

Evaluation of Sealant Application Quality Using Various Applicator Tips

Student of 2 th course Ergashev Azizbek

Scientific supervisor: Assistant of Orthopedic Dentistry of Samarkand State Medical University

Irgashev Shokhrux Xasanovich

Annotation

The importance of this topic is due to the prevalence of fissures – natural grooves and depressions on the chewing surfaces of teeth. Their depth and shape can vary, which affects the possibility of their inspection and the tendency for caries development [1]. Fissure sealing is an innovative method of caries prevention aimed at protecting the chewing surfaces of teeth [2]. The procedure involves applying a sealant, which forms a protective layer that prevents the penetration of food debris and bacteria. The use of this method helps to reduce the proliferation of microorganisms that cause caries [3]. A fissure sealant, also known as a pit and fissure sealant, is a composite resin that can be chemically or light-cured. It has low viscosity and contains no fillers. The basis of the sealant is methacrylate and polyurethane. Fluoride is often included in the composition of sealants to increase their anticaries efficacy [4, p. 133]. Fissure sealants have a number of advantages: they are resistant to the aggressive environments characteristic of the oral cavity, and due to their hydrophobic nature, they are reliably retained in the fissures of the teeth [2, p. 704]. It is important to note that their sealing ability is directly related to the density of filling and the thickness of the applied layer. If the sealant gets into the areas of tooth contact (occlusion), it can peel off, forming "bridges" for the penetration of microorganisms..

Purpose of study

The study is aimed at clarifying how different application tips affect the quality of sealant application.

Materials and methods

Three sealant options were selected: Vladmiva (Fissulayt), ULTRADENT (ULTRASEAL), and 3M (CLINPRO SEALANT). The following application tips were used to apply the sealants: Inspiral Brush Tip (with a brush from ULTRADENT), a fine cannula, and a probe. A total of nine "sealant-application tip" pairs were formed.

Result of study

First, the flowability of various sealants was compared, determining that CLINPRO SEALANT demonstrated the greatest flowability, and ULTRASEAL Gidro - the least. Fissulayt was intermediate. After preparing the teeth, which included cleaning, cutting, and fixation on a glass surface, staining was performed for ease of visual analysis. Next, the experimental results were obtained and analyzed. The effectiveness of sealing is directly related to the viscosity of the sealant, the shape of the tip, and the application method. A narrower tip provides more precise filling of the fissures. The use of a probe or a fine instrument to distribute the sealant can cause pore formation.

Contacts:

<Irgashev Shokhrux Xasanovich>
<Samarkand Medical University>

Email: burxonova.zara@bk.ru

Phone number: +998913136513



Conclusion

brush application of the sealant guarantees the optimal result, regardless of its viscosity, due to deep penetration into the fissure. Applying the sealant using a fine cannula is also effective, but probing the sealant can lead to pore formation.

Reference:

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