

## *The Fine Art of Laser Dentistry with Dr. Glenn van As*



### **Anterior Crown Troughing with the AMD Picasso Lite Diode Laser-**

#### Introduction:

In July's clinical technique article, I dealt with the role of the diode laser in the tissue management portion of the fabrication of posterior indirect restorations. As I mentioned last month, Gherlone et al (1) found lasers to yield less recession than using either a double retraction cord or electrosurgery technique for tissue management. Their conclusion was that the laser was "less traumatic to the periodontal tissues" when compared to the traditional techniques of using either retraction cords or an electrosurge.



For new laser users, my advice is to start with posterior crown troughing, and after a few cases then turn to using the diode in the anterior region. In my opinion, careful attention to detail is required when using the diode laser for anterior tissue troughing, and there are specific adjustments that should be undertaken. These adjustments are particularly important when esthetics in the case is of the greatest importance either due to patient demands or alterations in the shade of the final restoration as compared to the stump shade of the preparation.

#### Technique:

When considering using the diode laser for tissue management in the anterior esthetic zone where thin tissue genotypes exist, or if the patient is changing the color of the tooth significantly from the existing stump shade, then care with diode troughing must be taken. Goharkhay et al concluded that the diode laser has a "remarkable cutting ability and the tolerable damage zone" and due to its "excellent coagulation ability" it is a useful alternative in soft tissue surgery of the oral cavity.(2)

There is a risk of tissue recession to any tissue retraction technique so the clinician must evaluate the individual's risk prior to beginning. Generalized recession in the premolar area, recession around existing restoration margins,

non stippled gingival tissues and the presence of gingival inflammation (pseudo pockets) can all be warning signs that careful handling of gingival tissues regardless of technique is indicated in order to prevent iatrogenic damage to the gingival tissue complex.

As mentioned last month adequate magnification ( 4.0 X Loupes) and judicious use of power ( 0.6-0.9w CW) are vital to success in laser troughing. Another option to low settings is to use a pulsed mode of laser energy on the diode. (Comfort Mode on AMD Lasers Picasso Lite). Pulsing the laser means chopping up the continuous beam of light, and gives time between pulses to help cool the tissue down.

Prior to beginning with preparation of the teeth, the diode laser can be used to provide idealized soft tissue contours. Slight alterations in tissue height and/or tissue symmetry can be accomplished with the diode as long as these alterations do not infringe upon the biologic width of the sulcus. These subtle alterations to the soft tissue can improve the final result and be completed on the same day as final impressions for the restorations are completed.

Subsequently, the initial crown or veneer preparations are completed and the properly ***stripped, cleaved and initiated*** quartz fiber tip (or ***single use initiated disposable tip***) is extended just into the gingival sulcus (0.5 - 1.0 mm ). (**Fig. 1**) The laser is moved in small brush like strokes around the preparation, creating a slight distention of the tissue away laterally away from the margin of the preparation. This lateral distention is not intended to lower the height of the tissue like a gingivectomy would but simply create a “moat” which separates tooth from soft tissue. This separation allows for room for the impression material to capture details of the margin location.

Troughing for a veneer (20-40 seconds) should take less time than a full crown preparation (30-90 seconds) and careful analysis of the laser/tissue interaction should reveal minimal to no charring of the soft tissue, which causes postoperative discomfort and gingival recession. After the initial laser trough has been completed, the clinician places the final restorative margins on solid tooth structure or slightly subgingival on the facial for esthetics as needed. Hydrogen Peroxide in a Dental Infusor ( Ultradent) or a wet cotton pellet can be scrubbed on the soft tissue to remove any white tissue tags which may accidentally droop onto the margin. Increased lateral distention of the tissue trough can be accomplished with materials like Expasyl or Traxodent injected briefly into the sulcus. Vigorous rinsing of the sulcus after 90 - 120 seconds will yield a clean,

dry and well delineated margin and the final impression can be taken. Provisional restorations should be evaluated to make sure that they do not extend into the sulcus (especially important on the facial of the temporary restorations) which can iatrogenically cause the tissue to recede. Careful removal of temporary cement completes the initial appointment.

The patient returns for final insertion of the definitive restorations in 10-14 days and upon removal of the provisionals, the tissue appears healthy, and situated exactly where the laser troughing placed it at the first appointment. In cases of poorly fitting provisional crowns, some soft tissue “bounce back” leading to the margin being covered by soft tissue. The diode laser with topical ( Cetycaine) and settings of 0.6 -0.8 watts (CW) can be used to remove any soft tissue overhanging the margins and the crown can be tried in and cemented. With careful attention to detail the results can be identical to those obtained with traditional methods ( see case below) and the diode laser will become an indispensable part of the soft tissue management and impression taking for fixed prosthodontics.

**Table 1 - Clinical Procedure for Anterior Laser troughing.**

Step	Procedure
1	Slight alterations of gingival height or symmetry with diode.
2	Initial gross reduction and margin placed equi-gingival with magnification.
3	Diode laser troughing: suggested settings 0.6-0.9 w CW (less on facial)
4	Final margin placement subgingivally as needed for esthetics.
5	Hydrogen Peroxide or wet cotton pellet to remove tissue tags
6	Lateral distention of tissue if needed (Expasyl, Traxodent).
7	Rinse thoroughly and take PVS impression
8	Provisional fabrication - Careful to make sure no overhangs on facial.

**Clinical Case of Diode Laser for Tissue Management for Porcelain Veneers.**



Fig.1 View of properly stripped, cleaved and initiated diode fiber.

Fig.2 Preoperative appearance of teeth prior to veneers on maxillary incisors.



Fig. 3 High magnification view showing diode tissue management (0.6 w CW) on lateral incisor.

Fig. 4 Expasyl placed to laterally distend tissue.



Fig. 5 Empress veneers completed on maxillary incisors.

Fig. 6 High magnification view of tissue response postoperatively.

## **References**

1. Gherlone EF, Maiorana C, Grassi RF, Ciacaglini R, Cattoni F. The use of 980-nm Diode and 1064-nm Nd:YAG Laser for Gingival Retraction in Fixed Prostheses. *J Oral Laser Applications*. 2004; 4:183-190.
2. Goharkhay K, Moritz A, Wilder-Smith P, Schoop U, Kluger W, Jakolitsch S, Sperr W. Effects on Oral Soft Tissue Produced by a Diode Laser In Vitro.