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ENDODONTICS: Indirect Pulp Capping

INTRODUCTION:

Endodontics involves the treatment of the pulp of the teeth. Often this involves removing diseased pulp tissue to remove pain and infection and allow the patient to retain the use of the affected tooth. Sometimes we can prevent problems with early treatment.

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:

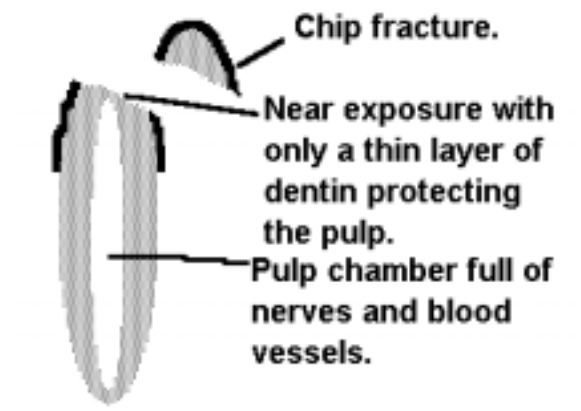
The main indication for indirect pulp capping is an acute injury to the tooth in which a portion of the crown is fractured off, leaving only a thin layer of dentin covering the pulp underneath. As the dentin is porous, bacteria may penetrate to the pulp and cause a pulp infection. Also, with only a thin layer of dentin to protect it, the pulp will be irritated by heat, cold and touch, causing pain.

Untreated, a near-exposure will lead to pulp death and 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, potentially leading to premature kidney failure or heart valve failure and other diseases.

When the injury to the tooth is fresh; before disease has a chance to get well established, it is possible to cover the nearly exposed dentin with medications and restoratives. This protects it from bacterial invasion and environmental irritations, thus relieving pain and preventing pulp death.

ADVANTAGES:

The advantages of indirect pulp capping are many. It is a relatively painless procedure with very little risk of complication. It gives rapid relief from the pain associated with nearly exposed pulp. It protects the pulp from irritation and so prevents more serious endodontic disease. Finally, though it often requires great attention to detail in the finishing, it is the least challenging endodontic procedure to perform.



LIMITATIONS:

If the pulp is visible beneath the fracture area and is seen to be brown or gray, it is too late for indirect pulp capping. In this situation, the pulp is dead and a full endodontic procedure is indicated.

Early diagnosis and treatment greatly improve the chance of success.

If the pulp appears pink, then the tooth may be a candidate for indirect pulp capping. However, there is no way to know for certain whether the pulp has already become irreversibly irritated by the time treatment is sought. If it has, it will go on to die and a full endodontic procedure will be indicated. 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 endodontic procedure would be indicated.

No restorative material, short of a metal crown, is more fracture resistant than natural tooth. If the pet continues with the behavior that led to the initial injury, a conservative restoration will likely be damaged in time. Owners are instructed to check the tooth at least weekly to inspect the restoration and seek veterinary attention should damage be detected.