How to Extract Permanent Equine Incisors

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1. Introduction

Incisor extraction can be performed in the standing equine with a minimum of instrumentation. Indications for incisor extraction include fracture, pulp horn exposure leading to pulpitis and apical infection, supernumerary teeth, displaced or maligned teeth, equine odontoclastic tooth resorption and hypercementosis (EOTRH), and severe periodontal disease not associated with EOTRH. Normal but unopposed incisors may also be extracted to avoid repeated shortening and the possibility of catching these teeth on a projection and possible fracture.

Pre- and post-operative radiographs will be needed to identify affected teeth and to document complete tooth removal. Ideally, radiographs should be repeated 6 months after surgery.

2. Materials and Methods

Required instruments include a double-ended Molt 9 periosteal elevator; 4- or 6-mm straight osteotome; 0 size monofilament absorbable suture; 00 or 0 malleable Simms curette; 7- or 8-mm-wide bone rongeurs double or single action; small periodontal elevators; bone mallet, small forceps, and medium plastic bucket; and a suture kit.

Sedation is initiated using detomidine (10–20 μg/kg, IV) plus butorphanol (0.01–0.02 mg/kg, IV). Repeat as needed to effect.

Surgical preparation is done over the appropriate foramen(s): the infraorbital foramen(s) for maxillary incisors and the mental foramen(s) for mandibular incisors. A 22- or 20-gauge 3.8-cm needle is inserted into the appropriate foramen, and 10 ml of carbocaine is injected slowly while maintaining firm digital pressure over the opening to prevent back flow of the anesthetic. Skin and subcutaneous tissue may be anesthetized before entering the foramen(s) to minimize head movement when the needle enters the foramen(s).

Two diverging incisions are made over the reserve crown of the diseased incisor (Fig. 1) through the periosteum to the bone overlying the reserve crown, ensuring that the base of the incisions is wider than the coronal end. The incisions extend apically 3–4 cm. At the level of the arrow in Fig. 1, blood vessels may be severed if the incision is extended into this region.

A third incision is made at the gingival margin following the white line in Fig. 1. The extractions in this paper were done gratis during a dental seminar. The horse had no 301, 302, or 303 incisors because of an injury. The extraction eliminated the need for repeatedly reducing 201 to 203 and this expense for the owner.
Using the periosteal elevator, the periosteum with the mucosa is elevated until ~80% of the bone overlying the reserve crown is exposed (Figs. 2 and 3). After elevation is complete, the periosteum is incised again at the base of the flap where the periosteum is still attached to the bone. Incising the periosteum reduces contraction and apical tension on the flap after suturing (Fig. 3).

The bone over the reserve crown is removed apically to the base of the flap (Fig. 4). Bone may be removed further apically if desired, but the rongeurs will be needed to remove bone fragments attached to the non-elevated periosteum. If adjacent teeth are extracted, the alveolar bone between teeth may be removed as much as the osteotome will reach. Once the labial tooth surface is exposed, the osteotome or a small periodontal elevator is used to

Fig. 1. Incisions for extracting 201.

Fig. 2. Initial incision for extracting 201, 202, and 203.

Fig. 3. Periosteal elevation on the left and incising the periosteum at the base of the flap on the right.
loosen the tooth along the interproximal spaces until the tooth can be extracted (Fig. 4).

After proper exposure and elevation (Fig. 5) of the periodontium, the osteotome is used to loosen the tooth from the alveolus and is removed with the forceps (Fig. 6).

The most common complication is fracturing the apex of the tooth. Iatrogenic fragments or tooth fragments from diseased teeth may be removed with the small periosteal elevators or the Simms curettes. Simms curettes are also used to debride necrotic tissue from apical abscesses.

After extraction, the tooth is examined to be sure that all of the tooth has been extracted, and radiographs are taken for documentation (Fig. 7).

The mucosal edges are sutured in a simple interrupted or cruciate pattern (Fig. 7).

The horse should be kept from food and water for 4 h after extraction. A bucket may be attached to the halter with holes cut out on the front and back to allow for air flow to enter and saliva to exit (Fig. 8). This will act as a simple disposable muzzle.

It is impossible to prevent day to day trauma to the incision associated with eating and drinking.
Sutures are removed in 10–14 days; however, dehiscence is a common sequelae and occurs in 90% of incisor extractions (Fig. 9). Sutures are removed immediately if the wound dehisces. Some time should be spent explaining to the owner about dehiscence and after care, and instructions should be written. To conserve owner resources, I have them photograph the surgery site every 24–48 h and e-mail them to me. This allows indirect veterinarian supervision without expense to the owner, and rechecks can be scheduled based on the photographs.

Although the rate of dehiscence is high, the sutured flap does protect the surgery site for several days, allowing for early granulation tissue formation. Depending on the size of the surgery, healing occurs in 4–8 wk. Figure 9 shows extraction sites 2

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**Fig. 6.** Extracting 202.

**Fig. 7.** Left; examination of the incisors. Right; monofilament simple interrupted pattern.

**Fig. 8.** Air holes seen close to the nostrils. Exit hole is on the back edge of the bucket.
wk after surgery. Figure 10 shows radiographs of horse pre- and post-operatively.

References and Footnotes


"Dormosedan®, Orion Corp., Espoo, Finland.
"Torbugesic®, Fort Dodge Animal Health, Fort Dodge, IA 50501.