

WHAT RESULTS DOES ICON PRODUCE IN THE TREATMENT OF FOCAL ENAMEL DEMINERALIZATION?

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Abstract: The work is devoted to the study of the modern method of dental caries treatment ICON (Infiltration Concept), the feature of which is the absence of traumatic operations, and the prevention of tooth tissue destruction is carried out by applying a special compound to the damaged tooth surface, capable of diffusing into the enamel and hardening under the influence of light. The study and development of non-invasive methods of caries treatment in the early stages of the disease is associated with the ineffectiveness of existing common treatment methods, which is confirmed by statistical data on the huge prevalence of this disease worldwide. To evaluate the clinical efficacy of Icon in the treatment of focal enamel demineralization of permanent teeth.

Keywords: focal enamel demineralization, caries, treatment, Icon drug.

Caries is a disease of the hard tissues of the tooth, which is accompanied by severe clinical manifestations (pain, hypersensitivity, aesthetic defect) and can lead to loss of the structural and functional integrity of the entire human dental system. It is known that carious lesions of teeth are currently a serious problem for the able-bodied part of the population, almost 90% are susceptible to this disease. The solution to the problem of reducing the prevalence of the disease comes down to the earliest detection of signs of the disease, the development and implementation of preventive measures and the search for the most effective, atraumatic treatment method, which is undoubtedly an urgent task of modern dentistry.

Focal demineralization is the primary destruction of tooth enamel at the initial stage of caries, which initially occurs in the subsurface layer of enamel. Currently, a large number of methods for the prevention and treatment of caries at the initial stage have been developed and implemented, which help to prevent tooth surface destruction. Until recently, the treatment of patients in this category consisted of time-consuming remineralizing therapy with fluorides, redoment, and calcium gluconate. In 2008, an alternative method was proposed to prevent the further development of focal enamel demineralization – the technique of caries infiltration with Icon (DMG, Germany). In the last decade, the effectiveness of infiltration of carious lesions in the treatment of carious spots on vestibular and approximal surfaces has been proven. The infiltration of caries-affected tissue areas with Icon material allows the damaged enamel to be impregnated and sealed with polymer resin and creates conditions for the natural remineralization of the carious lesion. In this regard, it is important to develop and improve methods for the prevention and treatment of early forms of caries during the eruption of permanent teeth.

An analysis of the literature on evaluating the effectiveness of the ICON system in the treatment of initial caries over the past 10 years has been conducted, and factors affecting patient compliance with treatment have been identified. Scientific databases were used for the analysis: PubMed, Cyberleninka, Scopus, Web of Science, MedLine.

Focal demineralization of teeth is characterized by demineralization of the subsurface layer of enamel, acids formed as a result of bacterial fermentation of carbohydrates dissolve the main mineral component of enamel, calcium hydroxyapatite, which leads to the formation of porous structures filled with enamel fluid. Traditional methods of treatment based on the remineralization of enamel using calcium and fluoride preparations require multiple procedures and a long time.

The essence of infiltration technology for the treatment of initial forms of caries can be expressed in 3 main points: opening the pores by removing the surface pseudointact layer of enamel using "ICON"-Etch, removing the enamel liquid and drying by applying "ICON"-Dry, filling the enamel pore system with infiltrate ("ICON"-Infiltrant).

The minimally invasive method has many advantages: 1. no discomfort during the procedure; 2. effective elimination of pathology without drilling and pain; 3. prolongation of tooth life; 4. Versatility of application; 5. Complete safety for healthy tissues and their maximum preservation; 6. restoration of enamel aesthetics (natural shine, shade, smoothness); 7. in one step a session can cure several teeth without anesthesia. "ICON"-caries infiltration is often used as part of orthodontic therapy and after its completion. The procedure can be performed even for children starting from the age of 4.

But despite its effectiveness, versatility, and practicality, the ICON system has some drawbacks.:

1. high efficiency is possible only in the treatment of superficial forms of the carious process, in the presence of erosive lesions of the enamel, the infiltrate will be ineffective; 2. high cost (in comparison with classical methods of eliminating the carious process); 3. The application of the technique requires a highly qualified doctor and skills to work with the infiltrate.

It should be noted that the "ICON" technique has been practiced in dentistry for several years. However, there is still no consensus among dentists. There are adherents who widely use the innovative technique in their practice, as well as opponents who believe that classical tissue preparation has a higher efficiency.

According to R.K. Fattal et al., the effectiveness of the use of infiltration of focal demineralization of enamel with the "ICON" material is very high, which was confirmed by the research of this group of authors in 2014.

Conclusions:

The results obtained as a result of the conducted research indicate that the ICON system allows:

1. Stop the development of caries: the system effectively infiltrates the affected dentin, restoring its structure and preventing further necrotization. 2. Preserve natural dental tissue: Thanks to a conservative approach, the ICON system avoids tooth dissection and preserves their natural structure. 3. Ensure long-term effect: the study showed that treatment using the ICON system is effective in the long term, with minimal risk of caries recurrence. 4. The ICON system is characterized by minimal invasiveness and high aesthetics, which increases the level of comfort for patients. The effectiveness of the drug depends on the level of oral hygiene and requires constant motivation and monitoring by a doctor.

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