Periodontal Surgery

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Any pocket with depths greater than normal (for the species) are pathologic and in need of therapy. These are present in the vast majority of patients and represent not only an opportunity to improve patient health, but also to increase practice income. A thorough oral exam will elucidate these pockets and allow for proper therapy.

Periodontal therapy/surgery involves removing the infection from the root surface (i.e. plaque, calculus, and granulation tissue), as well as smoothing the diseased root surface. These steps allow for gingival reattachment leading to a decrease in pocket depth.

In dogs, pockets between 3 and 6 mm which are not associated with tooth mobility or other pathology (furcation, root caries) are best treated with closed root planing and subgingival curettage. This step is performed in a similar manner to subgingival scaling described in the basic periodontal therapy lecture, 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. Following this, periocuetic can be administered to improve attachment gain.

Pockets greater than 5 to 6-mm require advanced procedures for effective cleaning, owing to the fact that residual calculus is seen with regularity in pockets greater than 6-mm. In humans this is known as the 5-mm standard. In addition, periodontal surgery is indicated for teeth with even moderate alveolar bone loss, furcation level II and III, and inaccessible areas. Visualization is best accomplished via periodontal flap procedures, which should be offered if the clients are interested in salvaging the teeth. These are advanced procedures, but can be learned by general practitioners.

Periodontal surgery is very effective for treating regaining attachment and salvaging teeth. However, without a commitment to regular periodontal care (consistent homecare and professional cleanings), these surgeries will ultimately fail. This should be communicated to the client prior to performing surgery.

Equipment needs:
All incisions for periodontal surgery are best accomplished with a number 15 or 11 scalpel blade. Other equipment should include a selection of periodontal elevators, several sharp curettes, 7 x 7 tissue forceps, and small needle holders. It is recommended to have all of this as well as a sharpening stone in a sterile pack. Suture should be swedged on a reverse cutting needle and should be absorbable and fine (6-0 to 4-0). Additional materials should include an absorbable barrier membrane and bone grafting particulate (Consil or Bone augmentation).
Surgical Preparation:
All surgery should initiate with a complete dental prophylaxis to decrease oral contamination. Following this, a complete oral exam is performed. Next, a dental radiograph should be exposed of the area to document attachment levels. Once the surgical site is determined, proper pain management should be instituted and administered, including regional blocks.

The Sulcal incision:
The sulcal incision is created reverse bevel. This means that the blade is angled AWAY from the tooth on approximately a 45 degree angle. This is designed to remove the diseased pocket epithelium. It is a more difficult incision to create, but will make the cleaning as well as suturing easier. Once the reverse bevel incision is performed, the rest of the flap is created.

Flap types:
There are numerous options for flaps, depending on the presentation. The most common flap used in periodontal surgery is a full flap, or one with vertical releasing incisions. This allows for increased exposure, however is somewhat more invasive. The other common flap for periodontal surgery is the envelope flap. This is created along the arcade, without vertical incisions.

Envelope (horizontal) Flap:
The envelope flap is created by first performing the reverse bevel incision along all diseased teeth. Once this is accomplished, the gingiva between the target teeth is incised. The incision should be made in one motion all the way down to the alveolar bone. This will create a full thickness flap. The incision can be carried to adjacent healthy teeth, if necessary for sufficient exposure. Make sure when you are performing this flap to not damage the gingiva.

After the extent of the horizontal flap is created, the flap is elevated from the alveolar bone. It is important to ensure that the entire flap is fully cut prior to attempting release. If there is a small area of attachment, it could result in tearing. Start elevation slowly and if significant resistance is felt, re-incise the area. This is best performed with a sharp periosteal elevator. Carefully release the full thickness flap to expose the root surface and alveolar bone for cleaning and contouring. Following therapy (see below), the flap is replaced (without tension) and sutured interdentally.
**Full Flap:**
The full flap is once again initiated by performing a reverse bevel incision around the target tooth (teeth). Once accomplished, vertical releasing incisions are created mesial and distal to the area. These incisions should be made very slightly divergent (so that the base is slightly wider than the gingival area) to maintain blood supply. Additionally, the incisions are typically made on line angles of the target teeth or one mesial and distal to the target tooth (teeth). Line angles are theoretic lines where two edges of a tooth meet. In general, the incisions are made on medial and distal line angles. If there is a diastema between the teeth (most notable distal to the canine teeth) an interdental incision may be made. Incisions should never be made mid root as this will damage the periodontal attachment.

After the extent of the flap is created, it is elevated from the alveolar bone. This is best performed with a sharp periosteal elevator. Carefully release the full thickness flap to expose the root surface and alveolar bone for cleaning and contouring. Following therapy (see below), the flap is replaced (without tension) and sutured interdentally. The vertical incisions are closed with simple interrupted sutures placed 2-3 mm apart. Full flaps can also be sutured at different levels on the tooth. Apical repositioned flaps are utilized to move the gingival height apically, thus decreasing pocket depth. These flaps are most commonly used in the mandibular incisor area. Coronal repositioning flaps are used to move the gingival attachment up the tooth. This is used to move the attachment up the tooth to gain attachment levels. This results in increased attachment, but may also result in increased pocket depth.

**Treating the exposed root/bone surface:**
The goal of periodontal surgery is to create a smooth and clean tooth surface for reattachment. This is comprised of several steps. The first and most important step is thorough root planing. This is best performed with a combination of ultrasonic and hand scaling. This author prefers utilizing the ultrasonic scaler on the root surface to remove the vast majority of the plaque and calculus. Following this, a sharp curette is used to plane the exposed root surface to as smooth as possible a finish. Following the root planing, the remaining alveolar bone is smoothed to a knife sharp edge. Additionally, the bone should scalloped around the tooth. This can be performed with a bone chisel or a finishing bur.

Next, root conditioning is performed. This step is designed to clean the root surface as well as slightly demineralise it to improve reattachment. There are many products that have been or can be used for this step. Classically it was performed with citric acid, but recently EDTA has been promoted as the best product. Following manufacturers recommendations, it is placed on the exposed root surface and left for the prescribed time. After that, it is rinsed from the surface. If bone augmentation is indicated, it is mixed according to manufacturer’s directions and placed in the defect. There are numerous products available; the practitioner must make their own decision based on cost.
A barrier membrane should be placed over the surgical site, if bone regrowth is desired. In veterinary medicine, absorbable membranes should be utilized. There are several types and manufacturers; this author finds that the vicryl membrane works well. Another option for the barrier membrane is to create one out of Doxirobe. This has the added advantage of the antibiotic and anti-inflammatory properties of the product. To perform this, place a small amount of properly mixed Doxirobe on a glass slab. Thin the product with air and then wet it. Once set, use a scalpel blade to cut out the correctly sized and shaped membrane. Then carefully lift the membrane and suture in place.

**Follow-up:**
The patient should be prescribed antibiotics and pain management and fed soft food for 2 weeks. At the end of 2 weeks, the patient should be rechecked to ensure that the flap has healed. The owner should be counselled on home care and recheck needs. The patient should be rechecked in six months to determine success or failure of the procedure. This recheck should be performed under general anesthesia and include probing and radiographic monitoring of the surgical site.

**Conclusion:** Periodontal disease is the number one diagnosed problem in small animal dentistry. More clients are interested in salvaging these teeth, and periodontal surgery can provide this benefit. By learning these procedures, general practitioners can provide this service under one anesthetic.