

# Managing feline oral diseases

*Practitioners must prevent and promptly treat dental diseases in all Pets—even geriatric patients.*



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**A**n important, and often overlooked, part of a geriatric Pet's health care is dentistry. Pet owners are often not aware that dental disease exists in their Pet or, when it does exist, that it can have systemic consequences if left untreated. Additionally, since the clinical signs of dental disease are often subtle and vague, clients may not be aware that their Pet is suffering from oral discomfort. Providing the dental care needed to maintain and improve geriatric Pets' quality of life must begin with client education. It is our responsibility as veterinarians to inform Pet owners if oral-cavity pathologies exist in their Pet and are causing pain.

All too often, owners say, "My Pet is too old to be anesthetized." This client perception is a barrier to providing care to geriatric patients, and it presents a great opportunity for client education. Veterinarians need to educate Pet owners that while physiologic changes and medical conditions are associated with aging, age itself is not a disease.<sup>1</sup> A thorough preanesthetic physical examination and appropriate preoperative laborato-

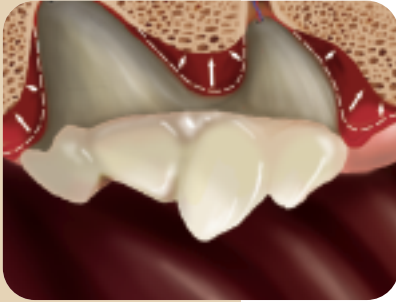
ry tests should help ensure that a favorable prognosis is likely.<sup>1</sup> The alternative is that untreated oral cavity pathology can have long-term systemic consequences (*e.g.*, renal, hepatic and cardiovascular) and can lead to decreased quality of life for geriatric patients. Veterinarians need to perform a risk vs. benefit analysis for each individual Pet.

Some oral cavity pathologies commonly encountered in geriatric cats include periodontal disease, chronic gingivostomatitis and feline odontoclastic resorptive lesions (FORLs). It should be noted that when discussing treatment of these conditions with clients, the term *dental prophylaxis* is not appropriate. Prophylaxis refers to the prevention of disease, whereas in cases of treatment, disease is already present and *periodontal therapy* is a more appropriate term.<sup>1</sup>

## **Periodontal disease**

The most common oral cavity pathology is periodontal disease, which is found in 85 percent of cats and dogs older than 3 years of age.<sup>2</sup> A component of periodontal disease is an inflammatory response to dental plaque.<sup>3</sup> Bacteria in plaque release metabolic toxins, which cause gingival

Figure 1



#### Extensive bone loss requiring extraction.

When more than 75% of the bony attachment to the root of a multirooted tooth is lost, an extraction should be considered. Oral radiographs are required to evaluate the extent of bone loss.

inflammation. As the disease progresses, inflammation leads to pocket formation, bone loss and, eventually, tooth loss.<sup>2</sup>

The first signs of periodontal disease that clients may recognize are halitosis and stained teeth. With more advanced disease, drooling, red and swollen gums and bleeding may be noted.<sup>4</sup> The

Pet may show nonspecific clinical signs, such as vomiting, reduced appetite, or weight loss. However, often clients are completely unaware that this process is occurring in their Pet's mouth, and it is only identified during a routine physical examination.

**Diagnosis.** To identify periodontal disease, practitioners must first recognize a healthy oral cavity. With healthy periodontium, the gingiva has a sharp margin that flows smoothly from tooth to tooth. Fine blood vessels may be visualized at the gingival margin. Radiographically, the alveolar bone is seen close to the neck of the tooth. A fine radiolucent line demarcates the periodontal ligament space between the roots of the teeth and the lamina dura.<sup>5</sup>

Periodontal disease, by nature a progressive condition, is classified into four stages.<sup>5</sup> Each stage has an increasing degree of gingival inflammation, pocket formation and loss of gingival attachment and bone. Stage 4 periodontal disease also includes abscessation and tooth mobility or loss.<sup>5</sup> It should be noted that periodontal disease is site specific, and the severity may vary in different areas of the mouth. Therefore, a thorough oral examination is necessary to determine the full extent of disease in all Pets.

A dental probe and oral radiographs are

invaluable aids in diagnosing periodontal disease. In cats, pocket depth should not be deeper than 0.5 mm, and anything greater should be considered pathologic.<sup>2</sup> Oral radiographs are needed to determine the degree of alveolar bone loss associated with pocket formation. Additionally, radiographs are warranted to evaluate soft tissue swelling, exposed dental root furcations and mobile teeth, to identify the presence of retained roots in places where teeth appear to be missing and to evaluate other oral pathology.

**Treatment.** Treatment of periodontal disease centers on removing accumulated plaque and dental calculus and treating or extracting destabilized teeth to prevent further disease progression. Once irreversible periodontal injury has occurred, the goal is to prevent development of new lesions and further tissue destruction at affected sites.<sup>3</sup> When performing a periodontal cleaning, practitioners must remove all the calculus and plaque on the teeth without further damaging the gingival tissue. This includes cleaning the deep gingival sulcus and, occasionally, root planing. Practitioners must exercise care to use the appropriate technique and instruments, as improper cleaning can lead to rapid new plaque formation or iatrogenic gingival injury.

In some cases, practitioners may not be able to save affected teeth because of the level of tissue destruction and alveolar bone loss. Indeed, periodontal disease is the most common indication for performing extractions. As a general rule, if there is greater than 50 percent loss of bony attachment to the tooth root on a single rooted tooth or greater than 75 percent loss of attachment on a multirooted tooth, extraction should be considered (*Figure 1*).<sup>6</sup> Practitioners should also consider tooth

mobility, pocket depth and radiographic pathology when determining the need to extract each individual tooth.

When performing extractions, appropriate pain control is necessary. Pain management should be multimodal and include preoperative pain management, local nerve blocks and postoperative pain relief. Opioid drugs can be administered preoperatively for an analgesic effect and to help reduce the required doses of induction and maintenance anesthesia agents. Local nerve blocks provide effective blockage of nociceptive signals, provide short-term postoperative pain relief and allow patients to be maintained under a lighter plane of anesthesia.<sup>6</sup> Bupivacaine offers a longer duration of action but has a slower onset than lidocaine. The maximum safe total doses are 1 mg/kg of lidocaine and 1 to 2 mg/kg of bupivacaine, and the total dose for each patient should be calculated before anesthesia.<sup>5</sup> For postoperative pain management, a combination of nonsteroidal anti-inflammatory drugs (NSAIDs) and opioids provide a synergistic effect and more effective pain relief than either alone.

After performing the dental cleaning, the next step is to delay the onset of new periodontal disease. For long-term management and prevention, client compliance is necessary. Practitioners must educate Pet owners so they understand that home care is an essential component of preventing periodontal disease. Brushing, oral chlorhexidine rinse solutions and enzymatic dental chews can be included in home oral care. Not all Pets, however, are amenable to brushing. For those Pets, over-the-counter diets, such as Hill's® Science Diet® Oral Care, can be used to slow the accumulation of plaque and dental calculus. When periodontal disease is already present, practi-

tioners can recommend such diets as Hill's® Prescription Diet® t/d® Feline and Royal Canin Veterinary Diet Feline Dental DD 27™. Neither of these is contraindicated in geriatric Pets.

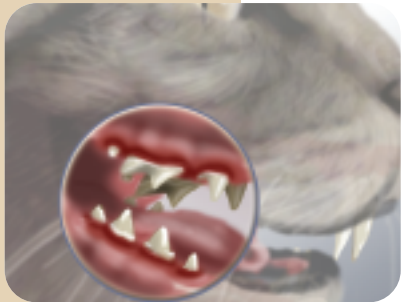
### Chronic gingivostomatitis

Also known as lymphoplasmacytic stomatitis, chronic gingivostomatitis occurs most commonly in middle-aged and geriatric cats.<sup>7</sup> Although the condition has an unknown etiology, the cause is most likely multifactorial. Current theories include an immune response to bacterial antigens in plaque or to the tissues of gingival attachment to the teeth, immunosuppression and infection with feline leukemia virus (FeLV), feline immunodeficiency virus (FIV), feline calicivirus or *Bartonella hensaelae*. Since treatment is generally most successful when the cause is known, the uncertain etiology of this syndrome makes it frustrating to treat for both practitioners and owners. However, with a multifactorial approach, we may be able to provide significant relief to Pets.

**Diagnosis.** Chronic gingivostomatitis has a range of presentations, from gingival inflammation to severe mucosal ulcerations and granulomatous lesions (*Figure 2*, page 44). The owner may present the Pet for drooling, signs of pain when eating, unkempt hair coat and sometimes weight loss. The lesions are often symmetric ulcerated lesions of the buccal mucosa and may be focal or diffuse.<sup>4</sup> The areas around the molars and premolars are most commonly affected, but the lesions may also affect the tongue, lips, glossopalatine area and fauces.

When presented with a cat showing clinical signs of chronic gingivostomatitis, a complete workup, including complete blood count (CBC) with differential, serum chemistry panel and FeLV and FIV testing is

Figure 2



### Chronic gingivostomatitis.

Gingivostomatitis may present as gingival inflammation but may also include severe mucosal ulcerations or granulomatous lesions. Gingival biopsies are necessary to rule out other potential diagnoses such as tumors and eosinophilic ulcerations.

ecessary. The most consistent laboratory abnormality is hypergammaglobulinemia.<sup>8</sup> Cats with FIV or feline calicivirus infection often have more severe lesions.<sup>4</sup> While laboratory test results may often be within normal limits, the possibility for underlying or contributing causes of inflammation in the oral cavity must be investigated. If an underlying cause is found, it should be quickly addressed.

**Treatment.** Plaque and bacteria are suspected to be a common underlying cause of gingivostomatitis. Since plaque may be present even in the absence of visible tartar, frequent dental cleanings are paramount even if no calculus is present. Plaque is not visible on teeth, so a plaque-disclosing solution applied after the initial cleaning is helpful to visualize areas that need additional attention. During the dental cleaning, all compromised teeth—including those affected by severe periodontal disease, fractured and nonvital teeth and those with resorptive lesions—should be extracted to minimize bacterial recolonization.<sup>9</sup>

While the Pet is under anesthesia for cleaning, practitioners should obtain a gingival biopsy. The histopathology report will often return as lymphoplasmacytic inflammation, but this result is not specific to gingivostomatitis because any immune-responsive tissue chronically exposed to bacteria can result in similar histopathology.<sup>4</sup> However, it is important to rule out differentials, such as squamous cell carcinoma, other oral tumors and eosinophilic ulcerations. While the Pet is under anesthesia, practitioners should obtain oral cavity radiographs because they aid in diagnosing conditions that may contribute to the stomatitis such as

FORLs and retained root remnants.

After the dental cleaning, initiate a feeding trial with a hypoallergenic diet, and recommend that clients replace plastic food dishes with metal or ceramic dishes. This is done to remove any possible source of allergen from the oral environment, and therefore reduce the chance of allergic stimulation of the gingivostomatitis. Home dental care should include daily brushing, chlorhexidine oral rinses and hexameta-phosphate-containing products, such as C.E.T. chews or oral wipes.

**Medical therapy.** The treatment goal for chronic gingivostomatitis is to provide pain relief so the Pet can eat, drink and groom. Medical therapies are available for patients that do not respond to frequent dental cleanings, oral care diets and diligent home dental care. In some cases, these may be sufficient to control clinical signs without resorting to dental extractions.

Corticosteroids are the cornerstone of medical therapy for chronic gingivostomatitis. Corticosteroids commonly used include prednisone (prednisolone) at 1 to 2 mg/kg orally twice daily for two weeks, then tapered to 0.5 to 1 mg/kg every other day as needed; methylprednisolone at 5.5 mg/kg subcutaneously or intramuscularly as needed; and triamcinolone at 0.1 to 0.2 mg/kg subcutaneously once every four to eight weeks. Possible side effects of long-term use should be discussed with Pet owners before starting therapy.

Antibiotic selection is directed at controlling the anaerobic bacteria associated with this syndrome. Appropriate antibiotic choices include metronidazole at 30 to 60 mg/kg orally twice daily for seven to 10 days (used for its antibacterial and anti-inflammatory properties) or clindamycin at 5 mg/kg orally twice daily for 10 to 30

days.<sup>8,10</sup> In difficult-to-manage cases, both medications can be used concurrently at their lower doses. Another antibiotic choice is amoxicillin-clavulanate at 11 to 22 mg/kg orally twice daily.

If the response to medical therapy is insufficient, all remaining molars and premolars should be extracted. Full tooth extractions must be performed, and the tooth sockets must be reamed to remove the entire periodontal ligament and all tooth tissue. This is because the inflammatory gingival reaction can occur even without visible tooth structure showing above the gum line. Therefore, crown amputations are contraindicated with chronic gingivostomatitis.

Once the Pet's teeth are extracted, medical therapy can be reinstated to see if better control is possible. Additionally, with the offending teeth gone, some additional medications may become useful:

- **Cyclosporine**, an immunomodulating drug, can be useful in place of corticosteroids. Doses may differ depending on the bioavailability of the individual formulation. Blood levels of the drug should be monitored weekly until 400 to 500 ng/mL is achieved.

- **Levamisole**, an immunopotentiator, can be administered orally in cats at 25 mg/kg every second day for three treatments. In immunocompromised patients, this treatment has been shown to help normalize lymphocyte numbers and function, and to increase macrophage phagocytosis.<sup>9</sup>

- **Alpha interferon** has immunomodulating and antiviral properties and has been shown effective in treating stomatitis in cats with FeLV and FIV infection. The cats remain viremic, but improve clinically and hematologically.<sup>9</sup>

- **Antihistamines** may help stabilize mast

cell membranes and decrease histamine release in inflammatory reactions.

- **NSAIDs** can be useful in managing pain and inflammation, but their use may be contraindicated in cases of renal compromise, gastrointestinal side effects and concomitant use of steroids.<sup>9</sup>

If the patient's condition is refractory to therapy, including extractions of molars and premolars, full mouth extractions are necessary. Even after all teeth are extracted, approximately 20 percent of patients will continue to have lesions.<sup>4</sup> Clients should be informed of this possibility before extraction procedures.

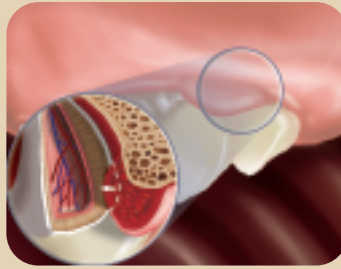
Clients must also be informed at the onset of treatment that gingivostomatitis is a chronic condition that requires long-term management, and it therefore requires commitment on the client's part to maintain home dental hygiene, appropriate dietary therapy, medical therapy and ongoing office visits. Varying degrees of remission may be reached with the available therapies. Chronic gingivostomatitis can often be controlled, but it is seldom cured.

### **Feline odontoclastic resorptive lesions**

FORLs occur from resorption of the tooth by odontoclasts. FORLs are neither caries nor erosions and are not caused by bacterial or acidic injury.<sup>4</sup> Their exact etiology is not known, but current theories include chronic inflammation, periodontal pathogens, viral disease, fatiguing of the enamel and hypervitaminosis D. These lesions often occur in cats 4 years of age and older.<sup>4</sup>

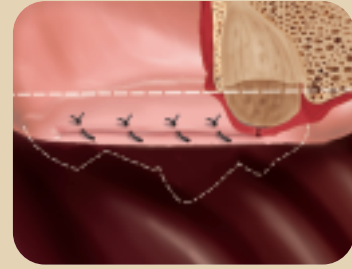
**Diagnosis.** Cats with FORLs often present with red spots on their teeth, a reluctance to eat hard foods or fractured crowns.<sup>4</sup> Upon physical examination, crown defects filled with inflamed granulation tis-

Figure 3



**Feline odontoclastic resorptive lesion (FORL).** The lesion in this figure extends only into the dentin of the tooth root and crown but the root is otherwise intact (Type I root involvement). In some other cases the roots may be more extensively damaged and become resorbed (Type II). Appropriate treatment for the Type I lesion in this figure would be full extraction.

Figure 4



**Tooth after crown amputation.**

Notice the extensive root resorption and replacement by bone. Also note that the crown is amputated about 2 mm or more below the alveolar crest to avoid sharp projections under the gingiva. Crown amputation is appropriate in only very specific circumstances and should not be performed if there are visible signs of gingival inflammation, or draining tracts, or if there is radiographic evidence of infection or disease in the surrounding bone.

sue may be noted (*i.e.*, the aforementioned red spots that clients may have noticed), which are often exquisitely painful on palpation. Some FORL lesions can be detected by visual or tactile inspection with a dental explorer. However, radiographs are often necessary to diagnose the majority of FORL lesions because they can exist below the gum line. *Table 1* (page 48) lists the five stages of FORLs.

Oral cavity radiographs should be performed at all yearly dental cleanings to help practitioners diagnose these painful lesions early. Radiographs help determine the extent of tooth root involvement so appropriate therapy can be selected. Root involvement includes:

■ **Type I:** Radiodensity of root structure is similar to that of nonaffected roots, and the periodontal liga-

ment space is identifiable.

■ **Type II:** There is a lack of identifiable root structure and a loss of an identifiable periodontal ligament space. The root shows evidence of replacement with alveolar bone.

**Treatment.** The treatment goal for patients with FORLs is to reduce pain. Glass ionomer restoration was previously attempted for shallow lesions just penetrating the dentin. However, it has been documented that the lesions continue to progress despite restoration therapy<sup>5</sup> and attempts to restore the lesions have fallen out of favor due to a better understanding of the progression of FORLs. Currently, extraction is the treatment of choice for Type I root lesions. For Type II root involvement, crown amputation with intentional root retention is recommended as long as the patient does not

**Table 1: Stages of FORLs**

<b>Stage 1</b>	Lesions extend into the cementum.
<b>Stage 2</b>	Lesions extend into the crown or root dentin ( <i>Figure 3</i> , page 46).
<b>Stage 3</b>	Lesions extend into the pulp chamber or root canal.
<b>Stage 4</b>	Extensive structural damage to the tooth is present.
<b>Stage 5</b>	Only the roots of the tooth remain covered by gingiva.

have endodontic disease, periapical pathology, chronic gingivostomatitis or FeLV infection.

To perform crown amputation, a gingival flap is made on the buccal and palatal or lingual surface of the tooth. Using a small bur, the crown of the tooth is amputated along with a small amount of the root just below the alveolar crest. Then the gingiva is closed over the site. After crown amputation (*Figure 4*, page 46), radiographs are obtained at regular intervals to determine if the root is continuing to resorb.<sup>5</sup>

Whether full root extractions or crown amputation is performed, adequate pain control, as discussed previously, is necessary both intraoperatively and postoperatively.

Once a FORL is present, additional FORLs may occur on other teeth. Due to the difficulty of diagnosing these lesions during routine physical exams, the use of a dental explorer and radiographs during yearly dental cleanings is essential. When appropriate extraction techniques are applied, the extraction site has an excellent prognosis for healing. Long-term dental care is necessary in these patients, including annual dental cleanings to monitor the patient for additional lesions.

Proper dental care is a vital part of maintaining the quality of life of geriatric Pets.

We treat dental disorders not only to alleviate our patients' immediate discomfort, but also to help prevent the eventual systemic problems thought to be associated with conditions such as periodontal disease. While we should always balance the benefits provided by treatment against potential risks, ensuring timely and appropriate treatment of dental problems in our geriatric patients is essential to our mission to act as advocates for our patients' health.

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