What's Your Radiographic Diagnosis?

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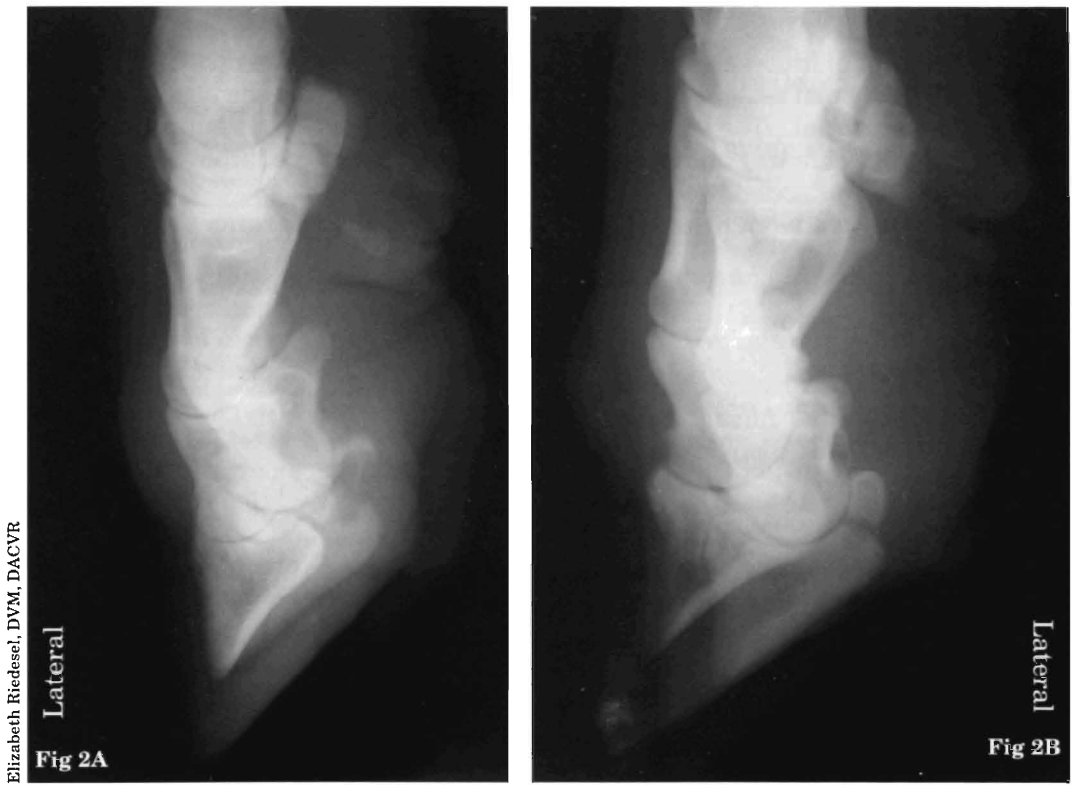
Presentation

An 18-month-old, Gelbvieh bull was presented for evaluation of lameness of the left hind leg. The lameness had been first noted 2 weeks previously. At physical examination swelling of the medial digit of the left hind foot was noted. A focal region of granulation tissue was found at the margin of the sole in the heel region of this digit. Radiographs of the foot were taken for bone and joint evaluation. (Figures 1, 2A, and 2B)

Fig 1. DorsalPlantar view of the left hind foot of an 18-month-old bull presented lame of 2 weeks' duration.
Fig 2A: PlantarLateral-DorsalMedial Oblique view;
Fig 2B: DorsalLateral-PlantarMedial Oblique view of left hind foot.



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Radiographic Findings

The clinically noted soft tissue swelling is most evident on the dorsal-plantar view of the foot. On this same view, there is mild widening of the distal interphalangeal joint of the 3rd digit when compared to the 4th. The summated opacity of the distal sesamoid of the 3rd digit compared to that of the 4th digit is decreased. The PlantarLateral-DorsalMedial Oblique view profiles the plantar aspect of the 3rd digit. This shows loss of opacity of the distal half of the distal sesamoid, widening of the distal interphalangeal joint space and focal osteolysis in the plantar process of the 3rd phalanx. However the subchondral bone of the 2nd and 3rd phalanges does not show obvious lysis.

Radiographic Diagnosis

The change in the distal sesamoid is most consistent with osteomyelitis. The widening of the associated distal interphalangeal joint is strongly suggestive of septic arthritis.

Clinical Diagnosis

Excision of the granulation tissue and further probing of the wound established drainage of purulent material. The wound was vigorously lavaged. This was treated as an open wound for 4 days. A cast was then applied to this foot with a block placed under the 4th digit.

Discussion

Infections of the foot are very common in cattle. If superficial and rapidly attended to, most resolve without complication. Infection of the distal interphalangeal joint can occur secondary to penetrating wounds, by extension from sole abscesses, external injury to the coronary band, from neglected interdigital infections, or from septicemia.[1, 2] Radiography is useful in the evaluation of foot lameness that does not respond to initial therapy. Its greatest use is for the detection of lesions in the bones and periarticular areas of the joint.[3]

Mild widening of the distal interphalangeal joint space is often the earliest radiographic sign to indicate joint involvement. If images are made in a weight-bearing animal, equal weight on both digits needs to occur to make the assessment of width meaningful. In the totally recumbent animal, both digits are equally influenced and comparison of joint space width should be valid. Osteolytic change in the subchondral bone is indicative of progression of infection through the articular cartilage and establishment of osteomyelitis. With longer duration of infection, periarticular new bone formation develops. Spread of cellulitis along tendon and facial planes often stimulates periosteal inflammation and extensive new bone formation.

Depending on the plane of entry, infection can involve the distal sesamoid, the navicular bursa, and the deep digital flexor tendon. The lysis in this bull's distal sesamoid suggests that the latter was involved.◆

References

1. Rebhun, WC and Guard, CG, Diseases of Dairy Cattle. Williams & Wilkins, Media, PA. 1995. Pages 369-406.
2. Greenough, PR and Weaver, AD, Lameness in Cattle. W.B. Saunders, Philadelphia, PA. 1997. Pages 250-256.
3. Farrow, CS, Digital infections in cattle and their radiologic spectrum, Veterinary Clinics of North America: Food Animal Practice, 15(2):411-423, 1999.