

Denture Sealants in Minimizing Risk of Caries Lesions

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Abstract

Patients can become entirely edentulous (without teeth) due to severe malnutrition, genetic defects such as dentinogenesis imperfect, periodontal disease, age, tooth decay or traumas. Sealants, however, are very thin and only fill the pits and grooves of molar teeth. Sealants keep germs and food particles out of the grooves by covering them with a safe plastic coating. Denture sealant cream is used to keep dentures in place during normal daily activity. When properly placed, sealants provide a physical barrier between the dental enamel and the oral environment shielding the tooth surface from acid challenge. Dental sealants are highly effective in preventing dental caries that occur on the surfaces of teeth that have pits and fissures. Sealants can save time, money, and the discomfort sometimes associated with dental fillings.

Keywords: Denture sealants, dental caries, partial dentures, acquired enamel pellicle

Introduction

Losing a tooth or teeth might cause a lot of problems. First of all, it creates gaps in mouth where food is retained and may provoke gums diseases. Also it may cause difficulties in chewing and even speech errors. And for most of people the greatest problem of missing teeth is their unaesthetic appearance. Modern dentistry offers a great variety of solutions. The most acceptable and affordable solution for the majority of people who have such problem is using dentures. There are different types of dentures and many factors must be considered when choosing a denture. Basically dentures can be partial or complete (full dentures). Main full dentures types are standard dentures, immediate dentures, implant retained dentures (removable implants), and Cu-Sil dentures.¹

Standard dentures are made for people who already lost all their teeth. The dentures are fixed in the mouth on the principle of "suction". There can appear some inconvenience to people who wear them because of their instability. But they are relatively cheap and sometimes can represent the only reasonable solution. Moreover, there are different fixing products on the market, like dentures glue, that help to make it more comfortable to wear standard dentures.

Immediate dentures (or temporary dentures) are the perfect solution for people with damaged teeth that need to be extracted, who cannot afford to spend any time with edentulous jaws. So, the non-repairable teeth are extracted and a prefabricated denture is inserted directly over the bleeding sockets. When the gums are healed a standard or other type of permanent denture can be made.

The Cu-Sil dentures have holes for not extracted teeth. If there are a few (or just one) healthy teeth (or tooth) in the mouth, they are used as a support for the dentures. They assure a better fixation, avoiding a lot of problems that a standard denture can cause. Also this option allows keeping the healthy teeth that in the past were extracted. Implant retained dentures are an improved type of dentures fixed in the jaws with mini-implants. When most of teeth are missing, removing each of them with individual dental implants will be very expensive. On the other hand, two or three mini-implants can fix an entire denture properly on the jaw, minimizing the inconveniences of a standard denture. A good fixation removes chewing and talking difficulties and minimizes the pressure of the lower denture on the mandible, also takes off the tension from the tongue. It is more expensive than a standard denture, but it is a great solution if one can afford it.

It doesn't matter how well your dentures presently fit in mouth, eventually the contours of gum line will shift, and the false teeth will need to be relined to adapt to that change. The thing is that one won't be able to reline dentures without visiting a dentist-not unless one has the necessary dental care equipment and abilities to perform this pretty complicated operation (extremely unlikely). But this is the reason why dental glues were invented-so that even ordinary folks could correct poorly fitting dentures at home. Dental sealants are thin plastic coatings that are applied to the grooves on the chewing surfaces of the back teeth to protect them from tooth decay. Most tooth decay in children and teens occurs on these surfaces. Sealants protect the chewing surfaces from tooth decay by keeping germs and food particles out of these grooves. The

purpose of this review is to gain an understanding of dentures so that one can take care of his/her teeth more effectively.

About Dentures²⁻³

Dentures are asset of artificial teeth, which are used when a patient has lost real teeth on the mandibular arch, the maxillary arch, or both. Patients can become entirely edentulous (without teeth) due to severe malnutrition, genetic defects such as dentinogenesis imperfect, periodontal disease, age, tooth decay or traumas. Dentures are durable for five to ten years.

Permanent molars are the most likely to benefit from sealants. The first molars usually come into the mouth when a child is about 6 years old. Second molars appear at about age of 12 years. It is best if the sealant is applied soon after the teeth have erupted, before they have a chance to decay. As with anything new that is placed in the mouth, a child may feel the sealant with the tongue. Sealants, however, are very thin and only fill the pits and grooves of molar teeth. Applying sealants does not require drilling or removing tooth structure. The process is short and easy. After the tooth is cleaned, a special gel is placed on the chewing surface for a few seconds. The tooth is then washed off and dried. Then, the sealant is painted on the tooth. The dentist or dental hygienist also may shine a light on the tooth to help harden the sealant. It takes about a minute for the sealant to form a protective shield. Sealants should be checked at regular dental appointment and can be reapplied if they are no longer in place. Fluorides, such as those used in toothpaste, mouth rinse, and community water supplies also help to prevent decay, but in a different way. Sealants keep germs and food particles out of the grooves by covering them with a safe plastic coating. Sealants and fluorides work together to prevent tooth decay. Decay damages teeth permanently. Sealants protect them. Sealants can save time, money, and the discomfort sometimes associated with dental fillings. Fillings are not permanent. Each time a tooth is filled, more drilling is done and the tooth becomes a little weaker.

Advantages of Dentures⁴

Improved mastication - Chewing ability is improved by replacing edentulous areas with denture teeth.

Improve aesthetics- Provide a natural facial appearance and gives support for the lips and cheeks and corrects the collapsed appearance that occurs after losing teeth.

Phonetics- By replacing missing teeth, especially the anterior, patients are better able to speak by improving pronunciation of those words containing sibilants or fricatives.

Self esteem – patients feel better about themselves.

Promote dental health- With the option of dentures, patients are less reluctant to get diseased anterior extracted.

Types of Dentures⁵

1. Partial Denture: A patient who has lost only a few teeth may be fitted with a partial denture. Some are removal, being held in place by metal clasps that attach to remaining teeth. Others are fixed in place through attachments to the teeth on either side. Several types of partial denture have been created to help with wide variety of orthodontic challenges that patients face when they start losing teeth or develop periodontal problems.

a) *Flexible dentures*: A new kind of denture uses a synthetic resin for a versatile lining that is less likely to break and can cause less mouth pain for some patients. These dentures may be a bit more expensive than other options, but for many patients, they provide a lot of comfort and easier maintenance.

(b) *Cast metal denture*: These types of dentures have been popular with patients who want a less “bulky” feel than they may get with the acrylic varieties.

c) *Removable partial denture*: If patients are missing only a few teeth, or even have a minimum of two teeth on both sides of the arch, then the patient can most inexpensively replace the missing teeth with a removable partial denture (RPD). There are several types of RPDs and all of them use standard plastic denture teeth as replacements for the missing natural teeth. Notable examples include but are not limited to flippers RPD, cast metal RPD, flexible framework RPD, lower Valpast, Vitallium PD, and Nebsit RPD.

2. Over Denture: Some patients loose significant number of teeth but have few viable ones in cases like this the remaining teeth are reduced in height, enabling them to accept an over denture, which is fitted to cover them.

3. Immediate Denture: They are placed all at once, and may require additional adjustments after the healing process. They are placed all at the time of teeth extractions during the surgery. It can take months for bone and tissue to stabilize after tooth extractions. The dentures often need to relined for proper fit at intervals

4. Complete Dentures: It is used for the patient having no remaining teeth. These patients may have a maxillary and mandibular device.

5. Implant Supported Dentures: These are like over denture except that implants support the denture rather than any teeth. Implants are placed in bone and then posts or attachments are placed on the implants that clip to the bottom of the denture. They also have the advantage of preserving bone levels under the denture.

Dental Caries

Dental caries is a complex, multi-factorial, transmittable infectious disease caused by the process of demineralization and remineralization in the presence of fermentable dietary

and cariogenic oral flora. The disease continues to be highly prevalent in the United States and other countries around the world. The 2001 Report of the Surgeon General-Oral Health in America-stated that 7% of children aged 2 years to 17 years had unmet dental needs.⁶ A 2006 survey found that 50% of children aged 5 years to 9 years had at least one cavity or filling with this proportion increasing to 78% among 17-year-olds.⁷

Shortly after the teeth erupt into the mouth, a protective layer of saliva-derived proteins-the acquired enamel pellicle (AEP) - forms on the tooth. A sticky, tenacious, and highly complex bio-film is created when dental plaque forms on the AEP and oral flora colonize it. The process of demineralization and dental caries formation begins when cariogenic microorganisms are present in large numbers and dietary fermentable carbohydrates become available in the dental bio-film.⁸ A white spot lesion initially appears. If demineralization continues, it results in cavitations of the tooth.

Many oral microorganisms are capable of forming organic acids that reduce the pH of the dental plaque when exposed to carbohydrates. Numerous streptococcus strains, including *S. mutans*, *S. sanguinis*, and to a lesser extent, lactobacillus, are considered important bacteria involved in the development of dental caries. However, our knowledge of the initial colonization of the oral bio-film, its maturation, and the microbial mediated caries processes remains incomplete. These organisms colonize the oral cavity prior to or shortly after the eruption of the first tooth.

The infant's oral cavity is often infected with *S. mutans* by transmission from a caregiver, usually the mother. Children colonized by *S. mutans* by the age of 2 years are much more likely to experience early childhood caries than children lacking cultivable *S. mutans*.⁸⁻¹⁰

Dental enamel is composed primarily of hydroxyapatite with smaller amounts of water, protein, and trace elements including fluoride. The enamel of newly erupted teeth is less dense and more permeable and soluble than mature enamel. The AEP assists in the post eruptive maturation of the dental enamel, considerably reducing its porosity. The application of topical fluoride to newly erupted teeth can also significantly increase caries resistance.¹¹⁻¹²

Denture Sealant Cream

Sealants are often used to occlude at-risk pits and fissures on teeth. When properly placed, sealants provide a physical barrier between the dental enamel and the oral environment shielding the tooth surface from acid challenge. Sealants are effective in arresting caries progression when properly applied to incipient demineralized lesions. Fluoride-releasing sealants are also on the market. The manufacturers of fluoride-releasing sealants claim that their products promote remineralization by releasing fluoride in the immediate area adjacent to the sealant.¹³

Denture sealant cream is used to keep dentures in place during normal daily activity. Dental sealant is applied as a pea-sized dabs to denture, then denture to be fit into the mouth so it is fully connected to the gums. Denture sealant actually improves the performance of ill fitted dentures. Denture sealant help to reduce irritation and sore spots caused by denture rub. Dental sealants are highly effective in preventing dental caries that occur on the surfaces of teeth that have pits and fissures. It offers good patient compliance by improving aesthetic values of patient; enhances denture retention, stability, and performance of denture; reduces mouth irritation and oral ulceration by giving cushioning effect, reduces denture wobbles and improves chewing efficiency and prevents food particles from sticking underneath prosthetic dentals.

An ideal sealant cream should be non-toxic, non-allergic, non-irritant and biocompatible with oral mucosa, be easy to apply and remove from the tissues and surface of the dentures, should not cause damage to the denture materials or to any other dental restorative materials, should retain its sealant properties for maximum time, should not promote microbial growth, or must not disturb the normal oral flora.

Conclusion

Dental caries is a common chronic disease that causes pain and disability across all age groups. Their non-life-threatening nature and their ubiquitousness have minimized their significance in overall human health. If left untreated, dental caries can lead to pain and infection, tooth loss, and edentulism (total tooth loss). Dental sealants are effective in preventing dental caries in the occlusal (chewing) and other pitted and fissured surfaces of the teeth whereas dentures are the last resort for regaining general aesthetic features.

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