

Multilobular Tumour of Bone and Classification

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Abstract

A seven-year-old neutered female golden retriever was presented for an acute onset of cervical pain and ataxia. Intervertebral disc disease or neoplasia was suspected. There was no evidence of a soft tissue or bony mass on physical examination or survey radiographs. Cerebrospinal fluid analysis did not show any evidence of a neoplastic process. Myelography evaluation identified an extradural mass lesion extending from inside the calvarium to the mid-body of the first cervical vertebra. No additional diagnostic tests were performed as the owners elected for euthanasia because of the high possibility of a neoplastic process with an accompanying poor prognosis. Multilobular tumour of bone was diagnosed on postmortem examination.

General physical examination was within normal limits. Multilobular tumor of bone (MTB) is a primary bone neoplasm, uncommon in dogs. This tumor was called of many names for a long time, as: chondroma rodens, multilobular osteochondrosarcoma, multilobular osteoma, multilobular chondroma, calcifying aponeurotic fibroma, although MTB was preferred chosen, because these other name could be correlated with humans' tumors. Neurological examination revealed obtundation, bilaterally absent menace responses, and cervical hyperesthesia. A multifocal neuroanatomical localization with forebrain and cervical spinal cord involvement was considered most likely. Results of a complete blood count and a biochemistry profile were within normal limits.

Keywords: Dog; Mandible; Multilobular bone tumor; Tumor

Introduction

The multilobular bone tumor is an uncommon bone neoplasm that affects dogs, with slow growth, being locally invasive and with malignant potential and high recurrence rate, occurring more frequently in the flat bones, mainly of the skull, although it can affect less frequently the bones of vertebrae, pelvis, penile bone, and palate [1]. The multilobular bone tumor has different alternative names such as chondroma rodens, multilobular osteoma, multilobular osteochondrosarcoma, calcifying aponeurotic fibroma and juvenile aponeurotic fibroma. This type of tumor most often affects medium or large breed dogs and rarely in giant and small breeds, being more common in middle-aged to elderly animals. In most cases, this tumor recurs locally after surgical excision, in addition to having a great capacity to metastasize to distant tissues and organs such as the lungs. Normally, on clinical inspection and palpation, this tumor appears as a solid and immobile mass with a nodular appearance on the surface of the skull bones. Depending on its location, the tumor can lead to the development of different clinical signs and symptoms in affected dogs, which range from difficulty in chewing, obstruction of nasal sinuses, neurological signs, exophthalmos and disfigurement of the face and head due to the tumor mass being extremely protruding [2].

The dog demonstrated ambulatory cerebellar ataxia and bilaterally absent menace responses the day after surgery. He gradually improved, was discharged from hospitalization 5 days after surgery and was, according to the owners, neurologically normal 7 days after surgery [3]. Histopathological examination of cruciate sections representative of the mass and surgical margins revealed a neoplasm composed of multiple islands and anastomosing trabeculae of well-differentiated woven bone and occasional cartilage surrounded by few polygonal to spindle cells, separated by thin, irregular fibrovascular septa.

A bone tumor is an abnormal growth of tissue in bone, traditionally classified as noncancerous (benign) or cancerous (malignant) [4]. Cancerous bone tumors usually originate from a cancer in another part of the body such as from lung, breast, thyroid, kidney and prostate. There may be a lump, pain, or neurological signs from pressure. A bone

tumor might present with a pathologic fracture. Other symptoms may include fatigue, fever, weight loss, anemia and nausea. Sometimes there are no symptoms and the tumor is found when investigating another problem. Diagnosis is generally by X-ray and other radiological tests such as CT scan, MRI, PET scan and bone scintigraphy. Blood tests might include a complete blood count, inflammatory markers, serum electrophoresis, PSA, kidney function and liver function. Urine may be tested for Bence Jones protein. For confirmation of diagnosis, a biopsy for histological evaluation might be required [5].

Methods

Dogs with multilobular tumors of bone often present with a non-painful, often well-defined bony mass on the skull. Histories may reveal a long course and a relatively slow, asymptomatic growth. When the tumor occurs near the TMJ (temporomandibular joint), pain can be associated with opening the jaw. The biological behavior is generally considered to be more favorable than osteosarcoma, and appears to be grade dependent [6]. Reported 39 cases of multilobular tumor of bone, in this report, 47% of the dogs had local tumor recurrence following resection at a median time interval of 800 days. Fifty-six percent developed metastasis after treatment, with a median time to metastasis of 542 days, and an overall survival time of 800 days. Even in patients that do experience metastasis, death due to metastasis can be delayed. Dog's diagnosed radiographically with lung metastasis have remained asymptomatic for up to one year or more [7].

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Recovery

A CT scan was performed, revealing a typical granular appearance of a multilobular tumor of bone. Although large, the tumor was fairly well demarcated and did not appear to be invading through the cranium; therefore the decision was made to go to surgery. Primary tumors of bone can be divided into benign tumors and cancers. Common benign bone tumors may be neoplastic, developmental, traumatic, infectious, or inflammatory in etiology. Some benign tumors are not true neoplasms, but rather, represent hamartomas, namely the osteochondroma. The most common locations for many primary tumors, both benign and malignant include the distal femur and proximal tibia [8].

The tumor had to be lifted from the bone, but was able to be removed due to its well circumscribed nature. Recovery was uneventful, and vision was immediately restored. Due to the low grade nature of Puppert's tumor, adjunctive chemotherapy or radiation therapy was not advised. As of 6 months post operatively, regrowth had not been observed.

Bone tumors are traditionally classified as noncancerous (benign) or cancerous (malignant). Several features of bone tumors and soft tissue tumors overlap. Their classification was revised by the World Health Organization (WHO) in 2020. This newer classification categorises bone tumors into cartilage tumors, osteogenic tumors, fibrogenic tumors, vascular tumors of bone, osteoclastic giant cell-rich tumors, notochordal tumors, other mesenchymal tumors of bone, and hematopoietic neoplasms of bone [9].

Classification of Bone tumors

Bone tumors may be classified as "primary tumors", which originate in bone or from bone-derived cells and tissues, and "secondary tumors" which originate in other sites and spread (metastasize) to the skeleton. Carcinomas of the prostate, breasts, lungs, thyroid, and kidneys are the carcinomas that most commonly metastasize to bone [10]. Secondary malignant bone tumors are estimated to be 50 to 100 times as common as primary bone cancers.

1. Primary bone tumors
2. Secondary bone tumors

Symptoms

There may be a lump, with or without pain. Pain may increase with the growth of the tumor and may be worse at night and at rest. A bone tumor might present with an unexplained broken bone; with little or no trauma. Additional symptoms may include fatigue, fever, weight loss, anemia and nausea. If the tumor presses a nerve, neurological signs may be present. Sometimes there are no symptoms and the tumour is found when investigating another problem.

Conclusion

Multilobular tumors of bone are locally invasive, and recurrence after surgical resection is therefore common. Recurrence occurs typically only after a prolonged period of time and affected dogs therefore have a

long disease-free interval and long survival times after surgery. In dogs undergoing surgical excision, with or without adjunctive radio- and/or chemotherapy, median time to recurrence was 14 months, while the median survival time was 22 months. Even longer survival times were reported in another study, indicating median survival times and times to recurrence of 797 days after surgery. In dogs receiving chemotherapy alone a median survival of 144 days is reported [9]. Surgery therefore remains the treatment of choice and predictably, grade I to III, in which grade III represents the most malignant grade and incomplete surgical margins. Despite the presence of incomplete surgical margins in the dog described in this report, local recurrence in 8 days was still considered an unusually short disease-free interval. Histopathological examination of both the originally excised tumor and the recurrent tumor revealed substantial morphological differences. The tissue obtained during the first surgery demonstrated relatively benign characteristics including a well-organized lobular or trabecular structure, low cellularity and mild cellular pleomorphism, typical of MTB. The tumor regrowth, on the other hand, displayed a markedly disorganized structure, high cellularity, extensive necrosis, marked cellular pleomorphism, and a higher mitotic count. These histopathological findings were considered consistent with osteosarcomatous transformation.

Acknowledgement

None

Conflict of Interest

None

References

1. Tomlin JL, Sturgeon C, Pead MJ, Muir P (2000) Use of the bisphosphonate drug alendronate for palliative management of osteosarcoma in two dogs. *Vet Rec* 147: 129-32.
2. Psychas V, Loukopoulos P, Polizopoulou ZS, Sofianidis G (2009) Multilobular tumour of the caudal cranium causing severe cerebral and cerebellar compression in a dog. *J Vet Sci* 10: 81-3.
3. Loukopoulos P, Thornton JR, Robinson WF (2003) Clinical and pathologic relevance of p53 index in canine osseous tumors. *Veterinary Pathology* 40: 237-48.
4. Bech-Nielsen S, Haskins ME (1978) Frequency of osteosarcoma among first-degree relatives of St Bernard dogs. *J Natl Cancer Inst* 60: 349-53.
5. Wilkins RM, Cullen JW, Odom L, Jamroz BA, Cullen PM, et al. (2003) Superior survival in treatment of primary nonmetastatic pediatric osteosarcoma of the extremity. *Ann Surg Oncol* 10: 498-507.
6. Kundu ZS (2014) Classification, imaging, biopsy and staging of osteosarcoma. *Indian J Orthop* 48: 238-46.
7. Papalas JA, Balmer NN, Wallace C, Sangüeza OP (2009) Ossifying dermatofibroma with osteoclast-like giant cells: report of a case and literature review. *Am J Dermatopathol* 31: 379-83?
8. Gelberg KH, Fitzgerald EF, Hwang SA, Dubrow R (1995) Fluoride exposure and childhood osteosarcoma: a case-control study. *Am J Public Health* 85: 1678-83?
9. Luetke A, Meyers PA, Lewis A, Juergens H (2014) Osteosarcoma treatment where do we stand a state of the art review. *Cancer Treat Rev* 40: 523-532.
10. Dhaliwal J, Sumathi VP, Grimer RJ (2009) Radiation-induced periosteal osteosarcoma (PDF). *Grand Rounds* 10: 13-18.