ABSTRACT

Today's dentists and patients have the awareness that accumulation of plaque on dentures has an impact on patients' general health. Patients are willing to learn proper oral hygiene techniques and use of advanced materials for the maintenance of the dentures. Dentists have an obligation to motivate and instruct the patient and provide the means and methods for plaque control. This review paper discusses current materials and methods for cleansing dentures and different ways for maintaining oral hygiene.

Keywords: Dental Plaque; Denture; Oral Hygiene; Patient Education; Public Health

Introduction

The process by which denture accumulate plaque, stain, and calculus is approximately similar to that process which take place on natural teeth.1-3 The calcareous deposits which form on dentures are consisting specially of inorganic and organic particles.4,5 The organic particles form about 15% to 30% of total calcareous deposits. They consist basically of glycoprotein and are responsible for binding the deposits to the denture. It is presumed that these glycoproteins are similar in nature to the organic matrix of plaque that form on natural teeth.

Beside the esthetic and malodor problems, the layer of plaque which forms on the surface of the denture, has a great clinical significance. It induces a variety of soft tissues changes like denture stomatitis, inflammation, papillary hyperplasia, or chronic candidiasis.2,4 A routine denture cleaning regimen should be followed by patients to remove mucin, food debris, calculus, and exogenous discoloration and to prevent re-accumulation of microbial plaque. The purpose of this article is to review current materials and methods designed for cleansing dentures and to discuss special differences between them.

Commercial denture cleansing products can be divided into two large categories, chemical materials and mechanical methods (Table 1).

A. Chemical Denture Cleansers

A.1. Alkaline peroxide: Such as efferdent and polident which are the most commonly used denture cleansers. They include powders or tablets which dissolve in water to form an alkaline solution.5,6 This type of cleanser acts by reducing the surface tension and releasing oxygen. The released oxygen can produce an effervescing action, and so the cleanser may exert a mechanical ability to remove loss debris. Peroxide cleansers seem to be more effective on new plaque and stain but they are not better than brushing with soap.7-9 These products are not effective when soaking period is limited. Denture should be soaked in the chemical solution for several hours overnight.10-12

There are no side effects from the use of peroxide cleaners according to recent electron microscopic studies. Prolonged immersion of heat or chemically cured acrylic resin in peroxide cleaners did not affect the surface.12,13 However, there is some evidence that peroxide cleaners used for denture cleansing may cause bleaching of acrylic resin.15 Soft resilient denture liners are very susceptible to the harmful effects of peroxide cleaners.16 Peroxide cleaners have a pleasant odor and show little harmful effect on the metal components of partial dentures.12

A.2. Alkaline Hypochlorite: Alkaline Hypochlorite solutions such as mersene, are useful as denture cleansers because they remove stains, dissolve mucine and other organic substances.17 They are bactericide and fungicide. It is believed that hypochlorites act directly on the organic matrix of plaque. Hypochlorites remove light stains and food debris with a bleaching action due to hypochlorite ion (ClO) and chlorine molecule (Cl2) which attack the organic matrix.7

Hypochlorites do not dissolve calculus but it may inhibit calculus formation on dentures. Alkaline hypochlorite is reported to tarnish and corrode the metal chromium-cobalt framework and the gold plated nickel pins in porcelain teeth.18,19 The addition of anti-corrosive agents such as sodium hexameta-phosphate or an excess of alkaline helps overcome this disadvantages. However, the anti-corrosive additives settle out and loss their effectiveness.10,20 Hypochlorite salts are effective with overnight immersion but they should not be used more than once a week because they bleach the resin.

A.3. Dilute organic or inorganic acids: Commercial solution cleansers of dilute acids are affective against calculus and stain on dentures. Their effect depends upon the dissolution of organic part of denture deposit.19 The acid cleansers are commonly a 5% solution of hydrochloric acid, or phosphoric acid. A combination of both acids may be used to enhance the

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Table 1. Classification of Commercial denture cleansing products
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The American dental association council on dental materials and devices suggest that the ultrasonic cleaners do enhance the cleaning capacity of a detergent solution. However, they indicate that the cleaning of the denture is mostly due to the chemical activity of the solution rather than to the mechanical properties of the devices themselves. The ADA found that ultrasonic devices are more effective than the sonic action machines.

Proper hygienic care of removable dentures is important for maintaining a healthy oral mucosa in denture wearers. 16, 36 Patients should be instructed to brush meticulously, and a routine denture cleaning regimen should be designed by dentists to prevent and remove re-accumulation of microbial plaque and to remove mucin, food debris, calculus, and exogenous discoloration. 25 Mechanical cleaning is effective for improving denture cleanliness and maintaining a healthy mucosa. 16 Efficient chemical denture cleaners might be important alternatives to mechanical cleansing, especially among geriatric or handicapped denture wearers. 26 Cleansing is often poor due to improper mechanical cleaning and to the relative inefficiency of the most commercial chemical products. 26

Conclusion

In conclusion, future researches should be directed to develop cleansing solutions, which can maintain plaque-free dentures with a daily soaking period of 15 to 30 minutes and do not affect the color and surface luster of the denture acrylic resin. 27

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