

CASE OF THE MONTH (July 2011)

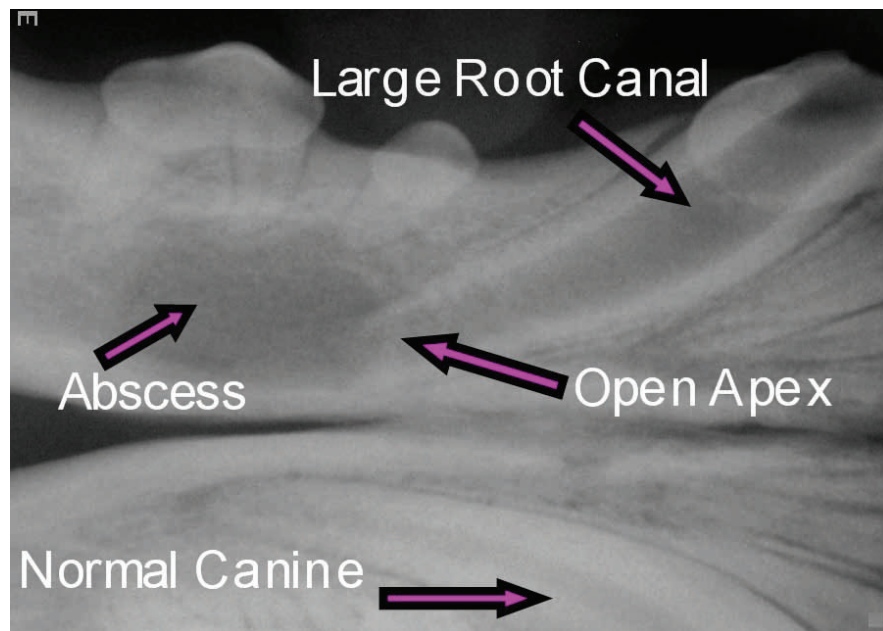
Signalment and History: A two year old neutered male Australian Shepherd was referred for a fractured right mandibular canine tooth with likely pulp exposure. Although the fracture occurred recently while the patient was chewing on a bone, this tooth had been discolored for several months. The patient was less than cooperative during the awake exam, but a pulp exposure was strongly suspected.

Procedures: The patient was placed under general anesthesia for a complete oral examination and intraoral radiographs. This examination confirmed a pulp exposure of the right mandibular canine tooth (404).



The dentinal walls were thin, the root canal was large in diameter, and an accumulation of hair and other debris could be seen within the exposed canal.

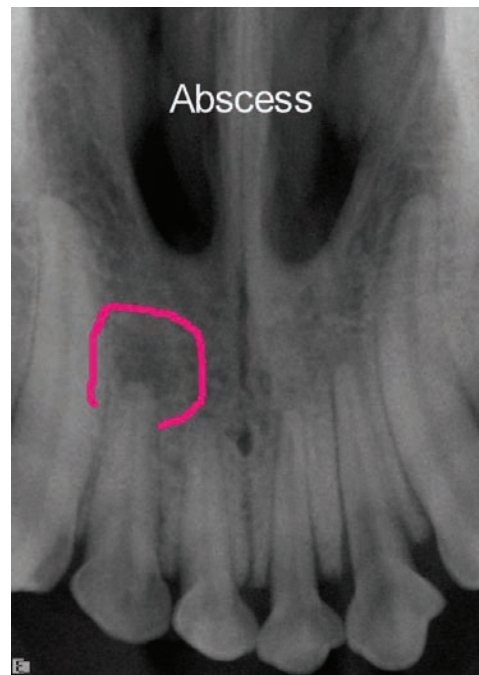
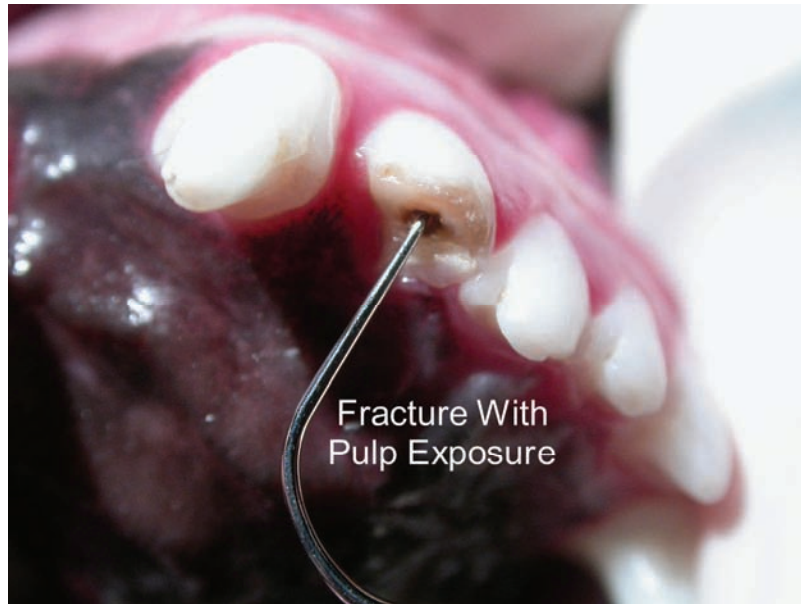
Intraoral radiographs confirmed that the root canal was unusually large for the age of the patient, the dentinal walls were thin, and the apex of the tooth was wide open. A large periapical lucency extended distally beneath the first and second premolars. The normal left canine could be seen on the same radiograph, demonstrating much thicker dentinal walls, a smaller root canal, and a closed apex.



The fractured canine tooth was surgically extracted and the flap was closed with 4-0 Monocryl in a simple interrupted pattern.



During the examination we also discovered a fractured right maxillary second incisor (102) with pulp exposure. An intraoral radiograph revealed a periapical lucency and apical resorption associated with this tooth.



This incisor was also extracted and the extraction site was closed with 4-0 Monocryl.



Discussion: This patient had originally been referred for root canal therapy of the fractured canine tooth, and the owner was amenable to this plan. After examination of the patient under anesthesia, however, it became apparent that this tooth was not a candidate for conventional root canal therapy.

In order to perform a successful root canal procedure, the apex must be closed. Part of the procedure consists of packing the canal full of gutta percha, an inert rubber-like material. The apex must be intact to prevent the gutta percha from migrating out the apex into the periapical tissues. Similarly, we must be able to seal the apex to prevent leakage of any bacteria that may remain in the canal.

The fact that this tooth had been discolored for several months before presentation indicates that it was suffering from longstanding pulp necrosis. When the pulp died, the normal tooth development, including thickening of the dentinal walls, came to a halt. In fact pulp necrosis occurred before the apex had a chance to close. Apical closure of a canine tooth usually occurs between 7 and 12 months of age, so it is evident that this tooth had been non-vital for many months.

Pulp necrosis leads to production of inflammatory mediators which migrate out the apex (even when closed), promoting periapical inflammation and destruction. Cessation of dentinal development left this tooth with very thin walls, leading to a tooth that was easily fractured, exposing the necrotic pulp tissue to direct bacterial invasion. The bacteria rapidly migrated out the open apex, creating pervasive infection of the periapical tissues, and accelerating its demise.

COMMUNITY ANIMAL HOSPITAL

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