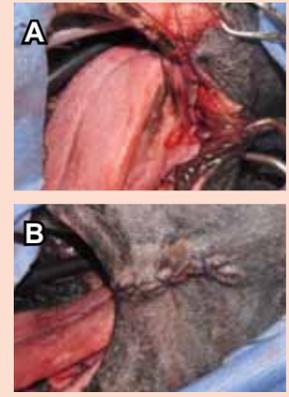


**SMALL MOUTHS, BIG HOLES:**  
What To Do When There Is Still Tumor Present?

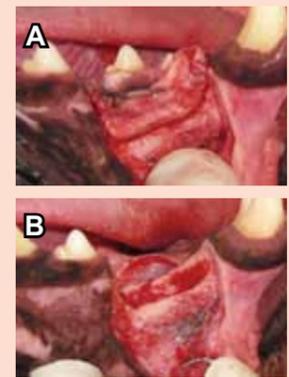
It is not unusual to remove a relatively small tumor only to find that the pathology report indicates that the tumor was not completely excised. *As a general practitioner, how do you advise your client?* Well, the tumor will continue to grow and at this time it is as small as it is ever going to be. Although no owner is happy to hear that a second surgery is recommended, *watching and waiting* only makes future surgery more extensive and difficult....especially in the mouth where “extra” tissue for wound closure is at



**Fig. 2** Wound closure includes mucosal apposition (A) and cheiloplasty to restore lip function (B).

a premium. Additionally, the patient’s anesthesia status is only going to regress over time. Therefore, it really is an easy recommendation to have the owner consider a definitive, final surgery to alleviate the problem.

Malignant melanoma is the most common oral tumor diagnosed in dogs, with squamous cell carcinoma most common in cats. Malignant melanoma is the most common tumor we see that was incompletely excised previously (Fig. 1 and 2). The next most



**Fig. 4** An en bloc resection of the adjacent teeth and associated bone (A) was required to completely remove the tumor (B).

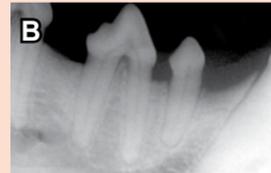
common incompletely excised tumor we encounter on a referral basis is epulis, especially acanthomatous epulis (acanthomatous ameloblastoma). *Complete removal of epulids require the removal of teeth and associated bone since these tumors emanate from cells of the periodontal ligament.* For incomplete excision of ossifying and fibrous epulids, relatively small, “mini” mandibulectomies or maxillectomies would be sufficient, involving probably 2-3 teeth (Fig. 3-5). Incompletely excised malignant tumors, and tumors that behave aggressively such as acanthomatous ameloblastoma require a minimum 1-cm tumor free margin. *Again, removing these “remaining” tumors quickly allows more conservative surgery that maximizes a successful outcome while preserving normal function.*



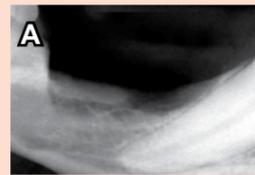
**Fig. 5** The ventral mandible and the canine tooth were unaffected (A) and the wound was closed primarily (B).



**Fig. 1** Scar tissue following incomplete excision of a gingival malignant melanoma (A). A marginal mandibulectomy was performed with minimum 1-cm margins (B). The completed mandibulectomy maintained the ventral cortex to provide mandibular stability (C).



**Fig. 3** This scar (arrow) is where a fibrous epulis had been incompletely removed (A). There were no bony changes (B).



**Fig. 5** The ventral mandible and the canine tooth were unaffected (A) and the wound was closed primarily (B).

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Dr. Mark M. Smith and Dr. Kendall Taney are partners in the Center for Veterinary Dentistry and Oral Surgery established in 2006. Dr. Smith is a Diplomate of the American College of Veterinary Surgeons and the American Veterinary Dental College. He was Professor of Surgery and Dentistry at the VA-MD Regional College of Veterinary Medicine at Virginia Tech for 16-years before entering private practice in 2004. Dr. Smith is Editor of the Journal of Veterinary Dentistry and co-author of Atlas of Approaches for General Surgery of the Dog and Cat.



Dr. Taney is a Diplomate of the American Veterinary Dental College and a Fellow of the Academy of Veterinary Dentistry. She has practiced dentistry and oral surgery at the Center since 2006. She is a 2002 graduate of the VA-MD Regional College of Veterinary Medicine. She completed her residency at the Center and has also performed internships in both general medicine and surgery, and specialized surgery.



Dr. Emily Edstrom is a 2010 graduate of the Colorado State University School of Veterinary Medicine. She completed a rotating internship in small animal medicine and surgery at VCA Veterinary Referral Associates in Gaithersburg, MD. She is a member of the American Veterinary Dental Society.



**BEYOND THE MOUTH:  
Laryngeal Masses...The Cork In The Airway!**

The larynx comprises only 3% of the surface area of the upper and lower airways. However, when compromised by laryngeal disease, it can have devastating effects on pet function. Diseases such as laryngeal paralysis, laryngeal collapse, everted laryngeal sacculles, and laryngeal mass all compromise the already limited airway at the larynx...the cork in the airway. Clinical signs related to airway obstruction include stridor, change in bark, exercise intolerance, fatigue, and hyperthermia from decreased heat exchange during panting. This latter clinical sign is a particularly life threatening consequence of laryngeal

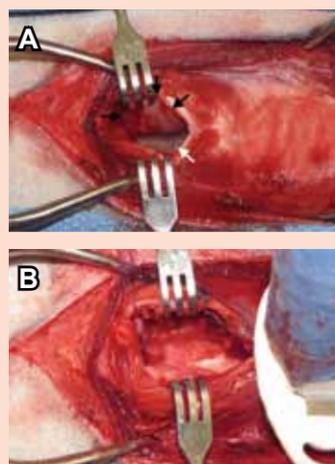


**Fig. 1** Image of the laryngeal rhabdomyosarcoma compromising the airway (black arrows). Note the remaining functional airway (white arrow).

disease and is most commonly noted in summer months. The good news is that these clinical signs usually have a slow, insidious onset. Unfortunately, owners may not notice these changes or may consider them secondary to their pets advancing age.

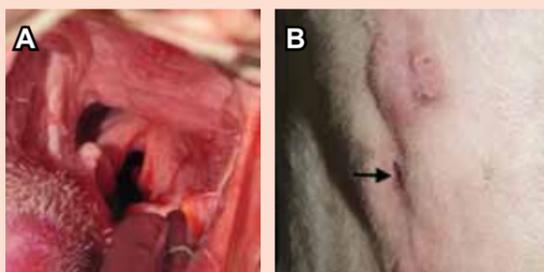
Laryngeal tumors are rare (Fig 1). The clinical signs are similar to those described previously. Treatment options include *per os* resection with long-handled instruments. This technique is reserved for small lesions emanating from the laryngeal cartilages performed similar to a vocal chordectomy procedure. Other techniques include exploratory ventral laryngotomy with resection of the tumor or partial laryngectomy. More aggressive surgeries such as sub-total or complete laryngectomy require the additional procedure of permanent tracheostomy for upper airway by-pass.

The case presented here had a slow onset of clinical signs with a *per os* biopsy indicating a benign neoplasm. The surgical plan included exploratory ventral laryngotomy and temporary tube tracheostomy to provide airway by-pass for the administration of general anesthesia through the cuffed tracheostomy tube (Fig. 2). These procedures allowed for a clear



**Fig. 2** Ventral laryngotomy shows the laryngeal rhabdomyosarcoma compromising the airway (black arrows) and the endotracheal tube (white arrow) [A]. The tumor was resected and the remaining vocal process lateralized. The cuffed tracheostomy tube allowed anesthetic delivery and an unobstructed surgical field (B).

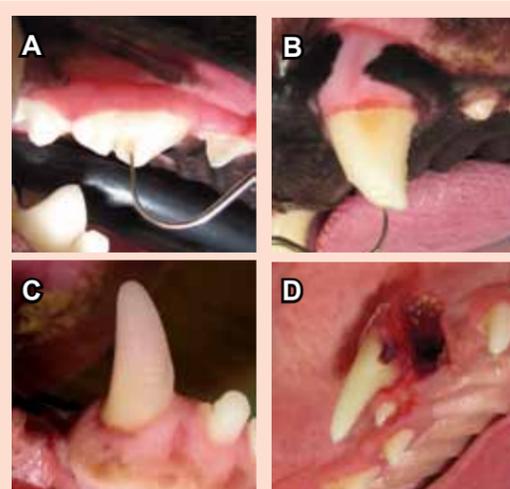
view of the lesion and an unobstructed surgical field. Unfortunately, the tumor was diagnosed as a rhabdomyosarcoma. The surgery provided an unobstructed glottis and the tracheostomy site healed uneventfully (Fig. 3). The success of this surgery was based on a plan that allowed for flexibility in approaching the larynx, including the possibility of permanent tracheostomy if required. Upper airway surgery is just another example of how your expectations may be exceeded by choosing the Center to help manage your patients' needs!



**Fig. 3** Postoperative view of the larynx showing a restored airway (A). Second intention wound healing of the tracheostomy site (arrow) was nearly complete 2-weeks following surgery (B).

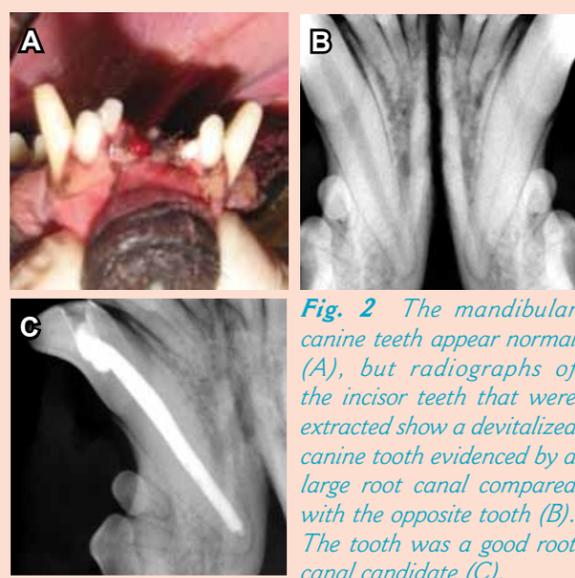
**ENDODONTICS:  
Teeth We Can Save!**

We have come a long way in veterinary medicine and what we can offer our patients. Veterinary dentistry as a specialty is relatively "new", and the ability to save teeth is especially exciting in our humble opinion! Many owners are happily surprised to learn from their veterinarian that not all teeth have to be extracted when there is a problem. So when is a root canal indicated? Fracture is the most common scenario where teeth are treated by root canal followed by non-vital teeth. A non-vital tooth may be suspected when the crown is discolored-pink, purple, or gray. Sometimes we see teeth that have been avulsed or luxated (Fig. 1). These teeth will need root canal therapy after they are replaced and stabilized. Dental radiographs are always indicated to determine if a traumatized tooth is a candidate for endodontic therapy, and are also a way to determine if a normal appearing tooth needs a root canal. For example, a routine radiograph of the rostral mandible to assess incisor teeth showed that the mandibular canine root canals were incongruent, indicating that one tooth had stopped producing dentin. There was no gross evidence that the



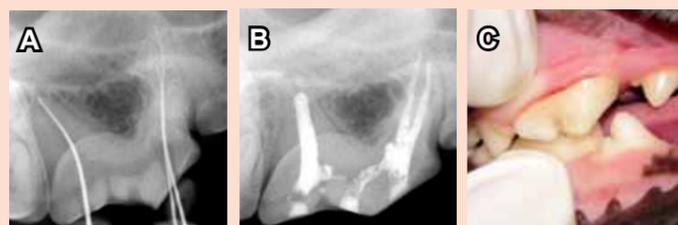
**Fig. 1** Indications for root canal include fractured (A and B), discolored (C), and luxated (D) teeth.

tooth was non-vital, however, the radiographs told a different story. The owner was happy to know that we could save her dog's tooth with a root canal (Fig. 2). Root canals in animals are performed exactly as they are in humans. Therefore, many owners are aware of the process and expense involved in performing this procedure! Files are used to clean and debride the canals and the canals are filled with an inert material. Finally the fracture site and access points are restored (Fig. 3). It is recommended that dental radiographs be taken of the tooth at each yearly cleaning to assess for any problems such as infection. We have very stringent guidelines for recommending root canal resulting in an approximate 95% success rate.



**Fig. 2** The mandibular canine teeth appear normal (A), but radiographs of the incisor teeth that were extracted show a devitalized canine tooth evidenced by a large root canal compared with the opposite tooth (B). The tooth was a good root canal candidate (C).

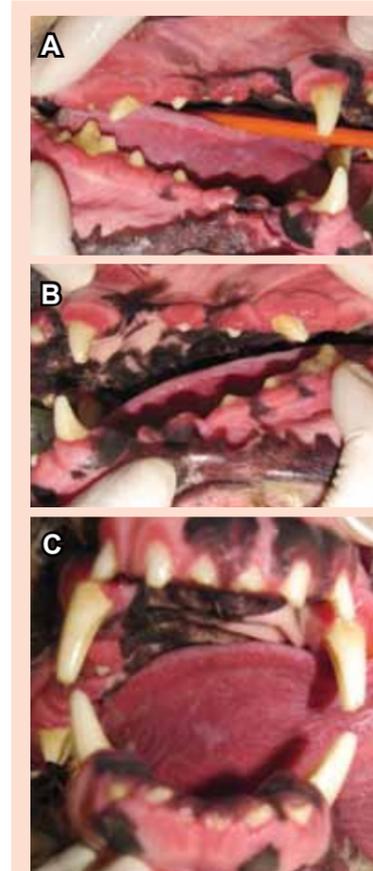
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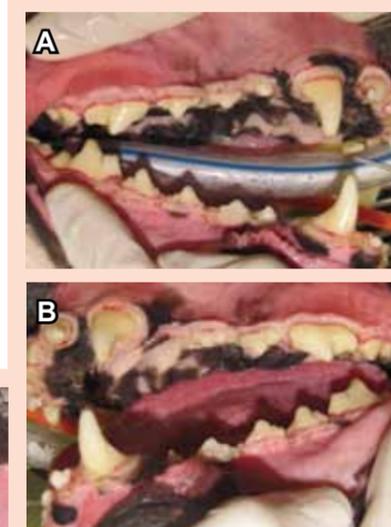
**Fig. 3** The technique for root canal includes cleansing and filing of the canal (A), filling the canals with an inert material (B), and composite restorations to restore the crown surface (C).

**PERIODONTAL DISEASE:  
Too Much Of A Good Thing!**

Gingival enlargement, or gingival hyperplasia as it is often called, is a common finding especially in large brachycephalic breeds (Boxers) or brachycephalic-cross breeds. However, in many of the patients we examine, it is an incidental finding. Gingival enlargement should not be ignored as it can expedite the progression of periodontal disease by disrupting the normal periodontal structure of the tooth. The supporting structure of the tooth, or periodontium, includes the gingiva, epithelial attachment, alveolar bone, periodontal ligament, and cementum. In a normal, healthy mouth, the normal sulcal depth, or free gingival margin, should not exceed 0.5-3mm, depending on the breed and size of the patient. Exuberant gingival growth can cause an increased sulcal depth, creating a pseudopocket where bacteria, plaque, and debris are prone to accumulate. Once the pseudopocket is present, no amount of brushing or home-care by an owner will prevent this build-up of periodontal pathogens and debris, thus creating the perfect environment for inflammation, and eventually periodontal disease to flourish. What can be done? Fortunately, gingival enlargement can be corrected by performing gingivectomy of the excessive gingival tissue. Radiographs should also be performed to assess the health of teeth and bone and to rule out progressive periodontal disease. Our treatment modality of choice for routine gingivectomy is radiosurgery that results in a clean, controlled incision while cauterizing small vessels. Postoperative care includes NSAIDs and narcotics for pain control, as well as a soft diet for 2-weeks while the gingiva becomes re-epithelialized. The critical component of prevention is at-home oral hygiene including tooth brushing that should commence 2-3 weeks following the procedure. Professional teeth cleaning should be performed at least annually, and perhaps semiannually. Gingivectomy is mandatory for treatment and relatively frequent professional cleanings (minimum once/year) are required for control and prevention of gingival enlargement.



**Fig. 1** Right (A), left (B), and rostral (C) preoperative views of gingival enlargement in a Boxer dog. Note how the premolar teeth are covered or nearly completely covered by gingival tissue!



**Fig. 2** Right (A), left (B), and rostral postoperative views following radiosurgical gingivectomy. The light pink, or "blanched," appearance of the gingiva returns to a normal pink color shortly following this procedure.