



Arizona Veterinary Specialists' News



LEADERS IN SPECIALTY CARE

April 2018

Tooth Resorption in Dogs

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Arizona Veterinary Dental Specialists, PLLC

Introduction: Tooth resorption in dogs (TR) occurs in three primary patterns: internal resorption, idiopathic bony replacement resorption, and osteoclastic resorption as seen in feline patients. The latter is the least common of the three patterns seen in dogs and will not be discussed here.

Etiology and Pathogenesis: Canine tooth resorption presents in two main patterns: external and internal. External resorption, which is more common, is also known as idiopathic bony replacement resorption. With both patterns, invasion of the tooth structure by osteoclasts (in external resorption) or odontoclasts

(in internal resorption) leads to remodeling of the dental structures and gradual replacement with bone. Normally, dental structures are protected from this cellular invasion by the presence of a layer of demineralized tissue on the surface of the root (cementoid) or on the surface of newly formed dentin on

the inside of the tooth (predentin). Mineralization of these tissues leads to a "bridge," which allows the odontoblasts/osteoclasts to invade the tooth. Initiating causes for tooth resorption may include dental trauma, orthodontic treatment or a malocclusion that places abnormal forces on a tooth. In most cases, however, no initiating cause is evident.

Clinical Presentation: Tooth resorption in dogs is generally considered to be non-painful until the process becomes exposed to the oral cavity, so most patients with tooth resorption will not show clinical signs recognized by the owner as being painful. Internal resorption can sometimes be seen as a pink discoloration of the crown (fig. 1), which becomes evident as the area of resorption approaches the surface of the tooth. Most tooth resorption in dogs, however, is diagnosed radiographically.

Radiographic appearance:

Internal resorption begins within the endodontic system, usually in the crown of the tooth. The effected area of the tooth becomes indistinct, and the outline of the root canal spaces becomes less distinct in the area of resorption (Fig. 2). External resorption (idiopathic bony replacement resorption) is commonly seen in older patients. Premolars are most commonly effected, and the process usually begin

apically and progress coronally (Fig. 3). Many effected teeth never have more than 1/3 to 1/2 of the root effected, but the process may continue until the entire root structure of the tooth is resorbed and the crown of the tooth is mobile. During resorption, the effected part of the root is typically ankylosed (fused) to the surrounding bone in the area of resorption, eventually becoming replaced by trabecular bone. The periodontal ligament space in effected areas is gradually lost. In some cases, the resorption can start in the mid-root area (Fig. 4). In most cases, no radiographic lysis is appreciated in the areas of resorption.

Treatment: Regardless of the type of tooth resorption present, treatment planning cannot be accomplished without detailed dental radiographs. As in all other dental treatment, skull films are inadequate. The following guidelines can be used to decide what should be extracted and how the extractions should be performed:

1. Teeth in which the areas of resorption are exposed (or soon will be exposed) to the oral cavity should be extracted.
2. Teeth that are mobile secondary to root resorption should be extracted.
3. When a tooth is extracted, any root structure coronal to the area of resorption that is

clearly visible and distinct from the surrounding bone should be extracted in it's entirety.

4. Any root remnant associated with radiographic lucency should be extracted.
5. Simple crown amputation with some drilling of the root remnants should be reserved for only those cases in which the roots are no longer radiographically distinct from the surrounding bone.

Decision making regarding crown amputation should follow similar guidelines to those published for Type 2 root resorption in cats. In the past the crown amputation technique has been overused as substitute for proper extraction. A description of the types of tooth resorption in cats is available at www.AVDC.org/nomenclature. If the crown amputation technique is used inappropriately, painful infected root remnants can remain hidden under the gum line for years.



Figure 1: Pink discoloration seen with internal resorption as it come close to the surface of this mandibular first molar. The radiograph of this tooth is shown in figure 2.

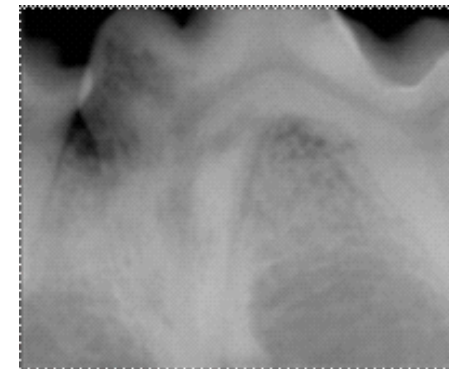


Figure 2: Radiograph of the tooth shown in figure 1, showing a hazy appearance of the mesial (left) half of the tooth. The root canal system in this area is indistinct, which is typical with internal resorption. When external resorption is present, the root canal space remains radiographically distinct until late in the disease process.

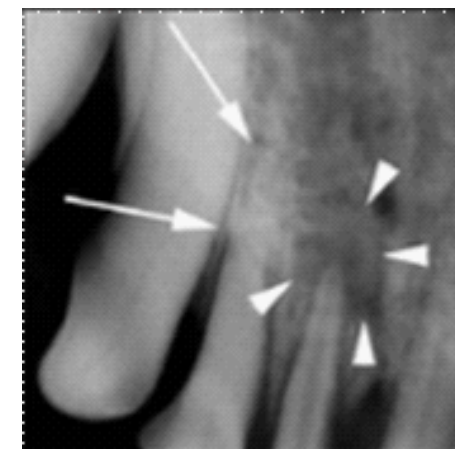


Figure 3: Classic idiopathic bony replacement resorption is seen in the apical third of the maxillary right upper second incisor (arrows). Note the indistinct appearance of the root and indistinct periodontal ligament spaces in the area of resorption. The adjacent right upper first incisor (arrowheads) is affected with

inflammatory root resorption, in which the area of resorption is surrounded by a radiographic lucency. The resorption in the first incisor was caused by the tooth being non-vital, as indicated by the wide root canal space. Leakage of the breakdown products of the pulp tissue is responsible for the inflammatory process and attendant root damage. This illustrates why non-vital (dead) teeth should either be extracted or treated with root canal therapy.



Figure 4: Idiopathic root resorption in a mandibular fourth premolar. In this case the tooth resorption has affected the central portion of the roots, sparing the apices. The process is approaching exposure to the oral cavity, indicating that the crown and root remnants coronal to the area of resorption should be extracted. Since the apices are not associated with any radiolucency, they do not require extraction. The periodontal ligament space

is visible around those parts of the root that have not undergone resorption.

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Arizona Veterinary Emergency & Critical Care Center



Emergency and Critical Care

- ◆ In house diagnostic tests
 - STAT laboratory blood tests
 - * Complete Blood Count (CBC)
 - * Serum biochemical analysis
 - * Blood gas analysis
 - * Urinalysis
 - * Blood lactate measurement
 - * Coagulation testing
 - * Ethylene glycol (Antifreeze) testing
 - * Parvovirus testing
- Digital x-rays
 - * Radiologist interpretation
- Scanning ultrasound
- Gastrointestinal endoscopy
- ◆ Specialized Therapies
 - Intravascular volume expansion/shock therapy
 - Blood component therapy
 - Rattlesnake antivenom therapy
 - Oxygen
 - Short and long term ventilator therapy
 - Anesthetic ventilator
 - Pain medication delivery via constantrate infusion
 - Nutritional support
 - Feeding tube placement
 - Peritoneal dialysis
 - Continuous suction for chest and other drains
 - Central and peripheral IV catheter placement
 - CPR with advanced life support
 - Electrical defibrillation & emergency cardioversion
 - Anesthesia for high-risk critical patients
- ◆ Soft tissue emergency surgical procedures performed by our emergency veterinarians (included, but not limited to):
 - Wound repair
 - Emergency tracheostomy
 - Chest tube placement
 - Abdominal surgeries

- Gastric Dilatation Volvulus (GDV) or bloat surgery
- GI foreign body removal
- C-section
- Splenectomy
- Bladder stone removal
- ◆ Intensive monitoring
 - Electrocardiogram (EKG)
 - Blood pressure (direct arterial and indirect)
 - Urinary catheter placement and measurement of urine output
 - Pulse oximetry (Oxygen saturation)
 - Capnography (End Tidal CO2)
 - Central venous pressure
 - Arterial and venous blood gas measurement

Dermatology for Animals, PC



Dermatology

- ◆ Allergy testing (skin testing) and immunotherapy
- ◆ CO₂ laser for ablation of skin tumors
- ◆ Testing for food allergies and hypoallergenic diets
- ◆ Ear disease diagnosis and treatment
- ◆ Bacterial and fungal skin disease diagnosis and treatment
- ◆ Cytological smears and microbiologic examinations
- ◆ Ectoparasite identification and treatment
- ◆ Immune-mediated and hormonal skin disease diagnosis and treatment
- ◆ Treatments of nail and nail bed disorders
- ◆ Skin biopsy sampling and histopathology interpretation
- ◆ Liquid nitrogen cryotherapy

Southwest Veterinary Surgical Service, PC



Surgery

- ◆ Abdominal surgery
- ◆ Airway surgery
- ◆ Angular limb deformity surgery
- ◆ Arthroscopy
- ◆ CT Scans
- ◆ External skeletal fixation
- ◆ Fracture repair
- ◆ Laparoscopy and Thoracoscopy
- ◆ Neurologic surgery
- ◆ Oncologic surgery
- ◆ Oral surgery, such as maxillofacial surgery and oral fractures
- ◆ Orthopedic surgery
- ◆ Otologic surgery
- ◆ Perineal surgery
- ◆ Reconstructive surgery
- ◆ Ring fixators
- ◆ Soft Tissue surgery
- ◆ Stem cell therapy
- ◆ Thoracic surgery
- ◆ Tibial Plateau Leveling Osteotomy (TPLO)
- ◆ Triple Pelvic Osteotomy (TPO)
- ◆ Total Hip Replacement (THR) both cemented and cementless procedures available
- ◆ Tibial Tuberosity Advancement (TTA)

Anesthesia and Pain Management

- ◆ Anesthetic management of high risk and critical care patients
- ◆ Extensive anesthesia monitoring
 - Blood pressure, both direct and indirect
 - Pulse oximetry
 - Electrocardiogram
 - Capnography
 - Body temperature
 - Ventilator therapy
- ◆ Pain patches
- ◆ Chronic pain management consultations

Arizona Veterinary Dental Specialists, PLLC



Dentistry

- ◆ Periodontics
- ◆ Dental digital radiography
- ◆ Root canals
- ◆ Nasal disease treatment
- ◆ Oral disease treatment
- ◆ Oral surgery
- ◆ Orthodontics
- ◆ Restoration
- ◆ Professional teeth cleaning
- ◆ Maxillofacial surgery
- ◆ Oral fractures
- ◆ Fractured teeth treatment
- ◆ Malocclusion treatment
- ◆ Crown therapy
- ◆ In house lectures
- ◆ Telephone radiographic consultation
- ◆ Bite evaluation

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Radiation Oncology

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- ◆ I-131 radioactive iodine treatment

Medical Oncology

- ◆ Chemotherapy
- ◆ Immunotherapy
- ◆ Cryotherapy
- ◆ Oncologic surgery
- ◆ Clinical trials



Internal Medicine

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 - Bronchoscopy
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- ◆Endocrine disorders
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- ◆Blood and plasma transfusions
- ◆Gastrointestinal diseases
- ◆Genitourinary disorders
- ◆Hepatic diseases
- ◆Infectious diseases
- ◆Intensive care treatment
- ◆Immune-mediated diseases
- ◆Nutrition consultations
- ◆Oxygen therapy
- ◆Pancreatic diseases
- ◆Pulmonary diseases
- ◆Renal disease
- ◆Respiratory diseases
- ◆Second opinion examinations
- ◆Ultrasonography
- ◆Tracheal and urethral stenting

Cardiology

- ◆Echocardiography
- ◆Electrocardiogram (ECG)
- ◆Chest radiographs
- ◆Blood pressure
- ◆Pericardiocentesis
- ◆Cardiology breed certification
- ◆Holter monitoring

- ◆Event monitoring
- ◆Non-surgical PDA repair
- ◆Balloon valvuloplasty
- ◆Pacemaker implantation
- ◆Invasive blood pressure measurements
- ◆Angiography
- ◆Implantable ECG Loop Recording

Radiology

- ◆Outpatient and inpatient ultrasound
- ◆Radiology Rounds
- ◆Digital radiography
- ◆Outpatient and inpatient CT scans
 - 64 slice
- ◆Fluoroscopic urinary, GI, and tracheal studies
- ◆Nuclear imaging
 - GFR scans
 - Bone scans
 - Thyroid scans
 - Splenic scintigraphy
- ◆Radiographic interpretation
- ◆CT and MRI interpretation

Eye Care for Animals, dba



Ophthalmology

- ◆Biomicroscopy
- ◆Indirect ophthalmoscopy
- ◆Electroretinography
- ◆Ultrasonography
- ◆Applanation tonometry
- ◆Fluorescein angiography
- ◆Glaucoma treatment
- ◆Cataract surgery
- ◆Corneal reconstructive surgery
- ◆Treatment of eyelid abnormalities



April 2018

Arizona Veterinary Specialists, LLC
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April 21, 2018
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Check-in begins at 12:00 pm.

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Speakers/Topics/Schedule:

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for 6 CE Credit Hours

12:30

Cardiology

Right Heart Failure ☐ When it's on the Right, Don't be Wrong
Whit Church, DVM, DACVIM (Cardiology)

1:30

Surgery

Bad Breaks - Fractures in Immature Patients
Jeffrey Steurer, DVM, MS, DACVS

Break at 2:30-Speaker from Hills

3:00

Ophthalmology

Top Ten Common Ophthalmic Mistakes
Lisa Felchle, DVM, DACVO

4:00

Critical Care

Non-Cardiogenic Edema: Why Less is More
Brandi Mattison, DVM, DACVECC

Dinner at 5:00

6:00

Dentistry

Oh Captain My Captain : Navigating Troubled Waters in the Dental
Operator
Curt R. Coffman, DVM, FAVD, DAVDC

7:00

Dermatology/Oncology

Treating Skin Cancer with Fire and Ice
Tom Lewis, DVM, DACVD
Eric Boshoven, DVM, DACVR (Radiation Oncology)

Registration Fee: \$60.00

*Includes proceedings, snacks,
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Registration Deadline 04/16/2018
Registration Fee is Non-Refundable

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Approved by the Arizona Academy of Veterinary
Practice for 6 CE Credit Hours

12:30

Ophthalmology

Tips and Tricks - Ophthalmology

Sara Power, CVT; Christina Adams, CVT;

Veronica Rebic, CVT

1:30

Dermatology

Bacteria...the Good, the Bad and the Crusty

Aimee Matter, CVT

Break at 2:30

3:00

Surgery

Pain Management for the Veterinary Technician

Amber Gunstra, DVM (Surgical Resident)

4:00

Emergency

Environmental Emergencies

Erin Criswell, CVT, VTS (ECC)

Dinner at 5:00

6:00

Oncology

Intro to Cancer

Andrea Seligman, CVT

7:00

Dentistry

Teeth Cleaning Start to Finish

Jenifer Hertzoff, CVT

"Staff Education Exchange"

Saturday

April, 21, 2018

12:30 pm to 8:00 pm

Registration begins at 12:00 pm.

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