

The Use of Soft Tissue Lasers in Orthodontic Practice

*Presented by Dr. Mark Yanosky at the PCSO Annual Session, November 15, 2008.
Summarized by Dr. Bruce P. Hawley, PCSO Bulletin Northern Region Editor.*

Dr. Mark Yanosky uses a soft tissue diode laser in his orthodontic practice to facilitate excellence in occlusion, facial and smile esthetics, tooth shape and gingival contours. Lasers apply concentrated and controlled energy to the tissues, which absorb the energy. In the process, the blood vessels are sealed at the tissue site, the tissues are sterilized, and there is less chance of postoperative inflammation and discomfort. Dr. Yanosky began using a laser to improve treatment efficiency, assist in the oral hygiene process, and to improve the esthetic results for many patients.

Why should an orthodontist have a soft tissue laser in the office? It can provide access for bracket and band placement, avoiding a delay in treatment while you await eruption. Removing swollen papillae can enhance oral hygiene. It can be useful for management of aphthous ulcers. Referring the patient out for these procedures is an alternative, but will add two to three months of time to the total orthodontic treatment, with an additional outside cost for the patient.

Technique and Patient Management

The purpose of a gingivectomy is to eliminate periodontal pockets, while a gingivoplasty creates physiologic and esthetic gingival contours in the absence of deep pockets. Measure the attached gingiva as well as the sulcus depth, and photograph the tooth for documentation. At chairside, provide the patient appropriate protective eyeglasses. The operator should wear a facemask, and high velocity suction should be used as viral particles can survive in the clinical plume created during the operation.

Improving Bonding Access

Establish the goal for tooth proportionality, measuring from the incisal edge or at the center of the clinical crown. Other indications may include increasing the amount of crown exposure following a prior surgical uncovering, in order to get faster into full archwire control, or perhaps a complete exposure of a superficially impacted canine. Prepare your bonding armamentarium before beginning the procedure.

Isolate the area and apply a topical anesthetic (either profound PET or TAC), generally with no infiltrated anesthetic. Immediately postoperative, clean the area with hydrogen peroxide, and then you can etch the tooth and bond the bracket. The patient can use warm salt-water rinses for the next 24 hours, while avoiding vigorous brushing. Use Ibuprofen for pain control as needed.

Laser operculectomies on the distal of a mandibular second molar may require a local anesthetic, as the tissue is thicker in that region. Orthodontic separators can be placed at the laser appointment. A week later the treated tissue will be healed, and band space will be available.

Gingival Hyperplasia

These cases can be lasered to improve oral hygiene, but the failure to bevel can leave a plaque trap (so do not trim tissue at 90 degrees to the tooth).

Aphthous Ulcers

Ten to twenty seconds irradiation of the lesion at 1 watt creates a laser wound, which heals normally in 14 days. Discomfort is reduced.

Esthetic Smile Enhancement

First evaluate the posed and animated smiles, measure appropriately with the periodontal probe, and assess CEJ level relative to sulcus depth. Always be sure to leave sufficient attached gingiva (at least 1mm, if not more). Normally there is 1 to 2mm distance from the CEJ to crestal bone. Confirm the etiology of the excess tissue display. Gummy smiles can result from vertical maxillary excess (which often needs orthognathic surgery), short crown heights, retroclined maxillary incisors, hypermobile smile, and/or short lip philtrum. Laser surgery is not always the best treatment. Cases with incisor attrition may need osseous crown lengthening or orthodontic extrusion and subsequent restorative augmentation, if there has been overeruption. Contraindications can include less than 1mm of attached gingiva, non-level CEJ's, suspected bone dehiscence, or the patient's desiring more crown length than

continued on page 34 ...

in muscle and airway function. Dr. Legan discussed a Vanderbilt study where the use of oral appliances successfully decreased the mean RDI from 11.2 to 2.9. Success is indicated by an RDI that is less than 5.

SOFT TISSUE SURGERY

Surgical correction has been used with the goal to improve soft tissue anatomy and function. But evidence has shown that any improvement gained from soft tissue surgery is not lasting and has only a limited improvement. The most common soft tissue surgical procedure is uvulopalatopharyngoplasty (UPPP), which involves excision of tonsils, anterior and posterior tonsillar pillars, and an uvulectomy. Laser assisted uvuloplasty (LAUP) was the next surgical procedure to be tried for OSA treatment. It could be done under local anesthesia, but had to be done multiple times. It was painful, and had limited effectiveness. Radiofrequency ablation is a procedure used at the base of the tongue or soft palate, where a coagulative lesion is precisely positioned where tissue reduction is desired. It is effective for only one year and thus not a desirable treatment option. The last resort procedure is a tracheotomy, which bypasses the pharyngeal airway and is thus 100% effective. Of course it is a rather extreme procedure and not generally recommended. The general conclusion about soft tissue surgeries is that they are not as effective or as long lasting when compared to skeletal surgery or oral appliances.

SKELETAL SURGERY

Surgical correction of the jaw position is the most effective treatment for OSA, with good long-term stability. Dr. Legan showed several severe OSA cases successfully treated with orthognathic surgery during his lecture. Skeletal surgery can involve maxillary and mandibular expansion and/or maxillary and mandibular advancement. Dr. Legan notes that a paradigm shift occurred in the treatment of OSA when mandibular expansion surgery was first described in 1990. Mandibular expansion is done using a modified RPE in conjunction with a vertical osteotomy in the mid symphysis to create a suture. Maxillary expansion is done using the familiar technique of surgically assisted RPE.

Orthognathic surgery primarily involves maxillomandibular advancements. Mandibular advancements usually have to be over 10mm to be effective in treating OSA, so, typically, maxillary advancement is also necessary. Dr. Legan pointed to stability studies and orthognathic surgery effectiveness for treating severe cases of OSA. In one study patients had a pre surgical RDI of 50-70. After

maxillomandibular advancement, the RDI dropped to 5-10, which is the same as that achieved by CPAP, except the change here is permanent and no device is needed. As for stability, most patients treated surgically have been followed for 10 to 20 years, and none so far has required the surgery to be repeated.

PREVENTING AND TREATING OSA IN CHILDREN

Clinical symptoms of pediatric OSA include disrupted nocturnal sleep, snoring, fatigue, school difficulties, hyperactivity or inattention. In some cases children who are diagnosed with ADHD are actually not hyperactive but rather are showing the clinical symptoms of OSA. The most common treatment for OSA in children has been and still is adenotonsillectomy. RPE is another effective way for treating OSA in children. Recent studies show that adenotonsillectomy is not always effective in resolving OSA in children and that RPE may still be necessary.

Dr. Legan made a strong case for the importance of the orthodontist in diagnosing OSA. His very informative and thorough presentation showed how the orthodontist is uniquely suited to recognize the symptoms of OSA, make a tentative diagnosis, and make the necessary referrals to coordinate treatment options for these patients.



Soft Tissue Laser

... continued from page 30

would be possible with a gingivectomy. Clinically, the same steps as for crown lengthening for bracketing are followed, although the tissue can come back if there is subsequent poor oral hygiene.

It can be useful to use computer simulation to show the patient what might be expected from laser surgery. In Dr. Yanosky's practice, there is no special charge for the laser procedure, but he suggested it may be appropriate. To avoid criticism, talk to and educate your general dentist colleagues regarding your use of laser procedures.

Our patients want aligned, beautiful, and white teeth along with a gorgeous smile. The use of the soft tissue laser in the orthodontic practice can help us to achieve these goals and create happy patients and nice clinical outcomes.