Forceps Extraction of Teeth with Severe Internal Root Resorption


Teeth that have been endodontically treated, have perforated during endodontic therapy or have undergone internal resorption may crumble under the slightest pressure when an extraction is performed by an elevator or forceps technique. One option, other than use of a root tip elevator by an experienced oral surgeon, is to reflect a full-thickness mucoperiosteal flap and remove labial bone with a surgical handpiece and sterile irrigation. However, this open-extraction technique can result in the removal of a significant amount of alveolar bone.

After healing is complete, the alveolar ridge remaining often presents depressions and irregularities from this surgery, which may compromise further definitive dental care. Postoperative difficulty can occur due to the loss of the cortical plate if the practitioner attempts to orthodontically move adjacent teeth into this extraction site. In addition, if the ridge is no longer ideal, the increased pontic lengths, required by loss of the labial plate, will often complicate the edentulous area.

The most common technique for extraction of teeth with severe internal root resorption is by using a no. 2 elevator, which can be effective; however, the surgeon must have excellent dexterity and control to prevent fracture of the crown or root when pressure is applied. When using a no. 2 elevator, additional bone loss may occur from the bevels of the elevator blades contacting the alveolar crest.

ABSTRACT

Many treatment plans require a dental practitioner to maintain the entire labial cortical plate of bone when removing an anterior maxillary tooth. A tooth with an undermined root secondary to an endodontic perforation or internal (idiopathic) resorption can present a surgical challenge to the general practitioner. This article describes a new technique for extracting a severely undermined anterior maxillary tooth while maintaining the entire labial cortex of bone.

These overall results in postoperative cortical bone level can likewise be achieved by bone grafting with either freeze-dried, demineralized or autogenous bone and/or the use of guided tissue regeneration. These secondary procedures, however, generally require multiple surgeries to achieve the same results that can be achieved by removing the tooth routinely.

Causes of undermined roots. The extraction of a tooth with internal resorption of the root can be a complicated procedure owing to the fact that there is usually only a thin shell of tooth structure left at the site of resorption. In this condition, the pulp tissue has undergone a metaplastic change that results in resorption of the dentin from the pulpal walls. This area of resorption in such cases, rather than being occupied by loose, delicate connective tissue that is bordered by odontoblasts, is devoid of such cells. Instead, it is filled with very vascular granulation tissue. Sometimes there is a history of trauma, but in most instances no cause of this histologic phenomenon can be elicited.

Perforation during endodon-
Perforations can occur during access and canal preparation when Gates-Glidden burs and endodontic files are used. Sometimes the perforation can be repaired. Amalgam plugs, hemisection and root amputations are possible techniques. Orthodontic extrusion to bring a perforation into a supracrestal position can also be considered. Unfortunately, extraction of the tooth is also a distinct possibility. The loss of tooth structure in a critical area may necessitate a surgical extraction.

**The composite packing technique.** A surgical extraction can, in comparison to a routine forceps technique, lead to increased postoperative pain and a variety of other complications such as bleeding and swelling. Therefore, when it is imperative to preserve the labial cortical plate of bone, the authors' treatment of choice is to perform a routine extraction. As much decay or pulpal tissue as possible is removed from within the tooth. Self-curing composite material is then bonded into the site of resorption, including the chamber and coronal portion of the tooth. This bonding maintains the integrity of the tooth so that during the forceps extraction it is possible to remove the tooth in one piece without using a surgical flap and removing bone. Hence, the entire labial plate can be maintained for any necessary treatment plan anticipated in the future.

**CASE REPORT**

A dentist evaluated the orthodontic status of a healthy 22-year-old man. The patient was diagnosed with a Class II, Division 1 malocclusion involv-
ing 7 millimeters of overjet and 1 mm of overbite. Also, from a restorative point of view, the general dentist had diagnosed the maxillary left central incisor as having a hopeless prognosis. The anatomical crown of the maxillary left central incisor had been fractured off in an accident approximately 10 years before. Endodontic treatment had been performed at that time, and a dowel post with an acrylic crown had been placed. After the restoration, the tooth had developed internal resorption, which left extensively undermined root structure (Figure 1).

The orthodontic treatment goal for this patient was to obtain a Class I molar and canine occlusion on the right side and a Class I molar occlusion on the left side. To create ideal space and alleviate the maxillary and mandibular arch length deficiencies, the dentist planned to extract the maxillary right first bicuspid, the maxillary left central incisor and both mandibular first bicuspids. The ideal orthodontic treatment plan would have been to remove the four first bicuspids. However, owing to the poor prognosis of the maxillary left central incisor, the dentist determined that it should be extracted instead of the maxillary left first bicuspid.

After orthodontic treatment was completed, the left maxillary anterior teeth would be modified using porcelain veneers to achieve acceptable esthetics.

Special consideration was given to the removal of the maxillary central incisor to minimize the trauma to the labial cortical plate and surrounding tissues. Local anesthesia was achieved with 2 percent lidocaine with 1:100,000 epinephrine. The dentist removed the dowel post and crown using a hemostat. Using a long, thin spoon excavator, the dentist removed the decay and granulation tissue from the chamber and the area of internal resorption (Figure 2). (To gain access to the site of resorption, in some cases, the dentist may need to widen the coronal portion of the root with a dental bur.) The internal aspect of the tooth was etched with 37 percent phosphoric acid for 30 seconds, and the tooth was then rinsed with water for 30 seconds. The dentist applied primer and chemical cure bonding agent according to the manufacturer's directions. A fast-setting chemical cure composite material (which set in less than 10 minutes) was then packed into the tooth with a felt condenser (Figure 3). After the composite was completely set, the epithelial attachment was...
tissue regeneration or possibly by a skilled oral and maxillofacial surgeon with a root tip elevator. However, the technique presented here provides an option for use by a general dentist to achieve minimal hard- and soft-tissue trauma. No follow-up procedures are required to increase the osseous structure to its presurgical level.

CONCLUSION

The integrity of a tooth can be reinforced by acid etching the canal and chamber, then adding bonding agent and composite material. This can allow a severely undermined tooth to be routinely removed in one piece, thereby maintaining the labial cortical plate of bone. This is imperative in cases involving restorative fixed prostheses, orthodontic treatment or implant therapy. It provides the dental practitioner with a technique that preserves the labial cortical plate of bone for the final restorative process.