

F. Karout

THE USE OF CARIES MARKER IN THERAPEUTIC DENTISTRY

Tutor: senior lecturer J.D. Borisova

*Department of Conservative Dentistry
Belarusian State Medical University, Minsk*

Resume. The prime treatment objective for carious teeth requiring operative intervention is complete removal of infected dentin followed by placement of a well-sealed, long-lasting restoration. Fundamental considerations in the process are the maintenance of pulp vitality and minimal destruction of sound tissue.

Keywords: caries marker, caries detector, CID dentine, CAD dentine, cavity preparation.

Relevance. The main goal of dental caries treatment is to completely remove affected tissues while preserving as much healthy tooth structure as possible and maintaining pulp vitality. Diagnostic aids should have a very low rate of false positives to avoid unnecessary treatment. Clinical assessment of caries often relies on color and dentin hardness, which are considered subjective and have low reproducibility. Caries detector dyes are used to aid in the diagnosis of caries in dentin, but studies have shown that they can cause false staining of healthy tooth surfaces, leading to unnecessary removal of intact dentin.

Aim: to evaluate the efficacy of caries detector dye in the diagnosis of dental caries.

Materials and methods. For the study, 10 teeth were selected, extracted due to periodontal diseases. The caries marker based on eosin was used in the work («Caries indicator», Omega dent) (fig. 1).



Fig. 1 – Extracted teeth

After extraction, the teeth were placed for disinfection and storage in a 10% formaldehyde solution at room temperature. The criteria for inclusion of teeth in the study were: presence of carious lesion of the crown (moderate and deep), absence of carious lesions of the root, absence of previous endodontic treatment, absence of restorations.

Teeth were divided into 2 groups according to the cavity depth. First, all 10 molars were stained before preparation to study the initial result of marking. A microlense was used for a clear and accurate assessment of the degree of staining. After the stages of cleaning the tooth surface from plaque and opening the carious cavity, the cavity was thoroughly rinsed with water and dried with an air stream. Excessive moisture will interfere with the effective staining process. Then, using an applicator, the dentin surface was stained with a caries

marker for 5-10 seconds. Next, a visual assessment of the intensity of staining was carried out. Then lesions were prepared with diamond burs and turbine handpiece for enamel and with carbide burs and angle handpiece for the dentine. After every process of preparation, the lesion was marked with the detector (according to instruction for 5-10 sec) and probing the hard tissues to assess both the hardness of the tissues and the degree of staining was performed.

The procedure was repeated until the staining disappeared when applying and washing off the caries marker, which indicates the absence of infected and demineralized dentine. At the end, the cavity was thoroughly rinsed and dried (fig. 2, 3, 4).

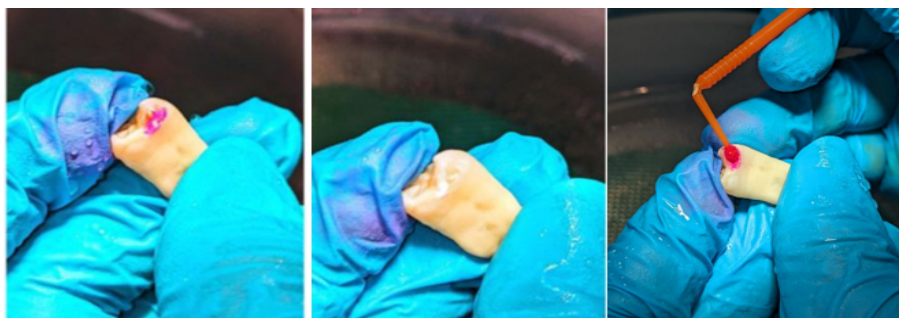


Fig. 2 – Sequential preparation and staining of moderate cavity (Group №1)



Fig. 3 – Initial dye state, preparation of the superficial layer and further dyeing (Group №2)



Fig. 4 – Sequential preparation and dyeing on different depths, the marker is still retained even with excessive preparation (Group №2)

Results and their discussion. The staining shows marking of DEJ only then complete absence after final preparation for moderate lesions (fig.5) while in deep lesions the staining persists even when reaching the hard tissues, noting that angular handpiece was used to eliminate the excessive force of the handpiece for the preparation of the lesion so that the only effect to be studied is the aimed effect of excessive preparation by the operator.



Fig. 5 – Result of preparation of moderate lesion, no stain left

The staining persisted even after extra preparation and reaching the sound circumpulpal dentine which increases the risk of pulp exposure which is known as the false positive result of the marker (fig.6).



Fig. 6 – False positive staining of circumpulpal dentine and pulp exposure

Conclusions. Based on the results obtained, the following conclusions were formulated:

1 careful tactile and spatial judgment to differentiate between heavily infected outer carious dentin, which must be removed, and uninfected, demineralized, inner affected dentin, which may be left, reduces the risk of direct pulpal exposure, allows continuing pulp vitality and maximizes the known reparative potential of the dental pulp in the absence of significant bacterial contamination;

2 disclosing agents are useful as an additional method but should be used with precautions;

3 the usage of markers is trusted for moderate lesions, in deep lesions, false positive tests are an issue and may lead to pulp exposure;

4 markers better be accompanied by other additional methods to save the hard tissues and avoid complications (like excessive preparation and pulp exposure).

Информация о внедрении результатов исследования. По результатам настоящего исследования опубликовано 2 статьи в сборниках материалов, 1 тезис докладов, получен 1 акт внедрения в образовательный процесс (кафедра консервативной стоматологии БГМУ), 2 акта внедрения в производство (УЗ «3-я городская стоматологическая поликлиника» г. Минска, УЗ «12-я городская клиническая стоматологическая поликлиника» г. Минска).

Literature

1. Brantley C. F. et al. Does the cycle of reresoration lead to larger restorations? //The Journal of the American Dental Association. – 1995. – Т. 126. – №. 10. – С. 1407-1413.

2. Anusavice K. J. Criteria for placement and replacement of dental restorations //Florida dental journal. – 1988. – Т. 59. – №. 2. – С. 30-31.