

Laser Dentistry

Uncovering the Tooth: The Diode Laser to Uncover Teeth, Brackets and Implants.

Introduction:

In this month's edition of Dentistry Today, I look at the role of the diode laser in helping with removing tissue that covers three separate areas: natural teeth, orthodontic brackets and dental implants. Soft tissue can act as a barrier in many cases during regular dental treatment and the diode laser can be used to routinely remove tissue

safely and efficiently around dental hard tissue (tooth structure and bone) as well as around metals (brackets, implants, amalgam, gold etc.). Although monopolar electro-surge units can be used around dental hard tissues, they cannot be safely used around metals as they can cause catastrophic iatrogenic damage (1-3), so the diode laser can be a tremendous alternative in those situations.



By Dr. Glenn van As

Uncovering teeth

The diode laser can be used to uncover teeth in many situations where tissue is acting as a barrier to successful completion of restorations. The simple laser gingivectomy which is the most common procedure a laser dentist encounters (4) can be completed at low settings of around 0.7 - 1.1 watts continuous wave (CW) with an initiated tip. (5-7) (Fig1-3)



Fig. 1. Prep of fractured upper premolar.

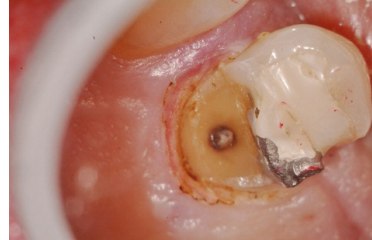


Fig. 2. Diode laser to expose tooth structure



Fig. 3. Note clamp placement during endodontic treatment.

Gingivectomies around Orthodontic Brackets

In a former article I have discussed how the diode laser could be used safely around metals such as gold crowns, amalgam, and orthodontic brackets to reduce gingival hyperplasia. (8) Other articles have also shown the value of the diode laser in orthodontics. (9-15) (Figs.4-6)



Fig. 4. Gingival hyperplasia around brackets.



Fig. 5. Immediate post-op.



Fig. 6. Eight-day healing of soft tissue after gingivectomy.

Uncovering tissue for Dental Implants

Soft tissue management around dental implants can be a problem that is difficult to solve with traditional means such as electro-surge, or surgical blades. Many monopolar electro-surge units can cause osseointegration to reverse with inadvertent contact with the implants after a matter of seconds.(1-2)

In a two stage technique where an implant is placed surgically and covered with soft tissue in the initial stage, the implant must be uncovered at the 2nd stage. If the implant is crestal or slightly supra crestal, and there is adequate soft tissue existing, the diode laser can be used to safely remove overlying soft tissue. (16-18) (Figs. 7-9).

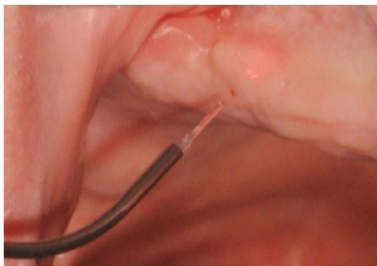


Fig. 7. Diode ready to uncover implant.



Fig. 8. Implant exposed.



Fig. 9. Four healing collars in place after diode exposure of implants.

In conclusion, the diode laser can be an invaluable tool to remove tissue in many situations such as around teeth, orthodontic appliances and dental implants. The ability to work in a bloodless field, quickly and efficiently without fear of interaction with metallic or dental structures makes the diode laser an indispensable tool for the restorative dentists armamentarium.

References

- Massei G, Szmukler-Moncler S. Thermo-explantation. A novel approach to remove osseointegrated implants. *European Cells and Materials* Vol.7. Suppl. 2, 2004 (page 48).
- Wilcox CW, Wilwerding TM, Watson P, Morris JT. Use of electro-surgery and lasers in the presence of dental implants. *Int J Oral Maxillofac Implants* 2001;16(4): 578-82.
- van As G. The Diode Laser as an Electro-surgery Replacement. *Dentaltown*. June 2010. pgs. 56-64.
- White JM, Swift EJ. Lasers for Use in Dentistry. *Journal of Esthetic and Restorative Dentistry*. Vol 17, Issue 1, page 60, January 2005
- Adams TC, Pang PK. Lasers in aesthetic dentistry. *Dent Clin North Am*. 2004 Oct;48(4):833-60, vi.
- Meeks T. Creating beautiful smile symmetry: tissue considerations. *Dent Today*. 2009 Oct;28(10):98,100-1.
- de Oliveira Guaré R, Costa SC, Baeder F, de Souza Merli LA, Dos Santos MT. Drug-induced gingival enlargement: biofilm control and surgical therapy with gallium-aluminum-arsenide (GaAlAs) diode laser-A 2-year follow-up. *Spec Care Dentist*. 2010 Mar;30(2):46-52.
- van As G. The diode laser- the diode laser for gingivectomies in orthodontics. *Dent Today*. 2011 Oct;30(10):176.
- Sarver DM. Principles of cosmetic dentistry in orthodontics: part 1. Shape and proportionality of anterior teeth. *Am J Orthod Dentofacial Orthop*. 2004;126:749-53.
- Sarver DM, Yanosky M. Principles of cosmetic dentistry in orthodontics: part 2. Soft tissue laser technology and cosmetic gingival contouring. *Am J Orthod Dentofacial Orthop*. 2005;127:85-90.
- Sarver DM, Yanosky M. Principles of cosmetic dentistry in orthodontics: Part 3. Laser treatments for tooth eruption and soft tissue problems. *American Journal of Orthodontics and Dentofacial Orthopedics*, Volume 127, Number 2, 262-4.
- Sarver DM. Use of the 810nm Diode Laser: Soft Tissue Management and Orthodontic Applications of Innovative Technology. *Pract Proced Aesthet Dent*. 2006 Oct;18(9):suppl 7-13.
- Hilgers JJ, Tracey SG. Clinical Uses of Diode Lasers in Orthodontics. *J Clin Orthod* 38 (5):266-73 (2004).
- Genovese MD, Olivi G. Use of laser technology in orthodontics: hard and soft tissue laser treatments. *European Journal of Paediatric Dentistry*. Vol. 11/1-2010;44-48.
- Kravitz ND, Kusnoto B. Soft-tissue lasers in orthodontics: An overview. *American Journal of Orthodontics and Dentofacial Orthopedics*. Vol. 133, issue 4, Suppl., Apr. 2008, Pgs S110-S114.
- van As G. The diode laser- The diode laser in second stage implant recovery. *Dent Today*. 2011 Sep;30(9):144.
- Catone GA (1997) Lasers in periodontal surgery. In: Catone GA, Alling CC (eds) *Laser applications in oral and maxillofacial surgery*. Saunders, Philadelphia, pp 181-196.
- Romanos GE, Everts H, Nentwig GH (2000) Effects of diode and Nd:YAG laser irradiation on titanium discs: a scanning electron microscope examination. *J Periodontol* 71:810-815. doi:10.1902/jop.2000.71.5.810