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Dr. Norman Ackerman served the University of Florida, College of Veterinary Medicine with distinction as Professor of Radiology from 1979 to 1994. A concerned teacher of veterinary students and residents of all disciplines, Dr. Ackerman also reached the veterinary scientific community through his writing. His numerous clinically pertinent publications are still today a vital part of the veterinary literature; therefore, it is appropriate this site perpetuates Dr. Ackerman's dedication to teaching. This site is presented in recognition of Dr. Norman Ackerman and his contributions to the field of veterinary diagnostic imaging.

Sponsorship of the display supports the Dr. Norman Ackerman Memorial Fund, dedicated to the teaching of diagnostic imaging residents at the University of Florida College of Veterinary Medicine.

- Cayo
- 4 month old M Great Dane

Dr. Norman Ackerman Memorial Radiography Case Challenge

radiography case challenge

Dr. Norman Ackerman Memorial

History and case presentation

- Cayo presents to your clinic with a 1 day history of acute lameness in all limbs with lethargy and inappetance.
- On physical examination, you detect pain and effusion diffusely throughout multiple joints in all four limbs, worst in his left carpus. You also detect severe pyrexia (105F).
- You order carpal radiographs



There are multiple linear lucencies in the metaphyseal regions, running parallel to the physes with adjacent areas of sclerosis. These abnormalities are present in the proximal and distal radius, distal ulna and distal metacarpal bones.

Additionally, there is a cone-shaped radiolucent area in the distal ulnar metaphysis.





Areas of linear lucency (white arrows) running parallel to the physis with areas of adjacent sclerosis (arrowhead)





A cone-shaped radiolucent area in the distal ulnar metaphysis (arrow).



Conclusion

You have found multiple linear regions of lucency adjacent to physes, surrounded by sclerosis, in the metaphyseal regions of multiple bones in a young giant-breed puppy.

You have also found a well-defined, focal area of lucency in the distal ulnar metaphysis.

In a young dog with acute multiple limb lameness, what are some differential diagnoses?

Hypertrophic osteodystrophy is correct!

- Hypertrophic Osteodystrophy (HOD) is a disease of young, rapidly-growing, large and giant breed dogs.
- Radiologic signs include transverse radiolucent lines parallel to the physes in the metaphyseal region (“the double physeal sign”). Mineralization around the metaphysis can occur causing thickening of the metaphysis (seen caudal to the distal ulna physis).



Retained cartilaginous core is correct!

- Retained cartilaginous cores occur in large-breed dogs
- They primarily occur in the distal ulnar physis, although they can occur in the lateral femoral condyle.
- They are caused by a defect in endochondral ossification leading to retention of hypertrophied cartilage in the metaphysis.
- They can be incidental, or, if they disrupt ulnar growth, can lead to angular limb deformities.
- In some cases they can be seen extending up the metaphysis (as faintly seen by the proximal arrow)
- There is another correct diagnosis, return and find it!



Hypertrophic Osteodystrophy (Trostel et al.) *Canine Lameness caused by developmental orthopedic diseases: Panosteitis, Legg-Calve-Perthes disease and hypertrophic osteodytropy. Compendium (2003); 25(4), 282-287* :

- Hypertrophic osteodystrophy (HOD) is an uncommon idiopathic disease that primarily affects young (2-8mo), rapidly growing large and giant breed dogs.
- Several causes have been proposed including nutritional, infectious and inflammatory etiologies although none have been consistently confirmed in all cases.
- Clinical signs include acute onset lethargy, anorexia, reluctance to walk/move and mild to severe lameness. The metaphyseal regions of long bones are firm, warm, painful and swollen.
- The distal radius, ulna and tibia are most commonly affected but HOD has also been reported in the femur, ribs, mandible, scapula and metacarpals.
- Lesions are usually bilaterally symmetrical
- Radiographic signs represent areas of necrosis and suppurative inflammation in the metaphysis. Additional to the radiographic changes previously mentioned, irregular widening of the physis and periosteal new bone formation can occur.
- Usually HOD is self-limiting. Permanent bone changes and physeal abnormalities (e.g angular limb deformities) are possible. In severe cases the disease can be fatal due to persistent hyperthermia and complications such as secondary bacterial infection.