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ПЕРИНАТАЛЬНОГО РИЗИКУ

## THE USE IRRIGATION OF CITRIC ACID FOR A STAGE OF ROOT CANAL TREATMENT

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**Introduction.** The use of irrigation solutions for cleaning the root canal system is one of the most controversial topics in endodontology [1, 2]. During the preparation and endodontic treatment (manual, rotary, ultrasonic techniques) of the root canals, micro-layering is produced on the treated dentin surface in the form of a so-called smear layer, which is formed from organic and inorganic components, preventing their further full obturation. Removal of the smear layer from the walls of the root canal and cleaning of the deltoid branches of the root apex should be considered the most important stage in the treatment of complicated caries, which will minimize the number of complications.

Recently, an additional use of chemical solutions (gels) has been proposed for maximal root canal system cleansing from dentin debris (chips) during the treatment [3, 4]. In modern literature, the feasibility of using citric acid with this purpose is actively discussed.

The purpose of the work. Therefore, the purpose of our research was to study the mechanism of the chemical interaction of citric acid solutions with the mineral and fibrous (collagen) structures of the tooth root for the effective removal of the smear layer from the root canal wall and cleaning of its apical deltoid branches.

**Research material and methods.** 28 teeth of different types, extracted for orthodontic and surgical indications in patients aged from 28 to 60, were used as the material in this study. The roots were used to simulate endodontic treatment (in vitro). In order to do this, the stage retrieval of root canals was carried out with the step-back

technique from size 15 to 30 accompanied with constant irrigation of a certain citric acid solution. Instrumentation ended at 1 mm from the root apex with master file No. 30. Then, after irrigation with the certain citric acid solution, a turunda soaked in the same solution was left in the canal for 2 days. In the experiment we used 7%, 10%, 15%, 25% citric acid solutions. Then each tooth was cut lengthwise with a water-cooled diamond blade and the changes in the root canal system were examined.

**Results and discussions.** As it turned out, the effect of citric acid on the tissues of the tooth root has certain characteristics. After a 48-hour contact with a 7% citric acid solution, a cleaned surface with moderately gaping and dilated dentinal tubules is clearly observed on the root canal wall. Prolonged contact with the citric acid irrigant leads to the appearance of insoluble crystals of calcium citrate on the canal wall. According to our observations, the concentration of the citric acid solution is of decisive importance in this process.

In the root canal treated with 10% citric acid we register an increasing degree of calcium citrate formation as compared to the above-mentioned case. Thus, on the canal wall there is a thin granular layer of calcium citrate, bordering on lumpy granular layers of calcium citrate. The latter tend to interfuse with or are close to each other.

With an increase in the citric acid concentration up to 15%, the side effect of an insoluble calcium citrate salt formation also increases. The lumen of the root canal is almost completely filled, only in rare cases solitary cavities buried in the formation are determined.

This process is plainer to see when using a 25% citric acid solution. The root canal along its entire length is filled with a white substance adhering tightly to the surface of the peri-pulpal dentin. On its surface there are small pits of various shapes and sizes.

Analysis of the reasons for the failure of endodontic treatment has made us somehow rethink the meaning of its individual stages. Biological prerequisites, such as the complexity of the internal morphology of the tooth, as well as the intracanal biofilm, force us to search for new effective methods of root canal cleansing. And in this regard, the problem of high-quality root canal irrigation comes to the fore as a guarantee of successful root canal treatment. Before filling, we have one last chance to remove the smear layer and disinfect the root canal system; the combined use of sodium hypochlorite solution with EDTA or citric acid is usually recommended for this purpose. The efficacy of the final irrigation depends on the chemical properties and concentration of the solution, as well as on the total volume of solutions and the duration of their exposure in the canal.

**Conclusion.** In conclusion, we would like to note once again that the results obtained indicate that the selected concentrations of citric acid solutions (7%, 10%, 15%) turned out to be effective to a certain extent. This refers to the process of demineralizing the smear layer. Since citric acid solution is rapidly inactivated in the presence of mineralized dentin chips, it must be renewed from time to time, especially if it is cloudy or begins to dry out. With an increase in the citric acid concentration, its destructive effect on the hard tissues of the tooth increases. The use of a 25% citric

acid solution was characterized by the formation of calcium citrate not only on the root canal walls, but also along its entire surface. After applying acids, it is recommended to rinse the root canal with distilled water as there is a tendency for crystallization and sediment formation.

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# A CLINICAL CASE OF HERPETIC INTERCOBAL NEURALGIA

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Herpetic neuropathy is a condition in which the herpes simplex virus affects the nerves, causing inflammation and damage. The disease usually affects the cranial nerves, which are nerves that originate in the brain and control functions such as vision, hearing, and facial movements. Herpetic intercostal neuralgia, also known as herpes zoster or shingles, is a condition caused by the reactivation of the varicella zoster virus in the sensitive nerve fibers that supply the skin of the chest and abdomen [1].

Symptoms of herpetic neuralgia may vary depending on the affected nerves. Clinical manifestations of herpetic intercostal neuralgia can vary, but usually manifest with the following symptoms: pain, which is the most common symptom, skin rash, sensory changes, and flu-like symptoms [2].