

## Chemodectoma in a Bitch

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### ABSTRACT

**Background:** Chemodectomas, better known as tumors of the base of the heart, arise from aortic bodies, respiratory chemoreceptors located near or inside the aortic arch or originate from receptors located in the carotid arteries. Relatively rare, they affect dogs and, to a lesser extent, cats. They gain great importance when they influence the function of the cardiovascular system, with animals showing clinical signs related to congestive heart failure. Clinical diagnosis is based on symptomatology and complementary tests such as radiography, electrocardiography and echocardiography, while the definitive diagnosis is obtained by cytological and histopathological exams. This study aims to report a case of malignant chemodectoma in a bitch, whose main symptomatology was neurological and not cardiovascular.

**Case:** A 1-year-old Rottweiler bitch was attended with neurological alterations compatible with vestibular syndrome, hyporexia, dysphagia, apathy, melena, emesis, and purulent nasal discharge on the right nostril. On physical examination, the animal showed depressed level of consciousness, poor body condition, bilateral chemosis, paralysis of the right eye, inspiratory dyspnea and muffling of cardiac auscultation, besides a subcutaneous nodule between the scapulae. On neurological evaluation, horizontal nystagmus, head tilt to the right side, ventromedial strabismus and facial nerve paralysis on the right side were observed so that the localization of the lesion was set in peripheral vestibular system. During anesthesia for esophageal tube placement, a mass from the hard palate to the oropharynx was noted, making endotracheal intubation impossible to perform. Biopsy of this nodule was performed, and tracheostomy was indicated, but the owner opted for euthanasia before the procedure. Necropsy revealed white soft masses in the bilateral retromandibular region, on the subcutaneous tissue near the scapulae, in the right ear and since nasopharynx to the soft palate, in addition to sparse white nodules in the heart, lung, carotid artery, kidneys, right ovary, mesentery near to the spleen, and axillary lymph node. Histologically, the nodules were characterized by neoplastic cells population organized in short bundles or cords, arranged around small blood vessels surrounded by delicate connective tissue. Neoplastic cells infiltrated muscles and blood and lymphatic vessels were filled by multiple neoplastic emboli. The histological pattern of the cells allowed the diagnosis of chemodectoma.

**Discussion:** The bitch from this case had 1-year-old when diagnosed with chemodectoma, differently from most cases from literature, that are between 7 to 15 years old. Furthermore, primarily cardiac tumors are considered rare, being chemodectoma the most common, often reported in Boxer and Boston Terrier dogs, but unusual in Rottweilers. Despite some articles mentioning seizure and Horner's Syndrome secondary to a carotid body chemodectoma, neurological signs are not commonly observed in these cases. The presence of the tumor in the middle ear region of the right side supports the occurrence of peripheral vestibular syndrome and facial nerve paralysis on the same side. Because it is a neoplasm that is usually detected late during the course of the disorder, most patients either cannot obtain diagnosis in vivo, as in this reported animal, which was in such a critical condition that underwent euthanasia, or there are no more possible therapeutic choices. In the patient described, there were numerous metastatic masses and nodules spread throughout the body. Although the typical clinical signs in animals with chemodectomas are often related to heart disease, neurological signs may also be present. This report emphasizes the importance of chemodectoma being included as a differential diagnosis in young dogs and even in breeds such as Rottweiler.

**Keywords:** aortic body neoplasia, paraganglioma, vestibular syndrome.

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## INTRODUCTION

Chemodectomas or paragangliomas, better known as tumors of the base of the heart, arise from aortic bodies, respiratory chemoreceptors located near or inside the aortic arch or originate from receptors located in the carotid arteries [10]. Relatively rare, they affect dogs and, to a lesser extent, felines. They gain great importance when they influence the function of the cardiovascular system, being more common in brachiocephalic dogs, due to the anatomical conformation of their respiratory system, in which they are believed to cause chronic hypoxia [10].

These tumors are mostly benign; however, the malignant variant may present metastases in the brain, lung, lymph nodes, liver, pancreas, kidney and bones. Vascular invasion and evidence of metastasis indicate malignancy [1,5].

Generally, animals show clinical signs related to congestive heart failure, which may include cough, dyspnea, anorexia, weight loss, weakness, abdominal distension, and commonly pericardial effusion, which is the most common clinical presentation of the disease [10].

Clinical diagnosis is based on symptomatology and complementary tests such as radiography, electrocardiography and echocardiography, while the definitive diagnosis is obtained by cytological and histopathological exams [10]. This study reports a case of malignant chemodectoma in a bitch, whose main symptomatology was neurological and not cardiovascular.

## CASE

A 1-year-old Rottweiler bitch was attended with neurological alterations compatible with vestibular syndrome, hyporexia, dysphagia, apathy, melena, emesis, and purulent nasal discharge on the right nostril. In previous care performed in another clinic, internal otitis was suspected, and was treated with otological washing, in addition to metronidazole<sup>1</sup> [20 mg/kg v.o., BID], and prednisone<sup>2</sup> [Meticorten® - 1 mg/kg, v.o., SID], with no clinical improvement.

On physical examination, the animal showed dehydration of 7%, capillary filling time of three seconds, depressed level of consciousness, poor body condition, bilateral chemosis, paralysis of the right eye, inspiratory dyspnea and muffling of cardiac auscultation, besides a subcutaneous nodule approximately five centimeters in diameter between the scapulae. On neurological evaluation, horizontal nystagmus, head

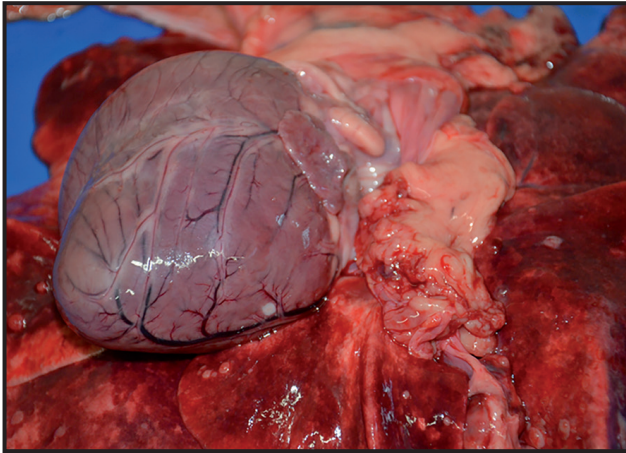
tilt to the right side, ventromedial strabismus, and facial nerve paralysis on the right side were observed so that the localization of the lesion was set in peripheral vestibular system.

A blood count was performed and showed leukocytosis of 22,800/mm<sup>3</sup> (ref.: 6,000 to 17,000/mm<sup>3</sup>), 19,836 neutrophils/mm<sup>3</sup> (ref.: 3,000 to 11,500/mm<sup>3</sup>) and 912 monocytes/mm<sup>3</sup> (ref.: 0 to 1,500/mm<sup>3</sup>). Serum biochemical tests were within normal limits for the species, including albumin, gamma glutamyl transferase, globulin, urea, alanine aminotransferase, creatinine, alkaline phosphatase, phosphorus, and total protein.

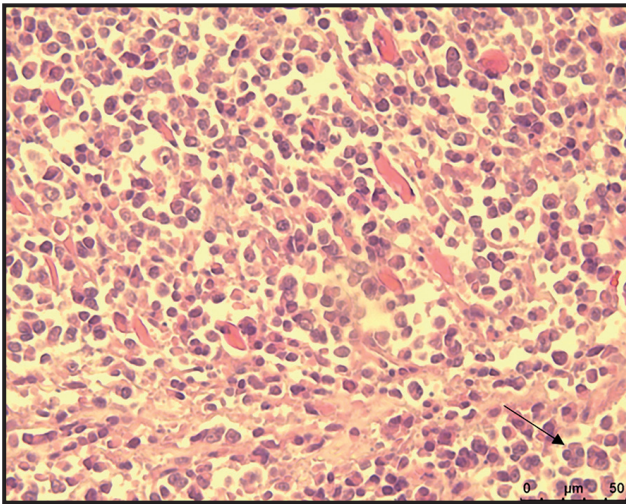
Tympanic leaflets, sinus, and thorax radiographs showed lysis of the tympanic bulla with stenosis of the right-sided auditory canal, opacification of the right side of the sinus and three radiopaque pulmonary nodules. Due to prolonged anorexia, esophageal tube placement was indicated for initiation of forced feeding. During anesthesia for this procedure, a mass from the hard palate to the oropharynx was noted, making endotracheal intubation impossible to perform. Biopsy of this nodule was performed, and tracheostomy was indicated, but the owner opted for euthanasia before the procedure.

Necropsy revealed white soft masses in the bilateral retromandibular region, on the subcutaneous tissue near the scapulae, in the right ear and since nasopharynx to the soft palate, in addition to sparse white nodules in the heart, lung, carotid artery, kidneys, right ovary, mesentery near to the spleen, and axillary lymph node (Figure 1). There was also about 140 mL of free bloody fluid in the thoracic cavity.

Histologically, all masses and nodules were similar and characterized by little delimited, partially encapsulated and densely infiltrative neoplastic cells population. The neoplastic cells were organized in short bundles or cords, arranged around small blood vessels surrounded by delicate connective tissue and were polygonal, with moderate to abundant cytoplasm, polygonal or round basal nucleus, finely stippled chromatin and occasional single nucleolus (Figure 2). Mitotic figures ranged from 2 to 11 per 40 x field (average of 5.4 mitoses in 10 fields of 40x) and binucleated or multinucleated cells were commonly seen. Neoplastic cells infiltrated muscles and blood and lymphatic vessels were filled by multiple neoplastic emboli. The histological pattern of the cells allowed the diagnosis of chemodectoma.



**Figure 1.** Anatomopathological aspects of chemodectoma in a bitch. There are sparse white nodules in the heart and lung.



**Figure 2.** Neoplastic cells with moderate to abundant cytoplasm, round or polygonal basal nucleus and finely stippled chromatin, with occasional single nucleolus. Binucleated and multinucleated cells are common. [HE; 40×].

## DISCUSSION

The animal had 1-year-old when was diagnosed with chemodectoma, opposed to cases observed in the literature, which mentions that most of the animals diagnosed are 7 to 15 years old [8,10], although 2 cases of 2-year-old dogs with aortic body tumor were described [1,6]. Primarily cardiac tumors are considered rare, with incidence of 0.19% in dogs. Among the cardiac tumors, chemodectoma is the most common, often reported in Boxer and Boston Terrier dogs, but unusual in Rottweilers [2,4].

Although it has been already published a case of a canine showing seizures due to chemodectoma [7] and Horner's Syndrome secondary to a carotid body chemodectoma [12], neurological signs are not commonly observed in these cases, being dyspnea, cough, anorexia, weight loss and abdominal distension the most often described signs [6,10].

The presence of the tumor in the middle ear region of the right side supports the occurrence of peripheral vestibular syndrome and facial nerve paralysis on the same side, due to the anatomical correlation of vestibulocochlear and facial nerves with the middle and inner ear [9]. Dysphagia and inspiratory noises described in our report occurred due to the presence of the pharynx and palate mass. Also, the muffling of cardiorespiratory auscultation was possibly due to the presence of free fluid and pulmonary nodules.

The difficulty in correlating clinical presentation of patients with the diagnosis of chemodectoma is due to the nonspecificity of signs [5,8,10], as happened in this case. Although this type of neoplasm can be found as a sole intrathoracic mass, its presence at the base of the heart and diffusely in vessels of greater caliber, besides pericardial effusion production is frequent [10], as evidenced in the studied animal.

Treatment of chemodectoma is based on symptomatic and local control through surgical resection of the tumor or pericardiectomy, whenever possible in order to increase the survival of the animal. In addition, the use of radiotherapy has shown good results [11]. Because it is a neoplasm that is usually detected late during the course of the disorder, most patients either cannot obtain diagnosis *in vivo*, as in this reported animal, which was in such a critical condition that underwent euthanasia, or there are no more possible therapeutic choices.

Chemodectomas are mostly considered benign with low metastatic potential. However, they are 12% likely to promote metastasis [2,11]. In the patient described, there were numerous metastatic masses and nodules spread throughout the body. Histopathological features were similar to those described in the scientific literature [3] and were necessary to confirm the diagnosis.

Although the typical clinical signs in animals with chemodectomas is often related to heart disease, neurological signs may also be present. This report emphasizes the importance of chemodectoma being included as a differential diagnosis in young dogs and even in breeds such as Rottweiler.

## MANUFACTURERS

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