

# The role of laser therapy in removable prosthodontic dentistry.

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Karic, V,<sup>1</sup> Shackleton J,<sup>2</sup> Dale Howes D,<sup>3</sup> Melman G.<sup>4</sup>

## INTRODUCTION

Laser technology has improved the patient management alternatives available for many disciplines in Dentistry including removable prosthodontics.

This is particularly true for soft tissue management including ulceration and inflammatory conditions, but also for hard tissue applications and pain control, enhancing outcomes in comfort, stability, retention and aesthetics.<sup>1</sup>

The lasers used in dentistry differ in the wavelengths of the radiation produced, each having a specific thermal output and a specific tissue interaction that are always predictable.<sup>2</sup> The wavelengths include: low level laser: visible light from 400 to 700 nm, Diodes :830-1,064 nm, Nd : YAG 1,064 nm, Erbium: 2,790-2,940 nm, and CO<sup>2</sup> :9.3-10.6 nm.

## DISCUSSION

Lasers can be used as adjuncts to removable prosthetic care for many different procedures.

These include reduction of hard and soft tissue tuberosities, removal of torus, preparation of unsuitable bony aspects of residual ridges such as reducing undercuts and smoothing irregularly resorbed ridges, vestibuloplasty and revising hyperplastic and unsupported soft tissues and dealing with other abnormalities of both hard and soft tissues such as epulis fissurata. Further, laser can be used in the treatment of papillary hyperplasia, denture stomatitis, nicotinic stomatitis, and other pathologic conditions associated with the

1. **Dr. Vesna Karic**, BDS (BGD, EU), MSc (Dent) (Wits), Mastership in Laser Therapy, (Aachen, EU) Senior Lecturer, Head, Laser and DNS Division, \*
2. **Prof J Shackleton**, BDS (Wits), MDent (Wits), HCU, Division of Removable Prosthodontics, \*
3. **Prof Dale Howes**, BSC (Dent) (Wits), BDS (Wits), MDent (Wits), HOD, \*
4. **Dr. Geoffrey Melman**, BDS (Wits), MSc (Dent) (Wits), Specialist in Paediatric Dentistry (U.K.).

- \* Department of Oral Rehabilitation and Prosthodontics, School of Oral Health Sciences, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg.

### Corresponding author:

**Dr Vesna Karic**, Department of Oral Rehabilitation & Prosthodontics, School of Oral Health Sciences, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg. Email : Vesna.karic@wits.ac.za

## ACRONYMS

nm : nanometres

wearing of maxillary dentures. The clinical use of laser therapy will confer several advantages upon patients :

1. Shorter overall treatment time owing to reduced mechanical trauma and less oedema.
2. Decreased bacterial contamination of the surgical site.
3. Reduced swelling, scarring, and wound contraction at the surgical site.
4. Excellent haemostasis, leading to superior visualisation of the surgical site.

In addition, laser reduction in the tuberosity area offers a special advantage over conventional techniques as this area is difficult to suture, and no suturing is required when a laser is used. Accidental sinus perforation is avoided because the bloodless surgical site is clearly visible, permitting ready distinction between mucosa, periosteum and bone.

Whilst risks are inherent in any surgical procedure, complications may be more serious when surgery is performed on or close to the floor of the mouth; reports include haemorrhage and infection and a life-threatening swelling after a mandibular vestibuloplasty. The ability of lasers to coagulate and cauterise surgical sites together with reduced manipulation of the tissues, compared with conventional surgical procedures, probably accounts for a significant advantage of lasers for this procedure.

Mandibular tori are present in 8% of the population, affecting men and women equally. Mandibular tori occasionally can interfere with fabrication of a full or partial denture, in which case a torus reduction is indicated. Palatal tori occur in 25% of female patients, twice the incidence in male patients. Palatal torus reduction is rarely necessary before fabrication of a maxillary prosthesis, as the discomfort associated with wearing the denture is usually managed by judicious easing of the acrylic bases. During the reduction or removal of palatal tori the following complications can occur:

- Nasal perforation
- Oronasal/oroantral fistula
- Palatal tissue necrosis
- Haematoma
- Palatal fractures.<sup>2</sup>

The erbium lasers may be used safely to ablate the osseous material layer by layer, until a sufficient amount has been removed. A slow but steady ablation of bone prevents the accidental perforation of the palate or creation of a fistula. Any laser wavelength can be used to create haemostasis and to decrease the risk of haematoma.

One of the more common soft tissue abnormalities diagnosed before full-denture fabrication, or during routine examination of a patient wearing a complete maxillary denture, is papillary hyperplasia. Causative factors include poor hygiene, poor fit of the denture causing a localised irritation, and occasionally, a fungal infection. Removal of the hyperplastic tissue by laser results in coagulation and cauterization of the site, preventing any haemorrhage.

Other oral mucosal lesions associated with the wearing of removable prostheses include the following:

- Denture stomatitis
- Traumatic ulcers
- Angular cheilitis

All of these lesions could be treated with lasers in “non-contact mode” with specifically prescribed fibre.<sup>2,3</sup>

## CONCLUSION

Laser therapy can be used in the delivery of conventional pre-prosthetic treatment as well as in the treatment of denture induced mucosal lesions, to the great advantage and comfort of the patient.<sup>4</sup>

### References:

1. Durrani S. Laser and its application in Prosthetic Dentistry. *Int, J Dent Med Res* 2015 1 ( 6) : 183-8.
2. RA Convisor, Principles and Practice of Laser Dentistry, 2nd edition. Elsevier, 2016.
3. Budtz-Jorgensen E: Oral mucosal lesions associated with the wearing of removable dentures. *J Oral Pathol* 1981;10(2):65–80.
4. Marei M, Abdel-Maguid S, Mokhtar S, Rizk S: Effect of low energy laser application in the treatment of denture induced mucosal lesions. *J Prosthet Dent* 1997;77:256–65.

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