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# Generalized Periodontitis and the Factor of Traumatic Occlusion

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**ABSTRACT**

***Objective***: *This study aimed to determine the role of occlusal factors in the development of localized periodontitis (LPT) and emphasize the necessity for functionally justified restorations of the chewing surfaces of teeth.* ***Method***: *The study involved 80 patients (12 men, 68 women, aged 22-63 years) diagnosed with localized periodontitis. Clinical examination, laser Doppler flowmetry (LDF), and radiographic analysis were used for diagnosis. Participants were divided into two groups and received professional oral hygiene, endodontic treatments, and medicamentous treatments, including the use of temporary splints and crowns.* ***Results***: *The main group showed rapid wound healing and reduced inflammation symptoms after treatment, with a shorter healing time compared to the comparison group. The main group also exhibited better long-term outcomes, with a 23.5% reduction in the periodontal pocket depth, whereas the comparison group showed a 15.6% reduction. The microcirculation indicator significantly improved in the main group, highlighting better recovery.* ***Novelty***: *The study introduces the effectiveness of orthopedic methods in treating periodontitis, particularly the use of temporary prostheses to eliminate traumatic occlusion, which significantly enhances healing and reduces inflammation compared to traditional methods. This approach provides a new perspective on treating localized periodontitis linked to occlusal disturbances.*

## INTRODUCTION

Generalized periodontitis is a widespread pathology that leads to early tooth loss, deteriorates the functional state of the stomatognathic apparatus, and reduces the quality of life [1], [2]. The stable position of the teeth and the functional unity of the dental arch are determined by the balance between periodontal tissues and occlusal relationships [3], [4]. Progressive atrophy of the bone tissue in the alveolar processes disrupts this balance, leading to pathological tooth mobility, deformation of the dental arch, and functional disturbances in various parts of the stomatognathic system [5], [6].

Modern periodontologists agree that occlusal disturbances are risk factors for the development of focal inflammatory-dystrophic processes, and in cases of generalized periodontitis, these disturbances significantly worsen the course of the disease and the prognosis of treatment [7], [8]. The multifactorial nature of the pathogenesis of generalized periodontitis requires an interdisciplinary approach, with a key role in complex treatment being played by orthopedic methods aimed at eliminating traumatic occlusion [8], [9]. Orthopedic treatment is performed to normalize occlusal relationships, prevent, eliminate, or reduce functional overload on the periodontium [10], [11].

**Objective of the Study**

To determine the role of occlusal factors in the genesis of localized periodontitis and substantiate the necessity of functionally justified restorations of the chewing surfaces of the teeth.

## RESEARCH METHOD

The study involved 80 patients aged between 22 and 63 years (12 men and 68 women) diagnosed with localized periodontitis (LPT). The diagnosis was confirmed by clinical examination, laser Doppler flowmetry (LDF), and radiographic analysis. The pathological process was predominantly localized in the area of the posterior teeth, which is associated with a higher number of fillings in this segment of the jaws [12], [13].

## RESULTS AND DISCUSSION

All patients received professional oral hygiene, endodontic treatment of teeth as indicated, medicamentous treatment of periodontal pockets, and curettage of periodontal pockets in cases of moderate severity of localized periodontitis (LPT) with pocket depths ranging from 3 to 5 mm. The area of the bone defect was filled with an osteoplastic material. Before the surgical treatment, patients in the main group were fitted with temporary splinting plastic bridge prostheses (interdental plastic splints), had the teeth in the area of the periodontal pocket prepared, and plastic crowns were fixed using temporary cement. After suturing, the temporary plastic prosthesis was fixed to the teeth, with the gum margins of the crowns adjusted to ensure effective hygiene of the postoperative area [14], [15].

In the comparison group, the first stage of treatment involved replacing inadequate restorations with the creation of a tight contact point and covering the teeth with individual temporary plastic crowns. After 21 days, once the surgical wounds had healed and the gum tissues were stable, the single crowns and bridge prostheses were replaced with metal-ceramic constructions, and interdental splints were made using an indirect restoration system.

During the study, there was a need to divide the clinical cases into types based on local dental status. The data indicated that the overwhelming majority of LPT cases belonged to Type I of local dental status, where the local inflammatory process was located in intact and/or filled teeth. This was further supported by the large number of filled teeth in patients aged 30-40 years and the relatively low number of crowns in this group. Therefore, there is a correlation between defective restorations, poor adaptation of the tooth walls at the contact point, and the prevalence of Type I local dental status in LPT [16].

After professional oral hygiene, all patients reported an overall improvement in well-being and comfort in the mouth, but the unpleasant odor and discomfort in the area of the local periodontal pocket persisted. Food continued to get stuck between the teeth, causing a feeling of pressure and pain. After the fixation of bridge prostheses and temporary crowns, which restored a tight contact point between the teeth, patients in

both groups noted a reduction in subjective discomfort after eating, as food fibers no longer became trapped between the teeth. However, patients in the comparison group continued to use dental floss to clean the interdental spaces.

The study also found that in the main group, after splinting the teeth in the area of the periodontal pocket, there was rapid wound healing and the disappearance of inflammation symptoms (on the 4th day). Patients reported no discomfort during meals, no gum bleeding, and an improvement in emotional well-being. The immediate outcome of the surgery in patients with moderate severity of localized periodontitis (LPT) in both groups was uneventful. However, in the main group, the healing process of the periodontium took 3-5 days less than in the comparison group. This difference can be attributed to the elimination of the traumatic effect of food loading, as well as the absence of the need to clean the interdental spaces with dental floss. The use of medicinal rinses in the surgical area under the bridge prosthesis positively impacted the healing time [17], [18].

In the comparison group, the impact of medicinal substances was short-term due to the open condition of the periodontal tissues. The effectiveness of treatment in the main group remained stable throughout the year of observation. The gingival margin was stable, and no signs of inflammation were observed. A tight contact point was maintained by the bridge prosthesis. One patient experienced occasional bleeding due to poor oral hygiene, and another reported unpleasant odor, also related to the lack of intermediate oral hygiene throughout the day.

In the comparison group, the positive effect of treatment persisted for 4-6 months after the fixation of permanent metal-ceramic crowns. Six patients (31.5%) developed a slight gap between the teeth, and food fibers began to get stuck again, although the integrity of the crowns and the edges of the restorations remained unchanged. Three to four weeks after the surgical intervention, temporary bridge prostheses were replaced with metal-ceramic prostheses in 34 patients. Four patients received interproximal splints using a system for indirect restorations. Two patients had temporary splints left as the primary treatment for a period of up to 6 months. After six months, during a follow-up examination, the treatment results in these cases were stable [19], [20].

Patients did not report any discomfort or food trapping, and they successfully performed hygienic procedures. The mucous membrane of the gingival margin in the area of the periodontal pocket was pale pink, firm, and there was no bleeding. No pathological changes were detected on the radiographs. In the comparison group, the healing time after curettage of the periodontal pocket was 7-10 days, and all patients reported no discomfort or unpleasant odor in the mouth. After complete restoration of the periodontal tissues, the temporary plastic crowns were replaced with single permanent metal-ceramic crowns (16 units). After 6 months, in the main group, the reduction in the periodontal pocket according to radiographs ranged from 0.5 to 1.5 mm (23.5%), while in the comparison group, the periodontal pocket decreased only by 0.5 mm (15.6%). The probing depth of the periodontal pocket in the main group after treatment decreased by 0.9±0.11 mm, while in the comparison group, it decreased by

0.45±0.12 mm. After 6 months, a re-evaluation of these indicators was conducted. In both clinical groups, an increase in perfusion (microcirculation indicator) was recorded. This indicates an increase in blood flow in the area. In the main group, the PM increased by 4 pf units (12.6±0.4 pf units), while in the comparison group, it increased by 1.9 pf units (10.6±0.4 pf units) [21]. The shunting indicator in the comparison group increased by 0.2 (0.9±0.1), while in the main group, it increased by 0.3 (1.1±0.1). The shunting value in the main group after treatment was comparable to the corresponding value in the control zone, which was 1.1±0.1. In the comparison group, after treatment, the shunting value did not reach the values of the control zone, although a tendency for its increase was observed.

## CONCLUSION

**Fundamental Finding** : The study found that inflammatory local periodontal processes (LP) are present in 89.1% of patients aged 18 to 35, with local traumatic factors contributing to 77.9% of cases, and 22.1% of cases being caused by functional overload in restored teeth. Ineffective restoration of the occlusal surface of teeth significantly reduces the endurance of the periodontium and antagonist teeth. Additionally, changes in microcirculation in teeth with fillings lead to local inflammatory processes, with microcirculatory disturbances compensating under aseptic conditions. **Implication** : These findings highlight the importance of effective occlusal restorations in preventing functional overload and preserving periodontal health. Orthopedic treatments focused on restoring occlusal relationships may reduce the risk of periodontal inflammation and improve overall oral health outcomes. **Limitation** : The study is limited by its focus on a specific age group (18 to 35 years) and does not account for other systemic factors that may influence periodontal health. The sample size and the use of temporary restorative materials also limit the generalizability of the results. **Future Research** : Future studies should explore the long-term effects of different restorative materials on periodontal health, expand to include a wider age range, and investigate other systemic factors influencing periodontal disease progression. Further research is needed to evaluate the sustainability of orthopedic treatments over extended periods.

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