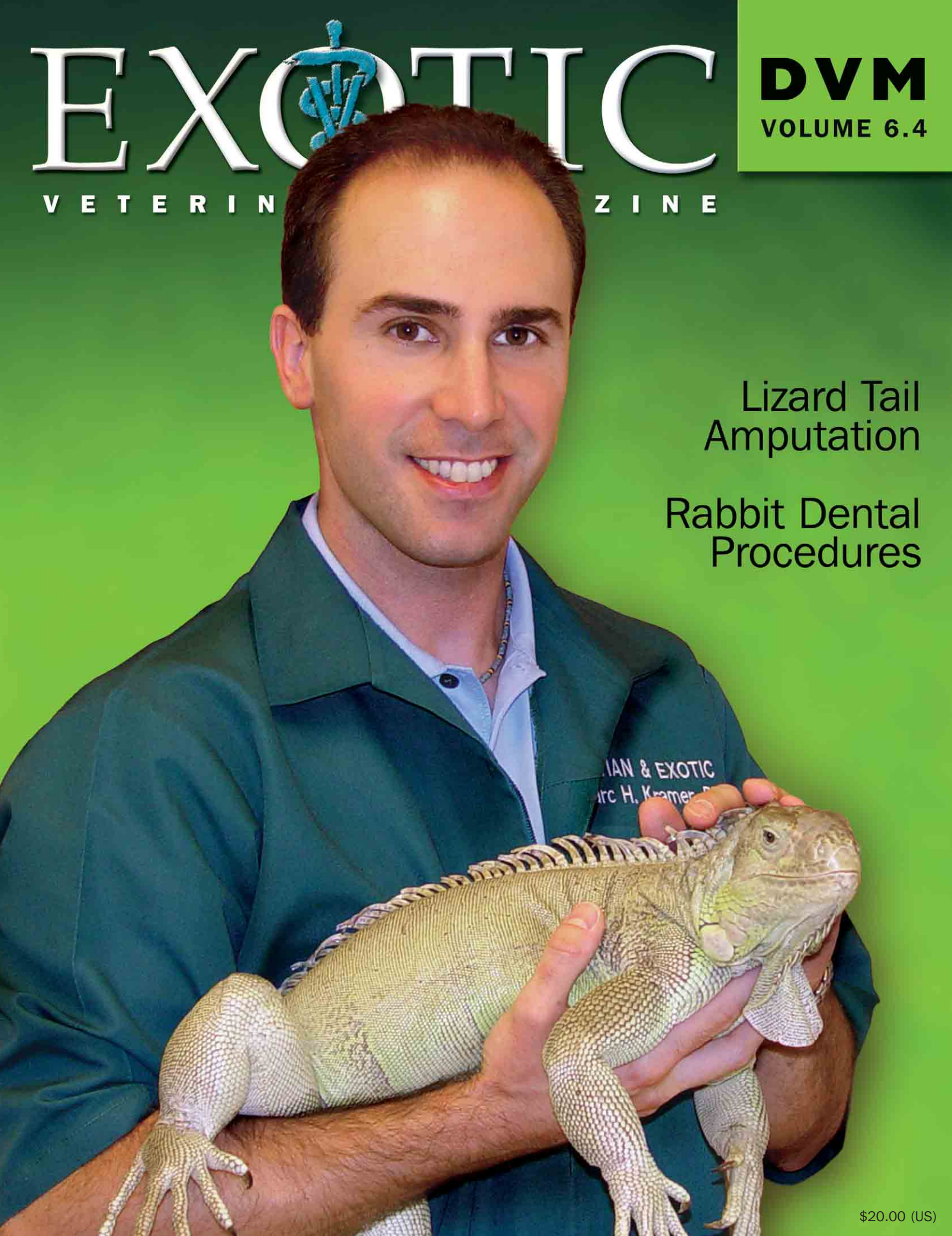
EXOTIC VETERINARIAN MAGAZINE

DVM
VOLUME 6.4

Lizard Tail Amputation

Rabbit Dental Procedures



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EXOTIC DVM
VETERINARY MAGAZINE
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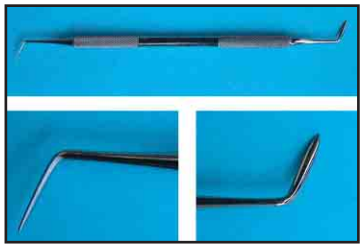
Extraction of Cheek Teeth and Surgical Treatment of Periodontal Abscessation in Pet Rabbits with Acquired Dental Disease

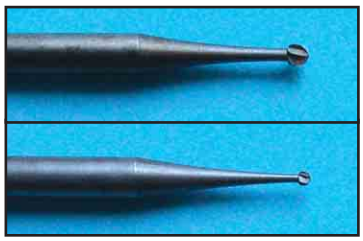
Vittorio Capello, DVM

Resources at a Glance

- Dental instrumentation - Sontec Instruments, Inc. Englewood, CO, www.sontecinstruments.com and Veterinary Instrumentation, Sheffield, UK, www.vetinst.com
- Heavy-duty flex shaft tool with foot control speed lever, 12.7-mm hand piece, burrs - Dremel, www.dremel.com
- Lone Star retractor - Lone Star Medical Products, Inc, Houston, TX, www.lsmp.com/html/products/vetproducts.html



Crossley's luxator for cheek teeth has been designed to cut periodontal ligaments of premolars and molars. The two edges of the instrument are sharp and angled at about 100° to correspond to the lateral/medial and cranial/caudal sides of the cheek tooth.

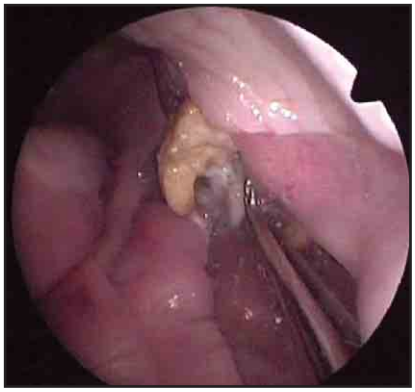


0.8 and 1.2 mm steel burrs

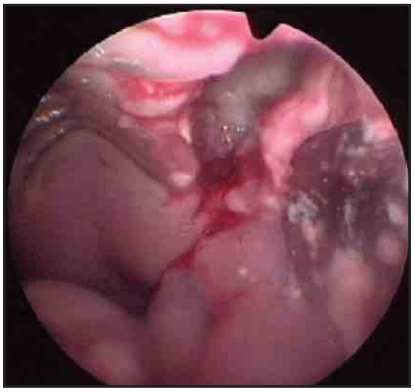
Extraction of Cheek Teeth: Intraoral Technique

1 Crossley's luxator is inserted between the cranial aspect of the 1st right lower cheek tooth and the gingiva to transect the cranial periodontal ligament. The same technique is applied to all sides of the tooth.

2 After the ligaments on each side of the tooth are cut and the tooth is loosened, it is grasped by an extraction forceps and removed. In pet rabbits, a small hemostat may work well as an extraction forceps.



3 Shown is Crossley's luxator in use on a severely infected upper molar.

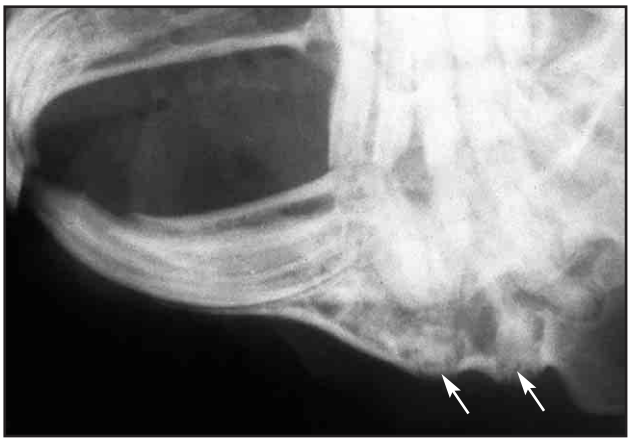


4 After extraction of the molar in Fig 3, deep abscessation is clearly visible. The socket is debrided of purulent material, flushed with saline and left open for healing by second intention.

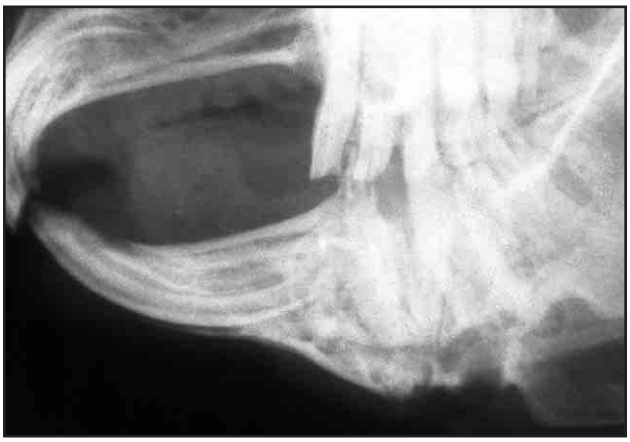
Extraction of Cheek Teeth or Their Fragments: Extraoral Technique

Extraction of cheek teeth from the intraoral approach can be very difficult due to the narrow oral cavity of the pet rabbit, the position of the tooth in the arcade and the strong adhesions between the tooth and the alveolar bone in cases of periapical infection or osteomyelitis. Extraction using this technique may also be impossible when the tooth is fractured and the crown is not visible.

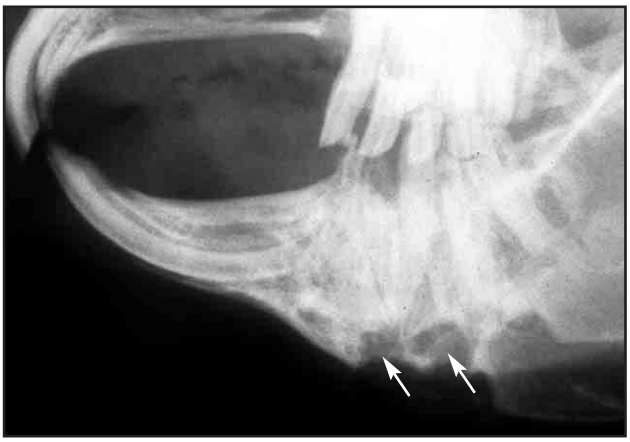
The extraoral surgical approach allows extraction of cheek teeth (or their fragments) by creating a fenestration in the cortical bone overlying the apex of the tooth. This technique is particularly useful for extraction of lower cheek teeth.



Radiograph 1. Shown is an oblique radiograph of the rabbit in Figs 1-8 on page 33. The 1st and 2nd lower premolars are fractured, and apical fragments are visible in the sockets (arrows). Mandibular cortical bone is swollen and irregular.

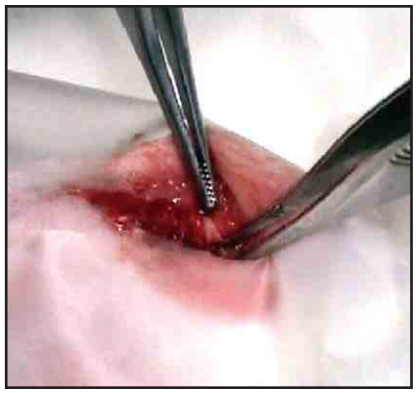


Radiograph 2. Radiograph taken after extraction of the 2nd premolar fragment (Fig 5 on page 33).

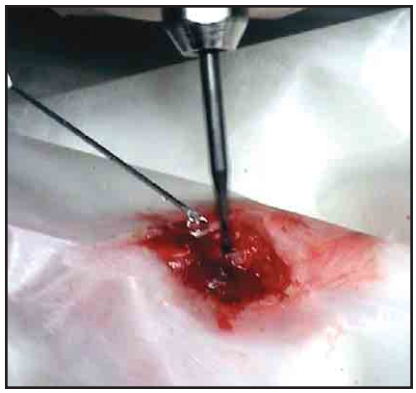


Radiograph 3. Radiograph taken after extraction of the 1st premolar fragment (Fig 7 on page 33). Radiolucency of the two adjacent sockets confirms extraction of the two premolar fragments.

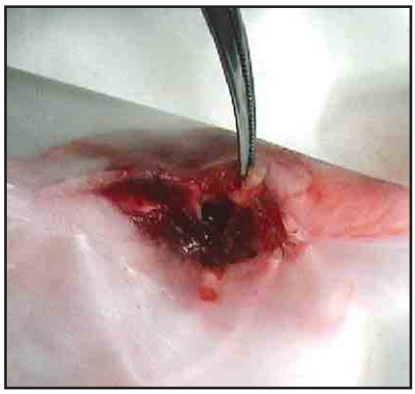
1 The rabbit is anesthetized and placed in dorsal recumbency, and the surgical site is aseptically prepared and draped. The anesthesia face mask is on the left in this photo. A 1-cm skin incision is made over the ventral mandible.



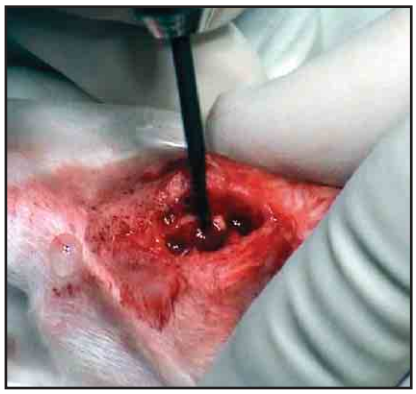
2 Subcutaneous and muscle layers are dissected, revealing an irregularity of the cortical bone. This swelling is caused by degeneration and fragmentation of the apex of the 2nd premolar (see Radiographs 1, 2).



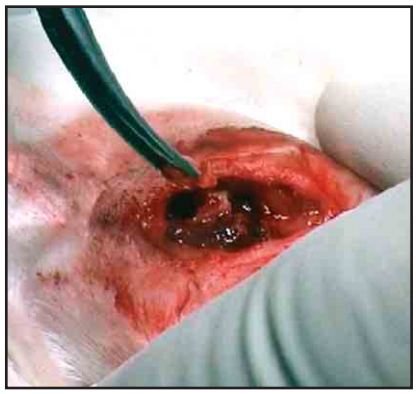
3 If the cortical bone is already very thin, a needle can be used for fenestration. Alternatively, a Dremel drill with a steel burr can be used to enter the cortical bone. If the drill is used, the bone must be wet with saline to prevent overheating.



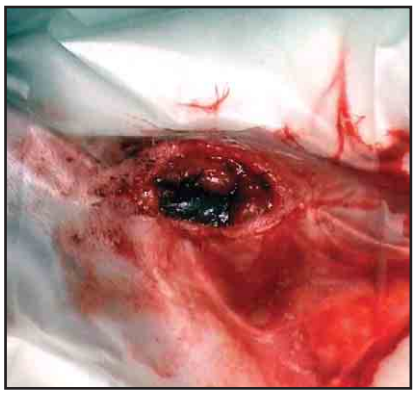
4 The tooth fragment is loosened from its socket using a 22- or 25-gauge needle then is extracted.



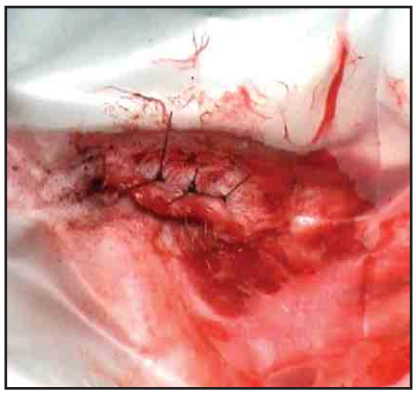
5 A second fenestration is made in the cortical bone to allow extraction of the fragment of the 1st premolar (see Radiographs 1, 3). Extreme caution must be exercised to avoid iatrogenic fracture of the mandible.



6 The second tooth fragment is loosened and extracted.



7 If the alveolus is not infected and the surgical procedure has been strictly aseptic, the site is closed using 4-0 absorbable suture.



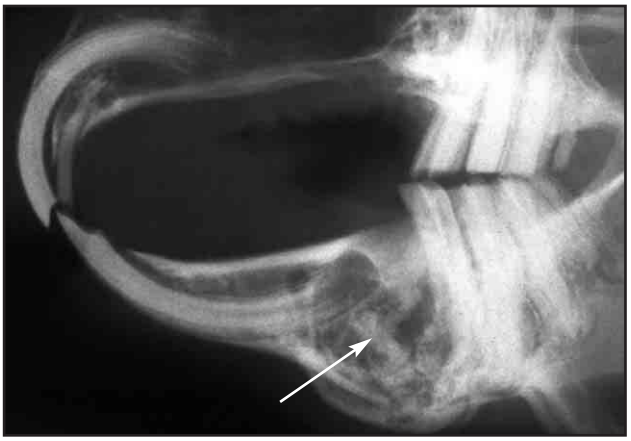
8 The skin is closed with 3-0 non-absorbable suture.

Surgical Debridement of Mandibular Abscessation

Periapical infection of the cheek teeth is a common sequela of acquired dental disease in pet rabbits, especially in cases of metabolic bone disease or tooth fracture. These aggressive infections can rapidly involve the surrounding bone with the subsequent development of osteomyelitis and mandibular abscessation.

Antibiotic therapy alone is not sufficient to resolve mandibular abscessation, so surgical therapy is the only effective therapeutic option. Successful treatment is dependent on:

- debridement of the entire abscess, including the capsule
- extraction of the tooth or teeth involved
- debridement of the infected/necrotic cortical bone

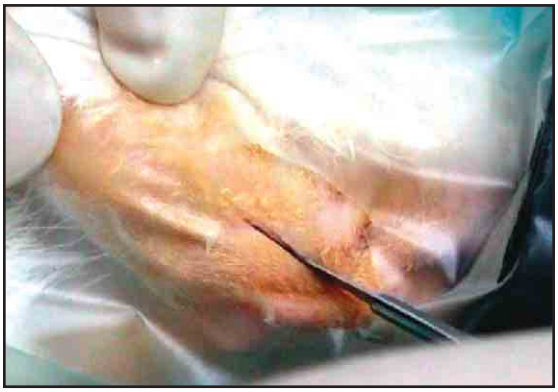


Radiograph 4. The abnormalities on this lateral radiograph are consistent with mandibular abscessation and osteomyelitis. A fragment of the 1st lower premolar is visible in the center of the infected site (arrow). The circular radiolucent lesion near the oral cavity likely indicates an area containing purulent material. The abscess had not fistulated into the oral cavity.

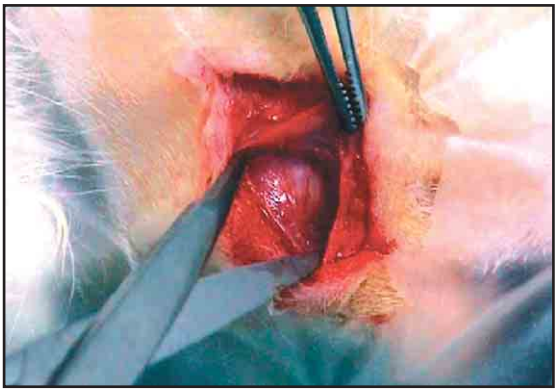
Case 1

1 The rabbit is anesthetized and placed in lateral or dorsal recumbency, depending on the site of infection. The area is shaved and aseptically prepared.

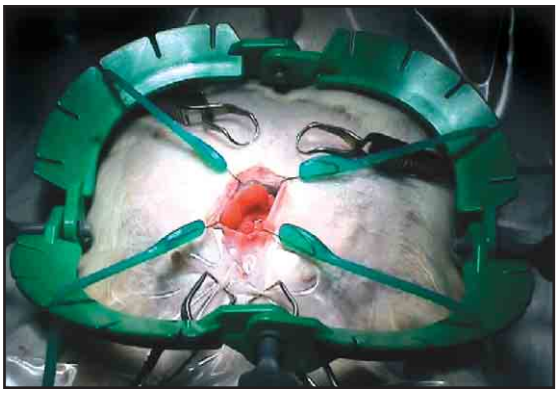
2 An adhesive transparent drape facilitates viewing of the position of the head.



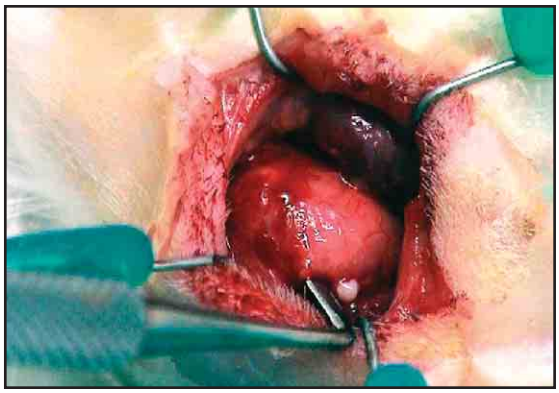
3 A skin incision is made over the firm bony swelling. In doing so, the surgeon must avoid lancing the underlying abscess.



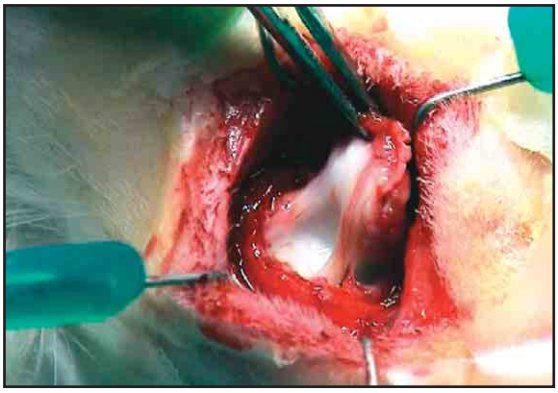
4 Subcutaneous tissue and muscle layers are gently dissected to free the abscess capsule, which must be isolated without disrupting its connection to the cortical bone.



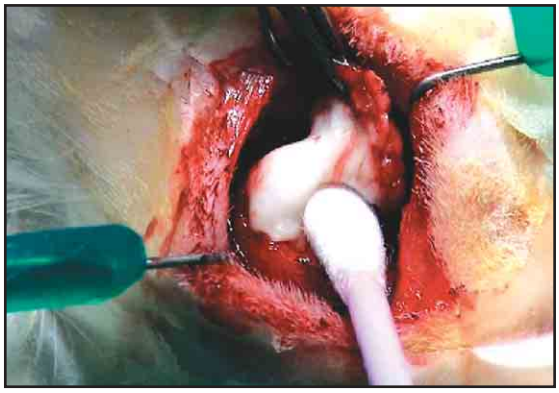
5 The Lone Star retractor system consists of an outer structure to which elastic stay hooks can be attached to provide adjustable retraction at the surgical site. It allows for optimal retraction while giving the surgeon adequate room to work.



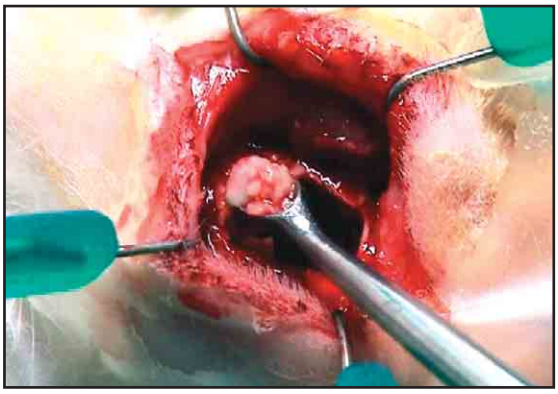
6 The junction between the capsule and mandibular bone is incised using Crossley's luxator for cheek teeth or the tip of a #11 scalpel blade. The lateral wall of the abscessed area may be composed of thick soft tissue or thin cortical bone of the mandible.



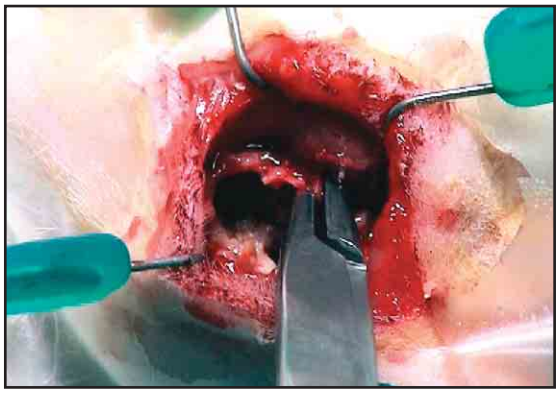
7 The lateral wall of the abscess is elevated and incised to reveal thick white purulent material.



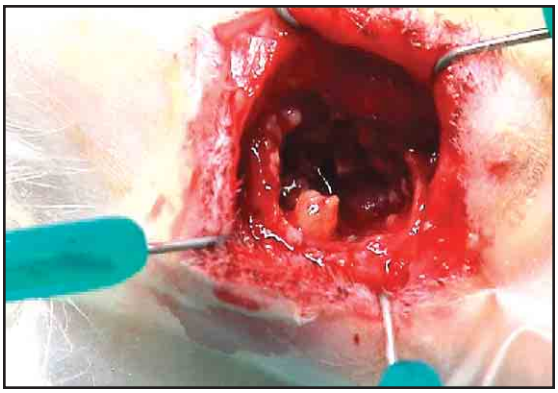
8 The pus is removed with cotton-tipped applicators, and the bone cavity is flushed. This purulent material is usually sterile, so culture results are unrewarding. A sample of the capsule wall may be more appropriate for culture.



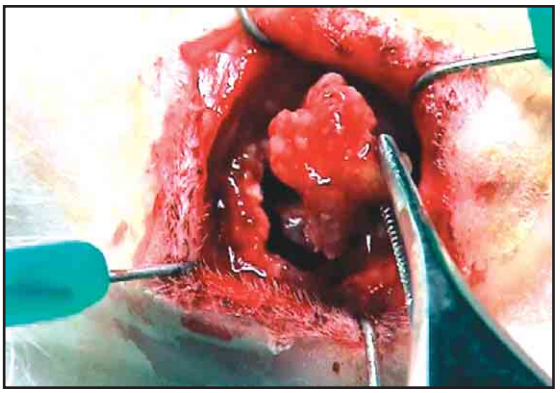
9 The bone cavity is debrided with a bone curette to remove the remaining pus and elicit bleeding of the infected bone tissue. This step alone is not sufficient to treat osteomyelitis.



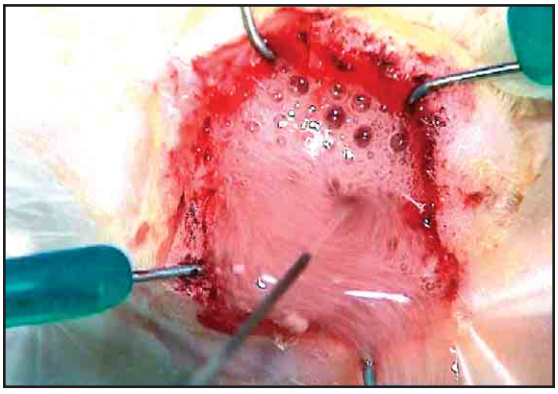
10 Infected or necrotic cortical bone surrounding the cavity is debrided using a small Rongeur or needle holder.



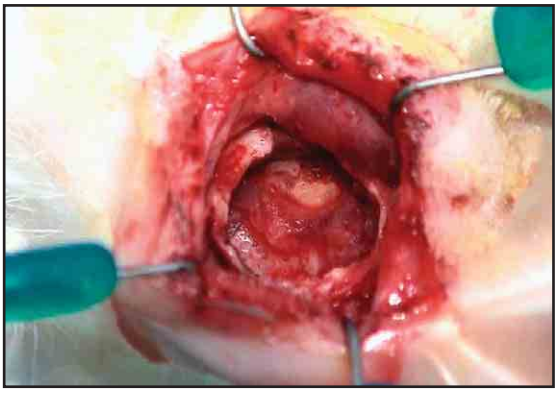
11 After thorough debridement, the fragment of the 1st premolar is visualized at the bottom of the bone cavity. Crossley's luxator or a needle is used to free the fragment's attachment to the bone.



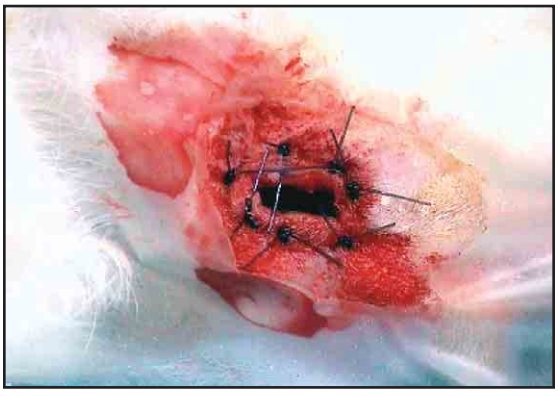
12 The tooth attached to a fragment of necrotic bone is extracted.



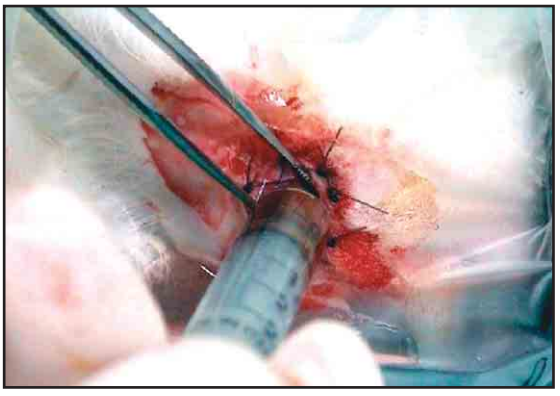
13 The bone cavity is again debrided and thoroughly flushed with saline and dilute povidone iodine.



14 Shown is the appearance of the inner wall of the bone cavity, which is actually the medial aspect of the mandible.



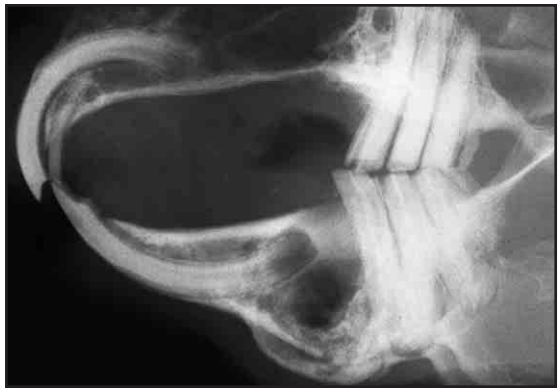
15 Marsupialization of the soft tissues is performed using 3-0 nonabsorbable suture. This will allow postoperative flushing and treatment and will facilitate healing by second intention, thus reducing the risk of recurrent infection. Even though postoperative care may be longer and more difficult, the author prefers this surgical option to the use of antibiotic-impregnated polymethylmethacrylate beads. Marsupialization allows more control over continued treatment of the affected area. The owner can be taught to perform the majority of the postoperative care at home.



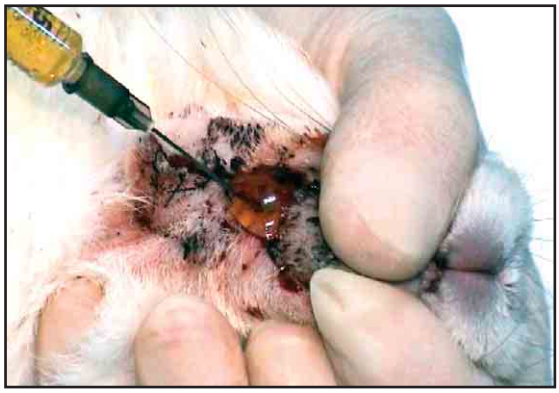
16 Povidone iodine/antibiotic ointment is used to fill the bone cavity.

Follow-Up Healing After Surgery

The owner must be prepared for the temporary unattractive cosmetic appearance resulting from marsupialization, but this is generally well accepted.



Radiograph taken after abscess debridement and extraction of the 1st lower cheek tooth (compare to Radiograph 4). This rabbit had previously undergone bilateral extraction of the two upper premolars.



Postoperative care includes frequent flushing with saline and dilute povidone iodine, application of antibiotic ointment and administration of antibiotics and analgesics. If the rabbit can be adequately restrained, local therapy can be performed without sedation.

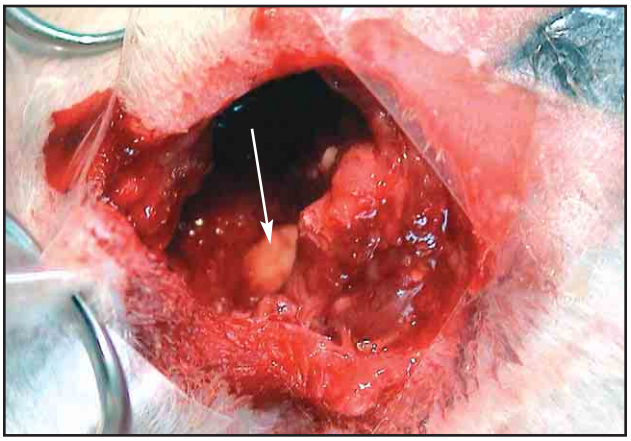
At the follow-up after 3 weeks, the bone cavity has been filled with new connective tissue, and the overlying skin is almost completely healed.

Case 2: Shown is another clinical case shortly after surgery and marsupialization.

At follow-up 18 days after surgery, sutures at the marsupialization site have been removed, and the cavity is significantly smaller.

Follow-up after 26 days shows complete resolution of abscessation.

Case 3: Surgical treatment of abscessation of the upper cheek teeth is similar to that of lowers. Frequently, such as in this case where creamy ocular discharge is present, the abscess communicates with the nasolacrimal duct. Usually extraction of the involved tooth is more difficult, due to the position of the upper cheek teeth (especially the three most caudal). This zygomatic abscessation has been opened.



The abscess capsule and enclosed purulent material have been removed. The apex of the infected tooth is shown after debridement of bone tissue (arrow).

At follow-up 10 days after surgery, the surgical site was healing.

Acknowledgements

The author appreciates the contributions of Sonia Giola, DVM, Giuseppe Ripamonti, DVM and Germana Scerbanenco, DVM.

References and Further Reading

1. Divers SJ: Mandibular abscess treatment using antibiotic-impregnated beads. Exotic DVM 2(5):15-18, 2000.
2. Greenberg T: Premolar extraction in the domestic rabbit. Exotic DVM 2(4):11, 2000.
3. Harcourt-Brown F: Dental disease. *In* Textbook of Rabbit Medicine. Oxford, UK, Butterworth-Heinemann imprint of Elsevier, 2002, pp 198-199.