Surgery can never replace solid endodontic principles and should always be a last resort. Apical microsurgery consists of nine basic steps that must be completely performed in their proper order, so the desired result can be achieved:

1. Instruments, supplies and equipment (including the operating microscope) ready;
2. Patient, doctor and assistants positioned ergonomically;
3. Anaesthetic and haemostasis staging completed;
4. Incision and atraumatic flap elevation;
5. Atraumatic tissue retraction;
6. Access, root-end level (RER and REB) and crypt management;
7. Root-end procedures: root-end preparation (REP);
8. Root-end fill (REF) techniques and materials; and
9. Sutures, healing and post-operative care.

Predictable microsurgery requires the use of an operating microscope (OM) and a team committed to operating at the highest level. The six-handed team approach optimises the instruments, equipment, techniques and materials that today’s level of technology presents for the benefit of all, especially the patient (Fig. 1).

Dr Berman, an old retired general surgeon, one of my senior-year dental school instructors, would begin each general surgery lecture by tapping the lectern with his pencil, and when he got our attention, he would say: “Treat the tissues with tender loving kindness and they will respond in a like manner.” I have heard those very words many times while performing apical microsurgery; it is truly a gentle technique when...

Apical microsurgery—Part I: Patient preparation
Dr John J. Stropko, USA

Fig. 1: The six-handed team utilises all that current technology can offer, to achieve results that are precise and highly predictable.

Fig. 2: All equipment, instruments, monitors etc. are readily accessible when required during the entire surgical procedure.

Fig. 3: These small but effective Tempur pillows should be available for the comfort of the patient wherever needed.
the steps are followed in the proper order.

A thorough past medical history and dental examination, using as many diagnostic aids as possible, is of value for a predictable microsurgical event. Thoroughness can help one avoid unfavourable experiences. For example, if the patient, or their physician, states they are sensitive or allergic to epinephrine to any degree apical microsurgery should not be performed. One of my golden rules of thumb is: No Epi, No Surgery ... Period! Should the doctor choose to proceed with the microsurgical procedure, it will be exceptionally more difficult for both the doctor, and the patient.

Today's technology presents us with much more pre-surgical information than was available even a few years ago; thus, recent advances should be included in the diagnostic process whenever possible. A good example of current technology is cone-beam computed tomography (CBCT). The radiological images we used for many years were far less than the digital images we used for many years.

One of my golden rules of thumb is: No Epi, No Surgery; and one with an air-only syringe also fitted with a modified 25-gauge needle, for more precise cleaning and drying (Little John); another three-way syringe fitted with a modified 25-gauge needle, for more precise cleaning and drying.

Also, as the lumens of the high-speed evacuator tips (Young’s Surgical) are so small, extra tips must be available if one should become clogged. A tip will not be available if not stored, so the ‘scope’ assistant can occasionally clear the evacuator system of blood and tissue debris from the evacuator tip.

After topical anaesthetic has been placed, local anaesthesia is begun using less than one carpool of warmed two per cent lidocaine containing 1:50,000 epinephrine. This small amount is used to anaesthetize the injection site and the area for the blocks and infiltrations. The 1:50,000 lidocaine is used for the blocks and infiltrations. The 1:500,000 lidocaine (Marcaine) because the Marcaine tends to cause a burning sensation upon injection, whereas the lidocaine is much more comfortable to the patient. This is then followed with one or two 1.8cc carpules of warmed Marcaine for nerve blocks and/or infiltrations. All anaesthetic is warmed up and maintained very slowly to avoid any unnecessary trauma to the tissue and to create much less discomfort for the patient.

After administering the local anaesthetics, haemostasis staging is performed using two per cent lidocaine containing 1:50,000 epinephrine. It has been shown that two per cent lidocaine containing 1:50,000 epinephrine produces more than a 50 per cent improvement in haemostasis compared with two per cent lidocaine containing 1:100,000 epinephrine. While keeping the tip of the high-speed evacuator system of blood and tissue debris from the evacuator tip.
sue in two or three sites to the buccal of each tooth (MB, B, DB), approximately three mm apical to the mucogingival line. Slow injection of just a few drops of the anaesthetic causes a slight ballooning and blanching of the tissue in the immediate area.

This is an important step as it causes the mucogingival line to become more pronounced, allowing the doctor to have better vision, which results in more accuracy with the following haemostasis injections (Fig. 5a).

As the anatomy of the tissue unfolds during the injections, the doctor should continue visualising and planning the incision (Fig. 5b). The amount and nature of the attached gingiva is an important consideration whether a full sulcular or a mucogingival (Leubke–Oschenbein) flap is used. In general, a full thickness sulcular flap is routinely used unless aesthetics is a concern and there is an adequate zone of attached gingiva present.

In order to ensure haemostasis, the lingual tissues should also be infiltrated to reduce blood flow during the procedure more completely. When performing surgery on the posterior quadrant of the mandible, special attention should be given to the apical region of the mandibular second molar. Occasionally, a small foramen, called the foramen coli, may be present. The f. coli contains an ascending branch of the mylohyoid nerve. Lingual haemostasis staging can contribute to more profound anaesthesia, will enhance crypt management and will contribute to a more predictable event with less stress for the entire team as a result.

If the surgery is to be performed on the maxillary, the patient is instructed to close on approximately eight layers of sterile gauze, (four 2 x 2s folded over once) for stability of the jaws and keeping any debris from inadvertently entering the oral cavity. A single piece of a sterile 2 x 2 is also gently placed distal of the tooth/teeth to be operated on. If the surgical procedure is to be performed on the mandible, especially if a full sulcular flap is to be used, the doctor may want to make the incision with the mouth slightly open before placing the gauze.

In either case, with the aid of the OM and using a pre-filled 3 ml syringe fitted with a 20-gauge needle the entire surgical site is rinsed with Peridex, to ensure the area is free of debris and plaque before the incision is made (Fig. 6). The surgical site is now ready for the next important step in the procedure: flap design, the incision and atraumatic flap elevation. Stropko Irrigators are available from SybronEndo or Obtura Spartan in the United States, from Clinicians Choice in Canada, or directly from www.stropko.com.

References

Dental holidays in the UK
Can Britain really compete with Europe for dental implants?

Dental implant costs to patients in the UK have traditionally been more expensive than in any other country in Europe, Japan or America. In the UK, the cost for comparative treatment can be twice as much as in other countries. This means more insect patients a year may be forced to choose between America to USA to have dental implants and save money. Compared with our friends in the Euro zone most accuse money to UK it is a cheaper location than in any other European country.

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 endodontics from the University of Florida. He recently retired from the private practice of endodontics in Scottsdale in Arizona. Dr. Stropko is an internationally recognised authority in endodontics. He has been a visiting clinical instructor at the Pacific Endodontic Research Foundation (PERF), an Adjunct Assistant Professor at Boston University and a visiting clinician/consultant of graduate 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 currently an instructor of Microsurgery in the Endodontic Faculty at the Scottsdale Center for Dentistry. He can be contacted at topendo@aol.com.