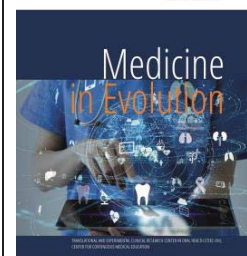


# Dental Sealings in a Group of Young Adults with Occlusal Stains – A One Year Follow up Study



Țandără A.<sup>1</sup>, Oancea R.<sup>2</sup>, Funieru C.<sup>1\*</sup>, Mărgineanu S.<sup>3</sup>, Slușanschi O.<sup>1</sup>

<sup>1</sup>Department of Preventive Dentistry, Faculty of Dentistry, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

<sup>2</sup>Preventive, Community Dentistry and Oral Health Department, Faculty of Dental Medicine, "Victor Babeș" University of Medicine and Pharmacy, Timișoara, Romania

<sup>3</sup>Private practice, endodontics

Correspondence to:

Name: Cristian Funieru

Address: Department of Preventive Dentistry, Faculty of Dental Medicine, "Carol Davila" University of Medicine and Pharmacy, Bucuresti, Romania, Eforie Street no. 4-6, district 5, 50037

Phone: +40 723268929

E-mail address: thycristi@yahoo.com

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## Abstract

**Aim and objectives:** The aim of the present study is to determine the rate of survival of dental sealings applied in a group of young adults (mean age 24) on lateral teeth which present occlusal stains that cannot be clinically diagnosed as caries. **Material and methods:** The study group consisted of 21 patients with 111 teeth to be sealed. After performing the sealings, the follow up was recorded in two sessions at 6 and 12 months, investigating the integrity of the dental sealings and any modification of the occlusal stains. **Results:** We recorded a global percentage of complete presence of sealings at 1 year of 92.79%. No sealing was completely lost and none of the occlusal stains under the sealings presented visible signs of evolution towards cavity. **Conclusion:** Dental sealing can be a viable and conservative option in young adults with occlusal stains that cannot easily be diagnosed as dental caries.

**Keywords:** Dental sealing, occlusal stains, young adults

## INTRODUCTION

Sealing, often used in caries prevention, is one of the most efficient methods for a dental practitioner to prevent the appearance of pit and fissure caries on the occlusal, buccal and oral surfaces of newly erupted teeth, as well as those with a longer period of time of persistence at the level of the dental arches. Often used in national and international dental prophylaxis programs, sealing helps patients to keep their teeth healthy for as long as possible, knowing the destructive potential of caries on hard dental tissues [1]. Although the occlusal surfaces represent approximately 12.6% of the area of the dental surfaces, 60% of the total carious lesions are grafted into the fissures and pits at this level, presenting an increased vulnerability to the cariogenic attack, for various reasons [2]. Evidence show us that sealants could minimize the progression of initial lesions (non-cavitated occlusal carious lesions) that receive a sealant [3]. The consensus appears to be that dental sealants are intended to be used mainly for children, whose teeth are in the early developmental stage, and teenagers. Yet, when applying them to adults, less attention is given to the preventive long-term aspects [4].

### *Aim and objectives*

The purpose of this study is to evaluate the short- and medium-term retention of dental sealants in teeth with discoloration in the occlusal fissures and pits, which cannot be clinically diagnosed as caries in the dentin, in young adult patients.

## MATERIAL AND METHODS

The study we carried out is an experimental, analytical, prospective one. We selected a study group, made of a number of 21 subjects, aged between 23 and 27 years. We considered several criteria for choosing the teeth that were to be sealed, excluding those with fillings on the surface to be sealed, carious lesions presenting a cavity, previous sealings or other resinous materials, resulting in a total of 111 teeth to be sealed. All selected teeth presented stains in their pits and fissures. All patients agreed to participate in the study, giving their informed consent. A single operator examined the 21 patients, chose the teeth to be sealed and performed the sealings in order to avoid distortions (bias) that may occur when there are several clinicians who must record similar data and/or perform similar treatments in a group of patients [5].

After choosing the teeth to be sealed, we proceeded to perform the sealings, following the well-known clinical steps of the procedure. Isolation during the procedure was done with absorbent rolls and saliva aspirator, no rubber dam was used. After performing the sealings, the patients were discharged, being called for control at 6 months and at one year. We monitored the evolution of the seals through the clinical consultation and photographs, which helped us establish the results of the study.

We have selected a material widely used and easy to find on the commercial dental market, namely Fissurit F from Voco. The chosen material has the following advantages: quick and direct application by means of the syringe, white color favorable to the control during and after sealing, excellent flow properties and low viscosity, does not incorporate air bubbles, increased stability and good adhesion to enamel, prolonged release of fluoride.

The first evaluation took place approximately six months after the dental sealings were performed, with the main objective of controlling the presence of the sealing material. In the case of its partial loss, we did not proceed to restore or complete the sealing in order to have the possibility to re-evaluate exactly the same sealing one year after it was performed, without any additional intervention.

The second evaluation took place approximately one year after the dental sealings were performed and consisted of a new check of their presence and the condition of the sealed teeth. In the case of their partial loss, this time we proceeded to restore or complete the sealing.

The data recorded during the 3 clinical sessions were introduced into tables created in Excel (Microsoft), then we performed the statistics to observe the evolution over time of the sealings performed.

## RESULTS

In this study, we monitored the retention of the sealings performed on a group of 21 patients, of which 12 were male and 9 were female, with a mean age of 24 years, to whom we applied a total of 111 sealings. The follow-up period was 1 year, starting in March 2011 and ending in June 2012, with professional checkups every 6 months. All the teeth included in the study presented stains in pits and fissures at the beginning of the study and all the sealings were made with the same material - Fissurit F. We applied sealings both on the molars (33), especially the mandibular ones, and on the premolars (78), with the latter the results being more favorable.

We recorded a global percentage of complete presence of sealings at 1 year of 92.79%.

At six months, following the examination, we detected a partial loss of retention at the level of 6 molars, and at 1 year we observed another 2 partially lost sealings, but none presented secondary caries or marginal staining, and there was no clinical sign of evolution in depth of any possible incipient dental caries covered by the sealing material. At the last evaluation, the one from 1 year, most of the sealings presented some mechanical wear, transposed by the loss of surface gloss and slight color changes, especially in the male sex, where we also found staining due to tobacco at the level of all teeth.

There was a significant difference between the sealings performed on premolars and those performed on molars. At the level of the premolars, out of 78 seals, all were fully maintained on the occlusal surface, thus having a 100% positive result in terms of strength and durability for one year, while at the level of the molars the success rate was lower, with differences related to sex. From the total of sealings performed on molars (33), we found the partial loss of 8 sealings, their success being 81.81% at 6 months and 75.75% at 1 year. The integrity of sealings related to the teeth groups is presented in Chart 1.

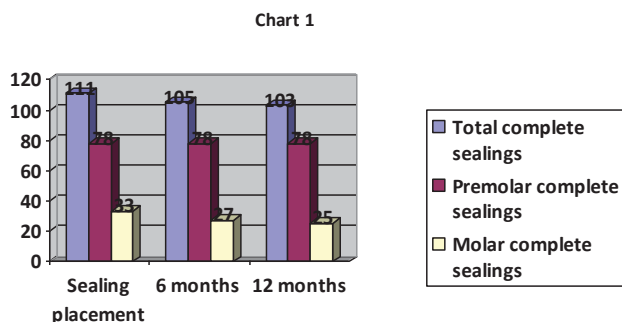


Chart 1. The integrity of sealings related to the teeth groups

Regarding gender, from 36 sealings performed on females, we recorded a favorable status and a retention of 100% at 6 months and 1 year, compared to the percentages of 92% at 6 months and 89.33% at 1 year, obtained in males from the total of 75 sealings performed on them. For the males, where the seals were partially lost, the sealing material changed over time in appearance and color, appearing more matte and darker in color compared to how it looked at the application session. The integrity of sealings related to patients' sex is presented in Chart 2.

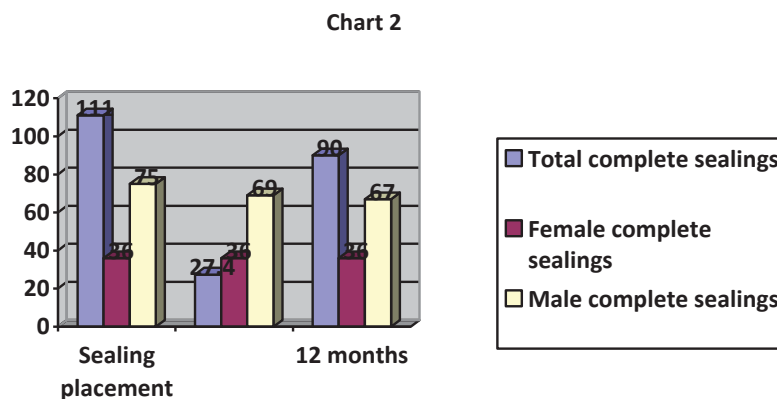


Chart 2. The integrity of sealings related to patients' sex

## DISCUSSIONS

The results presented here demonstrate the possibility of measuring the quality of a seal or a material, using a simple criterion to define the seal as satisfactory or unsatisfactory, namely the retention of the material at the level of the sealed fissure or pit, but also widely used by other studies [6] being easy to understand and apply without being time-consuming. The results obtained were satisfactory, but the study has some limitations, which must be mentioned.

One of these may be the relatively small number of patients, respectively of sealings and the disproportionate ratio between sealings performed on premolars compared to molars. Thus, the seals made on the premolars showed a retentiveness of 100%, and those on the molars only 75.75% after one year after performing the sealings, such results being also reported by other studies [7]. In the analysis by gender, we obtained a percentage of retention of 100% in females and 89.33% in males after one year, but it must be considered that in males we performed a double number of sealings than in females, as the sealings performed on the premolars were in much higher numbers than those made on the molars. Although the specialized literature informs us that the retention of the seals is superior at the level of premolars compared to molars [7], in this study we did not perform the same number of seals on the two groups of teeth, so the result in this sense cannot present verisimilitude. We can conclude that the lack of integrity of the material at the level of one wisdom tooth and seven second molars reside in the difficulty of achieving a perfect technique and good isolation, especially in terms of maintaining the isolation, which encounters some problems, given the access to the area respectively, under the conditions of using cotton rolls as absorbent means. In similar cases we consider that the use of rubber dam should be recommended, although placing a rubber dam around a 3rd molar is known to be quite difficult – we did not find significant studies regarding the placement of rubber dam around the third molar – and we consider this to be a necessary future direction to research.

Another weak point of the study was the age of the subjects to whom we applied the seals. All patients are close in age and are already at a young adult age so, some of the teeth recommended to be sealed had been affected by caries in the past and present occlusal fillings. In this age group the perception of oral health and hygiene may be different than in children and especially teenagers – we did not find significant studies to support this statement, and we also consider this to be a future direction to research – they pay more attention to oral care. Although most of the subjects present a problematic dental status, they currently have very good oral hygiene, with low or even zero bleeding and plaque indexes, and also present a reasonably good socio-economic status and a positive attitude towards the preventive measures. As general criteria, there were no patients that could be placed in the category of high caries risk. We placed them in the risk category that requires sealing based on the DMF-T/DMF-S indices, i.e. the dental status.

However, this aspect of age can also be considered a positive thing for the purpose of the study, since, usually, the sealings are mostly performed in children and adolescents, 2-3 years post-eruption, and less in adults, so it can be a reflection of the behavior of seals on some mature teeth, from an oral environment in which the factors determining and favoring the appearance of caries have already left their mark. The age of the patients also helped us, being able to perform a correct sealing technique, all patients being compliant to the procedure.

In the case of partially lost seals, it was unexpected and surprising that in most cases the change occurred in less than 6 months and up to a year no further loss of material occurred. Therefore, it cannot be a question of a gradual degradation of the retention of the seals, but on the contrary, they seem to maintain themselves very well over time, once they have passed the first months after application. The variables related to the technique and the material used can be related to this aspect. In this case, as far as the technique is concerned, it was only one hand (so one operator), we strictly followed all the clinical steps, and the material chosen has superior qualities and a proven clinical success, having a different color than that of the teeth, thus being easy to evaluate. Therefore, we consider the results obtained to be accorded to reality.

The sealing material that we applied is one that releases fluoride, so the expectations are for remineralization of the incipient caries under it, an aspect that we could not evaluate, considering the fact that the potential occlusal caries lesions remained sealed. But, at the control sessions, we could observe the fact that none of the sealed teeth showed any edifying symptoms or clinical signs for an evolution towards a more advanced stage of caries.

## CONCLUSIONS

According to literature, the durability and resistance of dental sealings can be a measure of their quality evaluation in dentistry.

After the one-year evaluation we recorded a percentage of 92.79% of intact sealings and 7.21% of partially lost sealings with no completely lost sealings.

Regarding the evolution of stains, out of the total number of sealed teeth, none developed an active cavity under the sealing material.

The procedure for applying a dental sealing is easy, within the reach of any dentist and even dental hygienists, bringing great benefits for occlusal caries prevention not only for children and teenagers but also for young adults.

When occlusal stains are present without the certainty of dental caries a conservative approach should be considered, consisting in dental sealing with regular follow-up.

When performing dental sealings in young adults on teeth presenting occlusal stains we recommend supplementary caution in males' molars since retention of sealings on these teeth seems to be most difficult to achieve.

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