

FROM CANINE TO K9

TALKING SHOP WITH A GUY
WHO DOES ORTHO ON DOGS!

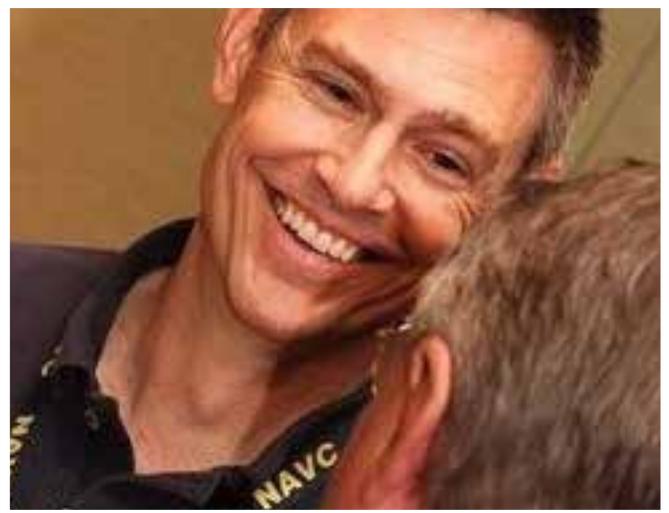


It's not often that a news crew shows up to cover a simple Class I correction. But then Dr. Don Beebe is used to receiving animated responses when he tells people he does orthodontics on dogs.

In the 2011 case, a local Colorado news crew was doing a "human interest" story on the orthodontic treatment that he was performing on a seven month old Sheltie. It wasn't a particularly challenging case, the patient had a deciduous tooth that failed to fully erupt, causing a mesioversion of one of the lower canines. But it did give Dr. Beebe the opportunity to educate the general public about the evolving field of animal orthodontics while dispelling one of its most persistent myths.

In the case of the Sheltie puppy, most general practitioner vets would have simply performed an extraction. But Dr. Beebe understood that of the 42 teeth the patient had, the incisors are among the eight "strategic" teeth. In essence, the lower canine wasn't just a tooth. It was almost like one of the dog's fingers. So instead of extraction, he used a button and an elastic chain to bring the tooth back into ideal occlusion.

Unlike with human treatment, the chain had to be anchored to multiple posterior teeth. According to Beebe, "In dogs, the canine has so much surface area that if we anchor it to the big premolar in the back, the canine is going to win. So we'll use the 3rd and 4th



Dr. Don Beebe

premolar and the first molar." OrthoWorld recently sat down with Dr. Beebe and discussed differences and similarities in performing orthodontics on *Homo sapiens*, and orthodontics on *Canis lupus familiaris*, also known as the domestic dog.

Man vs Man's Best Friend

Dr. Don Beebe is a Doctor of Veterinary Medicine and a Diplomate of the American Veterinary Dental College. In other words, he's a licensed animal dentist. Unlike with humans, there are no specialists in sub fields. His training as an AVDC Diplomate includes periodontics, restoratives, endodontics, orthodontics, prosthodontics and oral surgery

(that can include extractions, cancer resection, palate defect repair and maxillofacial fracture repair).

Just as with human orthodontics, there's a growing recognition that oral health is an essential component of overall oral health in animals. Unfortunately Dr. Beebe says some veterinarian GPs can graduate with as little as two or three hours of oral health training. He says that he wound up specializing after his ten years of practice taught him just how underserved the segment was.

Treating a Dog Bite

Despite all of the anatomical and evolutionary differences in the two species, the biggest difference between human and animal orthodontics is philosophical—orthodontics on a pet is strictly a medical procedure. Everyone who hears braces automatically assumes esthetics. But esthetics simply isn't part of the discussion when you're talking about treating a patient who needs to be anesthetized for every orthodontic visit. Dr. Beebe actually has a consent form that every pet owner is required to sign that includes language such as "The correction of malocclusion in animals has moral, ethical, and legal implications."

So when is animal orthodontics acceptable? He says, "We believe that all pets are entitled to a comfortable, functional bite. Treating acquired malocclusions is acceptable when they improve function and comfort. But some breeds, such as the boxer, are intentionally bred with Class III malocclusions." Most boxer breed owners don't want to correct the trait their dog was bred to exhibit.

Still the biggest differences in treatment are driven by differences in anatomical structures. Each specie's jaws have evolved to perform different tasks. Human jaws are

isognathous, meaning equal jaw widths, and so the premolars and molars of opposing jaws are aligned with the occlusal surfaces facing each other, forming an occlusal plane. Man has an imperfect isognathic, or near equal jaws. Dogs are anisognathous, with unequal jaw widths, in which the mandibular molar occlusal zone is narrower than the maxillary counterpart.

Another obvious clinical difference is with the specific teeth. Like the jaws, the crown and cusps of the teeth have evolved to suit the need of the species. Humans have



A passive bite plate is created to move the canine tooth.

bundodont dentition, that features cheek teeth with low rounded cusps on the occlusal surface of the crown. Cusps are commonly arranged side by side on the occlusal surface for crushing and grinding such as molars in primates. On the other hand dogs have secodont dentition, and have cheek teeth with cutting tubercles or cusps arranged to provide a cutting or shearing interaction; such as premolars in most carnivores, especially the carnassial teeth. Plus there's the size issue, which impacted the Sheltie mentioned above. Canine teeth have roots with an incredibly large surface area, which can influence orthodontic movement greatly, particularly when looking for appropriate anchorage.

Of course, both professions are extremely knowledge intensive and share an intimidating and exhausting board exam. The AVDC exam is a three day examination process that includes a written component, a bench exam and a practical exam, where students are presented with a cadaver dog or cat heads and they need to demonstrate proficiency in processes such as performing a root canal, taking an alginate impression and performing orthodontic procedures. The exam used to be held at the University of Texas, Dental Branch at Houston when the dental students would go on spring break. Today it's held in Las Vegas at the Oquendo Center, in Las Vegas.

Dog Days

There are no routine days for Dr. Beebe. While the majority of his work is root canals, periodontics and extractions, he admits to getting a thrill when the orthodontic case walks through the door.

"I had a Rottweiler come in who was 11 months old and she had a Class I level bite. I used a maxillary expansion appliance, not unlike a hyrax device, which was anchored to the upper canine, and it applied the force to the palatal side of the upper incisors. It pushed them forward. So we went thru the active phase for the first 8 weeks, and then we



left it in place, but not activated, for another 8 weeks. So that served as the retention device.”

Then there’s the patient feedback issue. Dogs don’t just lack the inability to vocalize pain, they’re actually genetically predisposed to hide it (else they might lose their place in pack, sacrifice food and breeding opportunities). As such, diagnosing oral pain can be a challenge.

“We’ve seen some awful things, like where a canine tooth can be tipped inwards and drive a deep groove into the palate. We’ll see puppies with teeth drilling a hole into their palate. It’s challenging because the pet owner will see the puppy bouncing around the room, eating food and happy to see them. So they assume there’s no pain.”

For this type of situation, we employ passive treatment by applying a composite to the upper tooth, forming an incline plane. We create a little ramp out of composite, along with a groove that will guide the tooth into alignment. So as the weeks go by, the natural function of the dog opening and closing the jaw guides the tooth into correction.”

Another parallel the two fields share is the growing use of the temporary anchorage devices, or TADs. Like his human counterparts, Beebe is fascinated with the thought of tinkering.

“What a benefit we’re going to have with the TAD. Instead of worrying about the teeth in the back, we can focus on treating the teeth we want to. I’ve got an 11 month old poodle with a Class I mesio lingual version of one of the mandibular canines. Normally that would have meant multiple attachments to the teeth in the back. But this time around, the plan is to simply place a TAD back there and anchor it to bone, and get that tooth to move.”

Beebe takes impressions with traditional PVS alginate, although he sometimes has to adapt human trays to suit his needs since they don’t make animal trays. Getting appliances made can also be a bit of an adventure.

“Because it’s such a small profession, we don’t have labs competing for this business. In fact, there is no such thing

as an animal dental lab. We just find human labs that think it’s cool to try and do. We’ll supply them with some dog and cat bite models to work from and we wing it.” He’s been working almost exclusively with Dean Cheetham of Lumident out of Indianapolis, who Beebe calls “a true artist”.

Dr. Beebe recently accompanied his wife to have a crown made and found himself asking questions about the 3D scanner in the office. Cutting to the chase, professional curiosity got the better of both Beebe and the dentist and he just dropped off a couple dog typodonts for the dentist to try and scan. He’s not expecting much, since the digital scanner does so much modeling. But he’ll be checking back in at the end of the month to see if ‘the people practice’ has any luck taking a digital canine impression.



A hyrax like device is used to push the canines forward.



Don Beebe

Dr. Don Beebe is a 1993 graduate from the University of Florida College of Veterinary Medicine. His residency in Dentistry and Oral Surgery was completed at the University of Wisconsin. He is a

Diplomate of the American Veterinary Dental College. In 2007 he founded Apex Dog and Cat Dentistry, a specialty referral service, in Englewood, Colorado. Dr. Beebe is very active in the veterinary community. He is well published in academic journals, has authored textbook chapters, and lectures nationally and internationally. His special interests include periodontal surgery, endodontics, and maxillofacial fracture repair. He lives in the Denver area along with his wife Lindsay their four children Colson, Chafe, Autumn and Avery and four dogs.