

Computed Tomography evaluation of occipital bone tumor in a Doberman – Case study

¹Radu Lăcătuș, ¹Cosmin PEȘTEAN, ²Nele ONDREKA, ¹Robert Cristian PURDOIU

¹University of Agricultural Sciences and Veterinary Medicine Cluj Napoca, Romania, Calea Manastur 3-5

²Justus-Liebig-Universitat Giessen, Clinic for Small Animal – Department of Radiology, Giessen, Hessen, Germany,
rlacatus2003@yahoo.com; Nele.Ondreka@vetmed.uni-giessen.de; robert.purdoiu@usamvcluj.ro

Abstract

A 6.5 years old intact Doberman female was brought to consultation showing sign of medullary compression. The neurological examination concludes a lesion in cervical part of the spine, given the fact that the patient presents mobility deficiency on all four limbs, having trouble maintaining a standing position. The mental status, the behavior and the evaluation of the central nervous system haven't show any kind of changes. The CT examination of the spine show no changes in the vertebral alignment or sign of compression. The CT scanning of the head reveals an infiltrative osteolytic formation in the right side of the temporo-occipital bone of the skull,

Keywords: *cranial tumor, dog, occipital tumor, computed tomography*

Introduction

Osteosarcoma in dog is the most common type of bone cancer and have an incidence of 80% from all the bone tumor, followed by chondrosarcoma (10%) and less frequently are encountered fibrosarcomas and hemangiosarcomas (7%) (1, 3). The most affected are the large breed dogs (55%) and giant breed dogs (29%) (4). The prevalence for the lesion is 79-95% in the appendicular skeleton and 5-21% were located in the axial skeleton in the giant and large dogs breed. In the medium breed the prevalence of osteosarcoma in the axial skeleton in higher (33%) but the incidence in this category is lower (11%) (2, 4). Regarding the location of osteosarcoma in the head at the level of parietal bone only 2.3% were recorded from a total of 1215 examined dogs (2, 3, 5).

The chondrosarcoma is also more common found in the appendicular skeleton, but there were reported cases of chondrosarcoma located in the mammary gland, tongue, kidney, abdominal wall, urethra, mitral valve and aorta (1). Location of the chondrosarcoma at the level of the skull is rare representing only 0.1% in humans (3).

Material and methods

The biological material was represented by a 6.5-year-old intact Doberman female that was brought to consultation for locomotor problem. The neurological examination concludes a lesion in cervical part of the spine, given the fact that the patient presents mobility deficiency on all four limbs, having trouble maintaining a standing position. The mental status, the behavior and the evaluation of the central nervous system haven't show any kind of changes.

The CT evaluation was performed with the patient under sedation and restrained in a dorso-ventral decubitus for spine evaluation and ventro-dorsal decubitus for head evaluation. The CT examination was performed using a Siemens SOMATOM SCOPE CT (Siemens), with soft tissues and bone reconstruction windows. The images were obtained using 130 kV and a pitch factor of 0.85.

Results and discussion

Computed Tomographic Findings

A mixed osteolytic and osteo-proliferative lesion with soft tissue component is seen at the right occipital and temporal bone. Multifocal permeative osteolysis is noted as well as chaotic osteo-proliferation and amorphous periosteal reaction. The lesion is perforating into the caudal and cranial fossa to the right of the skull base and is directly adjacent to the emergence of the right cranial nerves including the origin of the right trigeminal nerve (fig. 1).

Moderate right sided masticatory muscle atrophy is noted. The right tympanic bulla and the medial portion of the right ear canal are filled with hypoattenuating material (fig. 2).

The right medial retropharyngeal lymph node presents moderate enlargement with increased short-to-long axis ratio.

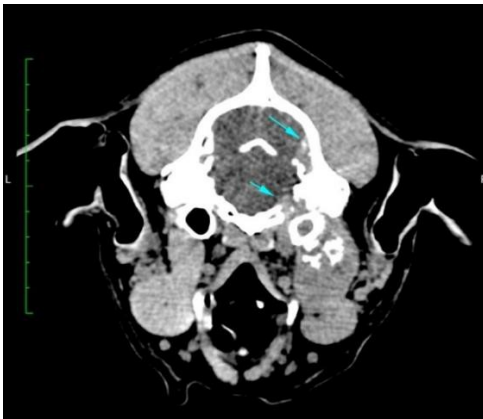


Fig. 1 Destruction of the bone and internal ear

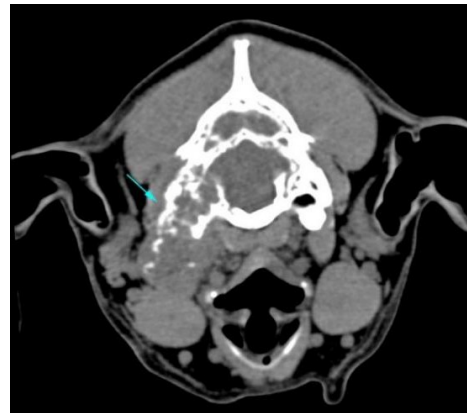


Fig. 2 Infiltrative character of the formation

Peripheral fat stranding is noted in proximity of the soft tissue component of the lesion as well as circumferential to the right medial retropharyngeal lymph node.

In the medullary canal at the atlas level a hyperattenuating material is present inside the medullary canal having a compressive effect on the spine (fig. 3, fig. 4).

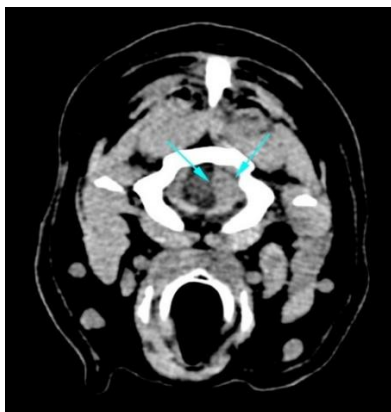


Fig. 1 Compression of the spine and retropharyngeal LN reaction



Fig. 4 Destruction of the occipital condyle

The osteolytic process is spread also to the occipital bone, there are new bone formation with infiltrative character on the right side of the occipito-atloidian junction (fig. 5).

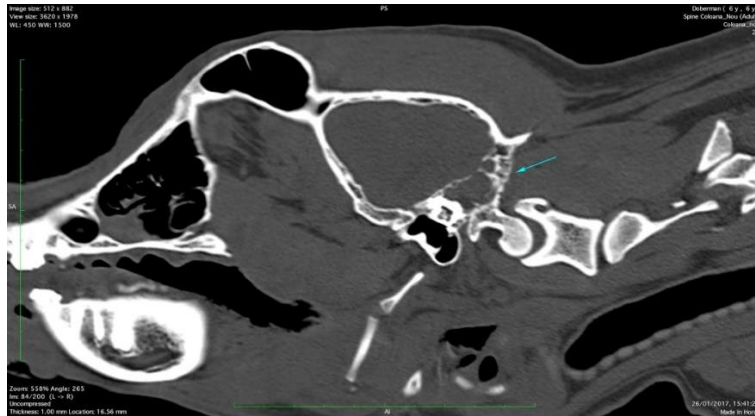


Fig. 5 Bone destruction in the occipital

Evaluation of the spine show no changes that could explain the patient symptoms.

CT Diagnosis

Neoplasia with aggressive biological behavior of the right occipital and temporal bone and intracranial extension. Possible metastatic spread to the right medial retropharyngeal lymph node. Secondary ipsilateral masticatory muscle atrophy. Secondary ipsilateral otitis media and externa.

Differential diagnoses

Squamous cell carcinoma, adenocarcinoma, osteocondrosarcoma, and lymphosarcoma are possible differential diagnoses. The lymph node changes are suggestive for metastatic spread.

Final diagnosis would require sampling. However, the long-term prognosis is poor. The lesion is not resectable.

Discussion

Unfortunately, the owner refuses a sampling from the formation in order to have a proper classification of the tumor and other form of treatment. According to the CT findings and the data from literature (2, 3), the radiographic presumptive diagnostics is of osteocondrosarcoma. The canine osteocondrosarcoma have relatively low metastatic rate and slow growing rate (1), that was proven also by the lack of other metastatic process in the body. Because of the slow rate of growing the spine and brain can adjust to the compression (1).

Because of the slow growing process the patients usually show clinical sign of at the late stage of the disease (4).

Acknowledgement: the studies was conducted in the laboratory of Medical Imaging – Radiology and are part of the internal grand research conducted by the Radiology laboratory.

References

1. Davis GJ, Holt D., 2003, Two chondrosarcomas in the urethra of a German shepherd dog. *J Small Abnim Pract* 44:169-171.
2. Goldschmidt MH, Thrall D., 1985, Malignant Bone Tumors in Dogs. In: *Textbook of small animal orthopaedics*, Newton CD, Nunamaker DM, J.B. Lippincott Company
3. Heejaung K., Munekazu N., Kazuhito I., Yasida G., Yasuho T., 2007, Primary chondrosarcoma in the skull of a dog. *J. Vet. Sci.* 8(1):99–101.
4. Kistler KR, 1981, Canine osteosarcoma: 1462 cases reviewed to uncover patterns of height, weight, breed, sex, age and site of involvement. Phi Zeta Awards, University of Pennsylvania, School of Veterinary Medicine.
5. Straw RC, 1996, Tumors of the skeletal system. In: Withrow SJ, MacEwen EG (eds.). *Small Animal Clinical Oncology*. 2nd ed., Saunders, Philadelphia, pp. 287-315.