



CASE REPORT

Near-Total Glossectomy for Treatment of Mast Cell Tumor in a Dog

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ABSTRACT

Tongue tumors are rare, comprising only 4% of all oropharyngeal tumors. Mast cell tumor (MCT) is the third most frequent tumor of the tongue. Although several treatment alternatives are indicated, the surgical excision with good margins is the best option for this malignancy. One grade III MCT case involving the base of the tongue was treated with near-total glossectomy and combined with pre- and post-operative chemotherapy providing high survival time and life quality.

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INTRODUCTION

Tongue neoplasms are rare, comprising 4% of all oropharyngeal tumors (Liptak & Withrow, 2007). Common clinical signs of tongue tumors are pain, dysphagia, drooling, anorexia, bleeding, dyspnea and respiratory stridor (Quessada *et al.*, 2007; Oliveira *et al.*, 2008b).

The rostral lingual neoplasms are usually detected and treated early. Small benign growths are removed with wedge glossectomy or hemiglossectomy, however, if the mass crosses the midline, transverse glossectomy should be performed (Oliveira *et al.*, 2008a).

The resection of 40-60% of the tongue is generally well tolerated by most animals and are a viable treatment for tongue neoplasms (Dvorak *et al.*, 2004). Postoperative complications include difficulty in retention and propulsion of food, accumulation in the oral cavity, and aspiration pneumonia (Oliveira *et al.*, 2008a).

Treatment options include surgical excision, radiotherapy, chemotherapy, immunotherapy, cryosurgery and electrosurgery. We aim to report the excellent response to surgical and chemotherapy treatment of a tongue mast cell tumor (MCT), providing good long-term quality of life.

History and clinical examination: A 9 years-old, male, Labrador Retriever presented to treatment showing signs

of dysphagia and drooling caused by an ulcerated mass on the dorsum of the tongue's base with six months of evolution (Fig. 1A). The mandibular and superficial cervical lymph nodes were enlarged. Cytopathology exam was performed after fine needle aspiration biopsy (Fig. 1B) and was conclusive for MCT, showing a highly cellular sample with a predominant population of discrete round cells with varying numbers of purple intracytoplasmic granules and moderate anisocytosis and anisocariosis (Fig. 1C and 1D). Cytopathological analysis of lymph node showed no sign of metastatic cells. Complete blood count and serum biochemistry resulted in no relevant abnormality. Chest radiography and abdominal ultrasonography did not indicate the presence of distant metastasis.

Diagnosis and treatment: Cytoreductive chemotherapy for later surgical procedure was performed. It was instituted a protocol associating vinblastine (2 mg.m⁻² IV every seven days for 6 sessions) with prednisone (2 mg.kg⁻¹ for 15 days, following 1 mg.kg⁻¹ for another 15 days and then every other day). The reduction was evident after the third chemotherapy session, which was interrupted for two weeks with a rapid increase of the tumor size, making necessary three more sessions. We tried a three cycles protocol of cryosurgery after tumor

growth at the fourth chemotherapy session, but no satisfactory improvement occurred. After two months of chemotherapy, the patient presented progressive weight loss, dysphagia, and nasal discharge. A partial response in tumor size was seen, which allowed a 2-cm margin near-total glossectomy at the base of the tongue (Fig. 1D).

Before intervention, metronidazole (35mg.kg⁻¹) and cephalothin (20mg.kg⁻¹) were administered intravenously. The remaining stump was sutured with 4-0 polyglactin (Fig. 1F) in a simple continuous pattern. A pharyngostomy feed tube was kept in place for 10 days. The patient had appetite and continued to bark (Fig. 1H). There was clinical improvement of the patient general status.

Histopathologic findings: Histopathological examination of the tumor shown a neoplastic mass with a mild infiltrative aspect, composed of anaplastic cells with large nuclei and prominent nucleoli, with a high level of pleomorphism. A moderate number of cytoplasmic granules were seen at Toluidine Blue Stain and a mitotic rate of 5 mitotic figures per high-power field. Thus, the final diagnosis was grade III MCT (Patnaik *et al.*, 1984) with free lateral and deep margins.

Outcomes: The extension and elevation of the neck and head, paste food and water support were provided at 50 cm high to easy food apprehension. This kind of movement facilitated to propel the food directly to the oropharynx and then to be swallowed.

Chemotherapy was reintroduced after a month. Vinblastine was maintained and combined with cyclophosphamide (150 mg.m²) intravenously, alternating every week. Every other day prednisone was administered orally. After 6 months, chemotherapy was discontinued, and the dog was clinically well. Three months later, there was enlargement of the cervical lymph nodes and decreased food intake. Physical and cytopathologic examination showed recurrence in the pharynx region and metastasis to regional lymph nodes. No evidence of distant metastasis could be found. Previously described chemotherapy protocol was used with partial remission of the tumor, that lasted only 60 days. The patient came to death 540 days after diagnosis.

DISCUSSION

Malignant melanoma, squamous cell carcinoma (SCC), and MCT are the most common tumors in dogs undergoing glossectomy, representing 32, 30 and 7%, respectively (Culp *et al.*, 2013).

Factors such as the evolution at the base of the tongue, pain, progressive decrease in feed, weight loss and decrease immunity associated with the risk of aspiration pneumonia, makes early diagnosis and surgical glossectomy the best option to provide a better quality of life. Almost 70% of lingual hemangiosarcoma was an incidental finding, detected at physical examination or dental procedures (Burton *et al.*, 2012). Clinical signs related to oral mass was present in only 30% of the cases (Burton *et al.*, 2012).

Surgical intervention was performed, corroborating with the literature, that recommends surgical resection (Zacher & Marreta, 2013). Different categories of glossectomy include marginal, subtotal (removal of the

entire free portion), near-total (Three-fourth removal) and total removal are described (Culp *et al.*, 2013). We recommend near-total transverse glossectomy even in cases of poor prognosis, and with risks of complications (Oliveira *et al.*, 2008b). A near-total glossectomy is an uncommon procedure, representing only 3% of the glossectomies in a retrospective analysis (Culp *et al.*, 2013). Since <2cm tumor is the most common size of tongue tumor, marginal resection is most often performed (Burton *et al.*, 2012). A complete surgical margin resection rate of 62% is reported after various degrees of glossectomy (Culp *et al.*, 2013).

A retrospective analysis of dogs evaluated after glossectomy showed acceptable and functional outcomes as in this case (Dvorak *et al.*, 2004). Long-term follow-up showed normal food apprehension in all animals submitted to glossectomy (Culp *et al.*, 2013). Cleaning the mouth after feeding must be highlighted to the owner so there is no trace of food that may predispose to aspiration (Liptak and Withrow, 2007).

Feeding tubes are recommended for all glossectomy procedures and should be maintained until the patient can take adequate nutrition orally (Dvorak *et al.*, 2004). However, lower mean survival time was associated with feeding tube placement after glossectomy (Culp *et al.*, 2013).

Considering being a grade III MCT located at the base of the tongue, metastases are more common due to increased vascularity, which facilitates lymphatic and venous drainage (Quessada *et al.*, 2007). In these cases, aggressive surgical approach and adjuvant chemotherapy are indicated for a better clinical improvement, quality of life, and survival time.

Chemotherapy as adjuvant therapy in the treatment of lingual tumors is rarely documented and did not affect the survival rate (Culp *et al.*, 2013); Nonetheless, a more focused study must be done to define how chemotherapy can be effective for tongue MCT. The protocol used in this case was chosen based on cutaneous MCT. First-line chemotherapy protocol is based on vinblastine and prednisone; other protocols such as lomustine and alternate vinblastine/lomustine could be used as well (Blackwood *et al.*, 2012).

The prognosis of tongue tumors depends on its location, type, and grade. The survival rate for dogs with grade I, II and III SCC of the tongue is 16, 4 and 3 months after surgical resection respectively (Liptak & Withrow, 2007). Survival time is significantly lower for tumors >2cm with a MST of 207 days (Burton *et al.*, 2012; Culp *et al.*, 2013). The treatment applied in this case was effective, providing 540 days MST while maintaining the quality of life.

Local recurrence occurs in about 25% of the cases, and 50% in patients with incomplete resection (Culp *et al.*, 2013). In tongue hemangiosarcoma, local recurrence and distant metastasis were found to be 41% and 45%, respectively (Burton *et al.*, 2012).

Historically, when facing a similar case, many clinicians tend to choose for euthanasia. Thus, the above case report aims to encourage fellow surgeons to intervene, even in a poor prognosis situation. We conclude that, even with a tendency to unfavorable outcomes, ablative surgery combined with antineoplastic chemotherapy provides quality of life and increases survival time for such patients.



Fig. 1: A. Neoplastic mass at the dorsal aspect of the tongue. Rostro-caudal view of the oral cavity. B. FNAB with a 25x7mm at tumor periphery. C. Histopathologic analysis showing stratified epithelium, muscle, and neoplastic mast cells. D. Neoplastic proliferation of mast cells. Round cells with a round or cleaved nucleus, prominent nucleoli, large and eosinophilic cytoplasm. E. The neoplasm aspect at surgical time. F. The oral cavity 15 days after the surgical procedure. G. Feeding time in the elevated bowl. H. Two months after surgery, the patient is able to bark.

Authors contribution: JLCC, MVMP, PTOL, SS, RRH, ABN, and JMP performed the surgery, anesthesia and postoperative care. VSPC and JREF analyzed both cytology and histology samples. VGPA conceived the review, discussion and organized the manuscript. All authors read and approved the final manuscript.

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