1 year. Already at the 3rd visit (on the 10th day of treatment), all patients noted a significant improvement - the majority of patients had no complaints. When analyzing the dynamics of the level of hygiene during the treatment, all patients noted a decrease in the level of hygiene indices API and PHP after 10 days, consolidation of the result within one and a half months after the basic treatment in the form of an additional slight decrease in indices values and their reverse slight increase after 3 and 6 months within the limits of optimal oral hygiene. As a result of the

treatment, significant positive dynamics were noted in reducing the depth of the periodontal pocket. The degree of reduction in the depth of the periodontal pocket was 32.15% (1.9 mm), so that in some patients, after a year of active maintenance therapy, the depth of the periodontal pockets was less than 5 mm (as with moderate periodontitis).

**Conclusions:** From the data we received over a certain period of time (3 days, 6 days, 1 month, 6 months and 1 year), we obtained a fairly clear dynamics of our treatment with a subsequent period of remission. There was a sharp decrease in all index indicators on day 3 of the study. After 1 month of the study, the indicators remained at the same level as before. The use of tPA injections in the complex treatment of periodontitis gives stable clinical remission, a stable level values of periodontal indices, reduction of the depth of the periodontal pocket. Therefore, the Plasmolifting method is simple, effective, and does not require large expenses. By using platelet autoplasm in complex therapy in the treatment of periodontal diseases, it becomes possible to reduce the time and achieve stable results for a longer period.

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