

Laser therapy as an adjunctive therapy for denture stomatitis

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ABSTRACT

Aim

To provide updated information about the use of lasers as an adjunctive therapy for denture stomatitis, the most prevalent oral lesion amongst denture-wearing patients.

Patients present with pain and burning sensation in the mouth, erythema, inflammation with swelling of the palatal mucosa. Normal function is disturbed, with difficulty in wearing the dentures and in eating and drinking. Ultimately the digestive system will be affected.

Prolonged conventional treatment may lead to the development of resistant *Candida albicans*.

The search for an alternative treatment modality has led to some studies which consider laser therapy as an option in the management of denture stomatitis.

Method

A literature search using "PUBMED" and "Google" was undertaken, using these key words in combination: "laser therapy for denture stomatitis", "approaches", "strategies".

Only those articles that dealt with denture stomatitis symptoms, treatment and laser therapy, were selected. Abstracts and full text articles were used to compile this short review.

Conclusion

The literature indicates that laser therapy may reduce the risk of the development of a drug resistant *Candida albicans* and could improve the prospects of treatment success for denture stomatitis. However, there remains a need for more research studies on various clinical lasers and wider laser parameters.

INTRODUCTION

Denture stomatitis is considered to be the most prevalent oral lesion amongst denture wearing patients, who may suffer severe discomfort with pain and a burning sensation in the mouth. The affected mucosa becomes erythematous and swollen, making wearing of the denture and eating and drinking difficult. Everyday oral functions are affected, leading to disruption of the digestive system. Denture stomatitis has been classified into three groups:

1. Petechiae dispersed throughout all or any part of the palatal mucosa in contact with the denture as **Newton type I**.
2. Macular erythema without hyperplasia as **Newton type II**.
3. Diffuse or generalized erythema with papillary hyperplasia as **Newton type III**.^{1,2}

AETIOLOGY

Denture stomatitis is probably multifactorial in etiology, but it has been speculated that poor oral hygiene together with continuous use of dentures could be the usual cause of this lesion.

The microorganism that is associated with denture stomatitis is known as *Candida albicans*, a fungus. Both systemic and topical antifungal drugs are used for treatment but it has been observed that prolonged administration of these medications may lead to the development of resistant *Candida albicans*. Alternative treatment modalities have therefore been sought and some studies have considered laser therapy as an option in denture stomatitis.³

TREATMENT

Some studies have confirmed that photobiomodulation could be efficient in the treatment of oral fungal infections.³

With this in mind and recognising the variation of the types of laser and their parameters, there is a need for more research studies that would perhaps narrow the selection of specific laser therapy in the management of these oral fungal infections.⁴

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Photodynamic therapy has been shown to have an antimicrobial effect on the biofilm, with the combination of laser emitted diode and erythrosine being more efficient than laser and methylene blue.⁵

Reactive oxygen species generated by photodynamic therapy promote the perforation of the cells of *Candida albicans*. Once inside the cell, oxidizing species generated by light excitation cause photo damage to internal cell organelles, resulting in cell death.

Some clinical studies exploring inactivation of oral *Candida albicans* with lasers have reported good results, although one investigation using laser as an adjunct therapy recorded only a 40% reduction in palatal candidiasis.

In comparison, a group treated with miconazole enjoyed an 80% success with reduced recurrence. This discrepancy could be due to complex multifactorial denture stomatitis or perhaps to the type of laser that was used, which may have had limited parameters.⁶

Most of the research studies have utilised lasers of the following wavelengths: 685 nm, 830 nm and 980 nm. The exposure time varied, starting with 10 seconds. The lasers that are in use for clinical dentistry today have much wider wavelengths to offer.

Further research studies of this non-invasive treatment of denture stomatitis should specify the parameters of the laser and should include investigation of the influence of low level laser therapy on the dimensional stability of denture base materials as well.⁷⁻⁹

Of relevance may be the finding that silver nanoparticle discs significantly reduced the adherence of *Candida albicans* without any effect on cell metabolism or proliferation.^{10,11} The option of the incorporation of silver nanoparticles into dental prostheses could be promising,¹¹ possibly enhanced by the use of laser therapy.

Denture stomatitis is multifactorial and complex. It is extremely important to identify predisposing factors and to arrange follow up sessions with patients to ensure compliance with oral hygiene procedures for dentures.¹²

CONCLUSION

Conventional treatment of denture stomatitis could result in resistant *Candida albicans*. Laser therapy as an adjunctive management could improve the prospects of successful treatment. Research studies investigating various clinical lasers with wider performance parameters are indicated.

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