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THE ROLE OF GLASS IONOMER CEMENTS IN THE TREATMENT OF DENTAL CARIES

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Annotation

Dental caries remains one of the most common dental pathologies, despite significant advances in prevention and treatment. Modern caries therapy is aimed not only at restoring the anatomical shape of the tooth, but also at preserving the viability of hard tissues, preventing secondary caries and ensuring the biological compatibility of filling materials. In this context, glass ionomer cements (CC) occupy a special place due to their ability to chemically bind to tooth tissues, release fluoride and provide an anti-carious effect. The article discusses the properties, mechanisms of action and clinical significance of glass ionomer cements in the treatment of dental caries, as well as their advantages and limitations in comparison with other filling materials.

Keywords

Dental caries, glass ionomer cements, fluoride release, adhesion, remineralization.

Dental caries is a multifactorial disease based on prolonged exposure to organic acids formed as a result of the metabolism of the cariogenic microflora of plaque. These acids cause demineralization of enamel and dentin, which, in the absence of timely treatment, leads to the formation of carious cavities and complications.

Modern concepts of caries treatment are focused on a minimally invasive approach, preserving the maximum volume of healthy tooth tissues and using biologically active materials. In this regard, glass ionomer cements are widely used in clinical practice, especially in the treatment of caries in children, patients with high caries risk, as well as in conditions of high humidity of the working field.

General characteristics of glass ionomer cements.

Glass ionomer cements are a group of dental materials consisting of fluorinated aluminosilicate glass powder and an aqueous solution of polyalkene acid. As a result of the acid-base reaction, a solid mass is formed, which has the ability to chemically adhere to enamel and dentin.

The main types of glass ionomer cements include:

* traditional glass ionomer cements;
* resin-modified glass ionomer cements;
* Highly viscous glass ionomer cements.

Each of these types has its own indications for use and features of clinical use in the treatment of dental caries.

The mechanism of adhesion of glass ionomer cements to tooth tissues.

One of the key advantages of glass ionomer cements is their ability to chemically bond with the hard tissues of the tooth. Adhesion is carried out due to the ionic interaction of carboxyl groups of polyalkene acid with calcium hydroxyapatite of enamel and dentin.

Unlike composite materials, the use of glass ionomer cements does not require complex adhesive systems, which reduces the risk of errors and increases the reliability of sealing. This property is

especially important in the treatment of caries in the cervical region and at the root of the tooth, where the adhesion of composites is often difficult.

Fluoride excretion and its role in the prevention of secondary caries.

The fluorine-releasing ability of glass ionomer cements is one of the most significant factors determining their anti-carious effect. After the filling is placed, fluoride ions are released for a long time into the surrounding tooth tissues and saliva.

Fluoride contributes to:

* remineralization of demineralized areas of enamel and dentin;
* reducing the solubility of dental tissues in an acidic environment;
* inhibition of metabolic activity of cariogenic microorganisms.

In addition, glass ionomer cements have the ability to "recharge" with fluoride when using fluorinated oral hygiene products, which enhances their preventive effect.

The clinical significance of glass ionomer cements in the treatment of caries.

Glass ionomer cements are widely used in the treatment of caries of various localizations. They are particularly effective in the following clinical situations:

* caries treatment in children and adolescents;
* treatment of root and cervical caries;
* temporary filling of carious cavities;
* Dental restoration in patients at high risk of caries.

Due to their biocompatibility and fluorine release, glass ionomer cements reduce the likelihood of secondary caries and contribute to the preservation of hard tooth tissues.

Advantages and limitations of the use of glass ionomer cements.

The main advantages of glass ionomer cements include:

* chemical adhesion to enamel and dentin;
* prolonged fluorination;
* Good biological compatibility;
* Simplicity of clinical application.

However, despite the numerous advantages, glass ionomer cements have certain limitations. These include relatively low mechanical strength, increased sensitivity to moisture in the initial stage of hardening, and limited aesthetic capabilities compared to composite materials.

Conclusions.

Glass ionomer cements play an important role in the modern treatment of dental caries, combining restorative and preventive functions. Their ability to chemically adhere, fluoride release, and remineralize hard tissues makes them indispensable in a number of clinical situations, especially in patients with high caries risk. The rational use of glass ionomer cements, taking into account their indications and limitations, makes it possible to increase the effectiveness of caries treatment, reduce the frequency of secondary caries and ensure the durability of restorations.

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