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Maxillofacial Surgery for Advanced Practitioners Mini Series

Session Three: Surgery of the Palate and Reconstructive Surgery of the Head

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Palatine surgery

Indications for palatine surgery in small animals include congenital clefts, trauma, dental disease resulting in oronasal fistula, foreign body damage, electrical cord damage and tumour resection. The general principles that apply to all palate surgery are

- First surgery is best chance of success
- Avoid suture lines over bony defects
- Preserve palatine arteries
- Elevate large flaps
- Achieve tension free closure
- Take wide suture bites

The authors preferred suture for palatine surgery is 2 metric polyglactin 910 (Vicryl). This lasts for an appropriate duration and produces a soft and secure knot.

Feedings tubes to by-pass the oral cavity following palate surgery is not routinely required but can be placed for case where there is concern about tension of the procedure is complex.

Cleft Palate

Cleft palate occurs due to failure of palate fusion during embryogenesis. This is primarily genetic in origin but can be a result of intrauterine factors. There is a higher incidence in purebreds and brachycephalics. Clefts can occur in the primary and secondary palates. Cleft primary palate rarely results in significant clinical symptoms but can be corrected for cosmesis. Clefts of the secondary palate usually produce symptoms seen from birth. The main symptoms are nasal discharge and failure to thrive. Patients have a high risk aspiration pneumonia.

Opinions on the timing of surgical repair vary. The author recommends repair when the animals are 4-6 months old. Reasons for this include more tissue for repair, the relative size of cleft decreases, tissues are less friable and there is less risk of affecting maxillofacial development. Rhinitis and aspiration pneumonia should be treated with antibiotics prior to surgery.

The preferred technique for repairing a hard palate cleft is the overlapping double flap technique. This is due to producing a more robust closure where the suture line ids not over the defect and there is good tissue apposition. An alternative technique is the Langenbeck technique which uses bilateral bipedicle flaps.

Clefts can also occur in the soft palate. This can be unilateral, central or a complete absence of the soft palate. Smaller defects are closed by debriding the edges and performing a 3 layer closure. If there is some tension on closure then lateral releasing incisions can be created.

For larger defects mucosal flaps maybe required. The prognosis for large defects is guarded as any repair will lack the muscle component of the normal palate that is responsible for its function.

Owners should be aware that partial failure of the closure is common. Small oro-nasal fistulas that result in no symptoms can be left but larger defects will need further surgical repair.

Traumatic split palate

This is most commonly seen in cats suffering high falls. Small defects of 1-2mm may heal without surgery. Larger defects should be sutured and where there is a large bone defect then a 22guage wire should be placed around the base of opposite teeth in the mid palatal region. This is used to close the bone gap and maintain stability.

Other Techniques

Other techniques for repairing palatine defects include

- Mucosal flaps
- Palatine artery pedicle flaps
- Full thickness lip flaps
- Auricular cartilage grafts
- Angularis oris axial pattern flaps

Angularis oris flap

The angularis oris artery arises from border of masseter extending to commissure and a flap of the mucosa can be raised based on this artery. Identifying the artery can be aided by creating an incision through the cheek skin and transilluminating with a sterile light source to identify the vessel. The flap can then be rotated into defect. Dental extraction maybe required to allow the flap to reach the defect.

Dental Obturators and Buttons

In cases where repair fails or there is insufficient tissues to repair. Dental obturators or septal buttons can be placed. These often are custom made for the individual requiring a procedure to make a cast a procedure to fit it. The main problems with this technique is keeping the obturator in position in the mouth.

Auricular cartilage grafts

Using a cartilage graft to close small oro-nasal fistulas in cats has been reported. The graft is avascular but acts as a scaffold for the growth of fibrous tissue and epithelium. A graft is harvested form the base of the pinna using a punch slightly larger than the defect. The edges of the fistula are debrided and undermined. The graft is placed under the edge and sutured in place with simple interrupted sutures

Facial Reconstruction Techniques

Facial wounds requiring reconstruction can result from bites, trauma particularly dragging and abrasion and wide resection for tumours. The aim of reconstruction of facial wounds is to maintain function of the mouth, eyes and nares with reasonable cosmetic result. Compared to humans the need for cosmesis comes secondary to function and simplicity. We are aided in reconstruction of the face by the large amounts lax cheek tissue and skin seen in many breed of dogs and the abundant blood supply. This blood supply allows for skin flaps with narrower bases than would often be used elsewhere in the body.

We have a variety of techniques for closure of wounds on the head particularly using skin flaps. Free skin grafts are rarely used in this location due to the difficulties in immobilising the graft following surgery

Reconstruction options

Primary closure

Due to the abundant skin and cheek tissue in many breeds of dog surprising large defects can be closed by primary closure. The cheek is closed in 2 or 3 layers and the commisure can be advanced if required. Care should be taken with primary closure near the eye not to affect eyelid function.

Advancement Flaps

Advancement flaps are often used to reconstruct the upper or lower lip. Upper and lower labial advancement flaps can be created. Care should be taken to preserve the labial artery supply to these flaps if possible. Some distortion of the nares can be seen due to tension with upper labial advancement flaps however this usually reduces over 1-2 weeks as the tissues stretch. Advancement flaps can alos be useful in the temporal region.

Buccal Rotation Flap

This flap is used to reconstruct larger defects of the upper lip. It results in advancement of the commisure.

Transposition skin flap for upper labial and buccal replacement

This flap is used for reconstruction of large defects of the upper lip where there is no mucosa available. The flap is folded on itself so skin is inside the mouth. Although skin is adequate reconstruction using mucosa is preferable.

Axial Pattern flaps

Three axial pattern flaps have been developed that can be used for reconstruction of larger skin defects on the head. There are experimental studies detailing these flaps but limited reports of clinical use of these flaps in the literature. As with all axial pattern flaps meticulous surgical technique is required to avoid damaging the direct cutaneous artery during surgery.

General principles of axial pattern flaps

- Precisely mark flap with reported anatomical description.
- Elevate flap deep to any superficial facial muscles.
- Handle flap as little as possible. Use stay sutures to handle.
- Care to avoid artery when dissecting near base of flap.
- Do not suture under flap only at edges

Facial Artery Flap

This can be used to reconstruct defects of the orbit, lateral and rostral nasal regions of the maxilla.

The flap base of the flap includes the commissure of the lip and the lower labial margins. The dorsal margin is the ventral zygomatic arch and the ventral margin is the ventral edge of the mandible. The flap length is to the vertical ear canal.

Superficial Temporal Artery Flap

This can be used to reconstruction defects of the maxilla and maxilo facial area.

The base of the flap is at the level of the zygomatic arch with the cranial margin border of the orbital rim and the caudal at the caudal edge of the zygomatic arch. The maximum length is dorsal orbital rim of the contra lateral eye.

Caudal Auricular Artery Flap

This can be used to construct the caudo dorsal part of the skull, the orbit and the ventral mandible.

The base of the flap is the lateral wing of the atlas. Two parallel incisions are positioned in the central third of the lateral cervical region. The extent of the flap is the scapula.

Precise anatomical descriptions are available in most surgical text books

Aftercare

Aftercare for all reconstructive surgery involving the lips and cheek includes soft food and avoiding toys and chews for 4 weeks.

Further reading

Reconstructive surgery and wound management of the dog and cat Jolle Kirpensteijn and Gert ter Haar Mason Publishing 2013.

Atlas of small animal wound management and reconstructive surgery Michael Pavletic Wiley Blackwell 2010.