Initial periodontitis in a 3-year-old cross breed female dog: case report

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Introduction

Periodontal disease is the most common oral disease in dogs with a prevalence of about 80% (Riggio et al., 2011). This disease is progressive and involves two stages: gingivitis (reversible) and periodontitis (irreversible, but often controllable). It is caused by plaque buildup on teeth. Plaque is a smooth membrane, adhesive, contaminated with saliva, bacteria and debris. Bacteria and bacterial products cause inflammation of soft tissue. The plaque becomes mineralized to form calculus, which migrates into the gingival sulcus, causing additional inflammation, loss of periodontal ligament, bone loss and ultimately tooth loss (Ford & Mazzaferro, 2007).

Case history/Biodata

A 3-year-old, 15 kgs Terrier and Spitz cross breed, female dog named Hazzel and belonging to Mr. Ongiri K.M (case number 34195) was presented to the University of Nairobi Veterinary Clinic with a complaint of halitosis and dental calculi deposit on teeth. The client also indicated that the patient had undergone dental cleaning a year earlier and had for the past one week noted purulent discharge below the left eye. Oral radiograph was done but no significant finding that were noted.

Management

The patient was fasted for 12 hours following which dental scaling was done under general anaesthesia. The patient was sedated using 16.5 mg of Xylazine Hydrochloride (Bomazine 2%, Bomac Laboratories Limited, Auckland- New Zealand) administered intravenously. Induction and maintenance of anaesthesia was achieved by use of 100 mg of 5% Thiopentone Sodium (Thiopental® Rotexmedica, Trittau-Germany) administered intravenously. The oral cavity was opened using a mouth speculum and further examination of the teeth and extent of calculi deposit done. Examination revealed presence of gingivitis characterized by swollen gums that
easily bled when touched as well as hard brownish deposit on buccal and lingual surfaces of all tooth. The large dental calculi were first removed, dilute hydrogen peroxide then applied on tooth surface and curettage done using dental scaler. Curettage was first done on the buccal surface of the teeth and then on the lingual surface. Both the supragingival and subgingival calculi were removed as much as possible. The mouth was then flushed using tap water. Amoxillin Trihydrate (Betamox® Norbrook veterinary Pharmaceuticals, Nairobi-Kenya) 225 mg and Dexamethasone (Dexamethasone, Eagle vet. Tech Co. Ltd) 4 mg were administered intramuscularly. The patient was discharged the following day with five, 200mg Metronidazole tablets (Trogyl, Biodeal Laboratories Limited, Nairobi-kenya) that were administered, one tablet once per day for five days.

**Advice to client**

As an initial preventative method, the client was advised to try brushing the dog’s teeth at least three times a week and use locally available mouth wash especially chlorhexidine. The client was also advised to use chewable objects like rubber ball and bone as well as ensure that the patient was taken to a veterinarian for evaluation and dental cleaning at least after every 3 months.

**Discussion**

Periodontal disease is an infectious condition of a periodontium that affects more than 80% of dogs (Riggio et al, 2011), and this prevalence increases to about 85% in dogs over four years old (Roman et al., 1995). The main factors that play a role in pathogenesis of periodontal disease include: bacterial plaque, microflora, immune status, the amount of saliva, breed, age, routine of prophylactic cleaning and type of food (Harvey & Emily, 1993). However, plaque is the primary aetiological agent, which consists predominantly of gram-positive, aerobic, non-motile bacteria.
early in the infection and anaerobic, gram-negative and motile bacteria in the later stages of infection (Harvey & Emily, 1993).

The toxic metabolic products of these microorganisms and the host immune response against infection that triggers the inflammatory process initially leading to gingivitis which may later worsen and develop into periodontitis that can cause loss of bone, periodontal ligament, cementum or tooth (Harvey & Emily, 1993).

The process of periodontal disease formation can be classified into four stages: healthy periodontium (stage 0), gingivitis (stage 1), initial periodontitis (stage 2), moderate periodontitis (stage 3) and severe periodontitis (stage 4) (Harvey & Emily, 1993). This case was an initial periodontitis as it was characterized by gingivitis, dental calculi and intensive halitosis as it has been reported by (Gorrel and Rawlings, 1996).

The diagnosis of periodontal disease is based on history, clinical examination and radiological evaluation. Just like in this case, the main complaint is always halitosis (Emily & Penman, 1994). In periodontal disease, halitosis is due to tissue decay and bacterial fermentation in the sulcus or periodontal pocket. Clinical examination is usually performed in anaesthetized dogs (Gorrel, 2004) and in this case, the patient was sedated using xylazine hydrochloride to facilitate through examination of intra and extra-oral structures. (Gorrel, 2004) has reported that oral examination should include bone surfaces, the jaw muscles, salivary glands and regional cervical lymph nodes since these structures may be involved in periodontal disease.

Periodontal examination includes the evaluation of teeth mobility; injuries or furcation exposure; gingival retracting or hyperplasia; the evaluation of the depth and presence of dental plaque; presence of gingivitis and dental calculus. In this case, there were no identifiable: loose teeth, resorption of furcation. The depth of the gingival sulcus was less than 3mm which is usually
normal in small dogs (Gorrel, 2004). The calculus was evident, presenting as a brownish hard mass on the buccal and lingual areas of all tooth surface, and could not be removed by scraping or brushing with a gauze. Pope, (1993) has reported that sometimes the calculi is yellowish or brownish in colour and affects mostly fourth premolar and first superior molar teeth, as close to them are the openings of the parotid ducts and zygomatic glands but overtime affects all teeth. The gingiva was bleeding easily when touched during examination and this was indicative of an inflammatory process. Grove, (1998) has reported that bleeding during examination is a useful method of evaluating an active gingivitis.

In this case radiograph was taken to rule out presence of malar abscess that was considered as an important differential diagnosis based on the history of mucopurrulent discharge below the eye but no significant findings that were seen on oral radiograph. However, full-mouth radiographic examination is important in getting information on the bone and periodontal structures such as changes in alveolar bone, interdental bone height, presence of lamina dura, trabecular pattern, periodontal ligament and severity of bone loss. (Gorrel, 2004).

Treatment in this case was done under general anaesthesia and was achieved by periodontal curettage as described by (Manfra-Marretta et al. 1992). Curettage was aimed at removing dental calculi that was causing inflammation of gingiva and could have affected the supporting structures of the tooth if not removed. It has been reported that if there is severe bone loss, with roots exposure, an elevation of a gingival flap, complete curettage and displacement of the gingival margin closer to the apex of the tooth may be necessary, followed by fixation of the flap with sutures (Wiggs & Lobprise, 1997). In the case of failure of this treatment, tooth extraction should be performed (Manfra-Marretta et al. 1992). However, the goal of periodontal treatment is to eliminate calculi and therefore control microorganisms, restore normal anatomy and
physiology and avoid new adhesion of bacterial plaque on tooth surfaces by employing a strict preventative program (Harvey and Emily, 1993).

As an initial preventative method, the client was advised to try brushing the dogs teeth at least three time a week and use locally available mouth wash especially chlorhexidine. The client was also advised to use chewable objects like rubber ball and bone as well as ensure that the patient was taken to a veterinarian for evaluation and dental cleaning at least after every 3 months. Brushing teeth three times a week has been found to be effective in preventing plaque formation in dogs (Dupont, 1998; Niemiec, 2008). Antimicrobial substances may also help in effective biofilm removal (Jensen et al., 1995; Niemiec, 2008), in particular, chlorhexidine has been found to have a high efficacy in inhibition of oral plaque (Hennet, 2002) and has good antiseptic activity against all oral pathogens, more directly on the bacterial plaque organisms (Harvey & Emily, 1993). Other techniques that has been used in preventing dental plaques in animals include use of cookies and chewing objects for oral hygiene (Niemiec, 2008), additives to drinking water with an inhibitory effect on the growth of bacteria (Clarke, 2006) and oral rinse solutions as well as leather and biscuits with the addition of antimicrobial agents (Niemiec, 2008).

References


