

Denture Cleansers: A Review

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Abstract: Denture cleansers correspond to a variety of products designed to safely remove stains, deposits, and debris from the surfaces of dental prostheses, by means of various methods. It is a known fact that, In spite of the increase in various cleansing products and dental awareness in patients, many, leave the dental office totally uninformed on how to care for their complete dentures. Various studies, show positives and possible negatives with the use of the same. Therefore awareness of these materials and the symptoms related to their exposure along with proper guidance to the patients is paramount for dental personals.

Keywords: Denture, cleansers, stains, debris, prosthesis.

I. Introduction

With the world's population ageing, the challenges to the dental profession in coming years will be greater in providing oral care to people in the older age groups. Those charged with oral care will need to be skilled technical, as well as empathetic, practitioners whose role will be not only in oral health, but in issues involving the general health and well being of their patients¹.

It is a known fact, that the dentures that are cared for on a daily basis heighten patient's sense of wellbeing by keeping the tissues in the mouth healthy and free from unfavorable changes. In spite of the increase in dental awareness in patients, many leave the dental office totally uninformed on how to care for their complete dentures. Though mechanical cleansing using a soft denture brush and water is the most recommended as well as effective and safe method to clean dentures, for persistent accumulations or stains, overnight immersion in denture cleansers is a common practice.

A number of patients learn to clean their dentures from news, media and advertisements which can prove to be detrimental to the overall health of the uninformed patient. Therefore a dentist must possess a thorough knowledge of the various types of cleansers, their mode of action, ingredients, their effect on dentures as well as their potential to cause allergic reactions.

II. Classification

Denture cleansers correspond to a variety of products designed to safely remove stains, deposits, and debris from the surfaces of dental prostheses, by means of various methods.

Denture cleansers can be classified as

According To Type: Creams, pastes, gels and solutions or even tablets that are made to clean dentures. Soaking dentures in the cleaning solution varies from a few minutes to overnight depending on the manufacturer's instructions where as denture cleansing creams, pastes or gels are brushed on the denture after it is removed from the mouth and then rinsed off.

According to the mode of action: The most commonly used cleansers are represented by the group of alkaline peroxides².

Oxidizing (bleaching) agents: Alkaline perborate, sodium perborate or potassium monopersulfate.

These compounds remove staining and kill the bacteria harbored on a denture's surface.

Reducing Solutions- Sodium hypochlorite

Effervescing agents - Perborate, carbonate or citric acid. Effervescing agents provide for the rapid disintegration of the product and also create a mechanical cleansing action.

Chelating agents - EDTA. This type of compound helps to remove the tartar that has accumulated on a denture's surface.

Detergents- Sodium polyphosphate. These compounds assist in cleansing the denture.

Additional compounds - Dye markers that provides a color change when the cleansing process has been completed. Flavorings and fragrances.

Enzymes – Protease, amylase

Disinfectants- Potassium permanganate, gluteraldehyde

Influence of Denture Cleansers on the Denture Prosthesis as well as the denture users:

Color stability is an important property of denture base acrylic resin. Color changes indicate aging or damaged dental materials. However, according to a recent study by Hong et al³, utilizing 3 types of denture base acrylic resins, it was inferred that the color stability of denture base resins is influenced by the type of denture cleanser used. The least discoloration was found with acid type denture cleansers; whereas the most commonly used Alkaline peroxide cleansers caused maximum discoloration.

Difficulty in cleaning resilient denture liners remains a material disadvantage. The purpose of a study to evaluate the effect of denture cleansers on hardness of resilient liner materials concluded that cleansers had no effect on hardness of the liners evaluated after 2 years of in vivo simulated conditions of hygiene⁴.

Another study by Yoji et al⁵, concluded that increasing time of interaction between the denture and cleanser beyond a certain extent did not improve the efficacy of the cleanser, proving that the manufacturer's directions should be diligently followed.

Renata et al⁶, concluded in their study that Denture Cleansers used in clinical practice resulted in increased weight changes in denture liners though surface roughness and tensile bond strength were unaffected.

Problems have occurred with both proper and improper use of these products, in past.

The ingredient, persulfate which is known to cause allergic reactions^{7, 8}, is used in most denture cleansers as part of the cleaning and bleaching process⁷. An allergic reaction to persulfates may not occur after the first use or even until after many years of use. This type of hypersensitivity is type IV or Delayed Hypersensitivity due to allergen contact and results from cell mediated immunity (cytotoxic T-lymphocytes and cytokines) causing harm to the body. Symptoms may include irritation, tissue damage, rash, hives, gum tenderness, breathing problems, and low blood pressure.

A 3 month study, using enzyme tablets (mutanase and protease) was done. It was concluded that, the denture immersion in dissolved enzyme tablets resulted in a significant reduction of the amount of denture plaque and improvement of the clinical condition of the palatal mucosa⁹.

According to a recent case reported in Japan, a 27-year-old male ingested three denture cleanser tablets in water over a two-day period in an attempt to cause a false negative result on a pre-employment urine drug screen. Seven days later he presented with a perforated gastric ulcer, which was successfully repaired. Literature review and chemical analysis of this product reveal that it is unlikely to cause gastric perforation unless undissolved fragments were ingested. As this patient had no history to suggest a previous peptic ulcer, it is possible that his perforation was related to the ingestion¹⁰.

III. Discussion

Denture cleansing may be performed by a number of products, which are divided into two main classes: mechanical and chemical cleansers. An ideal denture cleanser should be simple to use, effectively remove organic and inorganic matter from denture surface, have bactericidal and fungicidal properties, and be compatible with all denture base materials¹¹. Chemical agents for denture cleansing have advantage of being simple to use, and several investigations have shown their efficacy in reducing biofilm formation in vitro^{12, 13, 14}, and in vivo^{15, 16}. Sonic denture cleaners (Fig.1) along with sterilizing U.V light in combination with chemical cleansers have also been used recently. However, no currently available product fulfills all these requirements.

Many elderly patients in long-term care hospitals cannot adequately brush their dentures because of disease, dementia and poor dexterity. Such inadequate cleaning may allow for the multiplication of *Candida* spp. and bacteria, which could serve as reservoirs for disseminating infections. According to studies, the use of denture cleansers significantly reduced the number of microorganisms on dentures in patients, especially in a hospitalized geriatric population^{16, 17}.

Various studies, show positives and possible negatives with the use of denture cleansers. Investigations and studies have pointed out that, the correct use of chemical cleansers is not associated to alterations in mechanical properties of denture base materials^{2, 20, 21}. As a rule, till date allergy or harmful effects by the proper use of cleansers following manufacturer's direction have also not been reported.

IV. Conclusion

Education is paramount; dental professionals must continually learn about the chemical content of products used at work. Awareness of any new symptoms and proper guidance to our patients can not be stressed more as denture cleansers are a part of the daily life of almost all the denture wearers. We as dental professionals must take responsibility of our patients health even after his treatment at our clinics is over.

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