



## **Applications of Laser Technology in Removable Prosthetics**

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### **ABSTRACT**

**Aim of the Study:** This article's goal is to familiarize every clinician with the basics of lasers and the many laser systems that they can use in their clinical settings. **Practical Implications:** There is less injury to the surrounding tissue thanks to the laser's quicker and painless operation. It is a powerful and good approach that may be applied to both soft tissues and hard tissues.

**Keywords** Lasers, Prosthetic dentistry, removable prosthesis.

### **INTRODUCTION**

To provide the best possible treatment outcomes, it is crucial to have a complete understanding of the various lasers and how they interact with the target tissue of the oral cavity (Rathod A et al,2022; Roato, I et al 2021). Because they are minimally invasive and promote rapid tissue response and healing, lasers are a highly desirable technological advancement in many dental fields. They function as a tool to provide better results than in the past (Tzanakakis et al, 2021; Aljammali ZM et al,2019). The scope and practice of prosthetic dentistry may continue to be significantly impacted by the quick development of lasers and their wavelengths for a range of soft and hard tissue applications (Kesler G ,2004). The field of dentistry has created a niche market for laser technology during the past fifty years (Rocea JP, 2012).

#### **1. Review of Literature:**

**Treatment for inappropriate alveolar ridges:** because poorly fitting dentures have less stress-bearing area—a factor that soft linings do not entirely address—they place an increased strain on the remaining natural tissue structures. Today, different soft tissue wavelengths are employed in surgery with soft tissue lasers to reveal the bone and other hard tissue. Hard tissue therapy treatments typically use erbium lasers(Namour S, 2011) .

**Treatment of bony Exostoses or torus:** when they are greater, or develop an ulcer on the mucosal layer, it could result in prosthetic difficulties. These could obstruct the palatal covering of the maxillary prosthesis or the lingual flanges of lower denture. As a first line of treatment, erbium: yttrium-aluminum-garnet (Er:YAG) is used to remove bony protuberances(Kumar R et al, 2015) .

**Fibroma:** Sharp prosthesis flanges or over postdaming of upper denture can cause fibrous tissue to develop and cause ongoing damage to the tissue. Re-epithalization of soft tissue can occur by laser (de Arruda Paes-Junior TJ et al, 2011).

In some cases, when there is a little depth of vestibule and the upper and lower jaws' crest were atrophied, the stability of denture is compromised, vestibuloplasty is the treatment of choice. CO2 technology offers a quick and secure solution. There is no need for the grafts and stitches. Soft acrylic must be used to temporarily and urgently relines removable dentures. Following surgery, patients should wear their dentures for three to four weeks (Keerthana S et al, 2011) .

Epulis fissuratum: it is an hyperplasia of the mucosa in denture users, which is brought on by the tissue's ongoing irritation. Scalpels, surgical or electrical instruments, and soft tissue lasers are the most often used methods for removing lesions (Keerthana S et al, 2011) .

A persistent candidal infection known as denture stomatitis found in about (60- 65%) of patients with removable prosthesis. Not only does a laser beam aid in the removal of an epithelial surface that has been superficially infected with candida, but it also helps to keep nearby healthy mucosa from inflaming. It will not be required to write a prescription for antibiotics or non-steroidal anti-inflammatory drugs after surgery because the laser itself has virucidal and bactericidal properties. This might stop bacteria from infecting you again or causing a secondary infection. Lasers' neuron sealing effect makes them effective at relieving pain(Costela-Ruiz, V.J. et al, 2022).

In order to assess the correctness of the impression and denture occlusion, a newly developed laser scanner is a 3D digitizer that tracks the specimen's coordinates and stores the data with a resolution of 130 mm at 100 mm. The 3D laser captures intricate 3D texture-mapped models, which are then sent to a 3D software application for triangulation and construction into a 3D meshwork copy of piece (Sandesh G et al, 2012).

Dentures are made by selective laser sintering. In laser union, metal or polymer powders are liquefied under great temperature using a powerful CO2 laser. Consequently, it starts with a digital model that is recorded in standard triangulation language (STL) format and produces the strongest and most robust form of design from there(Akanksha B, Richard J). A removable partial denture's laser-welded component: The prosthetic is built using a Nd:YAG laser. Tensile strength figures for laser welding can be 20% to 50% greater than those for soldering(Richard J, 2006).

## **2. Conclusions**

There is less injury to the surrounding tissue thanks to the laser's quicker and painless operation. It is a powerful and good approach that may be applied to both soft tissues and hard tissues. For dental practices to do the most operations possible, clinical practitioners and dentists need be aware about the various laser systems.

## **3. Limitations and future researches:**

Further review about the previous articles about the uses of laser in all types of prosthetic prosthesis (fixed, removable, maxillofacial prosthesis and also in implant).

## **4. Conflict of interest: none.**

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