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Research Article

CLINICAL AND X-RAY ASSESSMENT OF INJECTION OSTEOPLASTIC EFFECTIVENESS OF GENERALIZED PARODONTITIS THERAPY OF I-II SEVERITY DEGREES

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Abstract:

Aim: To identify the dynamics of X ray parameters in the comparative groups in the treatment process of generalized periodontitis I - II degree including osteoplastic materials injection.

Materials and methods: Clinical and radiographic indicators were evaluated in the treatment process in 107 patients (33 people in the control group, 36 in the 1-st group, 38 in the 2-nd main groups).

In the control group traditional treatment of generalized periodontitis, the I - II degree was affected with aloe extract injection into soft tissues of parodontium in the causal teeth projection. In the 1-st main group, traditional treatment was combined with injection of PRP-gel into the periodontal tissues, in the second main group injection osteoplastic therapy was performed with PRP-gel and Collapan C. Degree and nature of the bone tissue destruction of the alveolar ridge were assessed with targeted radiographs and orthopantomograms. Studies were realized before treatment and 1, 3, 6, 12 months later.

Results. Analyzing radiographs of the control group 30 days, 6, 12 months later, X-ray picture remained similar, but in 5 patients (15,15%) decrease in bone tissue was identified. The first main group 1, 6, 12 months later didn't show increase in the volume of new bone tissue with signs of resorption. The second main group radiographs revealed the presence of additional primary bone structures, the alveolar ridge 30 days later. The completion of the formation process of an organized high-grade large-cell bone tissue was identified 6 and 12 months later.

Conclusions. X-ray studies in patients with generalized periodontitis I - II degree confirm the effectiveness of the injection use of osteoplastic materials in the complex treatment of this pathology. Visible positive effect was observed in patients of the 2nd main group, where osteoplastic preparations PRP-gel and Collapan C were administered. We suggest it is determined by the osteoinductive and osteoconductive properties of the preparations, against the background of the release of silver ions, that leads to the optimization of local conditions, preservation, restoration of the acquired alveolar bone volume. Patients of the 1st main group, where, despite the absence of significant bone growth, its volume was maintained due to the osteoinductive effect of the PRP-gel.

In patients in the control group the process of gradual loss of alveolar bone continued after treatment with a short-term positive result.

Key Words: jaw radiography, osteoplastic materials, Collapan C, PRP, generalized periodontitis treatment.

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INTRODUCTION:

Currently, the problem of increasing the effectiveness of traditional treatment methods of parodontium retains its importance, due to the dynamic growth of the patients among the population of the Russian Federation. In modern periodontology, surgical treatment methods with the osteoplastic materials application are widely used. One of the most effective preparations for optimizing regeneration processes is considered platelet-rich plasma (PRP), which contains strong osteoinductive properties [1, 5, 7, 10]. It is widely used in osteoplastic operations (sinus lifting, alveolar process augmentation), for the operating bed processing before dental implantation, etc. [5, 7, 8]. However, it is known that in the complex treatment of generalized periodontitis, it is advisable to use osteoconductors [3, 9, 11, 13], which can significantly increase the bone tissue volume. Recently, the medical market has expanded the range of domestic synthetic osteoplastic (osteoconductive) preparations. Among them, silver-containing materials (Collapan C, Biomin GTIS) occupy a special place.

AIM OF THE STUDY:

To identify the dynamics of X ray parameters changes in patients of the comparative groups in the complex treatment process of generalized periodontitis of I - II degree, including osteoplastic materials injection.

MATERIAL AND METHODS:

Patients' treatment was affected on an outpatient basis. The results of clinical and X ray indicators in the process of treatment and examination of 107 patients of both sexes aged from 25 to 50 y.o. (33 people in the control group, 36 in the I main group, 38 in the II main group) were analyzed.

In the control group, traditional complex treatment of generalized periodontitis of the I - II degree was carried out with aloe extract injection into soft tissues

along the transition fold in the projection of the causal teeth.

In the first main group, traditional treatment was accompanied by subperiosteal and suprapariosteal point injection of a PRP-gel into the periodontal tissues (at the rate of 0.3-0.5 ml in the projection of one tooth). The course of treatment consisted of 3 injections with one-week breaks.

In the second main group, along with complex treatment, injection combined osteoplastic therapy of periodontal tissues was affected with PRP-gel and a suspension of the preparation Collapan C (in isotonic sodium chloride solution), which were administered once separately point wise into periodontal tissue at the rate of 0.3 ml in the projection of one dental segment. Infiltration anesthesia with 0.5% lidocaine solution was used for anesthesia.

To assess the degree and nature of the bone tissue destruction of the alveolar process, in order to clarify the diagnosis and control the effectiveness of the treatment, all patients were referred for orthopantomography and targeted X-ray. These studies were carried out before treatment, as well as 1, 3, 6, and 12 months later its completion.

In analyzing the data, attention was paid to the shape, height, state of the tops of the interalveolar septa, peculiarities of construction and mineralization of the spongy bone substance, and the state of the cortical plate [2, 4].

RESULTS:

Radiographic assessment of the processes occurring in the alveolar process against the background of the complex treatment of chronic generalized periodontitis of I-II severity degrees, was affected on the basis of the dynamics analysis of the changes corresponding to the formation or loss of bone tissue. Special attention was paid to the signs of the emergence of the newly formed large-lamellar spongy bone.

During the analysis of radiographs obtained in patients of the control group one month later, no increase in bone tissue was observed, 6 and 12 months later the X-

ray picture remained similar (Fig. 1), in addition, 5 patients (15.15% of cases) experienced a bone tissue decrease.

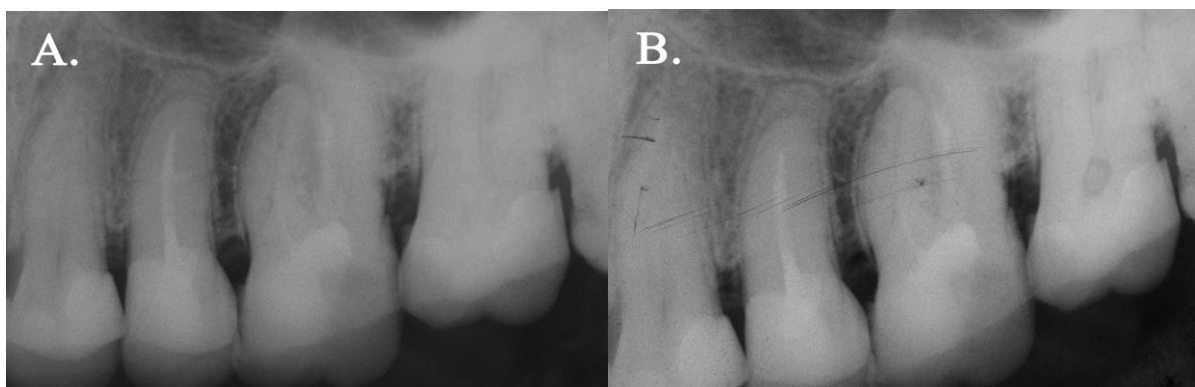


Figure 1: X-ray picture of the state of the alveolar bone in patient I, 36 y. o. (control group) before treatment (A) and 6 months later (B).

No significant identified changes.

In the first main group, where the injection of PRP-gel was affected 1, 6 and 12 months later, signs of restorative processes in the bone were not clearly identified; a significant increase in the volume of newly formed bone tissue, as well as further resorption of the alveolar process and interdental septa was not discovered (Fig. 2).

More defined positive changes in the X-ray pattern were observed in the second main group, whose

representatives were injected with PRP-gel and suspension of a silver-containing osteoplastic preparation (Collapan C). In this case, just 30 days later, the X-ray pattern revealed the presence of additional primary bone structures (osteoid formations with heterogeneous contrast, a small-meshed network was evident), layered on the background of already existing bone pattern along the entire plane (from the vestibular side) of the alveolar process alternating with mineralized large mesh networks.

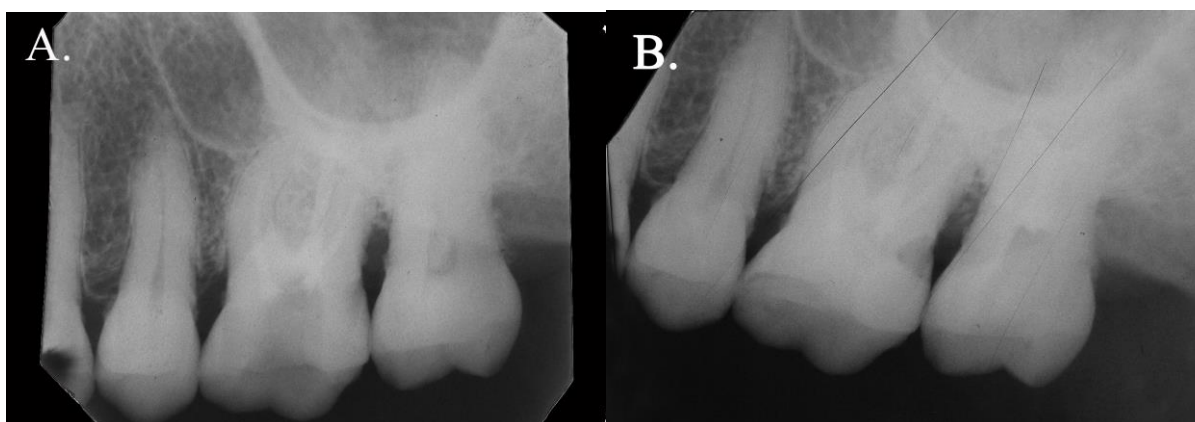


Figure 2: X-ray picture of the alveolar bone condition in patient C., 42 y. o. in the 1st main group before treatment (A) and 6 months later (B). Slight recovery of the lost volumes of the alveolar process (indicated by arrows) is determined.

In 62 patients, radiographic evaluation of the treatment results was affected 3 months later after the manipulations. All representatives of the 2nd main group

(28 people) had a bright dynamic of positive changes. The radiographic pattern of the bone corresponded to a well-organized, full-fledged, large-mesh osteoid tissue.

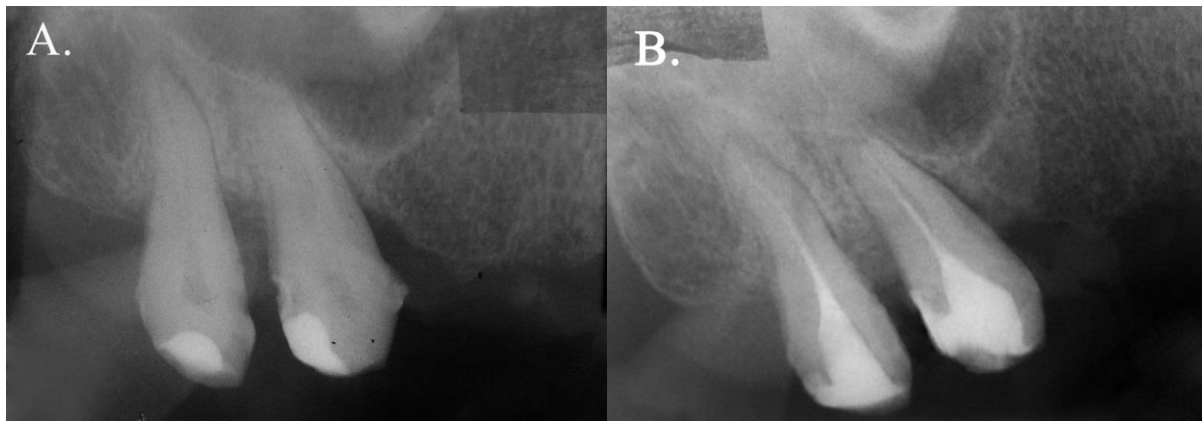


Figure 3: X-ray picture of the alveolar bone state in patient O., 48 y. o. (2nd main group) before treatment (A) and 6 months later (B). Partial restoration of previously lost volumes of the alveolar process (indicated by arrows) and increase in the level of bone mineralization are determined.

In 6 and 12 months the formation process completion of organized, full-fledged large-mesh bone tissue, practically indistinguishable from the surrounding healthy structures were discovered (Fig. 3). The data we obtained are comparable with the results of clinical observations conducted in the comparative groups.

DISCUSSION:

The results of X-ray study conducted in the comparative groups have led us to the conclusion that the bone structures recovery (after injection of osteoplastic materials) were more active in the second main group due to subperiosteal and suprapariosteal injection of a combination consisting of PRP gel and powder suspension Collapan C, which combined, produce osteoinductive and osteoconductive properties. As a result, more rapid reduction of local inflammatory reactions and the creation of optimal conditions for the preservation of the original volumes and partial regeneration of the lost alveolar bone occurred.

A positive result was also identified in patients of the 1st main group, where, despite the absence of significant bone growth, its volume was maintained due to the osteoinductive and reparative effect of PRP-gel.

In the control group, the process of gradual loss of bone tissue continued, which is typical for the course of chronic generalized periodontitis.

List of symbols and Abbreviations: PRP – platelet-rich plasma

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