Journal of
Agricultural Sciences Research

ORAL MELANOMA IN A DOG - CASE REPORT

Laura Ver Goltz
Department of Morphology – Universidade Federal do Rio Grande do Sul
Porto Alegre - RS
http://lattes.cnpq.br/3639378385545865

Camile Vitoria Silva Barreto
Veterinary Course– Universidade Federal do Rio Grande do Sul
Porto Alegre – RS
http://lattes.cnpq.br/5146863829043025

Lara Lanius
Veterinary Course– Universidade Federal do Rio Grande do Sul
Porto Alegre – RS
http://lattes.cnpq.br/2532931644043383

Juliana Voll
Department of Morphology – Universidade Federal do Rio Grande do Sul
Porto Alegre - RS
http://lattes.cnpq.br/9805216216377960

Abstract: Malignant melanoma is the most common malignant tumor of the oral cavity in dogs, it has a poor prognosis because the appearance of metastasis and/or recurrence is common, and also because it is most often diagnosed late. Survival of affected animals varies according to the treatment used, the condition of the tumor and the animal, but it does not usually exceed one year. A dog, SRD, 11 years old, not castrated, who had a nodule in the oral region, was treated. Clinical examinations, chest X-ray, blood count, biochemical tests to assess ALT and creatinine levels, and cytological examination by biopsy of the mass were performed. The exams indicated oral melanoma, with enlargement of the right mandibular lymph node and elevation in the ALT level. In a subsequent ultrasound, a hypoechoic and homogeneous liver was detected. The treatment proceeded with surgical excision of the nodule, and its referral for histological evaluation. As pre-anesthetic mediation, tiletain with zolazepam and methadone hydrochloride were used, followed by induction with propofol and maintenance with isoflurane. After surgery and anesthetic recovery, the patient was discharged with prescribed drug treatment and did not return to the hospital. The result of the histological examination showed malignant oral melanoma. The objective of this work is to compare the case report in question with a review of the literature on oral melanomas in dogs.

Keywords: Canine. Tumor. Biopsy. Surgery

INTRODUCTION

Oral tumors are neoplasms that affect the gums, buccal and labial mucous membranes, tongue, tonsils, dental elements, mandible, maxilla, palate and spread, possibly reaching bones and adjacent cartilaginous tissues. The oral cavity is the fourth most common site of neoplasms in dogs and cats, and in dogs they correspond to 5% and in cats to 7% of all malignant tumors (FERRO et al., 2004; 2005; FARIAS, 2008).

Melanomas are tumors that originate from the proliferation of melanocytes and melanoblasts, can be benign or malignant and are relatively more common in dogs than in cats (WILLEMSE, 2002; DALECK; NARDI; RODASKI, 2008; FARIAS, 2008). These neoplasms can reach any part of the body, however in dogs they are more common in the head, trunk and fingers, in addition to paws, scrotum, mucocutaneous transitions (BOJRAB, 1996; DOBSON, 2007; FARIAS, 2008), and in the head it is more common to occur in the mouth and eyelids, and in the fingers it is usually in the subungual region (MORRIS; DOBSON, 2007; FARIAS, 2008; ANDERSON, 2009). In dogs about 90 to 95% of oral and mucocutaneous melanomas are malignant (MULLER; SCOTT; KIRK, 1985; FOSSUM et al., 2005).

Malignant melanoma is the most common malignant tumor of the oral cavity in dogs (STOPIGLIA, 1999; FARIAS, 2008; RAIMAN; KING, 2008), it occurs more commonly in elderly animals (MORRIS; DOBSON, 2007; ROSENTHAL, 2004; WILLEMSE, 2002), and the most common ages of affected animals are between 7 and 14 years (DALECK; NARDI; RODASKI, 2008; RHODES, 2005). Oral melanomas, among dogs, occur more in males than in females (FERRO et al., 2004; TILLEY; SMITH JUNIOR, 2003; WILKINSON; HARVEY, 1996).

In benign melanomas, the prognosis is

good, contrary to what happens in malignant ones, mainly oral ones (BENITES; MELVILLE, 2003; CAMARGO; CONCEIÇÃO; COSTA, 2006; ANDERSON, 2009), since the appearance of metastases or local recurrence after surgery (MORRIS; DOBSON, 2007; FARIAS, 2008; RAIMAN; KING, 2008). When tumor recurrence occurs, it is usually due to the presence of a multifocal tumor, the development of a new tumor or inadequate pathological evaluation (FOSSUM et al., 2005). The stage, tumor behavior, tumor location and metastases influence the prognosis (TILLEY; SMITH JUNIOR, 2003; DALECK et al., 2007; MORRIS; DOBSON, 2007).

The treatment of choice for oral malignant melanoma is radical surgical excision of the tumor with a safety margin (MORRIS; DOBSON, 2007; FARIAS, 2008; RAIMAN; KING, 2008). However, even after treatment, the 1-year survival rate is less than 10% (BENITES; MELVILLE, 2003; BIRCHARD; SHERDING, 2008). According to Fossum et al. (2005), less than 20% of affected animals are free of the disease one year after surgery, with an average survival of eight to nine months. For Rosenthal (2004), approximately 45 to 60% of dogs develop metastases and the average survival is eight months, but it can reach one or two years. Rhodes (2005) states that survival is eight to 13 months and that the presence of metastasis makes the prognosis reserved. Morris and Dobson (2007) comment that when prevention or treatment are not effective, the survival rate is three to six months. For Silva et al. (2006) the survival of animals that underwent surgery is from three to nine months, and for Raiman and King (2008) it is from six to eight months.

In view of the high prevalence of oral melanomas in dogs, together with the unfavorable data regarding the prognosis in malignant cases, the objective of this work is to report a clinical case of a dog with malignant oral melanoma and to correlate the protocol and therapy adopted with the indicated in the aforementioned literature, in order to expand knowledge and techniques for the management of this pathology.

REVIEW OF LITERATURE

Melanoblasts are cells of neuroectodermal origin that, at the beginning of embryonic life, migrate mainly to the skin, where they will produce melanin, originating melanocytes (JONES, 2000; DALECK; NARDI; RODASKI, 2008; FARIAS, 2008). Benign neoplasms of melanocytes can be called melanocytomas (BENITES; MELVILLE, 2003; FARIAS, 2008). Melanin penetrates into the cell of other tissues adjacent to the melanoblast, such as the dermis, epidermis, choroid, retina and meninges. It is because of this that cell tumors can originate anywhere in the body (JONES, 2000; BENITES; MELVILLE, 2003).

Malignant melanoma develops more frequently in the gingival mucosa according to Fossum et al. (2005), however Benites and Melville (2003), Birchard and Sherding (2008) and Farias (2008) also consider the buccal and labial mucous membranes, the hard palate and the tongue and Jones (2000) also mentions the occurrence in the oropharynx.

The development of melanocytic tumors may be related to the immune system, changes in oncogenes and tumor suppressor genes (DALECK; NARDI; RODASKI, 2008). Animals with dense skin pigmentation are more likely to develop this type of tumor, and animals with more pigmentation of the oral mucosa are also more predisposed to oral melanoma (JONES, 2000; FOSSUM et al., 2005; MORRIS; DOBSON, 2007).

The breeds most predisposed to developing oral melanoma are Scottish Terrier, Boston Terrier, Irish Setter, Chihuahua, Golden Retriever, Airedale, Dobermann Pincher, Boxer, ChowChow, SRD and Cocker

3

Spaniel, the latter being the most cited in the literature. (WILLEMSE, 2002; TILLEY; SMITH JUNIOR, 2003; ROSENTHAL, 2004; RHODES, 2005; CAMARGO; CONCEIÇÃO; COSTA, 2006; SILVA et al., 2006; MORRIS; DOBSON, 2007; BICHARD; SHERDING, 2008). Due to the predilection for some races, it is believed that melanocytic neoplasms have a genetic predisposition (CAMARGO; CONCEIÇÃO; COSTA, 2006).

Melanocytic tumors, especially oral melanoma, are generally single tumors, alopecic, vascularized, non-encapsulated, with an irregular surface, firm consistency, with a diameter ranging from 0.5 to 10 cm, on average (MORRIS; DOBSON, 2007; FARIAS, 2008). They may look like nodules, macules, plaques or masses (FARIAS, 2008; MORRIS; DOBSON, 2007). Muller, Scott and Kirk (1985), Jones (2008) mention that melanocytic neoplasms vary between black or dark brown color, whereas Wilkinson and Harvey (1996), Daleck, Nardi, Farias (2008) and Rodaski (2008) and Raiman and King (2008) say that in addition to these colors, malignant melanomas can appear gray in color or even depigmented (amelanotic). Amelanotic oral melanomas are more malignant and tend to cause more metastases (KLEINER; SILVA; MASUDA, 2003).

Malignant melanomas are often ulcerated, necrotic, friable and tend to be larger and grow faster than benign ones (RHODES, 2005; MORRIS; DOBSON, 2007; FARIAS, 2008). Oral melanoma is a very aggressive tumor, with bone involvement being common (FERRO et al., 2004) and rapid local infiltration (BENITES; MELVILLE, 2003; SILVA et al., 2006; RAIMAN; KING, 2008).

Generally, melanomas that originate from the mucocutaneous junction of the oral cavity, scrotum or fingernails and fingers tend to be malignant, and soon metastasize to regional and local lymph nodes and viscera, mainly the lungs, in which case, there is the possibility of the animal presenting dyspnea and lung noise. (JONES, 2000; WILLEMSE, 2002; RHODES, 2005; MORRIS; DOBSON, 2007; ANDERSON, 2009).

Many owners only notice oral tumors when they are already large (FOSSUM et al., 2005; MORRIS; DOBSON, 2007). The most frequent clinical signs in oral melanomas are halitosis, oral bleeding, excessive salivation with or without blood, loss of teeth, excessively mobile, dislocated, necrotic or deteriorated teeth, visible tumor mass, pain when chewing and difficulty swallowing or reluctance to chew (SILVA et al., 2006; DALECK et al., 2007; MORRIS; DOBSON, 2007). Anorexia, weight loss, asymmetry or facial deformation and nasal discharge can also be observed (FOSSUM et al., 2005; DALECK et al., 2007; MORRIS; DOBSON, 2007). Oliveira (1996) also cites the presence of unhealthy foods. digested in the faeces, indication of pain near the mouth and oral malocclusion of gradual and rapid development.

Animals with a history of recent tooth extraction with a rapidly growing mass at the extraction site may lead to suspicion of oral neoplasia. Swelling or ventral neck injury can be a sign of metastasis in lymph nodes (FOSSUM et al., 2005; DALECK; NARDI; RODASKI, 2008). Spontaneous fractures of the maxilla or mandible can occur in case the tumor has invaded these bones (OLIVEIRA, 1996).

During the physical examination, depending on the position of the tumor, as, for example, in tonsillar or caudal oropharyngeal tumors, there may be a need for sedation or general anesthesia of the animal to define the extent of the disease. During this examination, measure the size of the tumor, observe the appearance, consistency, surface (if ulcerated, necrotic, infected), evaluate the regional lymph nodes for increase in size,

nodularity and adhesions to the surrounding tissue (TILLEY; SMITH JUNIOR, 2003; ROSENTHAL, 2004; FOSSUM et al., 2005).

X-rays must be taken to look for metastases in internal organs, such as the lung and regional lymph nodes. It is also recommended to perform a radiograph of the animal's skull, under general anesthesia, to assess the extent of the lesion, soft tissue edema and bone proliferation or lysis (BENITES; MELVILLE, 2003; FARIAS, 2008; RAIMAN; KING, 2008). Oliveira (1996) suggests performing a complete blood count and evaluating the hematocrit, as the animal may present anemia due to chronic blood loss and in this case, a blood transfusion may be necessary, however, abnormalities related to the tumor in this test are uncommon (TILLEY; SMITH JUNIOR, 2003; MORRIS; DOBSON, 2007; RAIMAN; KING, 2008);

The diagnosis of melanoma is made by cytological examination of needle aspiration biopsies of the tumor and draining lymph nodes and by histopathological examination of the biopsy of part of the tumor (MORRIS; DOBSON, 2007; RAIMAN; KING, 2008;ANDERSON, 2009), as clinically it is not possible to differentiate malignant and benign melanomas (MEDLEAU; HNILICA, 2003; RHODES, 2005; DALECK; NARDI; RODASKI, 2008). Cytological and mainly histopathological examination of the tumor and regional lymph nodes will be necessary to determine the prognosis and treatment (FELIZZOLA; STOPIGLIA; ARAUJO, 1999; MORRIS; DOBSON, 2007; DALECK; NARDI; RODASKI, 2008)

Cytological examination must be performed before surgery for tumor excision, and is not as definitive in the diagnosis as histopathology (FOSSUM et al., 2005; MORRIS; DOBSON, 2007; DALECK; NARDI; RODASKI, 2008). In cytology, round, fusiform and also oval or star-shaped cells are observed, with a moderate amount of cytoplasm (MEDLEAU; HNILICA, 2003; FARIAS, 2008). Often the cytoplasm contains granules (BIRCHARD; SHERDING, 2008; FARIAS, 2008). The presence of pleomorphic and fusiform cells represent greater malignancy of the tumor. Malignant melanomas may be less pigmented and present greater pleomorphism, and the less pigment present, the more malignant the tumor is (JONES, 2000; MEDLEAU; HNILICA, 2003).

Tumor malignancy cannot be determined only by cytological examination (MEDLEAU; HNILICA, 2003), but some criteria can be used to differentiate between malignant melanoma and melanocytoma, such as intense mitotic activity, presence of atypical cells, number of melanophages and hyperchromatic nuclei and the infiltration of small blood and lymphatic vessels through the dermis, which are characteristics of malignancy (WILLEMSE, 2002; CAMARGO; CONCEIÇÃO; COSTA, 2006; FARIAS, 2008).

Histopathological examination can be performed with an excisional biopsy (for example: surgical resection of the entire tumor mass) or an incisional biopsy, preferably before surgery (TILLEY; SMITH JUNIOR, 2003; ROSENTHAL, 2004; MORRIS; DOBSON, 2007). In histopathology, neoplastic melanocytes may have epithelial, polygonal, elongated, stellate, fusiform or rounded appearance (MEDLEAU; HNILICA, 2003; DALECK; NARDI; RODASKI, 2008). In malignant melanoma, cells may be so densely packed with melanin that nuclei and cytoplasmic morphology are eclipsed, or neoplastic cells may have no melanin at all, as in amelanotic melanomas. A large amount of melanin can also be observed in the cytoplasm of tumor cells and phagocytosed by melanophages (JONES, 2000). In amelanotic melanomas, the diagnosis is made by microscopic examination, mainly

by the morphology of the cells (JONES, 2000; RHODES, 2005). Histologically, malignant melanoma can be confused with fibrosarcoma and carcinoma (FOSSUM et al., 2005).

Other tumors and pathologies can be considered as differential diagnoses (FELIZZOLA; STOPIGLIA; ARAUJO, 1999; TILLEY; SMITH JUNIOR, 2003; FOSSUM et al., 2005), mainly squamous cell carcinoma, fibrosarcoma, epulides (TILLEY; SMITH JUNIOR, 2003; FERRO et al., 2004; FOSSUM et al., 2005), osteosarcoma, ameloblastoma or adamantinoma (TILLEY; SMITH JUNIOR, 2003; FOSSUM et al., 2005), odontoma, dentigerous cyst, papilloma (FOSSUM et al., 2005), mastocytoma, lymphoma (RHODES, 2005). In addition to these, oral melanoma must be differentiated mainly from eosinophilic granulomatous complex, gingival hyperplasia (FOSSUM et al., 2005; DALECK; NARDI; RODASKI, 2008), formation of granulation tissue secondary to a foreign body, trauma or infection and of plasmacytic stomatitis. Other differential diagnoses that may be considered include dental diseases (FOSSUM et al., 2005; OLIVEIRA, 1996), leishmaniasis, salivary mucocele (characterized by fluctuating swellings in the sublingual and pharyngeal region), congenital cyst, nasopharyngeal polyps, osteomyelitis, plasmacytic gingivitis-pharyngitis feline (FOSSUM et al., 2005), oral polyps and abscesses (TILLEY; SMITH JUNIOR, 2003). Felizzola and Stopiglia (1999) mention that oral melanoma must also be differentiated from cheilitis, tonsillitis, sialadenitis, ranula and osteomyelitis. Some of these pathologies can only be differentiated with cytological and histopathological examination of oral lesions (FOSSUM et al., 2005).

The treatment of oral melanoma will depend on the size and location of the tumor, the invasion of other tissues, the presence of metastases and the availability of treatment (TILLEY; SMITH JUNIOR, 2003). Along with surgical excision of the tumor, partial maxillectomy, mandibulectomy, tonsillectomy or glossectomy is recommended. This aggressive therapy, when performed early, improves the prognosis (FOSSUM et al., 2005; SILVA et al., 2006; DALECK; NARDI; RODASKI, 2008). When there is metastasis in the regional lymph node this must also be removed during surgery (MORRIS; DOBSON, 2007; OLIVEIRA, 1996). Tumor exeresis down to the bone usually results in recurrence (FOSSUM et al., 2005).

Depending on tissue involvement and the position of the tumor, it may be inoperable, such as malignant oral tumors that are caudal and cross the midline or those that invade the sublingual musculature, the caudal pharynx, or the underlying maxillary bone. 2005), and in these cases, according to Oliveira (1996), palliative treatment with radiotherapy, chemotherapy, immunotherapy, cryosurgery (FARIAS, 2008; RAIMAN; KING, 2008) or euthanasia (MEDLEAU; HNILICA, 2003; ANDERSON, 2009). In some cases of malignant melanomas, chemotherapy can prolong the survival of the animal (MEDLEAU; HNILICA, 2003; RAIMAN; KING, 2008), but it is generally not effective in the treatment of melanomas, especially oral ones (ROSENTHAL, 2004; FOSSUM et al., 2005; FARIAS, 2008), as well as immunotherapy (FOSSUM et al., 2005). If chemotherapy is chosen, the drugs of choice must be dacarbazine (DTIC), carboplatin, cisplatin, doxorubicin (TILLEY; SMITH JUNIOR, 2003; FARIAS, 2008; RAIMAN; KING, 2008) and cyclophosphamide (DALECK; NARDI; RODASKI, 2008).

Treatment with surgery and radiotherapy has increased the survival of animals with oral melanoma. Fractionated radiotherapy, in high doses, has shown moderate efficacy in dogs with oral melanoma (TILLEY; SMITH

JUNIOR, 2003; MORRIS; DOBSON, 2007; BIRCHARD; SHERDING, 2008). According to Fossum et al. (2005) and Farias (2008) the response to radiotherapy is better when used with intercurrent hyperthermia. Treatment with radiotherapy can also be done as a palliative treatment, in the case of tumors that cannot be operated on or that were not removed with a safety margin (ROSENTHAL, 2004; MORRIS; DOBSON, 2007; FARIAS, 2008). In the case of metastases, additional therapy may not be indicated, as melanomas may even be sensitive to radiotherapy, but this treatment becomes ineffective in the case of metastasis (OLIVEIRA, 1996; FOSSUM et al., 2005).

Prior to surgery, the use of antibiotics is recommended in cases where the oral tumor presents areas of necrosis and local infection (FOSSUM et al., 2005; MORRIS; DOBSON, 2007). Animals with feeding difficulties may need intravenous fluid and enteral and parenteral feeding (TILLEY; SMITH JUNIOR, 2003; FOSSUM et al., 2005).

Patient positioning for surgery is usually in the lateral decubitus position for mandibular tumors. Animals with maxillary tumors can be positioned in lateral or prone position. During the surgical procedure, the soft tissue with the tumor and the bone, when this will also be resected, must be identified and removed according to the techniques of mandibulectomy, maxillectomy, tonsillectomy or glossectomy. When possible, it is recommended to radiograph the region to make sure that the entire affected area has been removed. For this same reason, it is also suggested that a cytological evaluation be performed during surgery and that the excised tissues be sent for histological analysis (FOSSUM et al., 2005).

Some important precautions during the postoperative period must be taken, such as the use of analgesics and only on the day after surgery offer soft food and water (TILLEY; SMITH JUNIOR, 2003; FOSSUM et al., 2005). Mandibulectomy or maxillectomy procedures are well tolerated by many animals, because of this, dogs rarely refuse to eat (TILLEY; SMITH JUNIOR, 2003; FOSSUM et al., 2005; MORRIS; DOBSON, 2007). Facial swelling due to surgical manipulation reduces within three to seven days. The patient's reassessment must be performed in the first and second week after surgery to observe the healing of the surgical wound. Generally, the sutures come off two to four weeks after surgery (FOSSUM et al., 2005). For Fossum et al. (2005) it is important to carry out periodic oral examinations in search of tumor recurrence and chest radiographs must be redone at three, six and 12 months after surgery to assess the development of metastases. According to Rhodes (2005) and Raiman and King (2008) the reassessments must be prolonged until 18 and 24 months after surgery.

As already mentioned, the prognosis of malignant melanomas is unfavorable, and according to Tilley and Smith Junior (2003) and Rosenthal (2004) dogs with tumors caudal to the first premolar have a prognosis three times worse than dogs with rostral tumors. According to Muller, Scott and Kirk (1985), oral melanomas usually cause metastases and are highly fatal. The metastases of oral melanomas occur more frequently through the hematogenous and lymphatic pathways, in the lungs and mandibular lymph nodes (JONES, 2000; MORRIS; DOBSON, 2007; FARIAS, 2008).

For Tilley and Smith Junior (2003) the survival of dogs that underwent mandibulectomy or maxillectomy is 13 to 19 months, of dogs that only underwent tumor excision is seven to nine months and of dogs that underwent radiotherapy is up to 19 months. months. Tilley and Smith Junior (2003) also consider the size of the tumor

and its location as a prognosis, and in tumors smaller than two centimeters the survival rate is approximately 17 months, and tumors larger than two centimeters are five to six months. months, and furthermore state that in the association of surgical treatment with chemotherapy the average survival is 14 months.

CASE REPORT

A male, mixed breed, eleven-year-old, non-neutered, weighing 10.2 kg was attended at the Hospital de Clínicas Veterinárias da Veterinary Coursedo Rio Grande do Sul (UFRGS). The patient was taken for consultation by a neighbor of the tutor, who did not have much information about him, due to which some questions could not be answered. It was reported that the patient had a nodule in the oral cavity, which was externally visible (Figure 1). This had been observed approximately 30 days ago, but it was not possible to obtain information on whether there was an increase in the size of the nodule. Treatment was performed, without a veterinarian's indication, with chayote leaf teas, natural anti-inflammatories and medications, however he was unable to inform which ones and did not notice improvement or reduction of the lesion. He reported that the animal had normophagia, normodipsia, but he was unable to inform the type of food that the animal receives, nor about urine, feces, vaccines and deworming. He also reported that the patient has a history of fights with another dog and episodes of difficulty walking and breathing.

Figure 1 – Nodule adhered to the oral mucosa on the right side, in the region superior to the 4th premolar up to the molar teeth. The tumor mass extends cranially, without being adhered, to the 2nd premolar.

Source: Goltz (2020)

Due to the animal's temperament, there was a need for sedation, without prior examinations, so that it could be properly examined. Fentanyl hydrochloride (1 ml/10 kg IM) and a combination of tiletamine and zolazepam (2 mg/kg IM) were used for sedation. With the animal sedated, the clinical examination was performed, where rectal temperature was found at 39.5°C, normal colored oral and ocular mucous membranes, normohydrate, capillary perfusion time (CPT) less than 2 seconds, cardiac and pulmonary auscultation without alteration, panting, heart rate (HR) of 176 beats per minute (bpm), rhythmic pulse, slightly enlarged right mandibular lymph node, the others unchanged, abdominal palpation unchanged, good general and nutritional status and the presence of a nodule adhered to the oral mucosa of the gum on the right side, in the region superior to the 4th premolar up to the molar teeth (the tumor mass extended cranially to the 2nd premolar, but without being adhered to the gingival mucosa between the 2nd and 4th premolar). molar), oval in shape, irregular surface, with soft,

firm and friable areas, dark brown, alopecic, approximately 3 cm by 5 cm in diameter.

With the patient still under the effect of sedation, blood was collected for blood count and biochemical examination of liver function (ALT level) and kidney function (creatinine level), as a routine pre-surgical test. The blood count result showed no changes in the reference levels, the ALT enzyme was high, with 764.71 U/L, the normal parameter being less than 102 U/L and creatinine was 0.91 mg/dL, within the limits reference values.

A chest X-ray was performed (Figure 2) in order to assess the possible presence of pulmonary metastasis. The result revealed the absence of significant alterations in the organs of the thoracic cavity, as well as the absence of metastases.
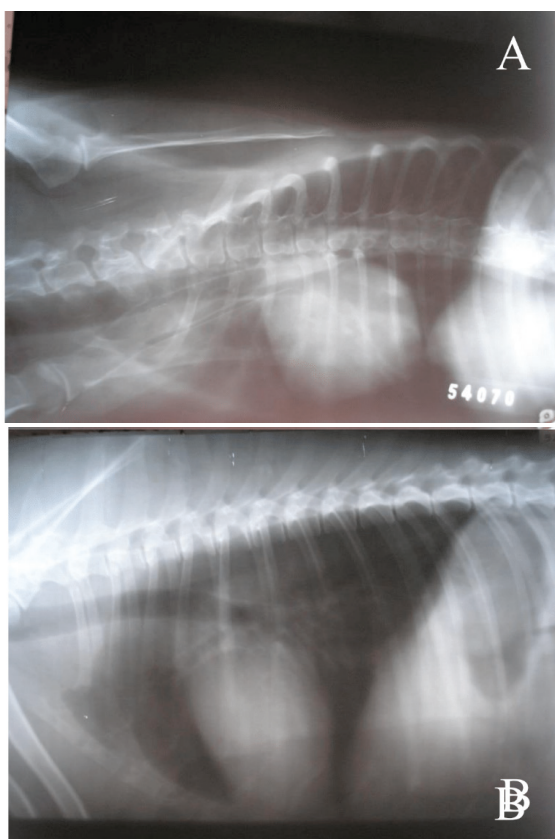

Figure 2 – Ventro-dorsal (A) and lateral-lateral (B) chest X-rays, both with no radiographic alterations observed.

Source: Goltz (2020)

A needle aspiration biopsy of the nodule was also collected for cytological examination (Figure 3), whose objective was to evaluate the cells present in the nodule. The examination showed the presence of pleomorphic and fusiform cells with a lower amount of pigmentation. The diagnosis, according to the result of the cytological examination, was oral melanoma.
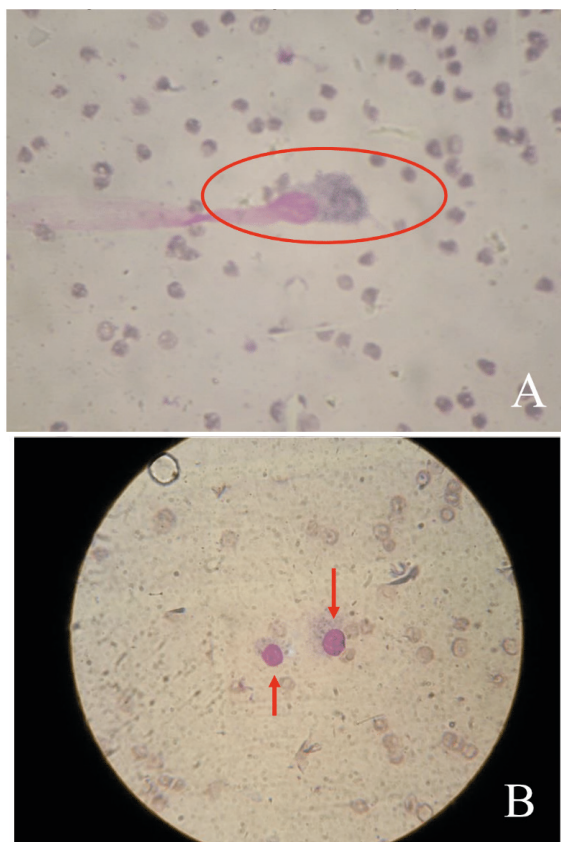

Figure 3 – Cytological image of the oral tumor, examination performed on the day of the first consultation. Presence of melanocytic cell indicated by red ellipse (A) and two melanocytic cells indicated by red arrows (B)

Source: Goltz (2020)

As therapy, a surgical procedure for excision of the tumor was indicated. The administration of meloxicam (0.1mg/kg, PO, SID) for three days was recommended.

The patient returned two days later to undergo an abdominal ultrasound, with

the main objective of evaluating the liver, since the biochemical examination revealed alteration in the liver enzyme ALT. For this examination, the patient needed to be sedated again, for which the same protocol as on the day of the first consultation was adopted. On ultrasound, the liver was visualized with a slightly hypoechoic and homogeneous appearance. The other organs showed no visible changes.

Two days later, surgery was performed to excise the tumor. At the time of the procedure, the patient was weighing 10 kg and it was not possible to perform the pre-surgical clinical examination because the animal was very aggressive. The patient was considered as ASA III, according to the classification of the American Society of Anesthesiologists and was administered as pre-anesthetic medication (PAM) a combination of tiletamine with zolazepam (2 mg/kg IM) and methadone hydrochloride (0.4 mg/kg IM). After a few minutes, venoclysis was performed on the patient to administer fluid therapy with Ringer Lactate (500 ml), and the area to be operated on was shaved (Figure 4). During this procedure, it was noticed that there was myiasis in the tumor (Figure 5).

Figura 4 – Patient after MPA and trichotomy positioned in left lateral decubitus. It was possible to observe the presence of an oral nodule on the right side, externally visible to the oral cavity.
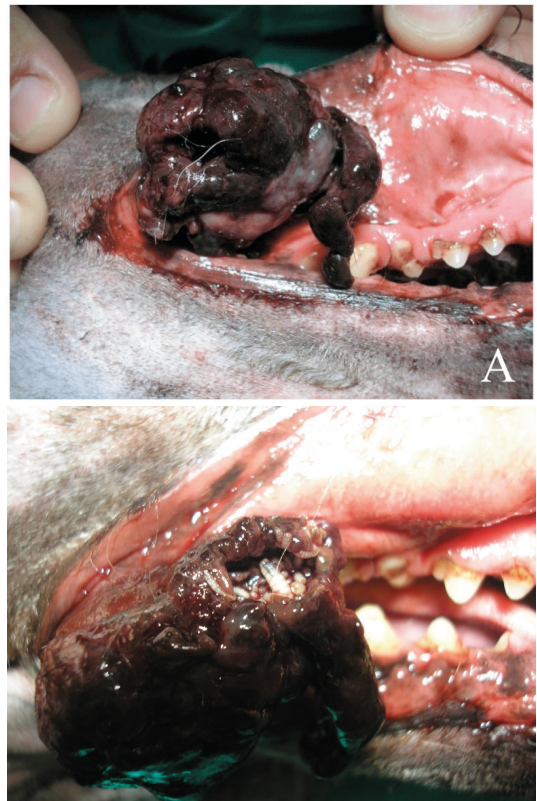
Source: Goltz (2020)

Figure 5 – View of the friable tumor nodule, adhered to the gingiva and upper oral mucosa, from the 4th premolar to the molars (A). The nodule was ulcerated and with the presence of myiasis larvae (B)

Source: Goltz (2020)

Anesthetic induction was performed with propofol (5 mg/kg IV). After loss of swallowing reflex and mandible relaxation, the patient was intubated. Then, he started to receive isoflurane for anesthetic maintenance and oxygen. The patient was then placed in left lateral decubitus. Afterwards, antisepsis was performed on the mouth and tumor with 0.12% chlorhexidine and on the right side of the skin with iodized alcohol and povidone iodine.

A circumscribed incision was made around the tumor and debridement of the mucosa and submucosa was performed to release it. A safety margin of approximately one centimeter of the tumor was removed. The tumor was not infiltrated in the oral musculature, it

was encapsulated. After its removal (Figure 6), the oral cavity was cleaned with a 0.12% chlorhexidine solution. An isolated "X" suture with 2-0 polyvicril absorbable thread was used to close the surgical wound (Figure 7). The tumor was immersed in a formalin solution and sent for biopsy.
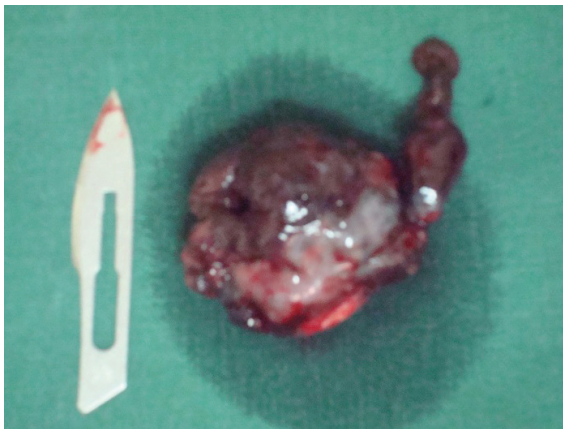

Figura 6 – Oral nodule excised alongside a number 23 scalpel blade for size comparison purposes.
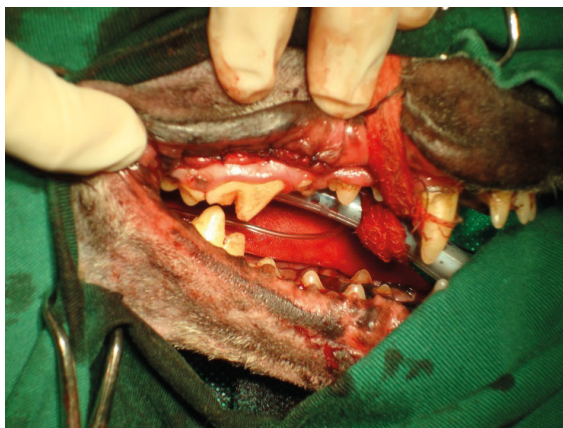
Source: Goltz (2020)

Figura 7 – Surgical wound with isolated suture in "X" with 2-0 polyvicril absorbable thread.

Source: Goltz (2020)

At the end of the surgery, pentabiotic (1 ml/4 kg IM) and 2% meloxicam (0.2 mg/kg IM) were administered. The patient received nitempiram 11.4 mg (11.4 mg/animal for animals weighing less than 11.4 kg SID) for two days, metronidazole 250 mg (10 mg/ kg, PO, TID) for seven days as therapeutic indication. days and administration of soft diet for six days. The animal was discharged after recovery from anesthesia.

After four days, the result of the biopsy of the nodule was obtained, with the description of melanocyte neoplasia with foci of pigmented cells, frequent mitoses, well-defined nodule and the presence of parasites (myiasis larvae), confirming the cytology result of malignant oral melanoma. The patient did not return for the stitches to be removed and 15 days after the surgical procedure, the owner was contacted, who reported that the animal was fine, but had no interest in returning to follow the treatment and chemotherapy.

DISCUSSION

The patient of this clinical case is a male SRD and not neutered dog. SRD dogs are among the breeds predisposed to develop oral melanoma according to Camargo, Conceição and Costa (2006). Oral melanomas are relatively common in dogs (ROSENTHAL, 2004; CAMARGO; CONCEIÇÃO; COSTA, 2006; MORRIS; DOBSON, 2007), and the vast majority of oral and mucocutaneous melanomas in dogs are malignant (MULLER; SCOTT; KIRK, 1985). Several authors agree that oral melanomas affect more male than female dogs (TILLEY; SMITH JUNIOR, 2003; FERRO et al., 2004; MORRIS; DOBSON, 2007).

The tumor developed in the animal at the age of eleven. This information is similar to literature records which say that melanocytic tumors occur more commonly in animals between seven and 14 years of age (RHODES, 2005; CAMARGO; CONCEIÇÃO; COSTA, 2006; MORRIS; DOBSON, 2007).

The owner reported that approximately one month ago a nodule was noticed in the oral cavity that can be visible externally. Many owners only notice oral tumors when they are

already large (FOSSUM et al., 2005; MORRIS; DOBSON, 2007). The head is one of the most frequent sites of this tumor, and the mouth is the site of occurrence cited in the literature (MORRIS; DOBSON, 2007; FARIAS, 2008; ANDERSON, 2009), commonly reaching the gingival mucosa (FELIZZOLA; STOPIGLIA; ARAUJO, 1999; FARIAS, 2008), as occurred with this patient.

The tumor lesion was a single nodule, measuring 3 cm by 5 cm in diameter, dark brownish in color, with an irregular, friable surface, with firm and soft areas, encapsulated, alopecic and had bloody contents. These characteristics are similar to those found in the literature (CAMARGO; CONCEIÇÃO; COSTA, 2006; MORRIS; DOBSON, 2007; FARIAS, 2008) and black or dark brown (MULLER; SCOTT; KIRK, 1985; JONES, 2008). These tumors are often ulcerated and friable (CAMARGO; CONCEIÇÃO; COSTA, 2006; MORRIS; DOBSON, 2007; FARIAS, 2008).

In the anamnesis, the owner reported that the animal eats and drinks water normally.; DOBSON, 2007). Several clinical signs are mentioned in the literature, but the owner said she did not notice many changes, but commented on the asymmetry or facial deformation (TILLEY; SMITH JUNIOR, 2003; DALECK et al., 2007; MORRIS; DOBSON, 2007; ANDERSON, 2009). During the consultation there was a report that the tumor appeared a period after the animal had fought with other dogs. This information can be related to the comment by Fossum et al. (2005) that an animal with a history of recent tooth extraction with rapid mass growth at the extraction site may lead to suspicion of oral neoplasia.

The physical examination performed on the animal was very similar to that mentioned by several authors, with the need for sedation or general anesthesia to define the extent of the disease. As complementary exams, blood count, analysis of serum renal and hepatic enzymes, cytology by fine needle aspiration biopsy, chest and head radiography and abdominal ultrasound were performed. Fossum et al (2005) says that laboratory tests of the biochemical profile, blood count, bleeding time, urinalysis and electrocardiogram can be requested by the Veterinary Doctor (FOSSUM et al., 2005), and Oliveira (1996) suggests performing the complete blood count and evaluation of hematocrit, as the animal may have anemia due to chronic blood loss, in which case a blood transfusion may be necessary. In the blood count of the animal, anemia was not observed, and there was no change in erythrocytes and hematocrit, but an increase in liver transaminases was observed.

According to Tilley and Smith Junior (2003), the increase in liver transaminases may be due to hepatocellular injury, enzyme induction and myonecrosis. Elevated serum activity may represent hepatocellular changes, both primary and secondary, reflecting underlying disease activity. Both ALT and AST are present in large amounts in the liver and striated muscle. Hepatic transaminase release may result from hepatocellular damage or induced enzyme synthesis. No specific treatment is advised unless the underlying cause of elevated activity is discovered and that cause treated.

The patient showed a considerable increase in the value of the ALT enzyme. Considering that the abdominal ultrasonography performed did not show visible alterations, it is believed that this elevation of the enzyme may have occurred due to the onset of liver metastasis not yet detectable on ultrasound. To conclude this suspicion, a liver biopsy could have been performed, but the owner was not interested in carrying out the procedure. The blood count was not repeated to check the enzyme level again, because the patient did

not return to HCV until the end of this article.

During the consultation, it was commented that the patient had already had episodes of difficulty breathing and during the physical examination, an increase in the right mandibular lymph node was observed. A chest X-ray was taken with the aim of looking for lung metastases, but the result of the examination was without visible radiological changes. According to the literature, radiographs must be performed to look for metastases in internal organs, such as the lung and regional lymph nodes (SILVA et al., 2006; FARIAS, 2008; RAIMAN; KING, 2008). An RX of the animal's skull must have been performed, as according to Bojrab (1996), Tilley and Smith Junior (2003), Fossum et al. (2005), Rhodes (2005) and Birchard and Sherding (2008), malignant melanoma has a tendency to invade the underlying bones at an early stage and several authors indicate the performance of radiography of the animal's skull, under general anesthesia, to assess the extent of the lesion, soft tissue edema and bone proliferation or lysis (RHODES, 2005; MORRIS; DOBSON, 2007; RAIMAN; KING, 2008).

Cytology was performed before the surgery, with the intention of knowing the types of cells present in the nodule, according to Fossum et al. (2005) and Daleck, Nardi and Rodaski (2008), who agree that cytological examination must be performed before surgery for tumor excision. The result of this cytological examination of the oral nodule was melanoma. Cytological examination must have been carried out in the right mandibular lymph node, after all regional lymph nodes are common sites of metastasis in this type of tumor (JONES, 2000; RHODES, 2005; MORRIS; DOBSON, 2007).

The examination showed the presence of pleomorphic and fusiform cells with a lower amount of pigmentation. According to Birchard and Sherding (2008) and Farias (2008), in cytology, rounded, fusiform cells are observed, which matches the characteristics that Jones (2000) and Medleau and Hlinica (2003) wrote about the diagnosis by observation of the cytological slide.

The anamnesis, the characteristics of the nodule and the cytological examination led to the clinical suspicion of Melanoma. As therapy, the indicated surgery was to extract the tumor. The tumor was removed with a safety margin of one centimeter. According to the literature, the treatment of choice for oral malignant melanoma is radical surgical excision of the tumor with a safety margin (MORRIS; DOBSON, 2007; FARIAS, 2008; RAIMAN; KING, 2008). absorbable polyvicryl thread, because there was a suspicion that the owner would not return to the HCV after surgery and because of the animal's aggressiveness, which would need to be sedated to remove the stitches.

The surgical procedure consisted of making a circumscribed incision around the tumor and debridement of the mucosa and submucosa to release it. It was visualized that the tumor was encapsulated, it was not infiltrated in the oral muscles, as a result, no bone part was removed. The literature says that malignant melanoma is a very aggressive tumor, with bone involvement being common (BENITES; MELVILLE, 2003; FERRO et al., 2004) and that, together with surgical excision of the tumor, partial maxillectomy, mandibulectomy, tonsillectomy or glossectomy (TILLEY; SMITH JUNIOR, 2003; SILVA et al., 2006; DALECK; NARDI; RODASKI, 2008)

After removing the tumor, it was immersed in a formalin solution and sent for biopsy. Biopsy was the conclusive exam for defining the diagnosis of malignant melanoma, as the cytological exam is not as definitive in the diagnosis as the histology (TILLEY;

SMITH JUNIOR, 2003; MORRIS; DOBSON, 2007; DALECK; NARDI; RODASKI, 2008). The histopathological examination report described it as a neoplasm of malignant melanocytes with foci of non-pigmented cells, frequent mitoses, a poorly delimited nodule and the presence of parasites (myiasis larvae). Regarding these exam findings, Jones (2000) and Daleck, Nardi and Rodaski (2008) talk about the presence of neoplastic cells without the presence of melanin. This characteristic and others found, such as intense mitotic activity and infiltration of small blood and lymphatic vessels through the dermis, are characteristics of malignancy (CAMARGO; CONCEIÇÃO; COSTA, 2006; DALECK; NARDI; RODASKI, 2008; FARIAS, 2008).

Right at the end of the surgery, antibiotics (Pentabiotic and Metronidazole) and anti-inflammatories were administered and therapy with nitempyram was indicated because of the myiasis. The administration of soft diet for 6 days was recommended. The authors Fossum et al. (2005) and Tilley and Smith Junior (2003) say that some important precautions during the postoperative period must be taken, such as the use of analgesics and that only on the day after the surgery, offer soft food and water. Both Fossum et al. (2005), as well as Rhodes (2005) and Raiman and King (2008) and consider it important to carry out periodic oral examinations in search of tumor recurrence and periodically repeat chest X-rays to assess the development of metastases. The use of preoperative prophylactic antibiotics must have been indicated, since the tumor was located in the mouth, which is a highly contaminated region. According to the literature previously surgery is recommended the use of antibiotics in case the oral tumor presents areas of necrosis and local infection (FOSSUM et al., 2005; MORRIS; DOBSON, 2007). As postoperative antibiotic therapy, Pentabiotic (broad-spectrum, with bactericidal action against gram positives and negatives, one application is effective for five days) was applied and Metronidazole was prescribed for seven days (anaerobic antibacterial). Oral infections of surgical wounds are more closely related to endogenous streptococci, but the main ones involved are Peptostreptococci, which are anaerobic gram-positive cocci. The presence of anaerobic gram-negative microorganisms, penicillin-resistant staphylococci and aerobic streptococci has already been demonstrated. The antibiotic of choice is penicillins, which are bactericidal and act against the microorganisms most likely to cause oral infection. Amoxicillin, a broad-spectrum semi-synthetic penicillin, can also be used, as it is better absorbed in the gastrointestinal tract, providing more adequate serum levels. As an alternative in penicillin-allergic patients, erythromycin or clindamycin can be used (SEABRA; SEABRA; SEABRA, 2004).

The severity of the disease and the need for periodic evaluation and repetition of exams were explained to the owner. In malignant melanomas, the prognosis is unfavorable (MEDLEAU; HNILICA, 2003; MORRIS; DOBSON, 2007; DALECK; NARDI; RODASKI, 2008) and the appearance of metastases or local recurrence after surgery to remove the tumor is common (MORRIS; DOBSON, 2007; FARIAS, 2008; RAIMAN; KING, 2008). Due to personal financial and practical factors, the owner was not interested in recommending another treatment adjunctive to surgery. In some cases of malignant melanomas, chemotherapy can prolong the animal's survival, but it is generally not effective (FOSSUM et al., 2005; MORRIS; DOBSON, 2007; FARIAS, 2008).

CONCLUSION

It is then concluded that oral malignant melanoma is a condition of great relevance in the area of Veterinary Medicine for small animals, and the results taken in the case report in question are largely congruent with the literary findings.

The fact that the animal's guardian chose not to continue the treatment leads to the inference of a poor prognosis and to the premise that more studies are needed so that an approach protocol can be developed that is at the same time assertive in combating the disease, and wide, so that it adapts to the different situations of each animal.

REFERENCES

ANDERSON, D. **Como tratar melanoma canino. How to do things.** Saúde e Cuidados de Animais de Estimação. Disponível em <http://www.howtodothings.com/pt/animais/como-tratar-melanoma-canino>. Acesso em: 6 mai. 2009

BENITES, N. R.; MELVILLE, P. A. **Tratamento homeopático de melanoma maligno em cadela**. Cultura Homeopática, São Paulo, v. 2, n. 5, p. 68-72, out./dez. 2003.

BIRCHARD, S. J.; SHERDING, R. G. **Manual saunders**: clínica de pequenos animais. 3. ed. São Paulo: Roca, 2008. 2048p.

BOJRAB, M. J. **Mecanismos da moléstia na cirurgia dos pequenos animais**. 2. ed. São Paulo: Manole LTDA, 1996. 1446p.

CAMARGO, L. P. de; CONCEIÇÃO, L. G.; COSTA, P. R. dos S. **Neoplasias melanocíticas cutâneas em cães: estudo retrospectivo de 68 casos entre 1996-2004.**Brazilian Journal of Veterinary Research and Animal Science, São Paulo, v. 45, n. 2, p. 138-152, 2006.

DALECK, C. R. *et al*. **Neoplasias de língua em cinco cães**.Ciência Rural, Santa Maria, v. 37, n. 2, p. 578-582, mar./abr. 2007.

DALECK, C. R.; NARDI, A. B. de; RODASKI, S. **Oncologia em cães e gatos**. São Paulo: Roca, 2008. 612p.

FARIAS, M. R. **Lentigo, nevos e neoplasias melanocíticas.** Serviço de clínica médica de pequenos animais. São Paulo. 2008. Disponível em <http://www.geocities.com/ResearchTriangle/Thinktank/5568/lentigo.html>. Acesso em: 6 mai. 2009.

FELIZZOLA, C. R.; STOPIGLIA, A. J.; ARAUJO, N. S. de. **Neoplasias orais em cães, avaliação dos aspectos clínicos, histopatologia e citologia esfoliativa**. **Ciência** Rural, Santa Maria, v. 29, n. 3, p. 499-506, out./nov. 1999.

FERRO, D. G. *et al*. **Prevalência de neoplasias da cavidade oral de cães atendidos no centro odontológico veterinária odontovet entre 1994 e 2003.** Arquivos de Ciências Veterinárias e Zoologia da Universidade Paranaense, Umuarama, v. 7, n. 2, p. 123-128, jul./dez. 2004.

FOSSUM, T. W. *et al*. **Cirurgia de Pequenos Animais**. 2. ed. São Paulo: Roca, 2005. 1389p.

JONES, T. C. **Patologia veterinária**. 6. ed. São Paulo: Manole LTDA, 2000. 1415p.

KLEINER, J. A.; SILVA, E. G. de; MASUDA, E. K. **Melanoma intra-ocular primário de coróide em um cão da raça rottweiller: relato de caso.** In: Conferência Sul-Americana, 3., 2003, Rio de Janeiro. Anais...Disponível em: <http://www.vetweb.com.br/Melanoma.htm>. Acesso em: 6 mai. 2009

MEDLEAU, L.; HNILICA, K. A. **Dermatologia de pequenos animais**: atlas colorido e guia terapêutico. São Paulo: Roca, 2003. 353p.

MORRIS, J.; DOBSON, J. **Oncologia em pequenos animais**. São Paulo: Roca, 2007. 300p.

MULLER, H. G.; SCOTT, W. D.; KIRK, W. R. **Dermatologia dos pequenos animais**. 3. ed. São Paulo: Manole LTDA, 1985. 935pg

OLIVEIRA, M. H. **Neoplasias da cavidade oral em cães e gatos: revisão de literatura.** Clínica Veterinária, São Paulo, v. 1, n. 4, p. 18-21, set./out. 1996

RAIMAN, R.; KING, D. S. **Malignant melanoma in dogs.** Animal Emergency Center Site. Oncology Specialty Services. Disponível em <www.animalemergencycenter.com/images/onc_**MELANOMA_IN_DOGS**.pdf>. Acesso em: 10 abr. 2009.

RHODES, K. H. **Dermatologia de pequenos animais**: consulta em 5 minutos. Rio de Janeiro: Revinter, 2005. 702p.

ROSENTHAL, R. C. **Segredos em oncologia veterinária**: respostas necessárias ao dia-a-dia em rounds, na clínica, em exames orais e escritos. Porto Alegre: Artmed, 2004. 295p.

SEABRA, F.R.; SEABRA, B. M.; SEABRA, E. G. **Antibioticoterapia profilática em cirurgias periodontais.** Odontologia Clínica Científica, Recife, v. 3, n. 1, p. 11-16, jan./abr. 2004

SILVA, M. S. B. *et al.* **Tratamento de melanoma oral em um cão com criocirurgia.** Acta Scientiae Veterinariae, Porto Alegre, v. 32, n. 2, p. 211-213, 2006.

TILLEY, L. P.; SMITH JUNIOR, F. W. K. **Consulta Veterinária em 5 Minutos**: Espécies Canina e Felina. 2. ed. São Paulo: Manole, 2003. 1423p.

WILKINSON, T. G.; HARVEY, G. R. **Atlas colorido de dermatologia dos pequenos animais**: guia para o diagnóstico. 2. ed. São Paulo: Manole LTDA, 1996. 304p.

WILLEMSE, T. **Dermatologia clínica de cães e gatos**: guia para o diagnóstico e terapêutica. 2. ed. São Paulo: Manole LTDA, 2002. 143p.