DENTAL ECONOMICS

PERIODONTAL-FLAP MANAGEMENT IS IMPROVED WITH RADIOSURGERY

by Robert T. Ferris, DDS, PhD

Introduction

As periodontal therapy has become sophisticated, more emphasis has been given to regenerative procedures than to resective treatment. Virtually all periodontal regenerative procedures call for precise flap management. Unfortunately, the usual determination of flap height and thickness is anything but precise. According to most texts, the clinician estimates the necessary dimensions of gingival flaps at the initial incision, when he knows little about the final requirements for flap coverage of the alveolar bone and roots. Ideally, the clinician would preserve all of the gingival wall of the periodontal pocket until all treatment of the underlying bony housing and root structure and any augmentation procedures are complete. Precise management of the flap height and thickness, however, is cumbersome at best and inaccurate at worst when performed with scalpels, scissors or both at the end of the procedure.

We present here a technique that permits the clinician to preserve the entire gingival flap until all treatment of the underlying structures is complete. The final dimensions of the gingival flap then may be determined exactly and achieved by careful contouring of the flap with a loop electrode from a radiosurgical instrument.

Radiosurgery is the removal, destruction or cutting of soft tissue by the passage of a high-frequency radio signal into that tissue. Maness demonstrated that the higher frequency (4MHz) and the continuous waveform produced less tissue alteration and destruction than lower frequencies and nonfiltered waveforms. The use of a fully rectified, fully filtered wave from a radiosurgical instrument permits better control of hemorrhage, a cleaner operative field, as well as better access to difficult areas of the oral cavity.

All of these objectives can be achieved with precision and relative ease with radiosurgical instrumentation.

Methods and Materials

Management of periodontal pockets with osseous deformities was limited to areas of pocket depth of 5-10 mm. After the administration of 2 percent lidocaine with 1:100,000 epinephrine, initial incisions were made with a double-edge carbon-steel blade. The incisions were made parallel with the root surface, within the periodontal pocket, to the crest of the alveolar bone at the base of the pocket.

The initial incisions were retraced to assure separation of the gingival connective tissue at the base of the pocket around the entire tooth, to include all teeth to be treated in the area (Figures 1 and 2). The flaps were reflected with a sharpened periosteal elevator to a level approximately 1-2 mm apical to the crest of the alveolar bone on the facial and oral surfaces of each tooth to be treated (Figures 3 and 4). Chronic granulomatous connective tissue was removed from the teeth and alveolar processes with periodontal curettes. Calculus deposits were removed from the roots with ultrasonic and hand scalers. Osseous irregularities were contoured with the high-speed rotary bur with copious sterile water spray, hand chisels and hand files. Only nonsupporting bone was contoured. Intraosseous defects greater than 2 mm were prepared for augmentation as described by Mellonig.

The flap edges were replaced against the teeth to determine the desirable flap heights around all facial and oral surfaces. The flap edges were contoured with a loop electrode on the fully rectified, fully filtered wave (Dento Surg90 FFP-Ellman International), until the precise height for coverage of the alveolar housing was obtained (Figures 3 and 4). The internal walls of the gingival flaps were contoured with the same instrument to permit flap adaptation to the alveolar crest, covering bony margins with the gingival flap edges 1 mm coronal to the alveolar crests (Figures 5 and 6). The facial and oral flaps were reapposed to the teeth with 3-0 plain, surgical gut suture (Figures 7, 8, 9 and 10). Periodontal surgical dressing is rarely used with this technique (see the discussion that follows).

Postoperative analgesia is obtained by a continuation of nonsteroidal anti-inflammatory analgesic started with a preoperative loading dose such as AnaproxDS one hour before surgery.

Discussion

It has been my experience that the fully rectified, fully filtered waveform instrument is a safe tool with which to achieve certain surgical precision in the management of oral soft tissue. Conroy pointed to the ease of access to difficult areas of the mouth as a distinct advantage of this instrument.

Most criticisms of this modality center on its purported damage to the underlying connective tissue and osseous structures, yet numerous reports in the literature demonstrate that this instrument is as safe or safer than conventional surgical steel or a laser.

The radiosurgical instrument is widely known for its use in the gingivectomy, where detailed contours and physiological architecture are desired. It also is frequently used in the preparation of gingival tissues for restorative dentistry. We have found the most effective use of this dental instrument, however, in the elimination or reduction of the periodontal pocket by contouring to readapt the treated soft-tissue wall to the tooth root and alveolar bone. It provides rapid, precise and reliable contours for the replaced or repositioned gingival flap.

The most common periodontal surgical procedure performed in contemporary practice is the full-thickness flap, as a means of gaining access for root debridement, osseous contouring and augmentation procedures. Soft-tissue flaps also are elevated for root amputations, hemisection, mucogingival procedures and apicoectomies. By far, the most difficult part of periodontal-flap management is the proper contouring of flap height and thickness. The radiosurgical loop offers a faster, easier and more-predictable management of flap dimensions.

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The common practice of performing gingivoplasty to contour irregular flap margins after healing is virtually eliminated with this modality, because the final contour is created with the radiosurgical instrument during the operation. The postoperative healing seen clinically is comparable to that observed with conventional instrumentation or with lasers, both in terms of speed and the quality of the soft-tissue response. The author has observed no difference in postoperative discomfort reported by patients receiving radiosurgical, conventional or laser flap treatment.

Summary

Periodontal-flap surgery is the most-common surgical therapy performed in clinical dental practice today. It is facilitated by the radiosurgical loop, in terms of access, speed and precision. Postoperative healing and discomfort are not significantly different from that experienced in conventional or laser surgery.

The author has used the radiosurgical instrument (Dento Surg90 FFP-Ellman International, Figure 11) for periodontal-flap surgery for over 20 years. We have found that it alleviates excessive stress on the operator and affords a predictable clinical result.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

About the Author

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