

# Laser Dentistry

## Reasons to Replace a Electrosurge Unit With a Diode Laser — Part One

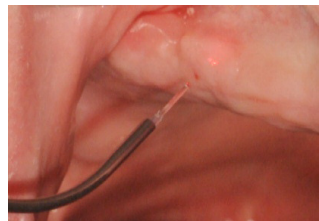
### Introduction:

In this months Dentistry Today article I will cover a topic that many clinicians ask me about and that is the benefit of the diode laser compared to the traditional soft tissue handpiece- namely the low cost monopolar electrosurge unit. The monopolar electrosurge unit has been a staple of many dentists office for removing tissue when it is a obstacle in restorative dentistry. In fact, as Christensen (1) mentioned in his article in 2008 in the JADA, the electrosurge units are inexpensive, can remove large of amounts of tissue quickly, and do not require safety glasses when used. Over the last 4 years since Dr. Christensen wrote this article the price of diode lasers have dropped significantly from over \$10,000 to a price of \$2500.00 for the Picasso Lite. For the treatment of soft tissue, the 2.5w diode laser is more than enough power for almost all clinicians. One of the only requirements to use higher power than 2.5 watts is if a dentist wishes to use the diode laser as a catalyst for in office bleaching. In this case higher energies ( 7watt Picasso Laser) are needed to accomplish the task. Otherwise, with a properly initiated tip, and magnification to observe the laser tissue interaction, almost all clinicians will find the 2.5 watt Picasso Lite to be more than enough power for soft tissue ablation. In fact, additional power may in fact lead to iatrogenic damage such as recession, increased post operative pain, and delayed healing. There are many benefits to using a diode over the conventional monopolar electrosurge unit (2), and I will present three good reasons in this months article, and conclude with three more reasons in next months part 2 of this topic.

### 1. Ability to Work around implants:

Various laser wavelengths that are available today can offer the clinician, who needs to expose an implant during second stage surgery, an alternative to traditional methodologies. The ability of the diode laser to ablate tissue, at times without the need for anesthetic, while controlling hemostasis, provide the clinician a great view of the surgical site. In addition, the diode wavelength like all lasers, provides for decontamination of the implant site through its antibacterial action. Bacterial reduction with the diode laser can lead to an almost sterile operative field (98% reduction of pathogenic bacteria). Finally, there is a growing body of evidence that suggests that lasers used at lower energy settings can have a biostimulatory effect on tissue which in turn can reduce postoperative discomfort, improve healing and shorten healing times while even improving early osseointegration. (3-7)

As an aside, there have been in the past suggestions of using an electrosurgery unit to expose implants. It is imperative to realize, that although more expensive bipolar (two electrodes) electrosurgery units can be used safely around implants, that single electrode (monopolar) units may damage the implant surface and can cause complete loss of osseointegration with resulting implant failure with contact times as short as **three seconds**. (8-9) Lasers, in contrast, can used safely with tremendous coagulation and a reduction in pain postoperatively for the patient. (10). (Figures 1-2)



**Figure 1:** Diode laser for second stage implant uncovering in edentulous maxilla.



**Figure 2:** Four healing cuffs in place in maxilla immediately after uncovering with the diode laser.

### 2. Ability to Work Safely Around Metal Intraorally.

As mentioned above monopolar electrosurge units have shown catastrophic results when accidentally touching metal intraorally. The literature has shown that contact for very short periods of time can not only damage implant fixtures but can cause pulpal problems, intraoral burns, and other iatrogenic problems. (8, 9, 11-13) In clinical practice, even with today's emphasis on the more esthetically pleasing "white" composite resins and newer porcelains, there are still many metallic materials used intraorally including: cast partial denture frameworks, gold, amalgam, orthodontic brackets and semiprecious alloys. Diode lasers have been shown to have little interaction with metallic objects to other intraoral tissues. As a reminder, due to the lasers ability to reflect off mirrored surfaces, all members of the dental team and the patient should be instructed to wear laser safety glasses for eye protection if they are within the Nominal Ocular Hazard Zone of 3-7 ft for the Picasso Lasers during laser operation. The ability to safely work around metallic objects without fear of creating iatrogenic damage is a key advantage to using diode lasers for soft tissue ablation. (Figures 3-5).

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**Figure 3:** Gingival Hyperplasia around orthodontic appliances.



**Figure 4:** Immediate post-op after diode laser gingivectomy completed.



**Figure 5:** Eight-day healing of soft tissue around brackets.

### 3. Ability to Work without local anesthetic for soft tissue ablation.

Monopolar electrosurgery units do not have the ability to be used routinely without local anesthetic. In contrast, diode lasers can often be used either with low wattages or in pulsed modes to remove minor to moderate amounts of soft tissue with only topical anesthetics. Although, at times this may not seem significant to the clinician, there are many instances where soft tissue acts as a barrier to ideal restorative treatment, and if local anesthetic can be eliminated, it becomes a big selling point to patients. Many patients are looking for alternatives to local anesthetic and when the occasion allows for the procedure to be completed without the patient being numb, the overwhelming majority of patients are grateful for this. Situations such as laser gingival crown troughing for tissue management around endodontically treated teeth, exposure of partially erupted canines for orthodontic brackets, gingivectomies around moderately sized class V lesions in geriatric patients are all situations where the author has been able to routinely and consistently complete soft tissue ablation with only topical anesthetic (Cetacaine gel and liquid). In fact, the literature has shown that a variety of soft tissue procedures (even frenectomies) can be completed on with only topical anesthetic. (14-16) Figures 6-9.



**Figure 6:** Preoperative view of partially erupted maxillary canine.



**Figure 7:** Topical Cetacaine gel on soft tissue for anesthesia during laser treatment



**Figure 8:** After diode gingivectomy completed without need for local anesthetic. Setting used 1.4 watts pulsed 30 millisecond duration, 30 millisecond interval between pulses.



**Figure 9:** Orthodontic brackets placed on exposed canines.

### Conclusion:

In part 1 of this article, I have demonstrated three advantages that the newer diode lasers such as the Picasso Lite have over traditional methodologies of soft tissue surgery with monopolar electrosurgery units. The ability to safely treat soft tissue around implants, other metal intraoral objects, as well as to complete some soft tissue ablation with lasers with only topical anesthetic provide three clear advantages over electrosurgery units. In part 2 next month, I will share three additional advantages that diode lasers have in addition to those covered above.