Bone Cysts in the Dog

M. H. Goldschmidt and D. N. Biery

Bone cysts are rare in the dog. They are divided into three types based on their location and contents.

MONOSTOTIC AND POLYSTOTIC BONE CYSTS

Bone cysts may be monostotic, that is, solitary, or polyostotic, occurring in more than one bone. The cyst is a benign fluid-filled lesion of unknown etiology.

Eight cases of monostotic bone cysts have been reported in the literature. (1,3,8-11) Of these, three cysts were found in the distal ulna, two in the distal radius, one in the distal femur, one in the distal humerus, and in one dog the site was unknown. The age of affected animals ranged from 4 1/2 months to 2 1/2 years, with most under 1 year of age. Breeds affected included the German shepherd, Weimaraner, Irish Wolfhound, Afghan hound, Saluki, Great Dane, and Doberman pinscher.

Most bone cysts do not produce clinical signs until they reach a fairly large size. Pain, swelling, and stiffness of the nearest joint may be noted, or the animal may show severe pain and swelling due to a pathologic fracture at the site of the cyst. (1)

Radiographs are essential to make a diagnosis of bone cysts. The radiographic findings are a benign, expansile, radiolucent area in the metaphysis, near to but not usually affecting the physis or epiphysis (Fig. 52-1). (1) The cortex is thinned by the expanding cysts (Fig. 52-2). If a pathologic fracture has occurred, this will be evident radiographically also (Fig. 52-3). Following fracture, a periosteal reaction and possible additional fractures produce an active-appearing lesion.

When surgical intervention to remove the cyst is undertaken, the fluid within the cyst lumen has a serous or serosanguinous appearance. The cortex is thin and blue. Fracture of the cortical bone may cause the cyst to fill with blood.
Histologic examination of the cyst shows that it is lined by fibrous connective tissue. Fibrin may be seen adhering to the cyst wall. In areas of injury osteoblastic and osteoclastic activity will be evident with callus formation at the fracture site (Fig. 52-4). (1)

Spontaneous healing may occur, which is probably precipitated by a fracture. Other cysts require curettage of the walls, filling with cancerous bone, and immobilization of the bone until healing occurs. (1)

Polyostotic bone cysts have been reported in dogs. (2,3,5) Most have been in Dobermans, in whom the disease is thought to be heritable. (3) Cases have also been described in a Mastiff-cross and a Golden retriever. (4,6) Affected dogs were under one year of age. Clinical signs may be apparent as early as 6 weeks of age.

The clinical features, radiographic appearance, and gross pathology are similar to those described for monostotic bone cysts. Histologic examination reveals the cyst to be lined by a poorly defined inner membrane, an amorphous layer that is intensely eosinophilic and periodic acid-Schiff (PAS) positive, and a layer of multinucleated cells. Outside the cyst is edematous, well-vascularized connective tissue. The bony trabeculae are thin and consist of unmineralized osseous tissue. The outer superperiosteal layer is extremely cellular. (3)

Treatment of the cystic lesions is similar to that described for monostotic bone cysts.

ANEURYSMAL BONE CYST
The aneurysmal bone cyst is a benign, blood-filled cyst with adjacent solid areas. Only one case, which arose in the tibia, has been reported in the dog. (12) Radiographic examination of aneurysmal bone cysts in humans reveals destruction of the periosteum with a thin shell of new bone at the periphery.

On gross examination the peripheral bone may be absent, with a thickened periosteum and compressed soft tissue at the periphery of the lesion. The central cystic spaces vary in size and are filled with fresh or clotted blood in various stages of organization.

Histologic examination shows the blood spaces to be lined by connective tissue trabeculae. Within the trabecular and solid areas of fibrous tissue large numbers of multinucleated giant cells, spindly osteoid, and mature bone may be found, with hemosiderin and inflammatory cells also in the stroma.

The lesions must be distinguished grossly and microscopically from telangiectatic osteosarcomas, hemangiosarcomas, and giant cell tumors.

SUBCHONDRAL BONE CYST
Subchondral bone cysts are situated in the subchondral bone between the epiphyseal plate and the articular cartilage. They have been described in humans and in young horses, but no cases have been reported in dogs. The lesions may be seen radiographically as radiolucent defects in the subchondral zone of the bone. Grossly and histologically they resemble a monostotic bone cyst.

REFERENCES

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