Apical microsurgery — Part II: Incision and atraumatic flap elevation

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The incision is made using a disposable CK2 microsurgical blade (SybronEndo). With the smaller size of this blade, accurate incisions can be made that have a cleaner cut than those of the much larger BP #15 or BP #15S blades. As the incision is being made, the operator needs to visualise the suturing process. Sometimes just a small variation in the design of the incision can make a significant difference to easier and less traumatic closure of the surgical flap. In general, the operator is working with relatively healthy tissue and no attempt should be made to remove or alter the periodontium. This is especially applicable when making a full sulcular flap.

All flaps are full thickness and the incision must be complete, so that there is no inadvertent tearing upon retraction of the flap. The split thickness flap is to be avoided, as it is the most traumatic and healing is compromised. The periosteum does not survive the flap reflection procedure. It has been postulated that depolymerised periosteal collagen plays a role in rapid reattachment of the flapped tissues to cortical bone.

In general, all flaps should be extended, at a minimum, to the
The gingival crest, following the root of the tooth being operated on. The incision is made through attached gingival tissue, or full sulcular flap should be used in all posterior quadrants. The full sulcular flap is routinely used in all surgical procedures (Fig. 3).

The most common cause of postoperative pain and swelling arises from impingement of the tissue during the retraction process. An effective way to achieve atraumatic retraction is to prepare a groove in the cortical plate of the bone, well apical to the anticipated access to the root end. A surgical length #8 round bur, on a high speed Innovator handpiece (StrykerEndo), is used to make the groove. A high-speed handpiece that has air escaping from the working end should never be used because of the danger of air embolism.

The groove creates a definite place for the retractor instrument to seat into, which can then be easily maintained in position, by either the doctor or the assistant, thereby eliminating the problem of inadvertently slipping during the surgery. Impingement of the tissue is also more predictably avoided by using a groove to hold the retractor.

Retraction can be accomplished using either the Carr or Rubinstein Retractors. However, there are many different styles of retractors from which to choose. The specific retractor chosen is the one that will best maintain clear visibility to the surgical area and be comfortable for the operator to hold during the surgical procedure (Fig. 6).

After the flap is retracted and the reflection of the flap is accomplished using the Molt, Ruddle 8, or Ruddle 1, peristomal elevators. The working end of the instrument is gently inserted into the releasing incision, line into the free gingival tissue apical to the mucogingival attachment intact (Fig. 2). The advantage of the full sulcular flap is the ability of the operator to visualise the emergence form of the involved teeth easily.

The Leubke-Ochsenbein or muko-gingival flap

This flap is used only when there is an adequate amount of attached gingival tissue present and the periodontal probing is within normal limits. The incision design should be scalloping in nature and generally follow the architecture of the teeth, which allows for easy repositioning upon completion of the apical periodontal procedures (Fig. 5).

All releasing incisions are made parallel to the long axis of the teeth. This is important because the blood supply to the area is also parallel to the long axis. If a wide-base flap is made, the blood supply to the tissue adjacent to the flap will be compromised and healing may not be as predictable or uneventful.

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After the flap is retracted and there is tension on the tissues during retraction. When there is tension, there is usually an opportunity for crushing or ischemia of the tissue and a resultant delay in the healing process. Generally speaking, the less tension the easier it is to maintain atraumatically during the surgical procedure.

Reference

About the author
Dr John J. Stropko
received his DDS from Indiana University in 1964 and for 24 years practised restorative dentistry. In 1989, he received a certificate for endodontology from Boston University. He recently retired from the private practice of endodontics in Scottsdale Arizona. Dr Stropko is an internationally recognised authority on micro-endodontics. He has been a visiting clinical instructor at the Pacific Endodontic Research Foundation (PERF), an Adjunct Assistant Professor at Boston University School of Dental Medicine and an Assistant Professor of clinical Endodontics at Loma Linda University. His research on in vivo Root Canal morphology has been published in the Journal of Endodontics. He is the inventor of the Stropko Irrigator, has published in several journals and textbooks, and is an internationally known speaker. Dr Stropko has performed numerous live micro-endodontic and micro-surgical demonstrations. He is the co-founder of Clinical Endodontic Seminars and is an instructor of Microsurgery in the Endodontic Faculty at the Scottsdale Center for Dentistry. He can be contacted at topendo@aol.com.