



What Is Your Diagnosis?

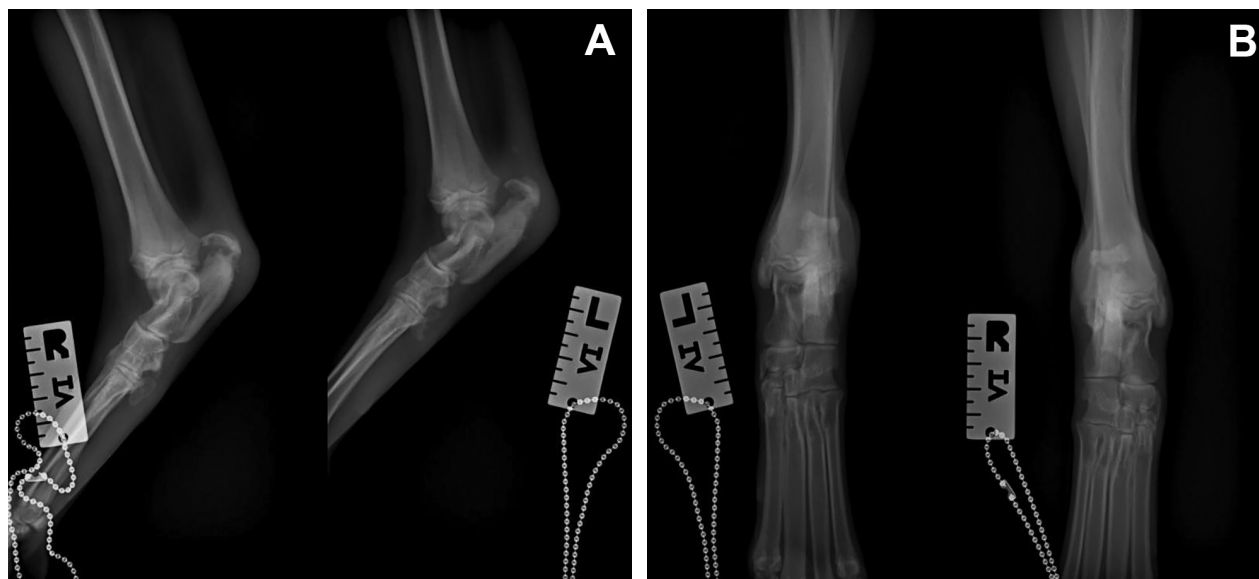


Figure 1—Mediolateral (A) and dorsoplantar (B) radiographic views of both tibiotarsal joints of a 7-month-old 28.0-kg (61.6-lb) sexually intact female Rottweiler referred for evaluation of severe, progressive, bilateral hind limb lameness but no history of trauma.

History

A 7-month-old 28.0-kg (61.6-lb) sexually intact female Rottweiler was referred for evaluation of bilateral hind limb lameness. The owner reported no known trauma, yet for several weeks the dog seemed to be progressively lame and reluctant to rise. Radiography of the hip joints and stifle joints bilaterally and CT of the vertebral column (not shown) were performed by the referring veterinarian; however, a cause for the dog's lameness was not identified.

On initial referral examination, the dog was unable to rise without assistance, but once standing, it could walk alone, albeit with an arched back, reduced support polygon, and hyperextension of both tibiotarsal joints. In addition, the dog had bilateral hind limb muscular atrophy and tibiotarsal joint swelling. Further, the tibiotarsal joints had limited range of motion in that both joints had an abnormally low capacity to flex and notable tension in the calcaneal tendons. Manipulation of these joints and palpation of the insertions of the calcaneal tendons elicited signs of pain. Radiography of both tibiotarsal joints was performed (**Figure 1**).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page →

This report was submitted by Bertrand Vedrine, DVM; from Clinique Vétérinaire Seinevet, 26 Rue de la République, 76520 Boos, France.

Address correspondence to Dr. Vedrine (bvedrine@yahoo.fr).

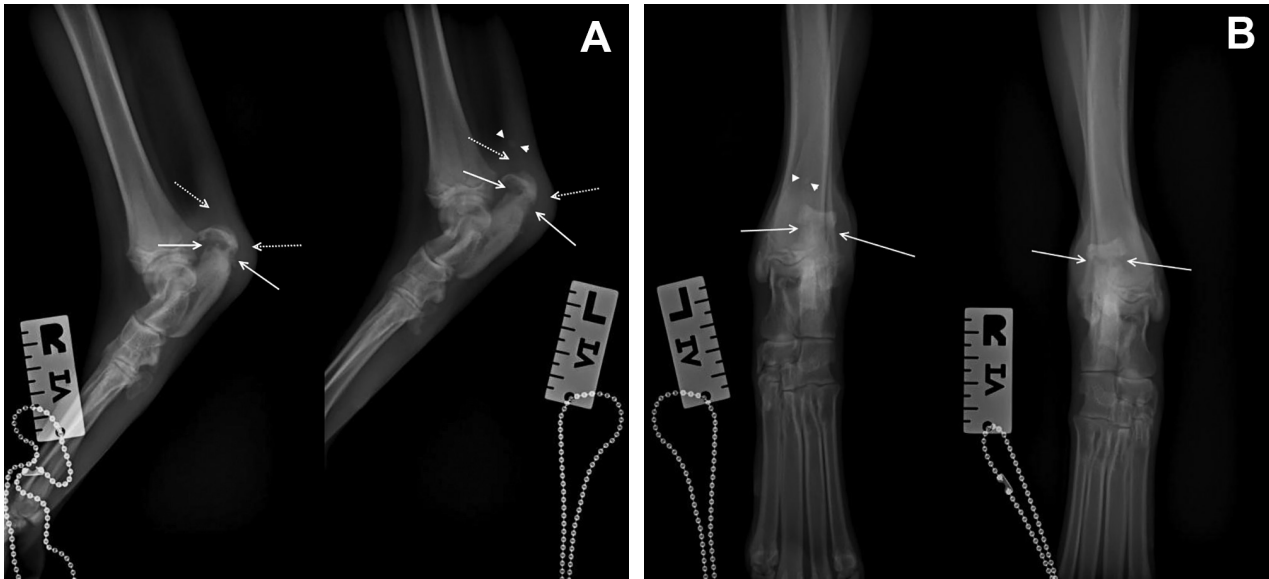


Figure 2—Same radiographic images as in Figure 1. In each hind limb, the apophysis of the calcaneal tuber has irregular margins and is avulsed (solid arrows; A and B) from the rest of the calcaneus. There is increased soft tissue opacity and thickening in the distal region of the common calcaneal tendon (dotted arrows; A) in each hind limb, and a mineral opacity is superimposed with the common calcaneal tendon (arrowheads; A and B) of the left hind limb.

Diagnostic Imaging Findings and Interpretation

In each hind limb, the apophysis of the calcaneal tuber had irregular margins and was avulsed from the tuber of the calcaneus (**Figure 2**). There was increased soft tissue opacity and thickening in the distal region of the common calcaneal tendon in each hind limb, and a mineral opacity was superimposed with the common calcaneal tendon of the left hind limb.

A diagnosis of bilateral calcaneal epiphysiolyis was made on the basis of findings from physical and radiographic examinations combined with no history of trauma. Because the calcaneus is classified as a short bone and not a long bone and it does not technically have an epiphysis, the term epiphysiolyis is a misnomer when applied to the calcaneus.¹ Nevertheless, the term calcaneal epiphysiolyis was used because it has been used similarly in other publications.^{2,3}

Treatment and Outcome

Both tibiotarsal joints were surgically managed in a single stage. Surgical management of each included curettage of the apophysis of the calcaneal tuber and the calcaneus, use of a bone graft (harvested from the ipsilateral ilial wing) to promote bone fusion, stabilization with a tension band that spanned the avulsed apophysis of the calcaneal tuber and the body of the calcaneus, and placement of a type II transarticular external fixator.

Results of a recheck examination 2 weeks after surgery indicated that the tension band for the right calcaneus had migrated, resulting in a loss of reduction of the avulsion. In addition, the surgical site had become infected. Bacterial culture of a swab sample

from the infected site yielded a *Klebsiella* sp. Treatment with clindamycin (11 mg/kg [5 mg/lb], PO, q 12 h for 3 weeks, then q 24 h for 3 weeks) was initiated. The infection resolved, and a revision surgery was performed. Results of the second surgery were not curative, and arthrodesis of the right tibiotarsal joint was performed 9 weeks after the initial surgery. The left tibiotarsal joint, however, had radiographic evidence of complete epiphysiodesis 6 weeks after the initial surgery, and the external fixator was removed.

The dog underwent physical therapy and regained clinically normal musculature of the hind limbs. At the end of follow-up 6 months after the initial surgery, the dog could rise, walk with an acceptable gait, and jump.

Comments

Calcaneal epiphysiolyis is uncommon in dogs but causes substantial hind limb dysfunction and is frequently bilateral.^{2,3} The underlying cause of calcaneal epiphysiolyis is unknown; however, some authors theorize it could be a form of osteochondrosis or an excess of mechanical traction on the apophysis of the calcaneus because of an increased tibiotarsal angle that is more frequently seen in large dog breeds such as Rottweilers.²

In the present report, atraumatic separation of the apophysis of the calcaneal tuber from the calcaneus was evident on the mediolateral radiographic views obtained of each tibiotarsal joint. Given the young age and immature skeletal structure of the affected dog, the differential diagnosis could have included a fracture (eg, Salter-Harris type I fracture) or an avulsion of the distal insertion of the calcaneal tendon. But such are usually the consequence

of trauma and generally not bilateral. On the basis of the dog's history, the possibility of trauma was excluded. Further, the dog had hyperextension of the tibiotarsal joints, whereas hyperflexion would have been expected with rupture or avulsion of the calcaneal tendons.

Calcaneal epiphysiolysis has been described in Doberman Pinschers³ and a Rottweiler.² Clinical findings consistently included swollen and painful tibiotarsal joints, similar to the dog of the present report. However, unlike the dog of the present report, affected dogs may also have hyperflexed tibiotarsal joints and injuries to interphalangeal joints and digital flexor muscles.⁴ Radiographic findings of bone remodeling of the apophysis of the calcaneal tuber and separation of the apophysis from the remainder of the calcaneus for the dog in the pres-

ent report were consistent with findings previously reported.³

The goal of the initial surgical treatment was to achieve epiphysiodesis to stabilize the apophysis of each calcaneal tuber. The tension band technique is an accepted stabilization method for bone fragments under traction such as the apophysis of the calcaneal tuber. However, achieving bone union is uncertain, and other authors reported some complications and failure with surgical treatment of calcaneal epiphysiolysis.^{2,3}

References

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