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In 2008, Dr. Gordon Christensen wrote an article in AIDA comparing the soft tissue cutting abilities of diode lasers to those of electrosurgery (radiosurgery) units. In comparing these two technologies against each other, he found that dental lasers were able to be used around metal (amalgam and gold) as well as with dental implants.

1. Although there was considerable overlap in their uses and both technologies were effective, Christensen found that diode lasers were able to be used around metal (amalgam and gold) as well as with dental implants.

2. He stated that lasers did not harm dental hard tissues (bone) or soft tissues (pulp), and that the clinician could use the laser with less anesthetic, and finally he mentioned that lasers were antimicrobial (antibacterial).

3. The acceptance and use of lasers, especially the diode laser, was increasing in dentistry, and that lasers attract patients because of their recognized and accepted role within the field of medicine (LASIK eye surgery).

4. Electrosurgery units were “far less expensive than diode lasers and the more expensive than the least expensive electrosurgical unit can cause both pulpal and periodontal problems, severe intraoral burns, arcing, and that within three seconds of exposure to a dental implant electrosurgical units can cause failure of osseointegration and loss of an implant.”

Advantages of the diode laser over electrosurgery

Ability to work around metals intraorally

Diode lasers in the range of 810–1,064 nm are well absorbed in hemoglobin and melanin and to some degree water (Fig. 1). These mid infrared dental wavelengths in the absorption spectrum offer the dental clinician the ability to ablate soft tissues precisely while controlling hemostasis, providing the clinician with an excellent view of the surgical zone (NOHZ) during laser operation.

Although electrosurgical units are inexpensive, require no safety glasses and can remove large amounts of tissue quickly, diode lasers have become much more common in dental offices in the four years since Christensen’s article was published. The primary reasons for their increased popularity are that diode lasers have a small footprint, are reliable and durable lasers, and are portable. Where a few short years ago, diode lasers could cost in the range of $10,000 to $15,000, they are now cost effective and can be purchased for less than $2,500.

Perhaps the greatest benefit of these lasers is that they allow the clinician to work safely around metals. The literature has shown that monopolar electrosurgery units can accidentally create catastrophic results when touching metal intraorally. Published reports have shown that contact for very short periods of time with the electrode of a monopolar electrosurgical unit can cause both pulpal and periodontal problems, bone loss, severe intraoral burns, arcing, and that within three seconds of exposure to a dental implant electrosurgical units can cause failure of osseointegration and loss of an implant.1

In clinical practice, with today’s emphasis on the more esthetically pleasing composite resins and newer porcelain, there are still many metallic materials used intraorally, including cast partial denture frameworks, gold, amalgam, orthodontic brackets and semi-precious alloys. Diode lasers, unlike their electrosurgical counterparts, show little interaction with metallic objects used intraorally. It is important to remember that due to the laser’s ability to reflect off mirrored surfaces and potentially cause eye damage, that all members of the dental team as well as the patient must wear laser safety glasses for eye protection if they are within the nominal ocular hazard zone (NOHZ) during laser operation.
Fig. 22: Two-week healing of lesion on lip is complete.

Fig. 23: Diode direct pulp cap to lower bacteria count on MO cavity preparation.

Fig. 24: Diode laser in gingival sulcus clearing bacteria count (image of diode pulse captured with video camera on operating microscope — typically the image is not visible to the human eye).

Fig. 25: Diode laser used to reduce bacterial counts inside a DT canal of upper right second molar after completion of instrumentation and prior to obturation of the canal.
Lasers have two added benefits in that they do not require a pad to be placed under the patient for ground- ing and there can be used safely with pacemakers. Diode lasers have found their place in dentistry. Once consid- ered an application looking for a purpose, these small, cost-effective and versatile lasers have discovered their niche as the new go to solution for many soft tissue problems in our daily dental practices.

References

Editorial note: Full list of references is available from the publisher.