

Long-term Survival in Two Dogs with Intracranial Meningioma Treated with Lomustina and Prednisone

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Abstract

Meningioma is a benign tumor that has origin in the meninges. Histologically, the tumor cells are characterized by the formation of cytoplasmic fibrils, collagen and desmosomes. Due to poor prognosis of patients, this study aimed to report the diagnostic and therapeutic approach of two intracranial meningioma tumors in dogs. A 6-years-old, female Boxer dog and an 11-years-old, female Poodle dog were presented at the Internal Medicine Service at the Veterinary Hospital with neurological signs. A computed tomography (CT) scan with an intravenous contrast was performed in both subjects and a neof ormation was found in the cerebellum and optic chiasm, respectively. After diagnosis, the chemotherapeutic protocol based on Lomustine (60 mg/m²) every 21 days, orally and 1 mg/kg of prednisone every 24 hours throughout the treatment. After establishment of the therapeutic protocol, the animals showed remission of clinical signs. The subject 1 was kept under treatment for 180 days and after this period the animal died and necropsy was performed showing a mass measuring 2x2x2 cm in the cerebellum. The subject 2 was kept under treatment for 120 days and after this period the animal was submitted to another CT scan where was noticed the enlargement of the neoplasia. The subject had 240 days of therapeutic control. Chemotherapy with lomustine associated with prednisone was effective in remission of clinical signs and patient stabilization.

Introduction

Meningioma is a benign tumor that has origin from meninges. It is the most common intracranial neoplasm in dogs, with an incidence ranging from 33 to 49% of all brain tumors (1). Computed tomography scan (CT) is an important diagnostic method, which characterizes satisfactorily dimensions of intracranial neoplastic processes. However, biopsy and histopathology is required to classify the neoplasia (AMARAL et al., 2008). The aim of this study is to describe the diagnostic and therapeutic approach of two intracranial meningioma tumors in dogs.

Case Presentation

The subject 1 was a 6-years-old, female Boxer dog that was referred to the hospital with ataxia, incoordination and anorexia. On neurological examination, facial and olfactory nerves showed reduction of stimulation. Proprioception was unchanged and patella, sciatic and radial reflexes were normal. Because of suspicion of intracranial neoplasm, the animal was referred to a head CT (Figure 1). The subject 2 was an 11-years-old, female Poodle dog with history of sudden blindness, ataxia and prostration. The subject had history of enucleation of the right eye due to exophthalmos (occurred one year ago) and have being diagnosed with meningioma retrobulbar in the histopathology evaluation. On physical exam, the animal was slightly apathetic, ataxic, prostrate and with a swelling in the right orbital region.

On ophthalmologic examination of the remaining eye, it was observed slight opacity of the lens, no blink to threat reflex and presence of photopupillary reflex without evidence of any change on the fundus examination by direct ophthalmoscopy. Complete blood count (CBC), hepatic and renal biochemical profile (ALT, AST, FA, urea and creatinine), electrocardiography and CT scan of the orbits and skull were tests requested. Both CTs were performed in helical device ESLCINT SELECT SP, with axial and coronal slices with 2 mm thick, using intravenous non-ionic contrast.

The subjects were sedated for the CT, using an association of pethidine (2mg/kg) and acepromazine (0.05 mg/kg) intramuscular (IM) injection and 10 mL of iodinated contrast injected intravenously (IV). The subject 1 showed a significant increase of the cerebrospinal fluid (CSF) within the left and right lateral ventricles. The cortical sulci and basal cisterns were compressed due to the increase of CSF within the lateral ventricles. The images

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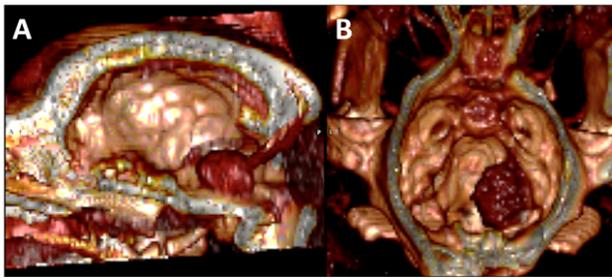


Figure 1: 6-years-old, female Boxer dog. 3D reconstruction on an intracranial meningioma compressing the cerebellar bulb. A: intracranial meningioma (arrow) presenting a well-delimited mass with peritumoral edema. B: intracranial meningioma (arrow) compressing the cerebellar bulb

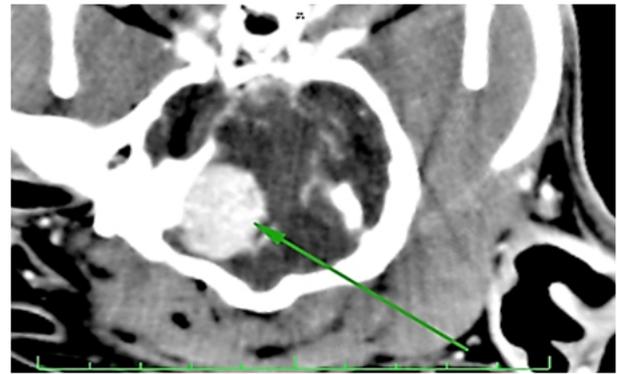


Figure 2: A 6-years-old, female Boxer dog with a hypercaptant mass in the cerebellum evidenced by intravenous contrast

were suggestive of hypercaptant mass (Figure 2) in the cerebellum evidenced by intravenous contrast, affecting and compressing the cerebellar bulb, the peribulbar cistern, the amygdala, pons, the cerebellar peduncle, rostral lunate lobule, the simple lobe and right quadrangular lobe, also involving the cerebellar tonsil and fourth ventricle. It was noted protrusion of the cerebellum in consequence of the increase in volume caused by the neoplasia.

Due the difficulty of performing intracranial biopsy to establish the histological classification of the tumor, it was decided to use lomustine in the chemotherapy protocol because of the drug's ability to pass the blood-brain barrier. Chemotherapy protocol was established, consisting of lomustine (60 mg/m²) every 21 days, orally and 1 mg/kg of prednisone every 24 hours throughout the treatment. The subject showed no clinical alterations by the use of chemotherapy drugs and survival of 180 days. During necropsy, we could verify the presence of 2x2x2cm node located in the cerebellum base, causing compression of adjacent structures. Histopathology was compatible with meningioma. The subject 2 revealed a neoplastic mass in the right orbital region, invading the orbital fissure and optic nerve, following visual tract through the intracranial portion of the optic nerve, with invasion of the optic chiasm. The tumor was compressing the encephalic mass. After diagnosis, a chemotherapy protocol was established, consisting of lomustine at a dose of 60 mg/m² every 28 days, orally prednisone at 1 mg/kg, every 24 hours. Laboratory tests were repeated every 28 days, and it was observed a decrease in leukocytes and platelets lineage, three weeks after the first dose of lomustine, and significant increase in ALT after the third dose. A CT performed after four months of the initiation of chemotherapy, showed an increase of the intracranial tumor and also a process of invasion of the left optic tract. After 240 days of treatment, the animal died and her owner chose not to conduct necropsies.

Discussion

Intracranial neoplasms are common diagnosis in elderly dogs with progressive neurological signs [2]. According to Diniz [3], the average age for the onset of intracranial neoplasms is nine years old. However, the subject 1 was below the average while the dog 2 (two) was within the average. Some authors report that meningiomas occur more in female canines than in males, as noted in this report [4]. The breed of the subject 1 is among the most described in the literature, while the subject 2 breed is not reported in the literature. MOORE et al. [5] state that the Boxer dogs, Golden Retriever, Doberman, Scottish Terrier and German Shepherd are more predisposed than the others breeds.

After CT, it was found the presence of intracranial tumor in the subject 1 and an extension of tumor mass in the orbital region of the subject 2. The characteristics of the CT can inform the location of the tumor, size and presence of infiltration of adjacent tissues, but only

histopathology can confirm the diagnosis [1]. According to [2], CT and MRI are accurate for macroscopic evaluation of tumors. In this case, after CT was performed because of suspicion of neoplasia, it was decided to institute chemotherapy treatment. The subject 1 after 15 days of treatment with prednisone and lomustine showed signs of clinical remission. Same chemotherapy protocol was maintained for 180 days. The subject 2 showed progression of neurological signs after 20 days of treatment. The dose of the chemotherapy protocol was according to RODASKI and Nardi [6]. Also according to [1] who described a case of intracranial meningioma in a dog, the treatment used was lomustine (60 mg/m²) and prednisone (1 mg/kg) for 390 days and the subject was euthanized due clinical deterioration. In this report, the subject 1 died after 180 days of treatment and the subject 2 died after 240 days of treatment. In dogs, unlike what occurs in man and cats, meningioma often invade surrounding tissues, which makes it difficult to complete surgical resection.

In both cases, laboratory tests were performed periodically. According Rodaski and De Nardi [6] myelosuppression causes leukopenia, anemia and thrombocytopenia with neutrophil nadir between five and seven days. In both cases, we observed a progressive decrease in the leukocytes and platelet lineage, starting two weeks after the first dose of lomustine. The chemotherapy with lomustine associated with prednisone was effective in remission of clinical signs and patient stabilization for a long period of time.

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