ORONASAL FISTULA REPAIR
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An oronasal fistula (ONF) is defined as a communication between the oral and nasal cavities and occurs as a result of a defect in the gingival or palatal tissues and maxillary or incisive bone rostral to the third premolar. Severe periodontal disease is the most common cause of acquired oronasal and oroantral fistulas in dogs. Other causes of acquired fistulas include: trauma, neoplasia, iatrogenic associated with extractions (most commonly maxillary third incisor and canines), and burns from electrocution or caustic material. The maxillary canine is the most common location of oronasal fistulas (Figure 1), but they can occur at any maxillary tooth. Several reparative techniques have been described, including: single layer flaps, double layer flaps, axial pattern flaps and autografts. In most cases, the single layer mucogingival flap technique is sufficient to repair ONFs, especially when done correctly the first time.

Figure 1: Large oronasal fistula from the extraction site of the maxillary right canine (blue arrows). This lesion is chronic, as evidenced by the calculus on the third incisor (yellow arrow). This patient had four previous unsuccessful surgeries.

The single layer mucogingival flap is created with either one or two vertical incisions. Depending on the size and location of the fistula as well as presence of the offending tooth, a horizontal interdental incision may also be necessary for successful repair. Proper design of the mucogingival flap will allow maximum exposure of the area for extraction of the tooth (if necessary), debridement of the fistula, and critically important tension-free closure. Incisions are created with a number 15 or 11 scalpel blade.

When repairing an ONF associated with a maxillary canine tooth, the distal incision is made at the mesial line angle of the first premolar, and the mesial incision is started at the mesial line angle of the canine (if present). If the tooth is already absent, the incisions are made at the mesial and distal edges of the fistula.

When making flap incisions, adequate pressure should be placed to ensure full thickness of the soft tissue is incised down to the bone. The incisions should be created slightly divergent as they proceed apically. (Figure 2) Divergent incisions allow for adequate blood supply for the newly created pedicle flap.
Figure 2: Mesial and distal vertical releasing incisions on the maxillary canine. Note, these incisions are created slightly apically divergent.

The mucogingival flap is gently elevated off the bone using a periosteal elevator (Figure 3). If the tooth is present, it is extracted at this time.

Figure 3: Mucogingival flaps elevated exposing the buccal cortical bone.

Any margins of the flap associated with the oronasal fistula should be debrided using a LaGrange scissors or coarse diamond bur to remove 1-2mm of tissue, leaving fresh epithelial edges. A coarse diamond bur on a high-speed handpiece is used to smooth the edges of the remaining maxillary bone and to remove any epithelial remnants between the fistula and the nasal cavity.

As with any closure in the oral cavity, the key to success is to ensure there is no tension on the incision line. Fenestration of the inelastic periosteum is performed to increase the mobility of the flap and allow for a tension free closure. This is accomplished by a combination of sharp and blunt dissection with a LaGrange scissors to ensure the overlying mucosa is not damaged (Figure 4).
The gingival flap is then placed over the defect so that it remains in position without being held. Once this is accomplished (i.e. no tension is present), the flap is ready to be sutured into place (Figure 5).

The remainder of the flap is then sutured over the defect in a simple interrupted pattern every 2-3 mm using an absorbable suture material. Suture lines should always be placed over healthy bone.