Perspectives

USE AND ABUSE OF LASERS IN PERIODONTICS

R ecently, there has been a renewed effort to promote lasers for the treatment of periodontitis, in spite of the lack of evidence to support their use for this purpose. In this day of evidencebased dental practice, it is incumbent upon dentists to critically assess the evidence before introducing a treatment or new product into practice. Unfortunately, when it comes to lasers in periodontics, there is little evidence available. and what is available indicates that lasers offer no additional benefits in the treatment of periodontitis. In the past 15 years, there have been about 250 articles published on the use of lasers in periodontics. Not one involved a randomized, controlled clinical trial. Only 10% were cohort or case-controlled studies, whereas over half were descriptive or opinion reports.

LASER CURETTAGE

It has been well established that gingival curettage offers no advantage over scaling and root planing and thus has no place in current clinical practice. As originally hypothesized, gingival curettage was thought to promote a new connective tissue attachment to the root surface following removal of the pocket lining. The actual result obtained is a long junctional epithelium, the same result obtained with scaling and root planing alone.¹ Thus, the theoretic benefit of curettage over scaling and root planing was refuted when a new connective tissue attachment was demonstrated not to occur following curettage. There are no reports that alternative methods of pocket lining removal have any clinical or microbial advantages over mechanical instrumentation.

Following an extensive review in the 1989 World Workshop in Clinical Periodontics, it was concluded that gingival curettage had no justifiable application in the treatment of chronic periodontitis.² In the absence of evidence that gingival curettage has any therapeutic benefit in the treatment of chronic periodontitis, the American Dental Association has deleted that code from the fourth edition of Current Dental Terminology (CDT-4).3 In addition, the American Academy of Periodontology did not include gingival curettage as a method of treatment in its Guidelines for Periodontal Therapy.4

In spite of this, lasers are being promoted for gingival curettage in a laser-assisted new attachment procedure. The laser-assisted new attachment procedure protocol includes the use of local anesthetics and systemic antibiotics and has three goals:

- To remove the pocket epithelium completely—an outcome not accomplished with a blade or with a laser
- 2. To kill all bacteria—the laser has a narrow beam to prevent collateral damage, making it difficult to impossible to kill all the bacteria, and studies have shown that bacterial reduction is not often accomplished by laser curettage^{5–7}
- To remove calculus—the laser has been shown to remove 68% of the calculus compared with 98% removal by scaling and root planing over the same time period⁸

The bottom line is that laser curettage offers no benefit over scaling and root planing in the treatment of periodontitis.

LASER FLAP AND OSSEOUS Surgery

The US Food and Drug Administration has awarded safety clearance for the use of the erbium, chromium:YSGG lasers for laser cutting, shaving, contouring, and resecting of oral osseous tissues. However, there are no published studies of its use in periodontal surgical procedures, and there is no evidence to indicate that this methodology is superior to conventional osseous surgery.⁹

Recently, lasers have been promoted for esthetic crown lengthening, including flap and osseous surgery. Most patients requiring esthetic crown lengthening have an alveolar crest too near the cementoenamel junction and/or an excessively thick alveolar margin. Adequate correction requires flap surgery with ostectomy and osteoplasty to reduce the bone level and thickness to a normal form around each tooth. Conventional esthetic crown lengthening is performed by gingival contouring followed by elevation of a full-thickness mucoperiosteal flap to expose the anatomic crowns and provide access to the alveolar bone (Figure 1). Bone reduction and contouring is then performed with a handpiece and bur. A laser does not work as well for bone removal as does a bur, and there are no studies





Figure 1. An example of healing following conventional esthetic crown lengthening by flap and osseous surgery. A, Gingival asymmetry owing to low gingival margin position on the right central and lateral incisors resulting in short clinical crowns. B, Flap and osseous surgery completed and sutures placed for the close adaptation of the flap. C, At 2 days after surgery, there is minimal edema and erythema. D, At 1 week after surgery, the sutures have been removed and the gingival margin is well adapted at the new level. E, At 3 months, the gingiva is mature, symmetry has been established, and a more pleasing tooth length has been achieved through crown-lengthening surgery. The esthetics has been further enhanced by internal bleaching of the right central incisor and minor incisal odontoplasty.







indicating a lack of damage to bone from a laser.

LASER USES IN PERIODONTICS

Lasers are useful for frenectomies (especially lingual frenectomies), biopsies (especially from mucosa, tongue, and palate), gingivoplasty, and gingivectomy.

ADVANTAGES OF LASER USE

Lasers do offer certain important advantages in surgery. They produce a coagulation of small vessels, significantly reducing hemorrhage. They may be used to coagulate, vaporize, and cut and result in a reduction of postoperative pain and swelling. Lasers are most useful for the removal of hemorrhagic lesions. They have a high patient acceptance and are perceived as high-technology, bloodless, and painless owing to excellent marketing. In actual fact, most laser surgical procedures in periodontics do require the use of local anesthetics.

DISADVANTAGES OF LASER USE

Lasers are often promoted as producing more rapid healing. Actually, a laser wound is a surface burn and has an initial delay of healing for 2 to 3 days. Healing of laser wounds and standard surgical wounds are equivalent at 4 to 6 weeks.

CONCLUSIONS

In summary, lasers do have an important role in selected oral surgical procedures. Unfortunately, they have been overpromoted and understudied for use in the treatment of periodontal disease. This trend continues as lasers are now being marketed for esthetic crown lengthening despite the absence of evidence of efficacy, lack of damage, or greater benefit than conventional methods. The astute dentist will recognize the limitations of lasers for periodontal procedures and not be swayed by unsupported and misleading marketing claims.

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