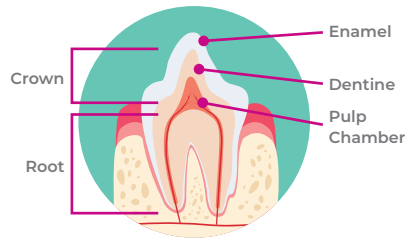


TOOTH INJURY

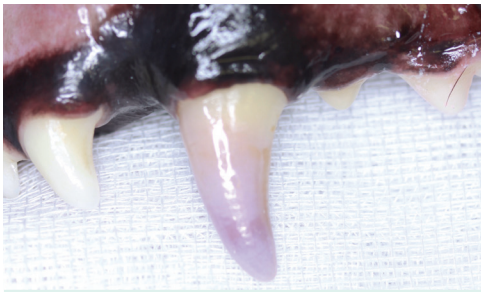
TOOTH INJURIES ARE OFTEN SEEN IN DOGS AND CATS. KNOWLEDGE OF THE STRUCTURE OF TEETH IS REQUIRED TO UNDERSTAND THE EFFECT PROPERLY, SO THE BEST COURSE OF TREATMENT CAN BE GIVEN.



Teeth are comprised of three separate layers – **enamel, dentine and pulp** – with the crown of the tooth above the gum and the root below the gum. The root of the tooth is significantly longer than the crown, often twice as long in adult teeth; this is even more marked in baby teeth.

Enamel

Enamel is the hardest substance produced by the body and forms a thin covering and the outermost layer of the crown of the tooth, forming an impervious (protective) barrier.



Left maxillary canine tooth with pink discoloration indicative of blunt trauma and bleeding inside the tooth.

Dentine

The layer immediately below the enamel is the dentine. Dentine is similar, in hardness and composition, to bone and has small tubules running through it, making it porous. These tubules connect to the pulp chamber, the hollow centre of the tooth, which is filled with nerves, blood vessels and the cells that deposit dentine onto the inner surface of the pulp chamber.

Dentine is secreted continuously through life at a low rate but can speed up in response to injury or may stop if the tooth dies. The development of dentine is used as a marker for the vitality of a tooth. Injuries to the different layers of the tooth have different consequences for the tooth as does the speed and type of injury.



Upper 4th premolar tooth with fracture exposing the pulp with plant material trapped in fracture.

Wearing away of the tooth

Slow and progressive injury (in other words, tooth wearing) is commonly seen in dogs that chew tennis balls. The enamel and dentine is worn away, although more dentine will be deposited on the inside of the pulp chamber. As long as the speed of wear does not exceed the speed the tooth can deposit new dentine, the pulp will not be exposed and the tooth will remain vital, even if the crown is almost completely worn away.

If the pulp is exposed, either by a sudden traumatic fracture or rapid wearing of the tooth, the bacteria of the oral cavity will rapidly infect and overwhelm the natural defences, killing the pulp.

Bacterial infection

During the death of the pulp there will be considerable pain, and this may continue for more than a month after pulp exposure. Once bacteria have infected the hollow pulp chamber, they will leak out from the tip of the root and result in the development of inflammation and eventually abscess formation in the bone of the jaw.

All teeth that have exposure of the pulp must be treated, either by extraction of the tooth or by root canal treatment. Fracture of the enamel and dentine without exposure of the pulp may not result in death of the pulp, but this cannot be known from a simple examination of the tooth.

Bacteria can enter the pulp chamber via the dentine tubules. This is more likely if the fracture exposes a large amount of dentine, if the dentine that remains is thin, or in younger dogs where the tubules are wider. Dental X-rays are required to assess teeth which have large fractures to the enamel and dentine.



Fractured lower canine tooth with pulp exposure

Increase in pressure

The dentine and enamel surrounding the pulp is solid and can't expand. Following trauma, the pulp may bleed and become inflamed. As the soft tissues are enclosed they cannot swell and there will be an increase in pressure inside the tooth, which may stop blood flow into it. This can result in the death of the pulp even when the tooth is not fractured.

Discolouration of the tooth is a common result of bleeding associated with concussion, and teeth that are completely discoloured have a 92% likelihood of being dead. Dead teeth have a high potential for the development of infection, inflammation or cysts, and that's when treatment by extraction or root canal management needs to happen.



Freshly fractured upper canine tooth with pulp containing highly sensitive nerve exposed



Lower canine tooth with abrasive wear to tip of tooth resulting in pulp exposure and subsequent death of the tooth

A common occurrence

Fracture of baby teeth, especially the canine teeth, is common in dogs, and they are similarly painful to fractures of adult teeth. However, they have the added complication that injury to the developing adult tooth underneath the baby tooth may also take place. At this point, extraction of fractured baby teeth will usually be the next step.

Next steps

You've been given this information sheet because your vet is concerned your pet has injured a tooth. It's common for pets to exhibit minimal, subtle or no clinical signs of tooth injury but they still could have significant pain and pathology present.

Detailed evaluation combined with X-rays are important to ensure your pet is not suffering in silence. Treatment options include extraction, root canal and repair of the tooth with a restoration or a crown.