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## **E N D O D O N T I C S :   D i r e c t   P u l p   C a p p i n g**

### **INTRODUCTION:**

Endodontics involves the treatment of the pulp of the teeth. Generally this involves removing diseased pulp tissue to remove pain and infection and allow the patient to retain the use of the affected tooth.

To better understand what follows, a brief anatomy lesson is in order. The portion of the tooth that is normally visible above the gum-line is called the *crown* and the portion below the gum-line is called the *root* . As we move closer to the tip of the crown, we say we are moving *coronally* and as we move closer to the tip of the root we are moving *apically* . The crown is covered with a thin coating of non-living, non-porous *enamel* which is the hardest substance in the body. Underneath the enamel of the crown is a living tissue called *dentin* . Dentin makes up the bulk of the tooth and is also the material the root is made of. In the center of the dentin is a hollow chamber known as the *endodontic canal* or *pulp chamber* ; this is where the tooth's nerves and blood vessels are located.

### **DEVELOPMENT:**

As a tooth erupts (develops) it starts out with a very large endodontic canal (also known as a pulp chamber), a thin dentinal wall in the crown and root and a fully developed enamel crown. This newly erupted tooth is relatively weak and easily broken. As the tooth ages and continues to develop, the dentinal wall grows inward and so becomes thicker as the pulp chamber becomes narrower. This thickening of the dentinal wall greatly strengthens the tooth. Depending on the species and breed, the teeth have obtained the majority of their final strength by three years of age.

### **INDICATIONS:**

One indication for direct pulp capping is an acute injury to the tooth in which living pulp has been exposed to the outside world. Once exposed to the bacteria in the mouth, the pulp quickly becomes infected and inflamed. This initial inflammation is painful as many readers will know from personal experience. As time goes on, the pulp starts to die, relieving pain in the short term, but allowing infection to advance

apically, eventually causing a chronically painful peri-apical abscess. These abscesses, as well as causing discomfort, act as a constant source of bacterial infection to the rest of the body, often leading to premature kidney failure or heart valve failure.

**Abscessed teeth are a constant source of pain and infection.**

When the injury to the tooth is fresh; before disease has a chance to get well established, it is possible to remove only the contaminated pulp in the coronal portion of the canal and reseal the tooth with various layers of filling materials. The advantage to this procedure, especially in a young animal with immature teeth, is that it leaves the pulp intact within the root of the tooth so that the dentin can continue to grow inwardly and strengthen the tooth.

### **ADVANTAGES:**

Compared to extraction of the affected tooth, which is the only alternative, endodontics offers many advantages. It is less traumatic to remove pulp than the whole tooth, often takes less time to do properly and so is safer for the patient. Endodontics avoids the potential complications of extraction such as oronasal fistulae, dry socket, tongue protrusion, jaw fracture and hemorrhage. As well, with endodontics, the patient retains the use of the tooth.

### **LIMITATIONS:**

Published recommendations suggest that, for pulp capping to be successful, the pulp should have been exposed for less than forty-eight hours although there are reports of success in cases where the injury was older. The longer the pulp is exposed to oral bacteria, the poorer the prognosis. After the window of opportunity has closed, the chances are much higher that the tooth will go on to develop an abscess unless complete removal of the pulp and sealing of the canal is carried out.

The portion of the crown that has the pulp removed will no longer be alive. It is prone to discolouration and will not continue to grow in strength. The latter means that the tooth is more prone to further fractures if the patient continues with the habits that led to the initial injury. To prevent further damage to the tooth, it can be protected with a metal prosthetic crown.

As with all surgical procedures, there is some risk of postoperative complications. Therefore, the treated tooth should be radiographed after six to twelve months and the patient monitored for signs of dental pain. These signs would include refusal to eat hard food or play with chew toys. Should a problem be detected down the road, a full root canal procedure would be indicated.

Bear in mind, also, that the treated tooth will have a filling in it. The owner is instructed to look at the tooth weekly to ensure that the filling is in place and to report it if it becomes dislodged.