

Management of dental disease in the canine and feline patient

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Categories : [RVNs](#)

Date : October 1, 2010

Michelle Donovan RVN, DipAVN (medicine), looks at complications associated with periodontal disease and giving advice to owners

PART one of this article (*VN Times* 10: 09), explained the anatomy and physiology of the tooth and head, and defined periodontal disease. Part two discusses complications with periodontal disease, other related oral and/or teeth problems, treatment, safety aspects and prevention – including advice to owners. Periodontal disease is caused by plaque and the rate of progress is affected by the animal's breed, as well as any underlying diseases.

Breeds

Pure-bred dogs and cats (such as Abyssinian and Siamese) appear to develop periodontitis more rapidly than cross-breeds. Underlying problems include:

- immune-compromised animals, such as animals undergoing long-term steroid therapy;
- cats with viral infections, such as feline immunodeficiency (FIV) or feline leukaemia virus (FeLV);
- animals with systemic diseases, such as diabetes mellitus or hypothyroidism;
- hormonal influences (this is known to occur in humans during pregnancy, but has not been studied in animals); and

- diet – foods that are sticky and high in short-chain carbohydrates allow plaque to accumulate more easily (Robinson, 2002).

Potential complications

Bacteraemia can develop from scaling and extracting teeth affected by periodontal disease. This occurs from inflamed periodontal pockets that may have ulcerated epitheliums, which allow bacteria and bacterial toxins to enter the inflamed vascular tissues and then into the systemic circulation. Patients with periodontal disease that have not undergone scaling and teeth extraction are suspected to encounter bacteraemia intermittently. This could be a primary cause of organ disease (such as renal disease) or exacerbate the existing disease (Robinson, 2002).

Oral ulcers

The calculus on the teeth causes friction on the lining of the mucosa of the cheek, and can result in an ulcer at this site. Ulcers can also develop from underlying disease, such as kidney failure or autoimmune disease. If suspected, this should be investigated and treated appropriately. The clinical signs of oral ulcers are excessive salivation, pawing at the mouth and anorexia. If the ulcer is caused by periodontal disease, the teeth need mechanical therapy as per the veterinarian's instructions. The patient is discharged and provided with a daily oral home care routine.

Oral masses or tumours

Oral masses can be caused by gum or tooth infection, or by a tumour. They may be benign or malignant. The clinical signs are the same as for oral ulcers – however, a bloody discharge from the mouth can be present. The oral mass needs to be diagnosed – a fine-needle aspirate can be sent to the laboratory for cytology or a biopsy can be taken. Depending on the position of the mass, the patient may need to be sedated or anaesthetised. Lymph nodes will be examined and, if appropriate, imaging for metastases will take place. Non-malignant masses can be surgically removed. Malignant tumours would need surgery to de-bulk the mass, and possibly radiation or chemotherapy. Prognosis depends on the tumour type.

Gingival hyperplasia

This is an increase in tissue in response to chronic mild irritation. Boxers are genetically predisposed to this ([Figure 1](#); Crossley and Hennes, 1996-2000).

Feline chronic gingivostomatitis

This is chronic inflammation of the gingiva and oral mucosa. The aetiology is unknown and the condition may be immunemediated. It will possibly cause excess salivation, discomfort and

anorexia. A full work-up to investigate the underlying cause is essential (Derbyshire and Gorrel, 2005).

Equipment, safety and procedures

One room should be designated for oral and dental procedures, due to the bacterial aerosol produced. The bacterial aerosol can travel up to two metres and remain in the air for several hours. Good lighting and ventilation are important. Any personnel involved should wear masks and glasses to protect themselves from the aerosol and debris. Gloves are important as bacteria will infect wounds – the oral cavity is never a sterile site.

The patient should be anaesthetised, orotracheal intubation performed (with a cuffed endotracheal tube) and a throat pack placed (remember to remove it at the end of the procedure), to protect the airways from bacteria, debris and fluid. Position the patient in lateral recumbency with the head down over a tub table to keep the patient dry and prevent hypothermia.

Instruments are sterile for each patient, and to work efficiently they must be kept appropriately sharp for their use. The dental machine should be serviced regularly – check with your supplier. At the start of the dental examination it is important to examine the teeth and record findings. A periodontal probe is used to measure the periodontal probing depth and assess gingival inflammation, furcation lesions and tooth mobility. The dental explorer is a sharp-ended instrument used to assess the presence of caries and enamel and dentine defects, such as fractures. Before scaling, it is recommended to clean the oral cavity with a 0.2 per cent chlorhexidine solution and a toothbrush to decrease the bacteria in the mouth.

Calculus forceps are used to crack off large pieces of calculus. Care must be taken to avoid nipping the gums and potentially chipping the crowns on small cat teeth.

Power scaling removes calculus quickly, but care must be taken not to cause heat trauma to the tooth. This could cause inflammation of the pulp and burn gingival tissues. Cool water continuously dripping from the tip of the scale probe should prevent this, and scaling teeth at intervals will allow the scaler to rest periodically. Scalers are available in two types – ultrasonic and sonic (air). Both scalers work with a vibrating tip – the ultrasonic scaler works at a higher frequency than the sonic type. This means the sonic is less effective, but generates less heat, and the level of heat trauma is decreased.

The tooth is scaled from the top down towards the gum. The scale tip should be kept flat on contact with the tooth and the pointed end of the tip not used on the tooth as it will engrave the tooth surface. This will leave surfaces uneven, which will allow plaque to collect (Robinson, 2002).

Hand scaling

Some people may prefer to use a hand scale instrument over a power scaler to remove calculus deposits. It is used directed away from the gum.

Curettes

The shape of the curette is similar to a scaler, but is smaller, rounded and not sharp, thus preventing soft tissue damage. A curette is used to scale below the gum line and root surfaces in periodontal pockets deeper than 2mm. The curette will remove necrotic and infected cementum from the root, leaving the tooth smooth and healthy. This is known as root planing.

Tooth extractions

These are carried out by the vet, usually after the teeth have been scaled and the mouth rinsed to flush out debris. This reduces the amount of bacteria in the mouth, reducing potential bacteraemia. The nurse needs to direct the light, retract tissues and provide suction and irrigation if the unit used does not have cool water. The two types of extraction are detailed below.

- Closed (non-surgical) extraction is performed by using luxation or elevation, leaving the alveolar bone intact. The socket can be left open to heal by granulation, or the gingiva can be sutured over the socket – this may reduce postoperative pain.
- Open (surgical) extractions involve raising the mucoperiosteal flap. This allows access to remove the alveolar bone from the buccal surface of the tooth root. The extraction socket is closed by replacing the mucoperiosteal flap, thus allowing primary healing (Derbyshire and Gorrel, 2005; see *VN Times* 10.09).

Polishing

This smooths the tooth surface, preventing plaque attachment, and removes stains from teeth. A coarse paste is effective at removing stains, but a smooth paste must be used afterwards to smooth the scratches. Dental polishers generate excessive heat and can cause trauma to the pulp. To reduce this, keep the polisher at a steady speed (such as 4,000rpm) and apply the paste to the teeth with light pressure. Avoid passing the polisher over the gums, as this will damage the epithelium.

Final rinse

Once dental treatment has been completed, the mouth should be rinsed and periodontal pockets flushed with a 0.2 per cent chlorhexidine solution.

Antibiotic therapy

Antibiotics are not recommended to be used alone, but are often used in combination with mechanical therapy to treat gingivitis or periodontitis (Crossley and Hennes, 1996-2000).

Preventing dental disease

Veterinary nurses can advise owners on the importance of oral home care, as without a daily routine, the benefits of dental treatment will only last a few weeks. Tooth brushing is most effective for removing plaque and preventing calculus formation. Special attention is needed at the gum line and gingival sulcus, where plaque can congregate easily and is not dislodged by chewing. A toothbrush of medium firmness is advised, as too soft a brush will lose shape quickly and not dislodge plaque. Too hard a brush may make the soft tissue sore. Choose the appropriate size for the dog or cat.

A plaque-disclosing solution can be used after brushing the teeth to see how effective the brush was and, if needed, an alternative can be used. The first time teeth are brushed, a finger brush is advised, especially for puppies. Once the patient is comfortable, a toothbrush can be used.

Toothpastes are not essential, as it is the action of brushing that dislodges the plaque, but toothpastes are made especially for pets with flavours such as chicken or fish to provide an enjoyable experience for the animal. Human toothpaste must not be used – if swallowed, the fluoride may cause harmful side effects, such as gastrointestinal and skin irritation.

Brushing techniques

Using circular or side-to-side motions for the teeth and gingival margins allows cracks and crevices to be reached. To reach the gingival sulcus, hold the brush at a 45-degree angle to the tooth surface. Initially, retract the lips and brush the sides of the teeth at the buccal surfaces and the gingival margins. Increase the number of teeth per day until the whole set of teeth can be cleaned in one session. Once the pet is comfortable, the mouth can be opened and the palatal and lingual surfaces of the teeth cleaned. Having an assistant hold the mouth open is the ideal situation. A reward for good behaviour is recommended, such as a game or treat for the dog. A cat may like a treat or to be groomed. Remember – do not force the animal, and stop if it becomes distressed. Gingivitis may result in bleeding when the teeth and gums are brushed – this should not be painful, so brushing can be continued. As plaque is reduced, the gingivitis will decrease.

Chemical anti-plaque agents

Chlorhexidine-based products aid in the removal of plaque, and have antibacterial properties effective against some viruses and fungi. These products are available as either solutions or gels. They are most effective when used in combination with tooth brushing, but can be used alone if the pet detests tooth brushing. The solution can also aid healing of superficial oral lesions (Robinson,

2002).

Advice for owners

Veterinary nurses can demonstrate to owners how to brush their pet's teeth and encourage the owner to repeat the process, then advice can be given if difficulty arises ([Figure 2](#)). Ideas to encourage owners to form a daily routine include explaining that tooth brushing:

- reduces halitosis (bad breath);
- will improve their pet's general health; and
- means teeth will remain cleaner for longer. Therefore, less dental treatment will be needed, thus resulting in less expense.

Chewing is still under discussion regarding any beneficial effects to reduce periodontal disease. Chewing an object can help dislodge calculus and plaque, but it can not access all areas of the tooth. Special diets have been developed to manage patients with dental disease. Hills Science Plan developed two dry diets for dogs and cats. The "oral care" diet is for preventive management of dental disease, and the "T/D" diet (tooth diet) is to reduce plaque and calculus accumulation or early gingivitis. The kibble shape is designed to resist crumbling when it is first bitten into; this allows the fibres in the kibble to wipe the tooth before the kibble splits, preventing adherence of plaque. Royal Canin developed a diet called British Shorthair 34; this can improve dental hygiene in cats. The kibble contains calcium chelators that help to remove calcium to reduce mineralisation, thus preventing plaque and calculus formation on the tooth.

Summary

It is important to assess the degree of periodontitis and procedures needed for dental therapy. Aim to prevent periodontal disease and use nurse clinics to advise owners.

- Crossley A D and Hennet P (1996-2000). *Pet Dentistry for Veterinary Nurses* (August 2000), The College of Animal Welfare.
- Derbyshire S and Gorrel C (2005). *Veterinary Dentistry for the Nurse and Technician*, Elsevier, Edinburgh. Robinson G A J (2002). *Everyday Dentistry For The Cat and Dog*, Henston.