# *The Effect of Ozonated Water, Sodium Hypochlorite and Glutaraldehyde on Candida Albicans in Complete Denture Wearers*

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## Dedicated to

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# Introduction

The oral deposits and microorganisms that adhere to a denture leads to several undesirable effects. The adherent material itself is unaesthetic in appearance and unpleasant in terms of tactile sensation, taste, and odor. The fungal organisms that are most commonly associated with denture plaque are of the genus Candida. Treatment should be directed at eliminating candidiasis with topical and possibly systemic agents, depending on the severity, and simultaneously improving oral hygiene.

Several methods were proposed to clean the denture base and prevent development of denture sore mouth in denture wearers.

Denture-cleaning methods are used clinically for the reduction of denture plaque, debris, and stains and these are generally divided into mechanical and chemical cleaning methods. However, it has been reported that mechanical cleaning methods are insufficient for a complete reduction of microorganisms on the denture.

Reviewing the dental literature revealed that the efficiency of different disinfectants in reducing the candidal colonization in complete denture is a controversial issue. Ozonated water, sodium hypochlorite and glutaraldehyde are three different disinfectants that have been used separately in disinfecting the complete denture.

The target of this study was to compare the effect of those three different disinfectants on the number of Candida albicans adhering to upper complete dentures.

# Review of literature

## Common problems in complete denture wearers.

Edentulism is considered a poor health outcome and may compromise the quality of life. Although the number of adults losing their natural teeth is diminishing, there are still large numbers of edentulous adults in the population. These patients are facing difficulties leading to patient's complaints. Some factors that lead an edentulous patient to complain include mastication, speech and denture hygiene [(1)].

Comprehensive patient education about denture hygiene is an essential component of the complete denture service. Care of dentures and the mucosal tissues in the edentulous mouth are important for overall health, as well as social consequences such as mouth mal-odour [(1)].

Denture plaque is considered as a source of infectious oral material available for aspiration, particularly in persons with limited salivary flow. Metabolic by-products and exotoxins are considered irritant to oral tissues. Denture plaque, like dental plaque can be calcified if not removed thoroughly and regularly. The surface of the mineralized calculus provides an even more hospitable surface for further plaque accumulation. Calculus is also readily stained by tobacco, tea, coffee, certain medications (particularly iron supplements) and numerous other ingested materials. Therefore, dentures need to be cleaned regularly to prevent the build up of microbial populations [(2)].

# ***Denture related Stomatitis:***

Denture related Stomatitis is defined as an inflammatory process that mainly involves the palatal mucosa when covered by complete or partial dentures [3, 4].

It was described by **Newton** as an erythematous reaction that can be focal or diffused; the mucosa may present either a smooth surface or papillary hyperplasia [5].

## *Classification of denture related stomatitis:*

### Newton classification (1962):

It has been most widely used. Newton classified the denture related Stomatitis as follows [5]:

1) Pinpoint hyperemic foci.

2) Diffuse hyperemia of the denture supporting tissues.

3) Papillary hyperplasia.

### Modified Newton Classification (2003):

The presence of denture related Stomatitis was assessed according to the ***modified version of Newton's classification***. This classification reflects the classic type of inflammation and the extent to which tissues are affected [6]:

1) No Stomatitis, no evidence of palatal inflammation.

2) Stomatitis Newton type I, petechiae dispersed throughout all or any part of palatal mucosa in contact with the denture.

3) Newton type II, macular erythema without hyperplasia.

4) Newton type III, diffuse or generalized erythema with papillary hyperplasia.

## *Predisposing factors:*

The etiology of the denture related Stomatitis is considered as multifactorial and could be divided into systemic factors and local factors.

**♦ Systemic factors:**

**Dietary factors:** Denture Stomatitis patients have been found to have nutritional deficiencies especially in case of vitamin $B_{12}$ and folate deficiencies [5].

**Immunosuppressants:** Immunosuppressed patients are those patients who have received long lasting immunosuppressive therapy. The immune deficiency or the side effects of the medication may increase the intensity of the denture related Stomatitis. The patients with immunosuppression were more frequently subjected to stomatitis and Candida infection [7, 8].

**Diabetes**: People with type II diabetes are at increased risk of developing this condition. So are people with weakened immune systems. They are more likely to be affected with denture related stomatitis [9].

**Smoking**: it has been implicated as one of the systemic predisposing factors of denture related stomatitis [9].

**Malignancies**: Candida albicans was the predominant organism isolated from the oral swabs of patients with advanced cancers and therefore predisposing to denture related stomatitis and oral candidiasis [10].