

Malignant Alveolar Neoplasm in a 10-Month-Old French Bulldog

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ABSTRACT

Background: Malignant tumors are the main cause of death or euthanasia in animals. The oral cavity ranking fourth in number of occurrences. Epidemiological studies with dogs suggest that canine cancer kills 40-50% of individuals aged over 10 years. In view of the interest of academics and professionals in the healthcare of dogs and cats, this paper reports the case of a 10-month-old bitch, which, despite being a young animal, was affected alveolar rhabdomyosarcoma of abrupt evolution.

Case: A 10-month-old French Bulldog bitch, weighing 10 kg, was referred to a veterinary hospital in the city of Rio de Janeiro for care. It had a history of mouth bleeding, after chewing a solid mineral material, edema in the region of the right maxilla, and protusion of the gland of the third eyelid. As the clinical examination also revealed a fracture of the maxillary canine, anti-inflammatory and antibiotics were prescribed, to be administered by the owner once a day for 7 days. During the next clinical examination, carried out one week later, an edema was found in the right region of the mouth, which proved difficult to examine. As the patient had already eaten, an appointment was made for the following day for an intervention in the operating room, where the animal could be anesthetized for better observation of the effected region. Blood was collected for hemogram, urea, creatinine, alkaline phosphatase, ALT, and GGT, and an 8 h food fasting and a 4 h water fasting were recommended. On that date, once the dog had been taken to the operating room, was administered the pre anesthesia, in addition to anesthetic induction and manutention. Upon examining the oral cavity, several loose molars were found on the right side, in addition to a tumoral aspect of the gum; thus, it was decided to collect a small sample of the tumoral mass for histopathology. The surgical specimen was placed in a formalin solution and sent to the laboratory for histopathological processing and diagnosis. One week later, the tumor mass was larger and the edema in the right region of the mouth was much larger than on the day of the procedure. Thus, a computerized tomography was requested to further investigate the alterations that had occurred in such a short time. Due to the results of the histopathology and the CT, an immunohistochemical test was suggested which determined the cell profile and morphology and confirmed the diagnosis of alveolar rhabdomyosarcoma according to clinical suspicion. The animal remained in the veterinary hospital for a further 48 h, during which the clinical condition worsened, with the animal suffering heavy bleeding. As the patient was no longer capable of oral intake of food or water, the decision was made with the consent of the owners to induce a painless death to alleviate the suffering of the animal. However, the owners did not authorize a necropsy.

Discussion: Veterinary physicians should be conscious of the treatment of serious illnesses that will not result in a benefit for the patient. They should know when to stop the treatment to not cause further pain and suffering to the animals and their owners. Many of the interventions which aim to treat severe malignant neoplasia will not promote an improvement in quality of life or significantly extend the patient's survival, and do not justify the suffering they entail. A painless death remains the best alternative in such cases.

Keywords: cancer, malignant neoplasm, alveolar rhabdomyosarcoma, oral cavity.

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INTRODUCTION

Malignant tumors are the main cause of death or euthanasia in animals and, despite the oral cavity ranking fourth in number of occurrences, owners only seek veterinary care when the animal's condition is at a clinically advanced stage [4]. Epidemiological studies with dogs, the companion animal species about which most data are available, suggest that canine cancer kills 40-50% of individuals aged over 10 years [2,3,12].

The recurrence, migration, and infiltration of malignant cells into adjacent tissues can cause metastasis via blood and lymphatic systems, giving rise to new tumor foci.

Melanoma is the most frequent malignant neoplasm in the oral region of dogs, followed by squamous cell carcinoma, and fibrosarcoma [6]. Rhabdomyosarcomas have been observed in both middle aged and elderly animals, although they are not uncommon in young animals [7].

In view of the intense interest of academics and professionals in the healthcare of dogs and cats, this paper reports the case of a 10-month-old French Bulldog bitch, which, despite being a young animal, was affected by an alveolar neoplasm of abrupt evolution.

CASE

A 10-month-old French Bulldog bitch, weighing 10 kg, was referred to a veterinary hospital in the city of Rio de Janeiro for care. It had a history of mouth bleeding, after chewing a solid mineral material, edema in the region of the right maxilla, and prolapse of the gland of the third eyelid (Figure 1). As the clinical examination also revealed a fracture of the maxillary. It was prescribed Prednisolone¹ [Prediderm[®] - 1 mg/kg, 1 tablet by mouth every 12 h for 7 days] and Spiramycin¹ [75,000 IU/kg] + Metronidazol² [Stomorgyl 10[®] - 12.5 mg/kg, 1 tablet by mouth every 24 h for 7 days].

During the next clinical examination, carried out 1 week later, an edema was found in the right region of the mouth, which proved difficult to examine. As the patient had already eaten, an appointment was made for the following day for an intervention in the operating room, where the animal could be anesthetized for better observation of the effected region. Blood was collected for hemogram, urea, creatinine, alkaline phosphatase, ALT, and GGT, and an 8 h food fasting and a 4 h water fasting were recommended.

On that date, once the dog was taken to the operating room, methadone hydrochloride³ [Mytedom[®] - 0.3 mg/kg/IM] was administered in pre-anesthesia, in addition to intravenous induction with ketamine hydrochloride⁴ [Cetamin[®] - 2 mg/kg/IV] and propofol¹ [Propovet[®] - 4 mg/kg/bolus]. The tracheal tube was then inserted into a semi-closed circuit connected to maintain anesthesia, with 1.5 MAC of isoflurane and 100% oxygen.

Upon examining the oral cavity, several loose molars were found on the right side, in addition to a tumoral aspect of the gum; thus, it was decided to collect a small sample of the tumoral mass for histopathology examination.

The surgical specimen was placed in a formalin solution and sent to the laboratory for histopathological processing and diagnosis.

One week later, the tumor was larger and the swelling in the right mouth region was much greater than on the day of the procedure. Thus, a computed tomography (CT) scan was requested to further investigate the changes that occurred in such a short time that they revealed extensive incisive, maxillary, zygomatic and frontal bone lysis, invasion of the nasal cavity and right orbital space with lateral displacement of the dorsum of the eyeball, in addition to submandibular and retropharyngeal lymphatic adenomegaly on the right. It also showed a lesion in the right maxilla suggestive of neoplasia which by the STM staging for dogs was classified as Stage IV (Figure 2). Histopathology results were for melanoma. Due to the rapid spread of the lesions, immunohistochemistry was suggested, which determined the cell profile and morphology and confirmed the diagnosis of alveolar rhabdomyosarcoma according to clinical suspicion.

DISCUSSION

The blood test results fell within the normal range of values and did not show any alteration. The anesthesia protocol, in turn, was effective for detailed examination of the oral cavity. This enabled extraction of the teeth that had completely loosened and collection of surgical material for biopsy from the tumoral region.

The alterations in the oral cavity provided a warning sign and increased the concern regarding diseases caused by the onset of tumors in this region, which has a high incidence of neoplasms and a high probability of these being malignant. In this regard, there is a consensus

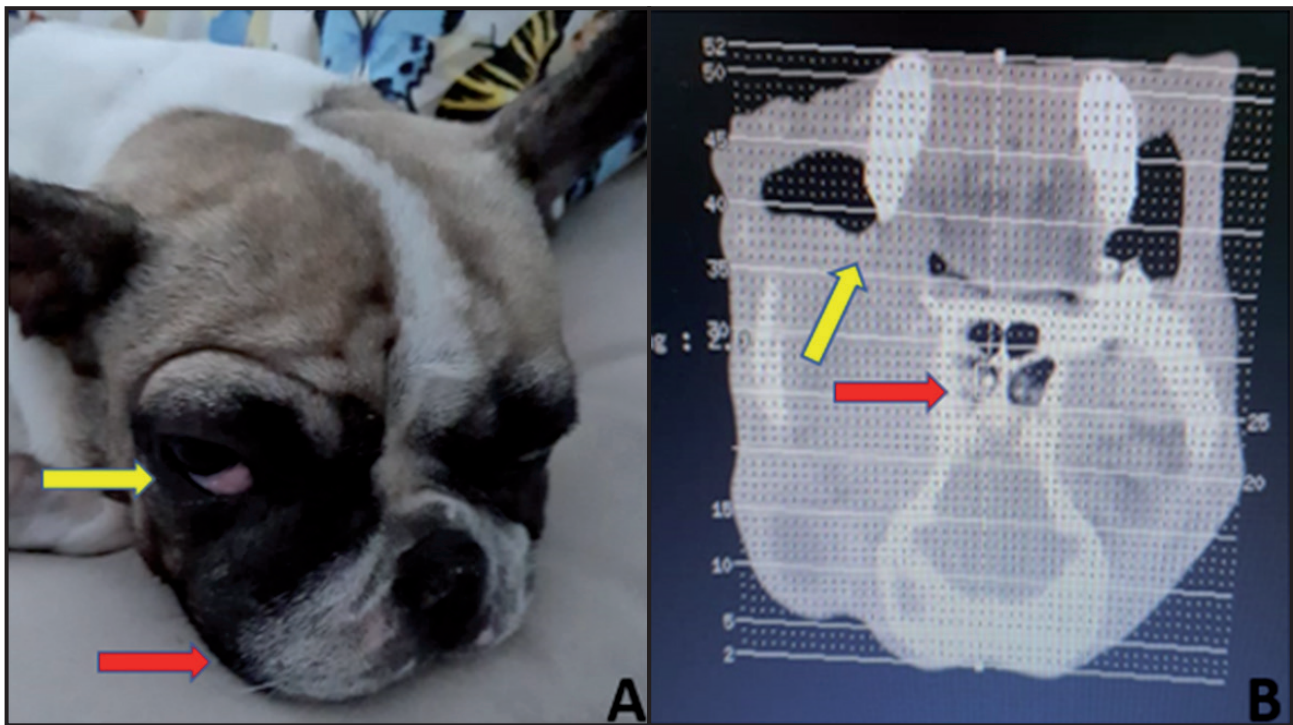


Figure 1. A- Edema in the mandible (red arrow). B- Computed tomography of the head. Expansive lesion in 71 the right maxilla region nasal cavity (red arrow) and orbit invasion, hypertrophy can be 72 seen in the gland of the third eyelid (yellow arrow)



Figure 2. Expansive lesion in the right maxilla region A- Edema of the face region (red arrow). Third gland hypertrophy eyelid (yellow arrow). Proliferation of tumor mass outside the oral cavity (blue arrow). B- Appearance of the tumoral mass within the oral cavity.

on the importance of periodic examinations of animals oral and nasal cavities, thus enabling early therapeutic interventions, increasing the chances of survival and improving the quality of life of affected patients.

Cancer is the leading cause of death and euthanasia in animals and, although the oral cavity

ranks fourth in frequency of occurrences [4,5,13], rhabdomyosarcomas are not frequent in this region [8]. In contrast, this case presented a notably young animal, only 10 months old, which was affected by this malignant neoplasm, precisely in the oral cavity and with uncommonly rapid development.

The CT revealed extensive incisive, maxilla, zygomatic, and frontal bone lysis, invasion of the nasal cavity and right orbital space with lateral dorsum displacement of the eyeball, along with submandibular and retropharyngeal lymph adenomegaly on the right side. It also showed a lesion in the right maxilla that suggested neoplasia. It was aggressive and expansive, had invaded the nasal cavity and orbit, and was extremely close to also invading the brain cavity., which by the STM staging for dogs was classified as Stage IV. All these findings corroborated that imaging studies of the oral cavity in anima nobili can be used to guide diagnosis and treatment of oral diseases, especially when clinical, endoscopic, and laboratory tests are insufficient. About 7% of oral cavity diseases are malignant, of which 90% are derived from squamous cells [11].

The decision to collect material for histopathology was motivated by the suspicion of the presence of a neoplasm in the oral cavity, despite the young age of the animal in question, which was just 10 months old, and the fact that epidemiological studies with dogs have concluded that these tumors occur in animals over 10 years old [2,3,12]. Little information was available on similar cases involving this occurrence in young patient this age. The only report of such a case was about a dog with a diagnosis of rhabdomyosarcoma in the oral cavity at the age of 15 months, which, even after undergoing surgical intervention, radiotherapy, and chemotherapy, only survived for 100 days [9], thereby demonstrating the aggressiveness of the tumor and the great capacity for metastasizing to lung and brain. Rhabdomyosarcoma is the most frequent soft tissue tumor in pediatric patients and alveolar rhabdomyosarcoma accounts for 5% of malignant tumors in children up to 15 years of age [1,10].

The histopathology revealed an oral mucous tissue fragment with malignant neoplasia invading the submucosa, characterized by organoids, some of which were solid, cohesive, and composed of rounded epithelioid cells with large nuclei, exuberant nucleoli, and the presence of numerous mitoses. Collagenized stroma were also observed, with extensive ulcer spots, compatible with malignant neoplasm of round epithelioid cells, which suggested the presence of amelanotic melanoma or alveolar rhabdomyosarcoma.

An immunohistochemical test was then required for deeper analysis of lesion histogenesis. This corroborates the study [9], on cells found in the oral cavity of a 15-month-old dog, in which histopathology with H&E staining also suggested the presence of amelanotic melanoma and, to determine this, an immunohistochemical test was also used.

The immunohistochemistry, which determined the profile and morphology, enabled the diagnosis of alveolar rhabdomyosarcoma using MyoDI, Desmin, and Myogenin immunoexpression found in neoplastic cells, and not with CD3, Granzyme, 1A4, HHF35, and Melanoma Cocktail. As a proliferation marker, positive expression of Ki67 occurred in approximately 80% of the neoplastic cells, which were similar in confirming the results. However, some extra antigens were also used, in which neoplastic cells were negative for CK AE1/AE3, CD3, CD20, CD79a, CD18, melan-A, chromogranin A, α -smooth muscle actin, and myoglobin, but positive for vimentin and desmin. Intensely positive staining for myogenin and MyoD1 was observed and was confined to the nuclei. Most of the cells with around 70.4% were positive for Ki-67 [9], akin to the outcomes found in the reported neoplasm affecting the 10-month-old animal.

Veterinary physicians should be conscious of the treatment of serious illnesses that will not result in a benefit for the patient. They should know when to stop the treatment to not cause further pain and suffering to the animals and their owners. Many of the interventions which aim to treat severe malignant neoplasia will not promote an improvement in quality of life or significantly extend the patient's survival, and do not justify the suffering they entail. A painless death remains the best alternative in such cases.

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