

Minimally Invasive Technique for the Treatment of a Wedge Defect in Hard Tissues

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ABSTRACT

The purpose of the study to improve the therapy of a wedge-shaped defect of hard dental tissues using a minimally invasive method. We have found that wedge-shaped defects in hard tissues of teeth directly affect the qualitative and quantitative composition of the microbiocenosis of the oral cavity, the hygienic state of the oral cavity. To extend the restoration period, it is recommended to use the Camouflage filling material, but in general, for dental practice, given the economic side of the issue, for the treatment of wedge-shaped defects, we recommend adhering to the complex treatment algorithm due to the severity of the clinical course of the disease.

KEYWORDS: *minimally invasive technique, wedge-shaped defects of hard tissues of teeth, «Camouflage» filling material, "Expert assessment of the quality of fillings".*

The relevance of research. Over the past twenty years, the prevalence of non-carious lesions of the teeth formed after their eruption, such as erosion, wedge-shaped defects, combined forms of lesions, has increased significantly and, according to a number of authors, is 64.4 - 72.9%. The prevalence of pathology in some regions of the world reaches critical figures - 82%, against the background of its high intensity [2,5,7]. At the same time, the increase in incidence is 3.5% every 5 years (Agadzhanyan M.A., 2018; Andreeva Yu.V., 2018).

Restorative interventions with the help of composite materials are complex in terms of the mechanism of their application. The right technique, the right combination of materials lead to the best result. Non-invasive interventions in the early stages are limited to symptomatic treatment and consist in the elimination of hyperesthesia of the teeth, do not realize the goals of a long-term and targeted remineralizing effect in the area of the pathological focus and adjacent tissues [1,2,3].

Currently, the main method of treating wedge-shaped defects in hard dental tissues is the removal of destroyed and affected tissues and the replacement of lost tooth tissues with artificial materials. There are two approaches to such a replacement: direct and indirect restoration (therapeutic and prosthetic approaches, respectively). Their difference lies in the method of manufacturing an artificial fragment, the materials used, the duration of treatment, and the reliability of the results obtained [3,4,5].

However, no matter how good modern filling materials are, they have their drawbacks. The main disadvantage of a composite filling is that it has a certain, rather limited lifespan. Composite fillings are constantly undergoing expansion-compression processes due to mechanical and thermal loads. In addition, after a while, chemical fillings begin to absorb moisture, swell and become loose. Sooner or later, a filling, even the best one, needs to be changed, otherwise secondary caries may form [2,4,7].

Based on scientific research by a number of foreign authors, in order to develop a standard protocol for the treatment of teeth with wedge-shaped defects, it is required to increase the number of clinical observations of this pathology [1,2,4,6,8]. Based on the foregoing, the emergence of difficulties that relate to the treatment of non-carious lesions of hard dental tissues - namely, a wedge-shaped defect

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using modern resins for restorations and adhesive systems, requires in-depth study.

The purpose of the study: to improve the therapy of a wedge-shaped defect of hard dental tissues using a minimally invasive method.

Materials and methods. To achieve this goal, we examined 35 patients (17 men and 18 women) aged 25-65 years. The control group consisted of 20 patients with no changes in the hard tissues of the teeth. Inclusion criteria: patients who were not exposed to occupational hazards and without exacerbation of somatic diseases, including diseases of the gastrointestinal tract, cardiovascular system and metabolic disorders, who underwent filling of four-degree wedge-shaped defects on 40 teeth. The studies were carried out in dynamics: before filling, 30 minutes after; after 1-5 weeks and 3-6 months.

In the course of the work, we identified 4 stages of the wedge-shaped defect of the teeth (Makhmudkhanov S.M., 1968). Camouflage (MEGADENTA Dentalprodukte GmbH (Germany)) is a dental light-curing flowable microhybrid composite Camouflage material for direct veneers as a permanent filling. The quality of the filling was determined by the method of , (Kamilov Kh.P., Bekzhanova O.E. 2008), which was carried out in accordance with the clinical criteria we selected, reflecting the functional and aesthetic qualities of fillings.

Results and discussion. 6 months after the treatment, "Marginal fit" is observed in 9 fillings out of 20 delivered from Megafill Flow, and 5 fillings out of 20 delivered from Camouflage. This suggests that according to this criterion, the Camouflage restoration showed the best result. According to the following criteria - "Recurrence of caries" and "Surface of the filling", "Camouflage" showed an excellent result. When filling "Megafill Flow" - the criterion "Anatomical shape" in 35% of the teeth showed deviations, in "Camouflage" - this indicator was in 10% of the teeth. Since the cervical region is disturbed in the case of a wedge-shaped defect, in the 1st group "Postoperative sensitivity" was observed in 25% of the teeth, in the 2nd group - 10.0%, respectively. As for the "Color of the filling", with group 1 in 25.0% of the teeth, with group 2 in 5.0%. The criterion "Color of the edges of the cavity" was 60.0% versus 30.0% when filling with the material "Camouflage".

The state of the gingival margin was examined: the indicators were equal to 35.0% versus 15.0%, respectively. Since the wedge-shaped defect is located on the cervical surface, an important role is given to the "Plaque" criterion, which was 30.0% versus 10.0% in group 2 after 6 months. One year after the treatment, the restoration quality indicators were significantly changed in both groups accordingly. "Marginal fit" was observed in 3 restorations out of 20 "Megafill Flow", and 1 restoration out of 20 "Camouflage" composites.

Of course, the difference is not big, but the Camouflage restoration had a significant positive effect. According to the following criteria - "Recurrence of caries" and "Surface of the filling", "Camouflage" showed an excellent result. When filling "Megafill Flow" - the criterion "Anatomical shape" in 15% of the teeth showed deviations, in "Camouflage" - this indicator was in 5% of the teeth. Compared with the indicators after 6 months, the indicator "Postoperative sensitivity" of the 1st group was observed in 5% of the teeth, in the 2nd group it was negative. As for the "Color of the filling", with group 1 in 10.0% of the teeth, group 2 is negative. The criterion "Color of the edges of the cavity" was 20.0% versus 10.0% when filling with the material "Camouflage". The state of the gingival margin was examined: the indicators were 10.0% versus 0%, respectively. An important role is given to the criterion "Plaque", which was 5.0% versus 0% in the 2nd group after 12 months.

We have established the relationship between the level of hygienic condition of the oral cavity and the quality of fillings. It was found that in patients whose fillings were rated "unsatisfactory", poor oral hygiene was found in 16.7% of cases, "satisfactory" oral hygiene was found in 60% of cases, while in patients where the rating was "excellent", poor hygiene was not marked. Statistical analysis of the results of the relationship between the level of hygienic condition of the oral cavity and the

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quality of fillings revealed that the difference between the results both between materials and in time is statistically significant since $P < 0.05$.

Thus, wedge-shaped defects in the hard tissues of the teeth directly affect the qualitative and quantitative composition of the microbiocenosis of the oral cavity, the hygienic state of the oral cavity. To prolong the period of restoration, it is recommended to use Camouflage filling material, but in general, for dental practice, given the economic side of the issue, for the treatment of wedge-shaped defects, we recommend following the algorithm of complex treatment in relation to the severity of the clinical course of the disease.

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