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Quality of life after major removal: Maxillectomy, Mandibulectomy or Glossectomy

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Introduction
Radical resective surgery often provides a cure in patients with oral and maxillofacial malignancy and is tolerated surprisingly well by dogs and cats. The quality of life provided by maxillectomy and mandibulectomy procedures is excellent. The multiple anesthesia episodes required for radiation therapy and the systemic sickness and multiple office visits required for chemotherapy are avoided. Combined therapy may be indicated, particularly for lesions with regional or distant metastasis.

Preoperative workup includes routine blood tests, blood type determination and cross-matching, coagulation profiles, buccal mucosa bleeding time, regional lymph node aspirates, and diagnostic imaging (thoracic radiographs, abdominal ultrasound, head computed tomography). The client must be informed about intra- and postoperative complications, follow-up care, long-term function and quality of life, and prognosis.

Maxillectomy

The practical limits for maxillectomy range from partial resection of the rostral upper jaw on one or both sides (rostral maxillectomy), a central or caudal portion of the maxilla (central or caudal maxillectomy), the entire dental arcade on one side including the palate to the midline (total maxillectomy) to the entire palate and both entire dental arcades. For more caudally located lesions that extend onto the side of the face, the bones forming the ventral and lateral limits of the orbit can be resected (partial orbitectomy). In cats the relatively small size of the skull and the short, tighter upper lip compared with that of dogs make radical maxillectomy far more challenging.

Mandibulectomy

The practical limits for resection of the lower jaw range from partial resection of the mandible on one or both sides (unilateral or bilateral rostral mandibulectomy and partial mandibular body resection), one entire mandible (total mandibulectomy) to one entire mandible and a portion of the mandible on the other side. For caudally located lesions the mandibular ramus or a portion of it can be resected by means of a dorsolateral approach through the zygomatic arch and the masseter and temporal muscles. Bilateral rostral mandibulectomy to the level of the first premolars provides good function and esthetics. Bilateral resection caudal to this level results in progressively greater problems with tongue retention, eating and grooming. Resection of the symphysis causes the two remaining mandibular sections to ‘float,’ which is functionally and esthetically acceptable.

Glossectomy

Lingual tumors are resected with good results if the resection can be confined to the free rostral or the dorsocaudal portions of the tongue. Clamping the tongue caudal to the excision site with non-crushing forceps greatly aids in control of bleeding. Surgical principles for resection of tumors of the lip and cheek include maintenance of a functional lip commissure so that the mouth can open adequately, separate closure of mucosal and skin incisions, avoidance of parotid and zygomatic salivary gland ducts or ligation of ducts when avoidance is not possible, and cosmetic closure of resulting facial defects by advancing or rotating tissue from the lower lip and side of the face, head or neck.

General Principles

Resection should include at least 1-2 centimeters of apparently healthy tissue surrounding the tumor. The use of electrocoagulation along the incised mucosal edges that will be sutured is to be avoided. Bone is cut with power instruments (rotating burs; sagittal and oscillating saws) or an osteotome and mallet. It is often safer to ‘break out’ the piece to be resected than to bur or saw through any remaining bony attachments. The wound is closed with a buccal flap that is undermined until it can cover the defect without tension. In the case of maxillectomies, a two-layer closure is preferred, with the first layer apposing connective tissues of the flap and palate, to relieve tension on the epithelial edges.

Hemorrhage is controlled by means of digital compression or vessel ligation. Diffuse bleeding may respond to surface application of a mixture of phenylephrine/lidocain. Other
hemostatic materials include gelatin sponges, thrombin, and polysaccharide beads. Dilute epinephrine is to be avoided. Unilateral carotid artery ligation is recommended if hemorrhage continues and cannot be controlled. Displacement of a ligature is the most common cause of bleeding in the immediate postoperative period. Hemoclips should not be used to ligate significant vessels due to their tendency to fall off or tear the vessel.

After total mandibulectomy the opposite mandible will swing over toward the midline, which may result in the remaining mandibular canine tooth to impinge on the palate when the mouth is closed; to prevent this, the tooth is extracted or its crown surgically reduced. After more involved mandibulectomy procedures, the tongue will lose its ventral support and often hangs out of the mouth, resulting in drooling and chronic dermatitis. This can be partially corrected by rostral advancement of the lip commissure on one or both sides to form a fold that contains the tongue (commissuroplasty).

Wound dehiscence 2 to 3 days after surgery usually results from tension on suture lines or compromised vascularity of flaps. Dehiscence of maxillectomy sites carries more serious consequences, as an oronasal defect may develop. Dehisced flaps are resutured after further undermining to eliminate tension. Closure of a chronic oronasal fistula should be performed after complete healing of surrounding soft tissues has occurred.

Postoperative pain control is achieved with a combination of intraoperatively given longer-acting local anesthetics, centrally acting opioids, and NSAIDs. Patients undergoing radical resective surgery invariably benefit from placement of a transdermal fentanyl patch plus injectable opioid supplementation until the patch achieves adequate blood levels. Antibiotic treatment is not required after oral and maxillofacial surgeries in the otherwise healthy patient. Broad-spectrum antibiotics are given perioperatively in debilitated and immunosuppressed patients and those suffering from organ disease, endocrine disorders, cardiovascular disease, severely contaminated wounds and systemic infections.

Water is offered once the animal has recovered from anesthesia. Soft food is offered 12 to 24 hours after surgery and maintained for about 2 weeks. Dogs usually eat the same or following day; cats may take several days to adapt. Cats may benefit from placement of an esophagostomy tube to ensure proper nutrition and medication during the immediate postoperative period. Chlorhexidine digluconate solution or gel (0.1-0.2%) is administered into the mouth for 2 weeks. Elizabethan collars, tape and nylon muzzles, or other restraining devices may be used in some animals to prevent disruption of the surgical sites.

Reexaminations are scheduled at 2 weeks (removal of skin sutures) and at 2, 6, 12, 18, and 24 months postoperatively. Collaboration with an oncologist is helpful after histopathological results return to discuss the need for further treatment (surgery, radiation therapy and/or chemotherapy). Palpation of nonresected lymph nodes (with cytological or histopathological examination of enlarged nodes) and thoracic radiographs should be performed to monitor for regional and distant metastasis.