

BASIC PERIODONTAL THERAPY

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The basis of periodontal therapy today is plaque control. This is accomplished via two to four components depending on the stage of the disease. These include a thorough dental prophylaxis, periodontal surgery, homecare, and extraction. There are numerous variations and treatment options for therapy. This lecture will cover the basics and touch on the available options.

The cornerstone of periodontal therapy is a **thorough dental prophylaxis**. This **MUST** be performed under general anaesthesia including a properly inflated endotracheal tube. The prophylaxis should include the following steps.

Step 1: Pre surgical exam and consultation

This is often a much neglected step of a professional dental prophylaxis. The veterinarian should perform as complete as possible physical and oral exam. The physical exam (along with pre-operative testing) will help ensure anesthetic safety. The oral examination will identify obvious pathology (fractured, intrinsically stained, or mobile teeth; oral masses; and resorptive lesions) as well as allow for a preliminary assessment of periodontal status. The veterinarian can then discuss the various disease processes found and the various available treatment options. Based on the physical findings, the practitioner can create a more accurate estimate (both financial and time). Both of which will decrease problems with over scheduling and client finances during the anesthetic event. This small time investment will improve the experience of everyone involved (veterinarian, technician, receptionist, client, and patient).

Step 2: Chlorhexadine lavage

The oral cavity is a contaminated area and a dental cleaning is a mildly invasive procedure. In this way, it often results in a transient bacteremia. For this reason it is recommended to rinse the mouth with a 0.12% solution of chlorhexadine gluconate prior to commencing the prophylaxis to decrease the bacterial load.

Step 3: Supragingival cleaning

This can be performed via mechanical or hand scaling. The mechanical scalars decrease anaesthetic time and include both sonic and ultrasonic types. The most common type of mechanical scaler in veterinary dentistry today is the ultrasonic scaler. There are two main types magnetorestrictive and piezoelectric). Both of these scalars

vibrate at approximately 45,000 Hertz. They are very efficient and have an additional benefit of creating an antibacterial effect in the coolant spray (cavitation). They are however can be more damaging to the tooth, and may leave some calculus behind. Thus, it has been recommended that hand scaling be performed after ultrasonic scaling to ensure the complete removal of calculus. Sonic scalers run on compressed air and vibrate at 8-18,000 hertz. They are safer, but slower than sonic scalers and do not offer cavitation. The area of maximum vibration is 1-3 mm from the tip. Do not use the tip or back of the instrument as these are not effective for calculus removal and can potentially damage the tooth. The instrument is placed on the tooth and LEFT on the tooth for up to 15 seconds. Once the instrument loses contact with the tooth, the scaler can no longer be effective. Run the instrument SLOWLY over the tooth surface in wide sweeping motions to cover every mm² of every tooth surface.

Hand scaling is performed with a scaler. This is a triangular instrument with e sharp cutting edges. In addition, the tip is very sharp. Scalers are designed for SUPRA-gingival use only. The scalers (as well as curettes below) are held with a modified pencil grip. The instrument is gently held at the gnarled or rubberized end with the thumb and index finger TIPS. The middle finger is placed near the terminal end of the shaft and is used to feel for vibrations which signal residual calculus or diseased/rough tooth/root surface. Finally, the ring and pinkie fingers are rested on a stable surface.

Hand instruments are used with a gentle touch and are run over the tooth numerous times in overlapping strokes until the tooth feels smooth. This step may be performed with a curette and combined with subgingival scaling (see below).

Step 4: Subgingival plaque and calculus scaling

This step is best performed by hand with a curette. A curette has 2 cutting edges and a blunted toe and bottom. In this way, it will not cut through the delicate periodontal attachment as long as excess force is not applied. The proper curette is selected based on its angulation. The lower the number (i.e. 1-2) the less the angle and the further rostral in the mouth the instrument is used. The face of the instrument is placed flat against the surface of the tooth and inserted gently to the base of the sulcus or pocket. Once there, the instrument is rotated so that the shaft is parallel to the long axis of the tooth. This will engage the calculus as well as place the instrument in the proper position for root surface and subgingival debridement. This is repeated with numerous overlapping strokes until the root feels smooth. Cleanliness can be further evaluated by gently directing compressed air into the sulcus. Any remaining calculus will appear chalky. This is a very technically demanding procedure and the practitioner is directed to continuing education programs to hone their skills.

Traditional ultrasonic scalers should not be used subgingivally due to thermal damage to the gingiva and pulp. This occurs because the water coolant cannot reach the tip of the instrument. However sonic and ultrasonic scalers with specialized periodontal tips have been developed for subgingival use. These are much easier to use and therefore will likely result in superior cleaning in the hands of novices. Like supragingival scaling, it is recommended to perform mechanical scaling first to remove the majority of the plaque and calculus first, and then follow up with hand scaling.

Step 5: Polishing

Scaling (especially mechanical) leaves the tooth surface (and especially the root) rough, which increases plaque attachment. Polishing will smooth the surface of the teeth which will retard plaque attachment. Polishing is typically performed with a prophylaxis cup on a slow-speed hand-piece with a 90 degree angle. The hand-piece should be run at a slow rate and no greater than 3,000 RPM. Ensure that adequate polish is used at all times. Running the prophylaxis cup dry is not only inefficient, it may also overheat the tooth. Just like with scaling, every mm² of tooth surface should be polished. In addition, slight pressure should be placed down onto the tooth to flare the edges of the prophylaxis cup so as to polish the subgingival areas. One tooth may be polished for a maximum of five seconds at a time to avoid overheating. The tooth can be further polished after a short break (while other teeth are polished).

Step 6: Sulcal lavage

The cleaning and polishing steps will result in debris such as calculus and prophylaxis paste (some of which is bacteria laden) to accumulate in the gingival sulcus. In some cases there are visible deposits, but in all cases there is microscopic debris. These substances will allow for continued infection and inflammation. Therefore a gentle lavage of the sulcus is strongly recommended. The lavage is performed with a blunt ended cannula which is placed gently into the sulcus and the solution is injected while slowly moving along the arcades. The typical lavage solution is sterile saline, although some authors favor a 0.12% Chlorhexidine solution.¹

Step 6 (a): Fluoride therapy (optional)

This is a controversial step with some dentists recommending that it be performed in all cases and some that it never be done. The positive aspects of fluoride include antiplaque and antibacterial activities, hardening tooth structure, and decreases tooth sensitivity. The latter activity is most important in patients with gingival recession and secondary root exposure. When root planing is performed, cementum is removed which may expose underlying dentin. In this case, sensitivity may result from the hydrodynamic theory of tooth sensitivity. Application of fluoride should help decrease this sensitivity.

Step 7: Periodontal probing, oral evaluation, and dental charting

This is a critical, however often poorly performed and underappreciated step. The entire oral cavity must be systematically evaluated using both visual and tactile senses. Careful visual examination should be performed during the periodontal evaluation. The periodontal probe should be inserted at six spots around EVERY tooth to identify periodontal pockets. This is performed by gently inserting the probe into the pocket until it stops and then “walking” the instrument around the tooth. The normal sulcal depth in a dog is 0-3 mm, and a cat is 0-0.5 mm. All abnormal findings must be recorded on the dental chart. Dental charting should be performed 4-handed. This means that one person evaluates the mouth and calls out pathology to the assistant who records it on the chart. Using the modified triadan system will greatly increase efficiency of this step. Dental charts must be of sufficient size to allow for accurate

¹ CHX®: Virbac

placement of pathology. The minimum size for an acceptable dental chart is 1/3 of a page, however veterinary dentists use full page charts. Samples of these may be downloaded at www.vetdentalrad.com/educationaldownloads.

Step 8: Dental radiographs:

Dental radiographs should be performed of ANY pathology noted on dental exam. This includes any periodontal pocket which is larger than normal, fractured or chipped teeth, masses, swellings, or missing teeth. Dental radiographs are a critical aid in the evaluation of dental pathology. Help is available for any questionable cases at www.vetdentalrad.com.

Step 9: Treatment planning

The practitioner, utilizing all available information (visual, tactile, and radiographic) then decides on appropriate therapy. Additionally, the prudent veterinarian will keep in mind the patient as a whole, the owner's wishes and willingness to perform homecare, and necessary follow-up. Following the creation of a dental plan for the patient, an estimate is created and the client contacted for consent.

Step 9 (a): Additional therapies

Based on the oral examination and client wishes, any additional therapy is performed. If this is extensive and would result in a long anesthesia or the practitioner to be unduly rushed, rescheduling the remainder of the work is an acceptable alternative. There are numerous possibilities for this (including referral), and the reader is directed not only to the extractions and composite bonding articles in this issue as well as to texts or hands-on labs for more information on these procedures. In this issue we will only cover periodontal therapy (see below).

Step 9 (b): Barrier Sealant

A barrier sealant has recently been introduced as a means to decrease plaque and calculus accumulation.² This is a waxy sealant that has been proven clinically to decrease plaque and calculus. While it has not been proven to decrease gingivitis and therefore periodontal disease, due to its placement at and below the gingival margin, it should theoretically work. Following a prophylaxis, the teeth are dried and then the product is applied. Following this, the client applies the home version on a weekly basis.

Step 10: Client education

The post-surgical release is an important step in periodontal therapy. Use this opportunity to go over radiographs (and pictures if available) with the client. This will not only re-enforce your findings and treatment, it will also allow you to discuss periodontal disease. This discussion should not only include immediate post-operative instructions; but also cover periodontal disease and long term periodontal care.

Home care:

² Oravet®, Merial.

This is a very important part of periodontal therapy. A recent study has shown that periodontal pockets are reinfected within 2 weeks of a prophylaxis if homecare is not performed. Therefore, homecare must be discussed with each client following a prophylaxis.

There are two divisions of homecare active and passive. They both can be effective if performed correctly, however active homecare is still the gold standard in homecare.

Active homecare consists primarily of tooth brushing. There are various veterinary brushes; however a soft child's toothbrush is also effective. There are numerous veterinary toothpastes available.³ These increase the palatability of the toothbrush, and many add a cleaning aid. Human tooth pastes are generally not recommended. There are also antimicrobial preparations that can be used in certain cases.⁴ Technique: Use a circular motion with the brush at a 45-degree angle to the gingival margin.

Frequency: once a day would be ideal, as this is required to stay ahead of plaque formation, but for most owners this is unrealistic. Three days a week is considered the minimum frequency for patients in good oral health. If the patient has periodontal disease, daily brushing is necessary. One other option for active homecare is to rinse with a chlorhexadine solution.⁵ This has been shown to decrease gingivitis if done consistently over time. Even though brushing and rinsing greatly improves periodontal health, it does not completely eliminate the need for professional cleanings.

Passive homecare is the other option for minimizing periodontal disease. Since this requires no work by the owner, compliance is more likely. This is especially important since long term consistency is the most important factor in the effectiveness of dental care. There are currently several diets that decrease tartar and plaque build-up. In addition, tartar control chews and treats have been developed.

All of these products have been shown to decrease plaque and calculus, however, they are most effective on plaque and tartar on the cusp tips not at gingival margin. Supragingival plaque and calculus is in general non-pathogenic. Of the available products, only two^{6 7} have been clinically proven to decrease gingivitis.

The downfall of all passive homecare products is that the patient is not likely to chew with the entire mouth; therefore areas will be missed. Passive homecare is most effective on the carnassial and surrounding teeth, where chewing is concentrated. Active homecare, in contrast, is most effective in controlling plaque and calculus on the incisor and canine teeth, likely due to the ease in accessing these teeth. Therefore, a combination of active and passive homecare is likely ideal.

Periodontal Surgery

Any pockets greater than normal for the species are pathologic and in need of therapy. It is important to note that this is a separate procedure from the prophylaxis and the practitioner should be charging for this. Periodontal therapy is aimed at removing the

³ CET®: Virbac

⁴ CHX®: Virbac

⁵ Nolvadent®: Fort Dodge Animal Health

⁶ CET hexachews®: Virbac

⁷ Prescription diet Canine and Feline t/d: Hills Pet Nutrition, Inc.

infection from the root surface (plaque, calculus, and granulation tissue) as well as smoothing the diseased root surface. This will allow for reattachment and decrease in pocket depth.

In the canine patient, pockets between 3 and 5 mm which do not have mobility or other issues are best treated with closed root planing and subgingival curettage. This step is performed in a similar manner to subgingival scaling above, with a combination of mechanical and hand scaling. This should be meticulously performed in order to achieve as clean a tooth as possible to promote healing.

An additional way to promote reattachment is the instillation of a sustained release doxycycline product.⁸ This has been shown to temporarily locally control the microorganisms as well as decrease inflammation. It is performed by mixing the product according to package directions and then inserting the product into the pocket until it is just over flowing. The product is then wetted, which will harden it, and tapped gently into the sulcus. If some of the product extrudes from the pocket, it should be rewetted and then placed. This should continue until the pocket is full.

Pockets greater than 5-mm require direct visualization of the root surface for effective cleaning. If the tooth is not effectively cleaned, the infectious agents remain along with the plaque and calculus. Visualization is best accomplished via periodontal flap procedures. These procedures are very effective in animal patients. If the clients are interested in salvaging the teeth, periodontal surgery can be performed. These are advanced procedure, but can be learned by general practitioners. However, the reader is encouraged to attend a hands on wet-lab prior to undertaking these surgeries.

The final and newest weapon in the fight against periodontal disease is the **Porphyromonas vaccine**.⁹ This is a bacterin against the most common periodontal pathogens in the domestic canine. Scientific studies using rodent periodontal and dog endodontic models have show efficacy. Weather this will translate into positive results in clinical patients is unknown at this time, however the theory is sound. Studies have shown that this is as safe as any other vaccine, and therefore should not be seen in a negative light. The only common side effect is local vaccine reactions mostly consisting of localized pain.

The final modality for the therapy of periodontal disease is **extraction**. While extreme, it is the only true cure. Without a commitment to homecare or routine professional cleanings, advanced periodontal surgery should likely not be attempted. Depending on the stage of periodontal disease, the involved teeth should be extracted.

⁸ Doxirobe®: Pfizer Animal Health

⁹ Porphyromonas Denticanis-Gulae-Salivosa Bacterin®: Pfizer Animal Health.