

Laser Dentistry



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Diode Laser Frenectomy in Lower Anterior

Introduction:

In last months Dentistry Today article I looked at the second and last part of why a dentist might want to replace their old electrosurgery unit with a diode laser. There are multiple reasons why a dental laser can be used as the soft tissue handpiece in the operatory including the benefits of being able to work around dental implants and other metal objects. Lasers offer the ability to remove minor amounts of soft tissue with less anesthetic and can be used around pacemakers as well. Diode wavelengths like other lasers are antibacterial in nature and can be of benefit in situations where localized reduction of bacteria is required such as in the disciplines of endodontics and periodontics. In this months edition of the Fine Art of Laser Dentistry at how the laser might be used to do a frenectomy in the lower anterior.

Introduction

A common soft tissue surgical application where lasers can be of tremendous benefit to dentistry is in the release, reduction or removal of aberrant frenums in either dental arch. A frenum is a fold of mucous membrane attaching the cheeks and lips to the mandibular and maxillary mucosa and limiting the motions of the lips, cheeks and tongue. In the authors practice about 5% of patients will have a "high" or deviant septal pull that will see the frenum attaching to the attached tissue in position that can cause recession, diastemas, or asymmetry In gingival architecture to occur.

The benefits of a laser frenectomy as compared to traditional techniques have been shown in the literature (1) The benefits of laser treatment included "reduced bleeding during surgery with consequent reduced operating time and rapid postoperative hemostasis, thus eliminating the need for sutures. The reduced need for local anesthetics and sutures, as well as improvements in postoperative comfort and healing, make this technique particularly useful both very young patients as well as geriatric patients. (2-3)

Technique:

When considering using the diode laser for frenectomies, the clinician must consider several factors. Diode lasers are attracted to pigment, and frenums are typically thicker fibrotic issue and have there is very little pigment to them. The lack of pigment and more fibrous nature of the tissue means that higher energies, and some patience are required to ablate this tissue. Diode lasers, being well absorbed in hemoglobin, provide wonderful hemostasis which can be an issue with other wavelengths such as Er:YAG lasers.

When considering the clinical technique for doing a mandibular frenectomy (table 1) the goal is to release the attachment from its location near to, or between the mandibular central incisors. The lower lip can be pulled out to give a better view of the attachment and the strength of the pull as well as the location of the attachment (see photos 1-2).

Although the frenectomy has been done in the literature without anesthetic (3), generally a few drops of anesthetic placed into both sides of the frenum will allow for a comfort level for both patient and clinician. Only a small amount (0.2ml) of anesthetic is needed, otherwise "ballooning" of the tissue can obscure landmarks. The actual release of the frenum should be done at 0.8-1.4 watts Continuous Wave (CW) with a very well initiated disposable 400 micron tip. The lip is stretched outwards distending the frenum and the laser incision is started right at the attachment to the gingival tissue. Small horizontal movements laterally will begin to release the frenum and a diamond shaped "wound" will appear. Remember that lasers are primarily end cutting, so dabbing motions with the laser tip on the vertical fibers of the frenum attachment will effectively ablate or tear the attachment. Firm tension with the other hand on the lip should continue to distend the frenum. Careful analysis of this diamond with continual ablation at "first" and "third" base followed by deeper ablation towards the periosteum, will cut all the fibers which run vertically and look like "small guitar strings".

The diode laser will not cut the periosteum and should the clinician wish to, they can "score" the periosteum with a scalpel blade or periosteal elevator to prevent reattachment. This is not easy to do without injections and will result in moderate bleeding. The author has found this more necessary in cases where the frenum is very thick. If the clinician pulls the lip gently laterally and observes where the wound "moves" they can get a reasonable idea of where the final new attachment will heal to.

Table 1 - Clinical Procedure for Frenectomy

Step	Procedure
1	Properly strip, cleave and initiate well the disposable 400 micron tip.
2	Place a few drops of anesthetic on either side of the frenum attachment.
3	Use 0.8 - 1.4 watts Continuous wave with an initiated tip.
4	Start ablation at the attachment and pull the lip outwards "releasing" attachment resulting in a "diamond" shaped wound.
5	Continue until all vertical fibers are removed and you are at the periosteum.



Fig.1 Preop prior replacement of Class V restorations and Lower frenectomy. This patient was 75 years old and refused to have gingival grafting done.
Fig.2 Higher magnification view of frenum pull.



Fig.3 Low Magnification view of frenectomy completed.
Fig.4 High magnification view of immediate postop, note diode hemostasis in 2 main areas where slight bleeding occurred.

Upon completion of the frenectomy, which should only take 1-2 minutes depending on the thickness of the frenum and the settings used, the following postoperative instructions can be given and the patient reappointed at 7-10 days to evaluate healing of the area. Finally, there is some concern in the literature on when a frenectomy should be done. If the frenectomy is to be done on a teenager and to help with closing a diastema, then it may be wise to complete the procedure after orthodontics to close a diastema is complete or just before the orthodontic appliances have been removed. There is considerable variation in the literature to this notion though, and some prefer to provide the treatment before appliances are placed.

Postoperative instructions for Laser Frenectomies.

Step	Procedure
1	Avoid spicy (salsa) , acidic (citrus fluids, wine) or sharp foods (natchos) or liquids for the first 72 hours.
2	Use of mild anti-inflammatories (Ibuprofen) may be needed initially.
3	Secondary intention healing means that a "white soft scab" will appear for first 7-10 days, it is not infection and is covering the soft tissue forming.
4	Lasers are antibacterial so infection is very unlikely but Chlorhexidine rinse (0.12%) can be used or dabbed onto area.
5	Cold fluids, ice, "freezies", "popsicles" can be used for first 24 hours to minimize swelling.
6	Soft tooth brush carefully around the wound.
7	Patient should return in 7-10 days to evaluate healing.



Fig.5 Low Magnification view of healing at 10 days.
Fig.6 High magnification view healing.

Conclusion:

The diode laser can be used as an adjunct to traditional methodologies in reducing frenum attachments in both upper and lower vestibular areas. It is possible that further periodontal procedures will need to be undertaken (Connective Tissue Grafting) to correct recession that has already occurred, but the release of the frenum with the diode laser can help to reduce the risk of further attachment loss in these cases.

References:

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3. Kafas P, Stavrianos C, Jerjes W, Upile T, Vourvachis M, Theodoridis M, Stavrianou I. Upper-lip laser frenectomy without infiltrated anaesthesia in a paediatric patient: a case report. Cases J 2009, 2:7138