

The Polishing of Teeth with Abrasive Pastes as a Procedure in Preventive Caries

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Summary

The aim of this study was to stress the importance of periodical removal of hard and soft sediments as well as of dental surface polishing. A clinical examination was performed among 18 fifth year students of the School of Dental Medicine, University of Zagreb. The use of Caries Risk Test (Vivadent, Schaan, Liechtenstein) showed the amount of Streptococcus mutans and Lactobacillus in the saliva. Based on the results obtained, we polished the teeth with Proxyt pastes for cleaning and polishing, each being of different abrasive value, determined by the producer and labelled as RDA (Relative Dentin Abrasion). After polishing the test was repeated. The results achieved were compared to data previously obtained and showed that dental surface polishing and removal of hard dental sediments have been neglected.

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Introduction

The enamel surface is covered with an organic membrane called pellicula. This membrane is formed 30 minutes after cleaning/brushing the teeth. In time, this pellicula is covered by carbohydrates from food, peeled cells of the epithelium and bacteria, which causes the pellicula to become thicker and a formation called dentobacteria plaque is created. Bacteria that colonize the plaque consist of normal flora of the oral cavity, the most important of which are *Streptococcus mutans* and *Lactobacillus*. These bacteria transform glucoses from food into weak organic acids (lactic, pyruvic, butyric etc.) which then defound through the plaque to the surface of the tooth and provoke demineralisation. If this process

lasts for a longer period it can cause tooth cavitation. It should be mentioned that the saliva contains puffer systems (bicarbonate, protein, phosphate) with the task of neutralising acids and preventing the demineralisation of hard tooth tissues (1,2). These systems, however, are efficient in the earlier phase of plaque creation. However, with maturing of the plaque and increase in its thickness, it becomes impenetrable for the saliva and the puffer system it contains.

Accumulation and agregation of the plaque can be prevented with frequent use of a toothbrush and pastes with the addition of fluoride. Completely mature plaque is a creation which firmly sticks to the tooth surface and can only be removed mechanically, using polishing gums and abrasive pastes

conducted by a dentist. The aim of this study was to draw attention to the necessity of periodical professional removal of hard and soft tooth sediments and teeth polishing performed by a dentist.

Materials and procedures

A clinical examination was carried out on eighteen fifth year students of the School of Dental Medicine. The amount of *Streptococcus mutans* and *Lactobacillus* in the saliva was specified by Caries Risk Test (Vivadent, Schaan, Liechtestein), and on the basis of the results the teeth of the subjects were polished with Proxyt pastes for teeth cleaning and polishing. After polishing the test was repeated been. The results obtained after polishing were compared with the previously gathered data.

Caries Risk Test determines the amount of the bacteria *Streptococcus mutans* and *Lactobacillus* in the saliva. The saliva taken from the subjects was smeared on the nutritious base and stored in the incubator at a temperature of 37°C. The results of the bacteria incubation were read after 48 h, using the key for reading bacteriological findings which is included in the polishing set (Figure 1). If the amount of bacteria in the saliva exceeds 10^5 , the test is positive. In other words, the risk of the creation of the caries is high (Figure 2a). On the contrary, if the number of bacteria does not reach 10^5 , this risk is lower (Figure 2b). Letters *a* and *b* denote two students whose results of the incubation have been taken.

The set of Proxyt polishing pastes comprises three tubes with different abrasive quality already determined by the manufacturer and marked as RDA (Relative Dentin Abrasion). The pink Proxyt paste has low abrasive quality (RDA 7) and is used for polishing composite fillings. The green Proxyt paste has medium abrasive quality (RDA 37) and is used for removing plaque. The Proxyt paste with the highest abrasive quality (RDA 83) is made for the removal of plaque and slight discolourations. The polishing is done with a brush inserted into the mycomotor, in a small number of turns (about 1500) to prevent the growth of temperature which could provoke pathological changes in the pulp. Both the upper and the lower dental arch were

polished. The efficacy of the paste is due to xylitol, which prevents metabolism of the bacteria and the development of plaque, and to amin fluoride which protects the tooth structure.

The test was repeated after polishing. The amount of bacteria after polishing was compared to the amount from the saliva before polishing. A significant decrease in the amount of the bacteria was noted, which indicates the efficacy of this procedure. The result of the bacteria incubation before and after polishing can be seen on Figs. 3a and 3b.

Results

Caries Risk Test, conducted after polishing with Proxyt polishing pastes, showed a significant decrease in the number of bacteria, which can best be seen on images of the teeth before and after polishing. Also, comparison with the key for reading results, showed an important decrease in the number and size of the colonies.

Discussion

Tooth caries is one of the most widespread diseases in the world. It affects all populations and age groups. Because of the very complex interaction of social, cultural, biological factors and nutrition habits, which all together support caries, it is a disease that may never be eradicated (3). It is particularly spread in developing countries, which can be explained by the rise in living standards and increased consumption of food richer in carbohydrates, especially with glucoses, together with incomplete implementation of caries prevention. Some preconditions are needed for the creation of caries, shown in Figure 1. If one of them is missing, the possibilities of caries development decreases (4). In developed countries the accent has been on prevention for some time now, and not on the treatment of caries, which has shown extraordinary results, because many countries have achieved the goal of WHO and do not have DMFT (Decayed, Missing, Filled, Teeth) index higher than 3 (5). These results were obtained

by increasing medical knowledge, milk and the salt fluoridation and even more important by fluoridation of drinking water, as well as periodical dental check-ups (2,6,7).

The object of our study was to point out the need for periodical removal of soft and hard tooth sediments as an additional procedure that can also contribute to caries prevention. It has been demonstrated that tooth sediment does not cling easily to smooth and polished teeth and it is thus easier to remove. Polishing is especially efficient for existing fillings because some irregularities on their surface can cause problems such as: plaque amassing, irritation of surrounding gingiva and aesthetic loss of aesthetic fillings (8).

Conclusion

In conclusion, it can be said that not enough attention has been given to the process of the removal of hard tooth sediments, especially when considering the negative effects that these sediments can cause. Roughness of the surface, which forms because of the accumulation of hard tooth sediments, can cause the creation of plaque. On the one hand, this provokes caries and on the other, it can cause different forms of gingivitis. The very roughness of the surface, as well as the mechanical pressure on the edges of the gingiva increase inflammation or lead to its retreat, which in the end causes different types of periodontal disease. Final polishing and removal of tooth sediments can prevent these problems.