Frontal Chondrosarcoma in a Cat

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Abstract

In this case, chondrosarcoma, detected on the frontal bone of a 12-year-old female cross-bred cat was examined clinically and histopathologically. After being processed routinely and specimens were stained with Hematoxylin & Eosin and Crossman Modification of Mallors Triple Stain. The neoplasm was composed of numerous fusiform mesenchymal cells intimately associated with the formation of lobular structure, separated by thin fibrous septae. In the center there were observed atypical chondrocytes, forming the matrix of the tumoral mass, surrounded by round-ovoid, fusiform mesenchymal cells having interference with the septal tissue of the periphery. Few mitotic figures were detected in these areas. The tumors pattern, localization, the species and the age of the animal were consistent with those of multilobular chondroma known as chondroma rodens. Although the mitotic figures and the wide atypia indicated that the entity was a neoplasm of malign type, it was more likely considered to be the malign transformation of chondroma rodens.

The post-surgical outcome of the patient was observed, and recurrence on the same site was reported within 2 months.

Key words: multilobular chondroma, cats, macroscopical and microscopical findings

Multilobular chondromas and osteomas (ML/O) are rarely encountered mesenchymal tumors generally developing on the canine skull with a locally invasive character [1, 2, 4, 6]. ML/O were formerly classified as a particular type of cartilage forming tumor by WHO and also known as chondroma rodens, calcifying aponeurotic fibroma and canine cartilaginous analogue of fibromatosis [3, 6]. The neoplasm has a multiple lobulated structure, each lobule of which is composed of cartilaginous, osseous or osteocartilaginous islands surrounded by poorly differentiated areas of round-ovoid and fusiform mesenchymal cells and mature fibrous lamina at the periphery.

Although it is encountered more commonly in dogs [1, 3, 4, 6], two cases were reported in cats [2, 3, 5] and one in a horse previously [5]. No sex or breed predilections were indicated. Despite the local aggressive character and the tendency of malign transformation of the neoplasm, it generally has a favorable prognosis [4, 6].

In this report, we aimed to describe the clinical and pathologic features of chondrosarcoma arising in a multilobular chondroma, on the cranium of a cat, as it is quite rarely encountered in this species. The tumoral mass, with the dimensions of 3 × 2 × 1 cm, located on the frontal region of the cranium of a 12-year-old female cross-bred cat was totally removed at the Department of Veterinary Surgery and submitted to our department. Radiograph of the skull (Fig. 1) revealed a compact mass in the frontal region. The cut surface of the excised mass was grayish in color, with a rigid and gritty consistency and the gross examination revealed a granular appearance consisting of abundant cysts. It was rather a loose mass, not firmly attached to the frontal region of the skull beneath and was surrounded by a thin fibrous tissue.

**Fig. 1.** Skull of a 12-years-old cat. Radiograph reveals the tumoral mass (arrow) (1). Mature bone spicules showing the invasion of the bone (arrow) (2). Bar = 50 μm.
Specimens were initially fixed in 10% formalin-saline solution and then decalcified with 10% nitric acid solution. After being processed routinely, the specimens were embedded in paraffin wax and cut at about 5-6 μm thickness and finally stained with Hematoxylin & Eosin and Crossman Modification of Mallors Triple Stain.

The tumoral mass was composed of numerous, fusiform and round to ovoid mesenchymal cells intimately associated with the formation of lobular structure, each separated by thin fibrous septae. In the center there were observed atypical chondrocytes and immature bone tissue forming the matrix of the neoplasm (Fig. 2). The lobules were surrounded by round to ovoid and fusiform mesenchymal cells interfering with an outer layer of fibrous connective tissue. Mitotic figures and hyperchromatic cells were detected both in the lobular center and in a middle zone of mesenchymal elements. In the central region of the neoplasm, there were necrotic areas (Fig. 2).

**Fig. 2.** Chondrosarcoma; 12-year-old cat. Multilobular structure with cartilaginous centers (arrows)(1), surrounded by mesenchymal cells and mature fibrous layer. Immature bone tissue in the centre of the lobule (arrow), surrounded by active, atypical mesenchymal cells (2). Atypical chondrocytes in the centre of the lobule (arrow), atypical mesenchymal cells and mature fibrous layer (3). Necrotic regions (arrows)(4).

To our knowledge, this is the third reported occurrence of a chondroma rodens in cats. This case was considered to be worth being presented as it was the first MLC case to be reported in Turkey and moreover it is rarely encountered in cats. Chondroma rodens was indicated to have resemblances to the juvenile aponeurotic fibroma (JAF), occurring in children or adolescents on the basis of its gross and microscopic features [2-4, 6]. It is no longer referred as the JAF, of which general location sites are the wrist and the sole. Moreover, the JAF does not undergo malignant transformation at all.

Recently it is considered to have developed on the flat bones of the skull via intramembranous ossification, on the basis of the histogenetical aspect [1, 3]. In some literatures, it was reported to have a favorable prognosis, despite its locally aggressive character. Necrosis, the loss of the lobular structure, hemorrhage, mitotic activity and the predominance of one of the mesenchymal elements were indicated as the criteria of malignancy [2].

This case was considered to be of malignant type according to the criteria mentioned. The animal age, species, the gross and microscopic findings and the localization site of the neoplasm were consistent with those of chondroma rodens. However, the term chondroma rodens was indicated not to reveal the malignancy of the tumor in a prognostic aspect. It was more likely evaluated as the malign transformation of chondroma rodens. Consequently, this neoplasm was considered to be referred as chondrosarcoma in order to emphasize the malignancy of the lesion.

The post surgical outcome of the patient was observed and recurrence on the same site was reported within 2 months, however the owner refused a new surgical application to be carried out.

**References**