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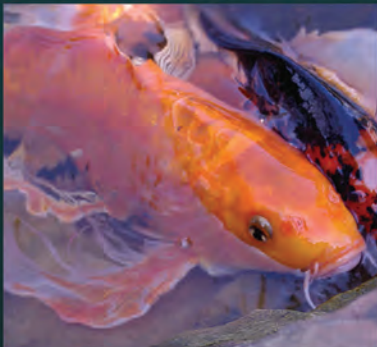
# EXOTIC



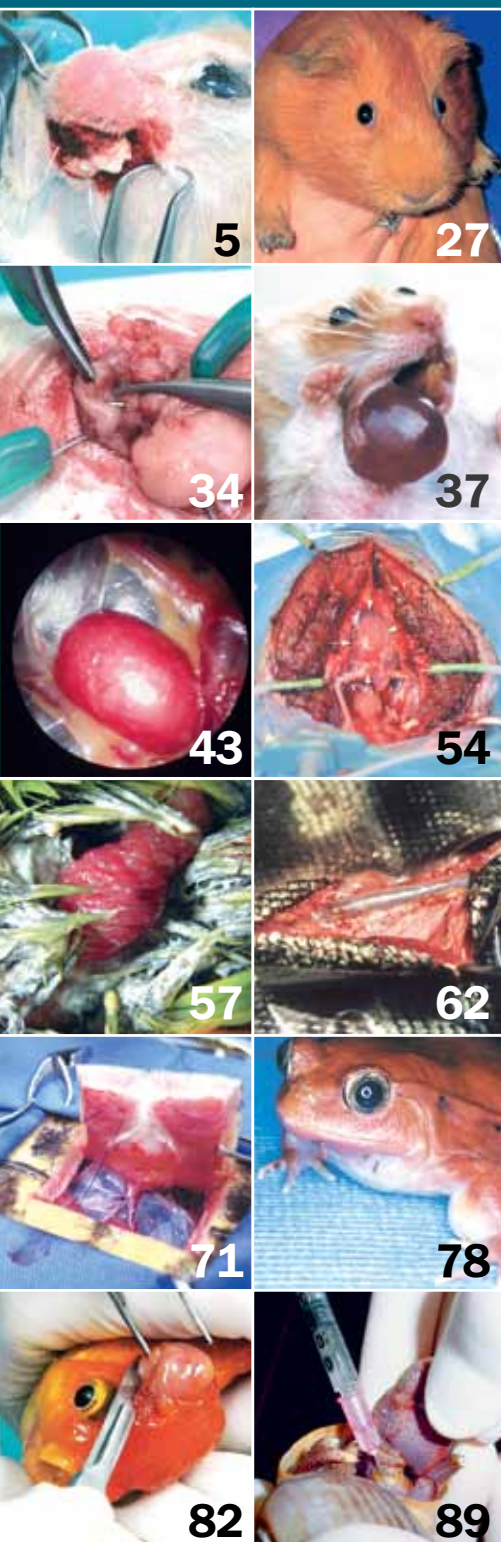
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## Exotic Animal Medicine & Surgery



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# Extraction of Cheek Teeth and Surgical Treatment of Periodontal Abscessation in Pet Rabbits with Acquired Dental Disease

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Vittorio Capello received his veterinary degree from the University of Milano, Italy. He has practiced exotic animal medicine exclusively since 1996 and provides professional services for two veterinary clinics in Milano, where his focus has been medicine and surgery of exotic companion mammals. Dr. Capello has lectured, published and taught exotic animal courses and practical laboratories throughout Italy, other parts of Europe, Japan and the United States. He is the author of two reference texts: *Rabbit and Rodent Dentistry Handbook* and *Clinical Radiology of Exotic Companion Mammals*. He is President-elect of the Association of Exotic Mammal Veterinarians (AEMV).

Specialized instrumentation is available to assist in extraction of cheek teeth in pet rabbits (e.g., Universal Surgical Instruments, [www.universal-surgical.com](http://www.universal-surgical.com), Sontec Instruments, [www.sontecinstruments.com](http://www.sontecinstruments.com) and Veterinary Instrumentation, [www.vetinst.com](http://www.vetinst.com)). Crossley's luxator for cheek teeth has been designed to cut periodontal ligaments of premolars

and molars (Fig 1). The two edges of the instrument are sharp and angled at about 100° to correspond to the four aspects of the cheek tooth. Most extraction forceps for cheek teeth available in the market are too large for extraction of cheek teeth of pet rabbits. A smaller extraction forceps (Figs 2a,b) has been produced by the author with Precision Surgical Inc. ([www.psint.net](http://www.psint.net)).



Fig 1. Crossley's luxator



Fig 2a,b. Extraction forceps have been developed by the author and Precision Surgical.

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## Extraction of Cheek Teeth: Intraoral Technique



**Fig 3.** The Crossley's luxator is inserted between the distal (caudal) aspect of the left maxillary premolar tooth and the gingiva to transect the periodontal ligament. The same technique is applied to all four aspects of the tooth.



**Fig 4.** After the ligaments on each aspect of the tooth are cut and the tooth is loosened, it is grasped by the extraction forceps and removed. Note the curvature of the diseased reserve crown. After extraction, the gingiva might be sutured or left open for healing by second intention.



**Fig 5.** The Crossley's luxator is working the buccal (lateral) aspect of a right mandibular premolar tooth affected by periapical infection. Note the pus coming out the socket.



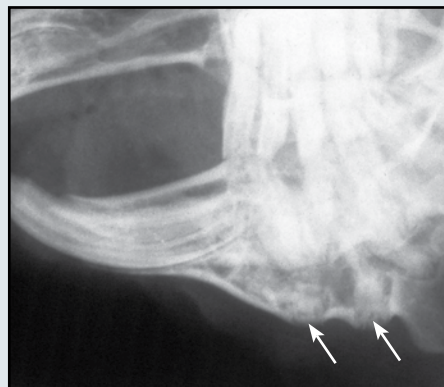
**Fig 6.** After patient and careful luxation, the clinical crown is grasped with the tip of the extraction forceps, and the tooth is extracted completely. Note the curved and deformed reserve crown. When periapical infection is present, the socket is flushed with saline and left open for draining and 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 acquired dental disease. Extraction using this technique may also be impossible when the clinical crown is fractured. The reserve crown is buried under the

gingiva and might be impossible to visualize or grasp for extraction.

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



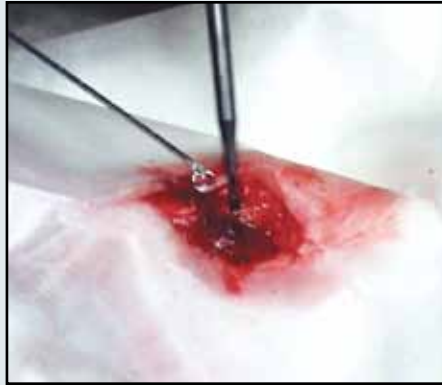
**Fig 7.** The oblique radiograph shows that the 1st and 2nd mandibular premolars are fractured, and apical fragments are visible in the sockets (arrows). Mandibular cortical bone is deformed.



**Fig 8.** 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 aspect of the mandible.



**Fig 9.** Subcutaneous and muscle layers are dissected, revealing the ventral deformity of the cortical bone. This irregular profile is caused by degeneration and fragmentation of the apex of the 2nd premolar (see Figs 7, 12).



**Fig 10.** If the cortical bone is already very thin, a needle may be used for fenestration. Alternatively, a Dremel drill with a steel burr may be used to enter the cortical bone. If the drill is used, the bone must be wet with saline to prevent overheating.



**Fig 11.** The apical tooth fragment is loosened from its socket using a 22- or 25-gauge needle and then is extracted.



**Fig 12.** Radiograph taken after extraction of the 2nd premolar fragment (Fig 11).



**Fig 13.** A second fenestration is made in the cortical bone to allow extraction of the fragment of the 1st premolar. Extreme caution must be exercised to avoid iatrogenic fracture of the mandible.



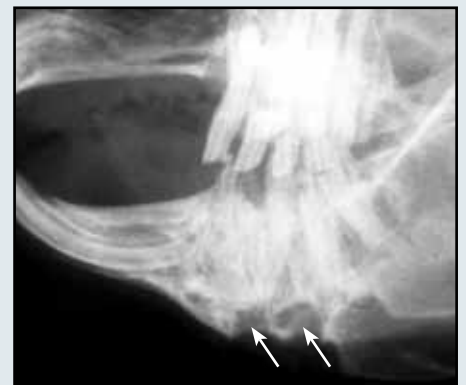
**Fig 14.** The second tooth fragment is loosened and extracted.



**Fig 15.** If the alveolus is not infected and the surgical procedure has been strictly aseptic, the site is closed using 4-0 absorbable suture.



**Fig 16.** The skin is closed with 3-0 non-absorbable suture.



**Fig 17.** Radiograph taken after extraction of the 1st premolar fragment. Radiolucency of the two adjacent sockets confirms extraction of the two premolar fragments. Coronal reduction of maxillary cheek teeth has not yet been performed.

## Surgical Debridement of Odontogenic Abscesses and Osteomyelitis of the Mandible

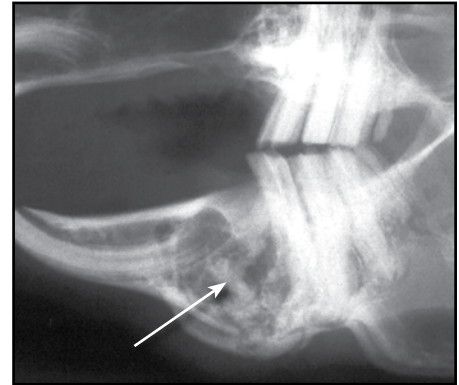
Periapical infection of the cheek teeth is a common sequela of acquired dental disease in pet rabbits. These aggressive infections can rapidly involve the surrounding bone with the subsequent development of osteomyelitis and mandibular abscessation.

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 or their fragments
- debridement of the infected/necrotic bone.



**Fig 18.** The radiographic abnormalities in this lateral projection are consistent with periapical infection and osteomyelitis. A fragment of the 1st mandibular 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. This rabbit had previously undergone bilateral extraction of the 2 maxillary premolars.

## Case Reports

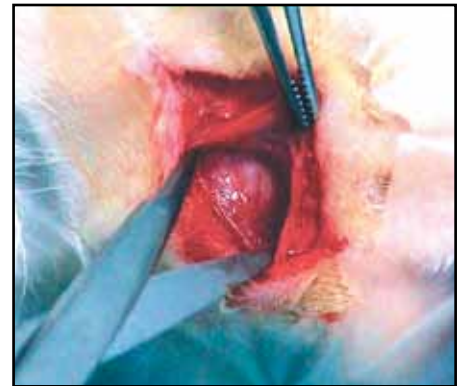


### CASE 1

**Fig 19.** The rabbit is anesthetized and placed in lateral or dorsal recumbency, depending on the site of infection. The area is shaved and aseptically prepared. For maintenance of anesthesia, the patient may be intubated as routine.



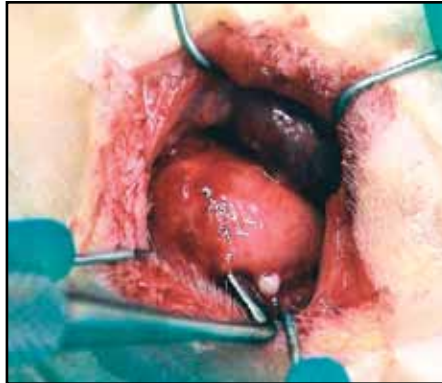
**Fig 20.** An adhesive transparent drape facilitates viewing of the position of the head. A skin incision is made over the swelling. In doing so, the surgeon must avoid lancing the underlying abscess.



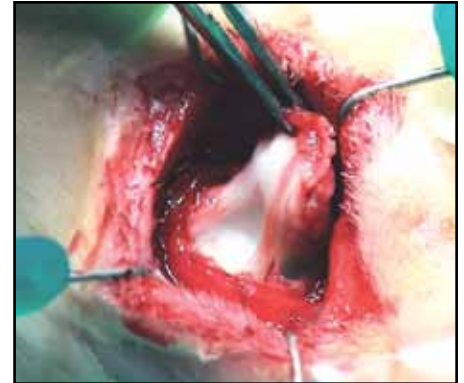
**Fig 21.** Subcutaneous tissue and muscle layers are gently dissected to free the abscess capsule, which must be isolated without disrupting its connection to the cortical bone.



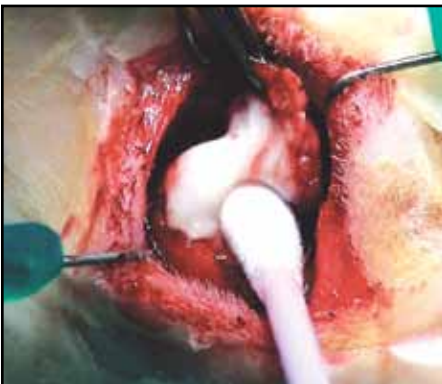
**Fig 22.** The Lone Star retractor system ([www.lsmc.com](http://www.lsmc.com)) is applied (here shown on another rabbit). It consists of an outer structure to which elastic stay hooks may be attached to provide adjustable retraction at the surgical site. It allows for optimal retraction while giving the surgeon adequate room to work.



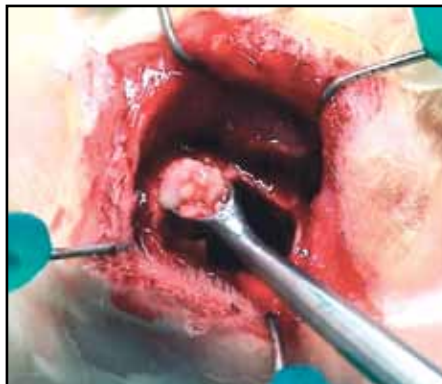
**Fig 23.** The junction between the capsule and mandibular bone is probed using Crossley's luxator for cheek teeth. It is then incised with the tip of a #11 scalpel blade. The lateral wall of the abscessed area may be composed of thick soft tissue or thin cortical bone of the mandible.



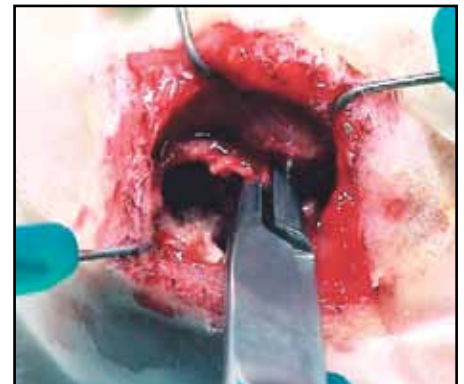
**Fig 24.** The lateral wall of the abscess is elevated and incised to reveal thick white purulent material.



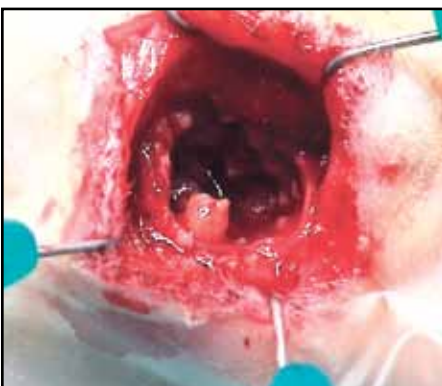
**Fig 25.** The pus is removed with cotton-tipped applicators, and the bone cavity is flushed. This purulent material is usually sterile, so culture results are unrewarding. A sample of the capsule wall may be more appropriate for culture.



**Fig 26.** 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.



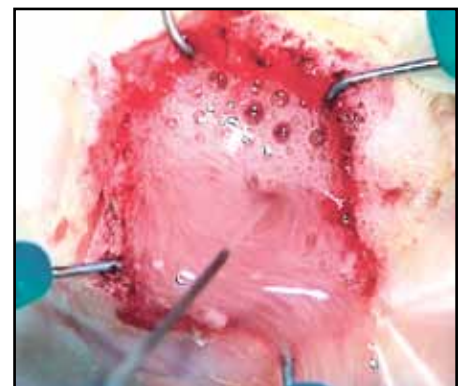
**Fig 27.** Infected or necrotic cortical bone surrounding the cavity is debrided using a small rongeur or burr.



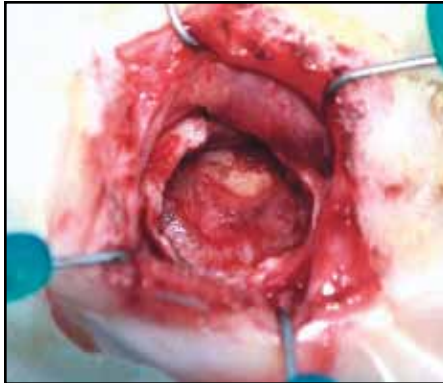
**Fig 28.** After thorough debridement, the fragment of the 1st premolar is visualized at the bottom of the bone cavity. Crossley's luxator or a needle is used to free the fragment's attachment to the bone.



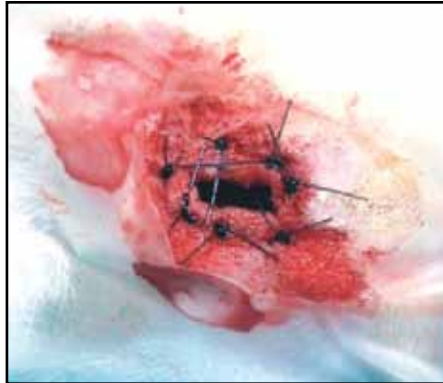
**Fig 29.** The tooth attached to a fragment of necrotic bone is extracted.



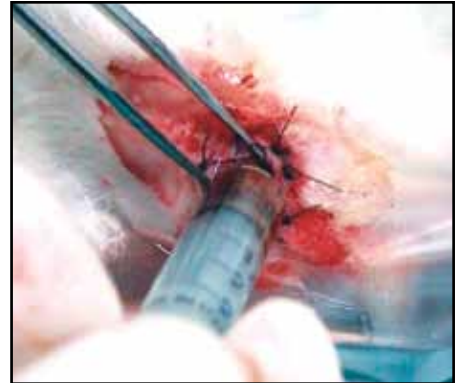
**Fig 30.** The bone cavity is again debrided and thoroughly flushed with saline and/or diluted povidone iodine.



**Fig 31.** Shown is the appearance of the inner wall of the bone cavity, which is actually the medial aspect of the mandible.



**Fig 32.** 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.



**Fig 33.** Povidone iodine/antibiotic ointment is used to fill the bone cavity.



**Fig. 34.** Alternatively, the author uses HEALx Soother Plus® cream, as shown in another rabbit.

## Follow-up Healing After Surgery



**Fig 35.** The owner must be prepared for the temporary unattractive cosmetic appearance resulting from marsupialization, but this is generally well accepted.



**Fig 36.** Radiograph taken after abscess debridement and extraction of the 1st mandibular cheek tooth (compare to Fig 18).



**Fig 37.** Postoperative care includes frequent flushing with saline and dilute povidone iodine, application of antibiotic and healing-promoting ointments and administration of antibiotics and analgesics. Pet rabbits can be adequately restrained, and local therapy can be performed without sedation.





**Fig 38.** At the follow-up exam after 3 weeks, the bone cavity has been filled with new connective tissue, and the overlying skin is almost completely healed.



**CASE 2**

**Fig 39.** Shown is another clinical case shortly after surgery and marsupialization.



**Fig 40.** At follow-up 18 days after surgery, sutures at the marsupialization site have been removed, and the cavity is significantly smaller.

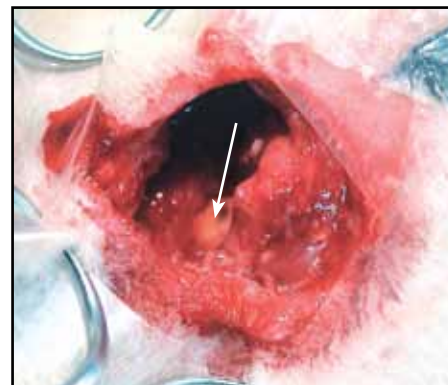


**Fig 41.** Follow-up after 26 days shows complete resolution of the abscessation.



**CASE 3**

**Fig 42.** Surgical treatment of periapical infections and abscesses of maxillary cheek teeth is similar to that of mandibular cheek teeth. 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 maxillary cheek teeth (especially the four most caudal). This zygomatic abscess has been opened.



**Fig 43.** The abscess capsule and enclosed purulent material have been removed. The apex of the infected tooth is shown after debridement of bone tissue (arrow). The tooth fragment will undergo extraction.



**Fig 44.** At follow-up 10 days after surgery, the surgical site was healing.

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