Title: Use of Local and Axial Pattern Flaps For Reconstruction of the Hard and Soft Palate
Ramesh K Sivacolundhu BVMS MVS FACVSc

Abstract
There are numerous conditions which may result in defects of the hard and soft palate. Reconstruction of these defects may be difficult due to anatomical limitations and limited tissue availability. The majority of palate defects, even when large, may be closed using local and/or axial pattern flaps, while other more advanced techniques such as free tissue transfer, muscle flaps and prosthetic implants are required in a smaller number of cases.

Introduction
Defects in the hard and soft palate may result from congenital abnormalities, resection of neoplasms, traumatic injuries, severe periodontal disease, tooth removals, severe chronic infections, and secondary to surgical and radiation therapy (1-5). Reconstruction of these defects can be challenging. The area concerned presents a number of anatomical limitations, with difficulties in exposure and access to affected areas, and limited tissue available for reconstruction of defects. In addition, the repair must withstand mechanical stresses induced during mastication and deglutition (1).

Reconstruction of palate defects requires a detailed knowledge of the local anatomy, and an understanding of the various options available to the surgeon. This may be particularly important in cases of large defects, or when radiation or previous surgeries have compromised local tissue (1). There are a number of general principles described by Harvey (1987) (3) and Luskin (2000) (4) that should be followed when considering surgery on a patient with a palate defect:

- Make flaps large compared with the size of the defect to minimize tension.
- Preserve the vascular supply to flaps by elevating a adequate underlying connective tissue. For hard palate epithelium this means elevating the mucoperiosteum as one layer and avoiding the palatine artery, which penetrates the palatine bone approximately 1 cm medial to the carnassial tooth, and then runs caudally and rostrally parallel to the midline.
- Suture tissues to freshly incised epithelium. A flap sutured to an intact epithelial surface will not heal. Incisions should be made with a scalpel blade rather than scissors to minimize crushing injuries.
- Avoid the use of electrosurgery or cauterization to control bleeding.
- Where possible, arrange suture lines so they are situated over connective tissue rather than over the defect, thereby preventing drying and contamination of the connective tissue side of the flap and decreasing the risk of dehiscence.
- Suture tissue gently and with large bites of tissue to minimize tension and interference with blood supply at the wound edges.

Suture materials used are usually 3/0, 4/0 or 5/0 absorbable suture material, depending on the size of the animal, type of repair being performed, and type of tissue being sutured (hard palate mucosa, soft palate mucosa or buccal mucosa). This author generally prefers the use of polydioxanone although other absorbable and nonabsorbable suture materials have also been utilized. If knots are left on the epithelial surface, they will usually slough in three to four weeks regardless of the type of suture material used (3).
There are several reports of management of palate defects in dogs and cats, with a variety of techniques described. Techniques that have been used for reconstruction or management of palate defects include local flaps (3,5-8), axial pattern flaps (1,9), distant tissue with use of a rostral tongue flap (10), free tissue transfer with microvascular anastomosis (2), temporal muscle flaps (11,12) and prosthetic appliances (13,14).

References