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An Overview of Common Feline Dental Problems (2 Nov 2000)

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Summary

The vast majority of feline dental problems can be grouped into four categories: periodontal disease, feline odontoclastic resorptive lesions, fractured teeth (with pulp exposure), and feline gingivitis/stomatitis syndrome. For treatment planning purposes, we can subdivide these problems into two categories: conditions that can be treated without extraction and conditions where extraction is indicated.

An Overview of Feline Dental Problems

As veterinarians and animal health care professionals our job is to improve the pet's overall quality of life - to alleviate pain and discomfort. As veterinary dentists, there are ample opportunities to improve the quality of life for our clients' pets. At least 50% of cats over the age of five have significant dental disease, and you can be sure that means they are experiencing discomfort, and for some, great pain. A job well done is when we successfully treat these painful conditions. A "better" job well done is if we can prevent these conditions in the first place.

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Preventing Periodontal Disease in Cats

The one disease that we have the power to prevent is periodontal disease. Periodontal disease is an ongoing process that can be broken down into stages for the purposes of diagnosis and treatment. For the majority of cases, periodontal disease can be diagnosed and staged during an oral examination of an awake patient. Once the diagnosis is made, appropriate treatment can be recommended. Notice that this can all be done during a routine office examination.

Periodontium literally means "around the teeth", and refers to the group of tissues that attach the teeth to the jaws. These structures include the gingiva, the alveolar bone, the cementum (which covers the root of the tooth), and the periodontal ligament. Periodontal disease is the most common disease we see in practice, affecting 85% of cats over the age of six [1]. Left untreated, periodontal disease can cause oral pain, oral abscess formation, osteomyelitis, tooth loss, and systemic disease from anorexia or bacteremia. Most cases of advanced periodontal disease in felines could have been prevented through a program of early disease detection and appropriate treatment.

Stage 1 - Early gingivitis - Stage 1 periodontal disease is characterized by mild plaque accumulation and mild hyperemia of the gum margins (marginal gingiva). This is the earliest detectable sign of periodontal disease. A form of juvenile-onset gingivitis is recognized in cats [2]. These cats, often pure-breeds, are presented at an early age (6 - 8 months) with gingival hyperemia and varying degrees of halitosis. Treatment of "early gingivitis" is done at home. Owners should be instructed to provide regular (daily !) home care to retard the accumulation of plaque on the teeth. It is important to inform pet owners about the proper way to care for their pets' teeth at home, and at the same time educate them to look for signs of advanced disease that would require professional treatment. Clients who regularly brush their pets' teeth tend to be the most responsive to recommendations for professional treatment.

Stage 2 - Established gingivitis - Plaque and/or calculus accumulation, hyperemia, and edema (swelling) of the marginal gingiva characterize Stage 2 periodontal disease. Gentle probing of the gingival sulcus with a periodontal probe can induce bleeding.

When you can document the signs of gingival edema, hyperemia, and bleeding on gentle probing, it is time to strongly recommend a thorough dental cleaning under anesthesia. Stage 2 periodontal disease is reversible; more advanced stages are not. This is why it is so important to perform the prophylaxis as soon as Stage 2 periodontal disease is recognized. In some of the juvenile-onset cases, this may occur as early as 6 - 8 months of age.

A complete periodontal prophylaxis (prophy) involves scaling the calculus and plaque from the tooth crown surface (supragingival scaling), removal of the plaque and calculus from the teeth below the gumline (subgingival curettage), polishing the teeth, and recording abnormalities in a medical record. This can only be accomplished under general anesthesia. Anesthesia for dental patients should be maintained with an inhaled gas agent administered through a cuffed endotracheal tube. Injectable anesthetics alone do not give the necessary jaw relaxation to complete a thorough prophylaxis. A cuffed endotracheal tube protects the lower airways from contamination by oral secretions and debris. A rubber band or a piece of I.V. tubing makes an excellent device for securing the endotracheal tube while performing dental prophylaxis. Working around tape or gauze becomes cumbersome; this is not recommended.

The veterinarian or technician performing the dental prophylaxis should wear appropriate protective gear (face mask and eye protection). It is very important that the veterinarian or technician performing the prophylaxis be familiar with the procedure, because an improperly-performed prophylaxis can actually accelerate the progression of periodontal disease as well as cause injury to the patient.

Following the prophylaxis, a dental chart should be completed indicating all abnormalities. Missing teeth, extra teeth, abnormal pocket depth, tooth furcation exposure, resorptive lesions, fractured teeth, and gingival recession are just some of the many kinds of oral pathology that should be recorded in a dental chart. The dental chart also will indicate areas requiring more advanced treatment or areas that require radiographic study. These additional treatments may then be performed, or can be scheduled for a later treatment.

Beyond Prevention: Advanced Periodontal Disease in Cats

Once periodontal disease has progressed into the more advanced stages, the treatment plan is geared more toward damage control than prevention. In cats, advanced periodontal disease can quickly progress to a point where extraction is the only valid treatment option remaining. If the goal is to save teeth, aggressive treatment combined with daily home care is required.

Stage 3 - Early periodontitis - Stage 3 periodontal disease is when the deeper periodontal structures start to become diseased. Clinically, you may see exaggerated gingival inflammation. However, the deep pockets, especially on the palatal side, may only be evident upon probing during a more thorough intraoral exam under anesthesia. This stage is usually irreversible, and treatment goals are aimed at "damage control" and prevention of local extension of the disease.

Treatment starts with a periodontal prophylaxis. Further treatment may be necessary for pocket reduction (gingivectomy, or flap surgery), bone or tooth re-contouring (odontoplasty or osteoplasty), and deep pocket debridement (open curettage). Intraoral radiography is helpful to document pathology and plan more advanced treatments.

Stage 4 - Established periodontitis - Deep periodontal pockets (greater than 5 mm), gingival recession, loss of alveolar bone (sometimes exposing the root furcations), and tooth mobility characterize Stage 4 periodontal disease. Treatment requires a firm commitment for home care and frequent follow-up visits. It is very important when planning periodontal surgery to get a strong commitment from the owner for home care compliance. When home care is not an option, extraction is often necessary. Some of the procedures utilized to save Stage 4 teeth include: flap surgery, osseous implants, guided tissue regeneration, and periodontal splints.

Stage 5 - End-stage periodontitis - "End stage" periodontal disease is treated by extraction. The teeth which have been diseased this severely are no longer functioning to benefit the animal's masticatory function, and are simply acting as "splinters" in the mouth harboring a nidus for more infection. Pet owners will often ask, *"How will my pet eat without all those teeth?"* The answer is *"Better than with them in this shape !"* Always get owner consent prior to extraction. Pet owners are often shocked at the number of teeth which must be removed in advanced periodontal disease cases. These same pet owners, however, are often surprised at how much better and happier their cats feel following multiple extractions. Teeth that have been rendered loose in the mouth should be treated by extraction. Teeth with radiographic evidence of greater than 75% bone loss are generally considered candidates for extraction as well. Teeth with moderate periodontal disease, exhibiting such signs as gingival recession and furcation exposure, must be dealt with on a case-by-case basis. Treatment plans must take into consideration the ability and willingness of the pet owner to care for the cat's teeth at home.

Extraction of feline teeth for periodontal disease treatment must include extraction of the whole tooth.

Never leave a fractured root tip behind. Retained root tips are a continued source of pain and infection. The best way to avoid root fracture during extraction is to perform the extractions carefully and correctly. The extra time spent performing a careful extraction is always less than the time spent retrieving root tips. Single-rooted teeth (incisors, second premolars, and maxillary molars) can be extracted by "simple" elevation. Multirooted teeth should be sectioned prior to extraction, and the individual roots elevated separately. Canine teeth should be approached surgically by creating a mucoperiosteal flap and removing buccal cortical bone. Postoperative bleeding is reduced, and healing progresses faster if extraction sites are sutured. Suture material should be fine (4/0 or 5/0) and absorbable.

Fractured Teeth with Pulp Exposure

Tooth fracture may occur in cats following trauma, or less commonly through chewing activity. Fractured teeth can be recognized by visualizing a loss of crown structure. When a tooth has been broken, the pulp chamber may be exposed to the oral environment. This pulp exposure is seen on oral examination as a pink (vital pulp) or black (necrosed pulp) spot at the site of exposure.

Any time a pulp cavity is exposed, it must be treated. The "let's wait and see" days are over. Exposed pulp is painful to the animal and can lead to serious infections [3]. There are basically three treatment options that should be discussed whenever an exposed pulp is encountered. The first is to do nothing, and this is a very poor option. Doing nothing leaves a painful tooth in the mouth as a potential source of infection. The second option is to extract the tooth; extraction fulfills the treatment goals of preventing pain and infection (as long as no broken roots are left behind). A third option is to save the tooth by filling it (performing a root canal), if an intraoral radiograph shows the tooth to be treatable.

A freshly-broken tooth is one of the few dental emergencies where time is critical. Vital teeth can be saved by performing a direct pulp cap if treated in time (up to two weeks in very young patients, only 48 hours in adult patients).

In feline dentistry, a pre-treatment radiograph is very important prior to undertaking any endodontic treatment. Teeth with evidence of resorptive lesions or other root pathology have a much poorer prognosis.

Feline Odontoclastic Resorptive Lesions

Feline odontoclastic resorptive lesions (FORL), also known as neck lesions, cervical line erosions, and cat carries, are a common problem in cats. Studies worldwide have shown incidence rates of over 50%! On oral examination, these lesions often are associated with intense, cherry-red gingival inflammation at the gingival margin. FORL can also be demonstrated on oral examination by gently brushing the suspected lesion with the soft, feathered end of a broken wooden "Q-tip". Gentle stimulation of these lesions invokes a strong jaw chattering response.

Feline odontoclastic resorptive lesions are very painful. Clinical signs associated with feline odontoclastic resorptive lesions include anorexia, drooling, and overall malaise. These lesions are not thought to be infectious in nature, but teeth affected with FORL may go on and become abscessed secondarily. The etiopathogenesis of FORL has yet to be elucidated. Histologically, the lesion is characterized by increased odontoclastic activity. Odontoclasts function to resorb tooth structure. At this time, there is no record of success in preventing these lesions from occurring. FORL have been classified into 5 categories. Class 1 lesions are erosions in the enamel only. Class 2 lesions are erosions into the enamel that extend into the dentin. Class 3 lesions extend into the pulp chamber. Class 4 and 5 lesions involve varying degrees of crown destruction. Internal and external root resorption often accompany these lesions and must be documented radiographically.

Restoration of FORL is controversial. The controversy lies in the fact that the majority of restorations fail [4]. With these poor results in mind, it is this author's opinion that all teeth affected with FORL (Class 2 or greater) be extracted.

A crown amputation procedure has been described for "extraction" of teeth exhibiting advanced FORL [5]. In this procedure, the crown of the tooth is removed while intentionally leaving the resorbing roots behind. Prior to performing this procedure, it must be shown that there is no evidence of concurrent periodontal disease. Cats with associated periodontal disease or gingivitis/stomatitis should never be considered candidates for crown amputation. In these cases, the whole tooth structure must be removed.

Feline Gingivitis/Stomatitis Syndrome

Probably the most frustrating oral disease seen in clinical practice is feline gingivitis/stomatitis syndrome (FGS). Cats will present clinical signs of partial to complete anorexia, drooling, halitosis, and oral pain. Physical exam will show various signs of gingivitis (inflammation of the gingiva), stomatitis (inflammation extending to the oral mucosa), palatitis, faucitis (inflammation of the caudal fauca), and pharyngitis. A complete diagnostic workup is necessary to help rule out the various causes of this

syndrome.

The diagnostic workup begins with a complete physical exam, CBC/Chemistry, feline serology and other ancillary tests as needed should be performed. Next, a dental prophylaxis should be performed. All teeth exhibiting feline odontoclastic resorptive lesions and all teeth with end-stage periodontal disease should be extracted. Also, any root tips or fragments need to be removed. Never leave fractured root tips behind in these cases. Dental radiographs are essential when evaluating for retained roots. Additionally, a biopsy should be performed. Samples from the gingiva, and affected areas in the pharynx should be submitted for histopathology and DFA staining (to rule out pemphigus).

The results of the biopsy often show "lymphocytic-plasmacytic stomatitis (LPS)". This is not a diagnosis. This is the typical histological picture whenever cats have chronic inflammation. The histopathological results that we may see to alter our treatment include eosinophilic granuloma, autoimmune diseases, or neoplasia.

Following dental prophylaxis, the owners need to be counseled to provide daily home care. Most cases of feline gingivitis/stomatitis syndrome are thought to be resulting from an overexaggerated oral immune system response to plaque bacteria. In some cases, simply keeping the oral environment clean will keep this condition in check. A home care program may include daily toothbrushing, two-to-three times a week chlorhexadine (topical) application, and chronic antibiotic therapy. Clindimycin, metronidazole, or **tetracycline** are good antibiotic choices.

When the biopsy results are not specific (LPS) and home care is not working, treatment options include medical or surgical management. Many drugs have been used with varying degrees of success. The most successful drug appears to be **methylprednisolone acetate** (Depo Medrol) given at a dose of 20 mg per cat, every 3 - 4 weeks as needed. This drug has many potential side effects and negative consequences, including diabetes.

Surgical treatment, involving extraction of all teeth caudal to the canines, has been shown to be effective in curing this disease [6]. This is a labor-intensive procedure, and will not be successful if any root fragments are left behind. It is difficult, if not impossible, to perform this procedure without dental x-rays and high-speed drills.

Management of FGS with laser treatments does show promise for the future. Treatment of feline gingivitis/stomatitis with a laser should still be considered experimental. To date, no published papers have appeared documenting this procedure. There are, however, anecdotal reports of great success.

Feline gingivitis/stomatitis is a frustrating disease. Lymphocytic-plasmacytic gingivitis is not a diagnosis. Never leave root tips in these cats. Total mouth extraction should be reserved for cases refractory to home care (or when home care is not possible), but it is often successful.

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