



EXPERIMENTAL JUSTIFICATION FOR THE CHOICE OF FILLING MATERIAL IN THE TREATMENT OF ROOT CARIES

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Abstract. The high prevalence of root caries and the frequency of violation of the marginal seal of fillings makes the problem of choosing a filling material for the treatment of root caries relevant. For the study, filling materials of various classes were selected, the most commonly used in filling carious cavities: a nanohybrid composite with a fifth-generation adhesive system, triple-curing hybrid glass ionomer cement (GIC), packable self-curing glass ionomer cement of increased strength.

Keywords: root caries, marginal adaptation, marginal permeability, nanohybrid composite, triple-curing hybrid glass ionomer cement.

INTRODUCTION

Root caries is a pathological process characterized by the involvement of tooth root tissues within the enamel-cementum boundary or, more often, on the exposed root cementum surface. In the International Classification of Dental Diseases (ICD-DA, WHO 1995), root caries is considered in section CO2 Dental caries. Root caries in this classification is designated by the term “K02.2 Cementum caries” [4].

MATERIALS AND METHODS

The frequency of tooth root caries varies according to various studies from 14 to 82% [1]. Root cementum caries has high medical and social significance due to a number of circumstances. Firstly, there is no common understanding of the etiology, pathogenesis and main risk factors of this nosology. Secondly, the prevalence of this pathology among adults remains at a high level and has no tendency to decrease. Finally, the clinical picture of root caries at an early stage is characterized by a latent course, which complicates timely diagnosis and delays the start of adequate preventive and therapeutic measures[6]. Research by O.A. Chepurkova showed that the frequency of root caries during periodontitis in patients with a low level of resistance is 95.6%. In recent years, the prevalence of cement caries has increased [2].

RESULTS AND DISCUSSION

The results of the marginal permeability of fillings made from the studied filling materials are presented in Table. 1.

Table 1

Marginal permeability of fillings made of materials of various classes in the enamel/cement zone (in%)

Point	Nanohybrid composite		Restoration triple curing hybrid glass ionomer cement		packable self-curing high strength glass ionomer cement	
	enamel	cement	enamel	cement	enamel	cement
0	60	6,7	33,3	92,4	0	0
1	40	6,7	53,3	6,6	13,3	40
2	0	40	13,3	0	26,6	33,3

3	0	33,3	0	0	60	26,6
4	0	13,3	0	0	0	0
Итого:	100	100	100	100	100	100

For the nanohybrid composite, the best results of marginal adaptation with the lowest marginal permeability were obtained in relation to the enamel, namely, the absence of signs of marginal permeability in 60% of cases and the marginal permeability within the enamel of 40%. At the same time, with regard to the marginal permeability in the cement zone, the results are lower: only in 6.7% there is no marginal permeability and in 6.7% within the cement edge; a result of 40% corresponds to marginal permeability up to the cemento-dentin boundary, and in 33.3% of cases after this boundary; The composite under study is the only material that revealed marginal permeability for cement according to the 5-point system Khera S.C., Chan K.C. score 4 – in 13.3% of cases.

The results obtained with triple-cured glass ionomer restorative cement indicate good marginal adaptation to dentin and cement. Thus, in 92.4% of cases, better marginal adaptation was observed in the cement zone. However, in the enamel zone, the absence of marginal permeability was determined only in 33.3% of cases; a violation of marginal permeability was detected in 53.3% of cases along the enamel edge, and at the enamel-dentin junction in 13.3% of cases.

In chemically cured glass ionomer cement, a violation of marginal adaptation was observed in 100% of cases. Moreover, the most pronounced violations were noted in the enamel zone and in 60% of cases had a score of 3 points.

The results obtained are confirmed by the studies of N.V. Bidenko, A. Gilmour [1,3], who stated that it is best to use glass ionomer cements (GIC) for filling carious cavities on the tooth root. Materials of this group adapt well to dentin, do not require special preparation of the surface of the defect being filled and do not cause an undesirable reaction of the dental pulp. In addition, they have excellent biological compatibility when combined with cement and dentin, and prevent the occurrence of secondary caries. Moreover, 80-90% of fillings are retained for 4-5 years. When GIC comes into contact with the gum, no inflammatory process develops.

CONCLUSION

The best marginal adaptation with the lowest marginal permeability in the enamel zone was observed for the nanohybrid composite, and in the cement zone for triple-cured restorative glass ionomer cement.

1. When filling carious cavities limited by root cement, it is advisable to use restorative glass ionomer cement.

2. When filling carious cavities limited by enamel and root cement, the method of choice is the combined use of a composite and restorative glass ionomer cement according to the principle of the open sandwich technique.

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