

Oral care and the reduction of periodontal disease in companion animals



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Kelly achieved a BSc (Hons) in Animal Behaviour and Welfare degree before qualifying as an RVN in 2017. She has since worked in first opinion, emergency and referral practices, and has recently completed the BVNA Oral Care Nurse Certificate. Kelly loves the variety and scope involved in being an RVN. She has a wide range of clinical interests, including wildlife, exotics, analgesia and dental. In her spare time Kelly volunteers for the BDMLR, pampers her three cats and goes on countryside walks with her two dogs.

ABSTRACT By the age of 2 years, it is estimated that 80% of dogs have periodontal disease (Stott, 2019), as do 70% of cats over 3 years old (Ackerman, 2020; Cullen, 2011) and 80% of older cats (Milella, 2012). Early treatment of periodontal disease can prevent the complications of systemic disease, infection and malnutrition (Stott, 2019). Heart, liver, kidney and respiratory health can all be compromised by periodontal disease (Milella, 2012) and early intervention is deemed the only way to prevent periodontal disease from progressing.

Keywords oral, dental, periodontitis, gingivitis, teeth, tooth

Periodontal disease

Periodontal disease is a group of inflammatory diseases and can be divided into two stages: gingivitis and periodontitis. Gingivitis is the inflammation of the gingiva caused by bacteria, and can be reversed by good oral care at home, whereas periodontitis is irreversible and causes tooth mobility and attachment loss (Stott, 2019).

Plaque is a microbial community within a matrix of polymers of bacterial and salivary origin (Milella, 2012) which can build up on a clean tooth within hours and cause gingivitis within 48 hours (Milella, 2020a). Plaque is soft and not always obvious on the tooth surface, whereas calculus is mineralised plaque that can only be removed by scaling the teeth (Milella, 2009). This rough deposit encourages the proliferation of further plaque and bacteria (Fletcher, 2015).

Halitosis, hypersalivation, anorexia and alterations in behaviour are the most common signs of periodontitis that are noticed by owners (Stott, 2019). On closer assessment, changes in gingival colour, gingival bleeding, periodontal abscesses, gingival recession, tooth mobility and pathological fractures can often be seen (Stott, 2019). Dental radiography can be used to give a more complete understanding of the extent of the periodontal disease, particularly vital in the case of tooth or jaw fractures, severe periodontal disease, resorptive lesions, missing teeth and oral swellings (Milella, 2011).

It should be noted that some suggestions have been made on the method of scaling and the effectiveness of polishing teeth. Fletcher (2015) discusses these studies and concludes that manual scaling is less efficient than ultrasonic scaling, while different ultrasonic scaler techniques can cause damage to the enamel surface, particularly if contact time is over 5 seconds or the tip is used instead of the flat surface. In addition, the same study concluded that polishing with a soft prophylaxis cup after scaling increases the calculus removal and does not increase enamel damage when combined with a fine prophylaxis paste.

Dogs

The breeds deemed most at risk include toy and small dog breeds (Stott, 2019), border terriers (Summers et al., 2019), toy poodles, King Charles spaniels, greyhounds and brachycephalic breeds (Westgate, 2021; Woodmansey, 2019). Maltese terriers and those with dental disease in their familial groups are also more at risk (Partridge, 2018). Non-congenital dental diseases requiring veterinary intervention can include trauma such as fractures, discoloration and erosion through chewing hard materials.



A fractured crown with pulp exposure will catch a dental explorer probe, as opposed to abrasion in the case of slow long-term wear, where abraded teeth will have brown tertiary dentine present and a smooth surface. If the pulp is exposed, the tooth must always be presumed to be painful and requires extraction or root-canal treatment (Milella, 2020a). As 93% of discoloured teeth contain necrotic pulp, extraction or root canal treatment is always recommended (Milella, 2020a).



Cats

Maine coon and oriental breed cats can be particularly susceptible to periodontal disease (Milella, 2012). Cats of any breed that are over 4 years old are at risk of feline odontoclastic resorptive lesions (FORLs), with as many as 29% of all cats found to have them (Milella, 2020b). These require a radiographic assessment to determine the level of root resorption to reduce the amount of iatrogenic damage the veterinary surgeon may cause searching for non-existent root remnants during extractions (Bloor, 2006). FORLs are classified as Type 1 or Type 2. Type 1 FORLs present with significant inflammation at the gingival margin and have lesions at the neck of the tooth. The root remains unchanged radiographically, while the neck and crown are radiolucent, with some resorption at the furcation and alveolar bone. Type 2 FORLs present with very little gingivitis, sometimes with discoloration of the crown, and the radiography shows lamina, root structure and periodontal ligament loss, with the root density equal to that of the surrounding bone (Milella, 2020b). Removal of teeth affected by either of these lesions is recommended as this is a progressive and painful condition. Type 1 FORLs require the removal of the whole tooth including the root, whereas in the case of Type 2 FORLs without endodontic disease or periodontitis, crown amputation is acceptable (Milella, 2020b).

Feline chronic gingivostomatitis is an excessive inflammatory response to the presence of plaque and often extends beyond the mucogingival junction into the tissues of the entirety of the oral cavity. In these cases, full-mouth extractions are recommended (Milella, 2020b).

Rabbits

Dental disease in rabbits can be congenital or acquired (Druce, 2015). Rabbit breeds predisposed to congenital dental malocclusion, a precursor of dental disease in rabbits, include the lionhead and Netherland dwarf breeds, as well as other similarly short-faced breeds (HPC, 2021; PDSA, 2021; RWA, 2021; VCA, 2021).

Acquired dental disease, including malocclusion, causes teeth to be worn insufficiently or unevenly and is a progressive condition (Lord, 2012; Druce, 2015). Reduced appetite, bruxism (teeth grinding), salivation, hair loss on the face, epiphora (excessive tear production), weight loss, gut stasis, nasal discharge, reduced coat condition, abscesses and reduced faecal output are all indicators of rabbit dental disease (Druce, 2015; Lord, 2012). Diet, genetics, trauma and infection are all causative factors in rabbit dental disease (Lord, 2012). The duration of time spent grazing and the abrasiveness of the diet are all factors in the sufficient wearing of healthy rabbit teeth. Offering a diet composed of 80% high-quality grazing of grass or hay (Speight, 2017), small volumes of commercial pellets and some fresh leafy green vegetables increases the time spent on chewing in a natural, figure-of-eight motion, wearing down teeth in a more uniform fashion (Druce, 2015). Avoiding muesli diets limits the animal's ability to selectively feed (Lord, 2012). For rabbits unaccustomed to hay or reluctant to eat it in large volumes, a variety of hay types and methods should be offered. Rye, timothy, fescue, cocksfoot and meadow grass are all suitable for adult rabbits, and hay can be offered in large trays for foraging, in raised racks, bowls or containers, or stuffed into tubes to provide enrichment and interest (Speight, 2017).



A dental handpiece and burr should be used where rabbit incisor length requires reducing. In congenital dental disease, removal of the incisors may be recommended by the veterinary surgeon (Druce, 2015). Cheek teeth and spurs can be burred to restore normal occlusion surfaces where dietary management alone is insufficient, although owners must always be made aware that this is a long-term condition which is likely to reoccur, depending on the causing factors and changes implemented in the rabbit's routine (Druce, 2015).

Nutrition

Nutrition and oral hygiene modifications can help reduce the risk from periodontal disease in all pets (Stott, 2019). While food sources alone cannot prevent periodontal disease, dry food is considered the best nutritional option for preventing periodontal disease in dogs and cats, with entirely dry-fed dogs having a 22% chance of developing periodontal disease. Mixing wet and dry food increases this chance to 30%, and home-prepared meals increase the risk yet further to 41% (Stott, 2019). Similar results have been proven in cats fed a specific dental diet (Milella, 2012), however, the nutritional status and requirement for the pet as a whole must always be considered, as dry diets can be detrimental to those with poor renal, urinary or gastrointestinal concerns (Stott, 2019).

The popularity of raw diets has grown in recent years, and while the debate about their suitability for pets is a cause of contention in many veterinary practices, it should be acknowledged that feeding bones can decrease cosmetic tartar evident on pets' teeth. However, it does not reduce periodontitis or plaque, and it can increase the incidence of fractures, as well as the associated risk to the rest of the gastrointestinal tract (Chandler, 2018; Davies, Lawes & Wales, 2019; Freeman et al., 2013) – although there is some debate on the prevalence of obstruction or perforation in raw versus cooked bones (Freeman et al., 2013). The Raw Feeding Veterinary Society (2021) promotes the chewing of 'appropriately sized' raw bones, never cooked or large limb bones, and agrees that more research should be undertaken to quantify the risk-benefit in this discussion.

Oral care at home

Following professional intervention, an absence of appropriately diligent home care will result in the return of periodontal disease and gingivitis scores within 3 months (Stott, 2019). This home care can take the form of both mechanical and chemical plaque-removal techniques. While only 2% of dog owners comply with regular toothbrushing, this is considered the best method for preventing periodontal disease (Cullen, 2011; Stott, 2019) when completed at least 3 days per week (Robinson, 2019). In cats, it was found that no owners who began toothbrushing continued past 6 months (Milella, 2012).

Toothbrushing should be introduced slowly to habituate the patient to the process. Initially, begin with head restraint and examination of the buccal (outer) teeth surfaces (Ackerman, 2020), then advance to placing a small amount of pet-appropriate toothpaste on a canine tooth or inner cheek. Once the pet readily accepts this, the toothpaste can be gently massaged on to the buccal teeth and gums. When this routine has been established, the toothpaste can be applied to a brush and this introduced to the back teeth initially, working forward towards the incisors (Milella, 2009). Active toothbrushing in young animals should only be commenced once all the adult teeth have erupted, although animals should be encouraged to allow oral examination from a young age (Milella, 2009). Teeth should be brushed at a 45° angle to the gingiva, with medium-bristle toothbrushes. While human toothpaste is contraindicated due to the presence of fluoride (Stott, 2019), enzymatic and chlorhexidine-based toothpastes are shown to have the highest effectiveness at reducing plaque build-up (Ackerman, 2020). Finger brushes are deemed inappropriate due to their inability to actively clean the subgingiva (Ackerman, 2020).



Owners should always be made aware of the risks of animals showing aggression due to pain or fear during toothbrushing, and a demonstration in the consult can primarily assess how the patient is likely to tolerate the procedure, as well as demonstrating safe practice (Ackerman, 2020).

If toothbrushing is not possible, oral spray and gel containing cetylpyridinium chloride can effectively reduce calculus, halitosis and plaque occurrence, but can cause mucosal irritation and tooth staining in the long term (Stott, 2019). Chlorhexidine gel and mouthwash at 0.12% concentration prevent and reduce plaque build-up and gingivitis, and can remain active in the oral mucosa for 12 hours (Milella, 2012). Water additives are less effective than either toothbrushing, gels or sprays as the product's contact is not ensured on the tooth surface (Cullen, 2011) and their tolerance by the patient can be varied.

A list of approved dental products from the Veterinary Oral Health Council (VOHC) gives reliable accreditation to the oral-care products available, including toothpaste, oral gel, spray and water additives, dental chews and treats, and dental diets. The VOHC also explains whether plaque or tartar is prevented and whether products must be purchased from a veterinary clinic (VOHC, 2021).

Dental chews claim to reduce the requirement for veterinary treatment of dental disease, mainly by the abrasive action they have against the tooth surface. In dogs, they have been shown to reduce halitosis by 45%, plaque by 32% and calculus by 60% (Stott, 2019). This varies according to the structure and composition of the chew, as well as the length of time and mechanical action the pet chews with.

Some chews, such as the Pedigree Dentastix daily oral care chew and Dentastix Advanced chew, contain ingredients designed to slow the mineralisation of plaque to tartar, giving owners more opportunity to brush the teeth before mineralisation occurs (Milella, 2020a). Greenies are designed specifically according to breed size, and may last even longer (Milella, 2020a). For cats, Dentabites have been specifically designed to cause abrasion on the tooth surface, rather than shatter when chewed, by having a lower density (Milella, 2020b).

Conclusion

Early assessment of young pets can be undertaken in nursing clinics to make owners aware of congenital defects which may affect the animal's dentition, as well as to promote good standards of oral health (Baxter, 2007). Using a model to demonstrate to owners how to brush teeth, explaining the effects of poor oral hygiene and providing them with written information to take home helps improve their compliance (Barnes, 1994).

It is important to discuss the safety and effectiveness of dental chews, rawhide and biscuits (Jevring, 1994) with visual displays for the owners during regular nursing consults (Bowden, 1996). After dental treatment has been conducted, nursing recall appointments will demonstrate the team's commitment to their pets' health (Bloor, 2009) and could potentially improve client compliance.



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