

• Your Dog



The newsletter for caring dog owners

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The high cost of obese pets

One insurer last year paid \$14 million in claims related to obesity. Cheerier news from the company: Max remains the most popular dogs' name.

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A journey down the path to self-control

Help your dog learn to control himself rather than relying on you as the sergeant at arms. Begin by teaching him the "Watch me!" cue.

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Medical conditions that can trigger hair loss

Among them are hypothyroidism, Cushing's syndrome and estrogen imbalance. Regrowth will occur after treating the cause in many cases.

MEDICINE: 6

Tips and tricks to give medicine successfully

Wrap a pill in food, have flavor added in compounding or try a commercial pill injector. Most of all, keep the experience positive.

HEALTH: 7

Winter threatens their safety and well-being

Provide protective gear for breeds with thin coats and little body fat. Limit puppies' time outdoors, and give old-timers a heated or orthopedic bed.

TIMELESS TIPS: 8

'I like the fast results of surgery'

new! In the debut of a new occasional series, we showcase the work of *Your Dog* editorial board members and other faculty at Cummings School.

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How can they better manage hypoglycemia?

A mixed breed's family controls his low blood sugar with frequent meals but wants more information. A diet low in simple sugars will help.

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Not all dogs thrive in cold weather. 8

CUTTING EDGE

By Tucker J. Coombe

Root canals can save broken teeth

Untreated, they may cause painful and potentially dangerous infections

■ Betsy, a 6-year-old border collie, was obsessive about carrying objects in her mouth. Her former owner satisfied this compulsion by giving her a steady supply of tennis balls and, for reasons unknown, kept her on a diet of softened rice, mushy kibble and chicken broth. When she changed

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Any one of these six signs can indicate a broken tooth

Because your dog has no way to describe the pain of a broken tooth, Bonnie Shope, VMD, at Cummings School suggests watching for these signs:

- Reluctance to chew or chewing on only one side of the mouth.
- Excessive tartar build-up on one side of the mouth.
- Inability to chew on toys or items your pet used to chew regularly.
- Facial swelling, which can indicate that a tooth infection has drained into surrounding tissue, creating an abscess.
- A red, ulcerated spot on the gum, which may leak pus when touched. Like the swelling, this spot indicates infection has drained through the root of the tooth.
- “Chattering” of the jaw. When a mouth is painful, it may be difficult for a dog to close his jaws easily. The teeth will chatter as a reflex to pain.



A root canal reveals a break deep inside the tooth — a sign it's infected.

homes, Betsy's new owner noticed the teeth in the front of her mouth were worn down almost to the gum line — tennis balls are surprisingly abrasive.

Betsy also seemed to become winded fairly easily, the new owner remembers, and her breath was almost bad enough to drive a person from the room. The family veterinarian, noting a broken tooth among a multitude of

dental problems, referred Betsy to Bonnie Shope, VMD, clinical assistant professor of dentistry at Cummings School of Veterinary Medicine at Tufts University.

Dr. Shope sedated Betsy and took a set of full-mouth dental X-rays to get a better perspective of her problem. Numerous teeth in the front of her mouth, it turned out, were badly broken and

chronically infected. Dr. Shope extracted almost all of those teeth, but saved the canines — the large, prominent teeth critical for grasping, puncturing and holding — by performing root canals.

Imagine a cracked tooth in your own mouth — the searing sensation of an exposed nerve, the inability to chew food. A fractured tooth takes its toll on a dog as well, generating pain and developing into a potentially dangerous infection. Whether you choose extraction or root canal, it's essential to treat your dog's fractured teeth.

Often owners don't notice their dog has a problem until infection has spread into the bone around the tooth. At this point, a dog will commonly have facial swelling or an abscess that's broken through the skin. “By this time, the infection's been going on for months, even years,” Dr. Shope says.

Acting depressed

“Sometimes an owner gets used to his dog acting quiet, depressed or lethargic and doesn't know it's because of chronic pain,” she says. “It's only in hindsight after we fix the tooth that he realizes that, yes, it was a problem. Owners come back afterward and say, ‘My dog is so much more playful now. He's so much happier. He acts much younger!’”

Other times, however, owners will know their dog has a damaged tooth almost immediately. “They'll notice their dog salivating or pawing at his face,” Dr. Shope says. “Maybe they'll see some blood on the lip, or they'll find a piece of tooth somewhere. Or they may look in the mouth and see a bit of exposed pulp, which is pink.”

Here's how a broken tooth can lead to such trouble. When a tooth is fractured or severely injured, the pulp — the soft, innermost layer with blood vessels, nerves and tissue that nourish the tooth — becomes inflamed and

painful. Eventually, the nerves shrivel, the blood supply dries up, and the pulp dies. The outer shell of the tooth, comprised of dentin and enamel, may still appear intact and healthy, but the tooth itself is no longer vital.

The dead pulp attracts bacteria, setting up an infection that drains into the root of the tooth and from there into the surrounding bone, causing another bout of pain for the dog. It's suspected, although unproven, that the infection can travel through the bloodstream to organs such as the heart, kidney and liver.

Dr. Shope offers this advice to owners hoping to prevent a broken tooth: If an object is too hard to compress with your fingernail, it's too hard to give to your dog. The five culprits that most often fracture teeth are:

- Raw or cooked bones
- Hard, nylon chew toys
- Rocks
- Ice cubes
- Animal hooves

Aggressive or habitual chewers, like Betsy, aren't the only ones who wind up with broken teeth, Dr. Shope says. Dogs with separation anxiety or thunderstorm phobia can be equally at risk if they bite on metal crate doors or a chain link fence when under stress.

"Discolored teeth are also candidates for root canals or extraction," she says. In 92 percent of cases, a discolored tooth — usually appearing pink, purple, gray, brown or any combination of these colors — is a dead tooth. "A normal tooth is ivory-colored. But if the pulp of a tooth becomes traumatized — say, a dog is hit by a car or kicked by a horse or a puppy receives a shock from chewing on an electrical cord — the blood vessels in the pulp will bleed, staining the tooth from the inside out, much like a bruise."

Brushing your dog's teeth will not prevent a fracture or injury to the pulp. "However, people who brush



After root canal therapy, a metal crown covers a fractured carnassial tooth — one of the large teeth near the back of the mouth — on the left and a lower canine tooth on the right.

their dogs' teeth are more familiar with their dogs' mouths and are more likely to notice a broken or discolored tooth," Dr. Shope says.

Considering extraction

In evaluating whether a damaged tooth should be extracted or saved through a root canal, you and your veterinarian need to consider several factors. Veterinarians perform most root canals on either canine teeth or carnassials — the large chewing teeth near the back of the mouth. Imagine life for a dog without his canines: How would a hunting dog pick up a bird or a police dog apprehend a fleeing criminal? How would a family pet catch a Frisbee? Without his carnassials, how would a dog grind up his food before swallowing it?

For certain teeth, the complexities of an extraction are so daunting that a root canal is a better choice. The lower canine, for example, has roots that are twice as long as the crown — the visible part of the tooth. Extracting this tooth requires major surgery and can lead to weakening of the lower jaw because it involves so much bone removal.

Of course, extraction is preferable in some cases. Generally, dogs are un-

der anesthesia longer for a root canal than for an extraction, Dr. Shope says, and they will need to be sedated again for follow-up examinations in the months after the procedure. If she's concerned about a dog being under anesthesia because of advanced age or

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Dogs have 20 upper teeth and 22 bottom.

CUTTING EDGE

Continued.

a systemic disease, Dr. Shope usually recommends extraction. She also considers the amount of crown left on a fractured tooth: "If a tooth is broken down to the gum line, it makes more sense to extract it."

Inevitably, price is a consideration. The cost of each procedure reflects different variables, says Dr. Colin Harvey, executive secretary of the American Veterinary Dental College. They include the dog's age — the canal within a dog's tooth narrows with age — the tooth's shape and size, anesthesia requirements of a particular animal and the decision to build a custom crown. "Keeping these variables in mind, a root canal can range from less than \$1,000 to significantly more than \$2,000," says Dr. Harvey, BVSc, Fellow of the Royal College of Veterinary Surgeons.

Rare complications

Complications for both procedures are relatively rare. The most common after an extraction is that the incision may come open after being sutured, says Dr. Shope. "And in a tooth that has had a root canal, the filling, or restoration, can fall out. That's bad because bacteria can get in. Another complication during a root canal is inadvertent damage to either the tooth root or surrounding tissue with the files." Finally, she says, if infection is found in or around the tooth after a root canal, the procedure is deemed unsuccessful, and the infection must be treated. Failed root canals occur in only five to 15 percent of cases, however, Dr. Shope says. "The more experienced the person doing the procedure, the less likely you'll see complications."

The threat of recurring infection is only one reason Dr. Shope considers follow-up visits essential. "Four to six weeks after a root canal, I like to do an oral exam on the dog while he's awake

Procedure: Remove diseased pulp in the canal, irrigate, scrape and seal it. Time elapsed: 90 minutes to 3 hours

A root canal can save a tooth that is, for all intents and purposes, already dead. Here's how: At the most basic level, the procedure involves removing diseased pulp from the canal of the tooth, then filling the canal with an inert material to prevent re-infection. Each root of a tooth contains a canal. These canals merge together, creating a chamber within the crown of the tooth above the gum line.

Bonnie Shope, VMD, at Cummings School accesses the canal through the crown — either by creating a small hole with a high-speed dental drill or by maneuvering instruments through the original fracture site.

Using a variety of files, she removes the diseased pulp and debris, scrapes the inner walls of the canal until they're free of infection and shapes the interior of the canal to be refilled. As she cleans and scrapes, she continually irrigates the canal with a diluted bleach solution.

It's quite difficult, of course, to peer into a canal in the root of a tooth. Dr. Shope wears what is called a surgical loupe, which provides magnification. "As I clean, I'm feeling the canal with my instruments," she says. "I also use dental X-rays to give me an image of the canal and see where my instruments are within that canal." Once she's thoroughly cleaned the canal, she dries it, lines it with a cement sealer and packs it with a rubber-based material.

Finally, to restore the crown, Dr. Shope uses tooth-colored material to fill in the original fracture and smooth and seal any hole she has created. Up to this point, the procedure has taken from one-and-a-half to three hours. For some patients, Dr. Shope will add a custom-made, metal crown to bolster the strength of the tooth.

To learn more: Visit the American Veterinary Dental College's Web site at www.avdc.org. It includes a list of specialists organized by state.



By the time an abscess breaks through the skin, as it has in this sedated dog's cheek, the tooth has been infected for some time.

to look for any tenderness or swelling and to make sure the restoration is intact. Then I like to see the dog back in 6 months, 12 months and 24 months. At those visits I re-examine the restoration and take an X-ray of the tooth with the dog under anesthesia to determine there's no remaining infection."

Today, Betsy the border collie relies on her canine teeth to pick up dry kibble. She rolls them toward the back of her mouth to chew. With no

other teeth in the front of her mouth, she uses the canines to grab and hold on to socks, stuffed animals and the occasional stick. Betsy is energetic and healthy, and her horrid breath is gone. Although it's can't be known for sure, it's a good bet that treating her fractured teeth contributed significantly to her improved health and attitude. ■

Tucker J. Coombe is a writer in Cincinnati, Ohio.