Bilateral distal fibular growth abnormalities in a dog

Dermot J. Jevens, MVB, and Charles E. DeCamp, DVM, MS

A 6-month-old 12.3-kg male Shetland Sheepdog was referred to the veterinary clinical center, for evaluation of a valgus deformity of the left hind limb. Six weeks earlier, the dog had developed an acute lameness in its right hind limb. Radiographic evaluation by the referring veterinarian revealed a transverse fracture of the distal portion of the right fibula, proximal to the physis (Fig 1). The left distal fibular physis appeared abnormal, having a 0.5-cm radiolucent area with a central bony density (Fig 1). Radiography of both stifles revealed that each fibular head was distracted distally from its normal point of articulation with the proximal portion of the tibia.

Treatment for the fibular fracture consisted of bandaging the right hind limb for 2 weeks. At the time of bandage removal, the dog’s right hind limb lameness had improved. During the 4 weeks prior to referral, however, the dog became progressively lame on its left hind limb. An angular limb deformity of the left hind limb was noticed by the owner and appeared to worsen during that period.

On admission, physical examination revealed a left hind limb weight-bearing lameness. A valgus deformity centered proximal to the left tarsus was noted. Radiography revealed a valgus deformity centered at the distal tibial and fibular physis (Fig 2). A 0.5-cm diameter radiolucent area was evident at the level of the left distal fibular physis, with sclerosis of the fibular proximal and distal to the lesion. There was smooth periosteal proliferation lateral to the radiolucent area. The left fibula was 1.5 cm shorter than the left tibia (lateral cortex), with the fibular head distracted distally from its normal site of articulation with the proximal portion of the tibia. Clinically, neither medial nor lateral deviation of the right tarsus was noticed. Radiographically, however, the right fibula was 1.3 cm shorter than the right tibia, with the fibular head distracted distally (Fig 2). The previous right distal fibular fracture was healing, but a fracture line was still evident. The left tibia was 0.1 cm shorter than the right tibia.

Anesthesia was induced with thiamylal sodium and maintained, after tracheal intubation, with halothane and oxygen. Through a medial approach to the distal tibial shaft and medial malleolus of the tibia, a closing wedge ostectomy was performed on the left tibia and fibula, using a microsagittal saw.1,2 The limb was carefully aligned, and the tibial ostectomy site was stabilized and compressed, using a 5-hole, 2.7-mm dynamic compression plate3 (Fig 3). After surgery, a modified Robert Jones’ bandage was applied to the limb to minimize swelling.

The dog was reexamined at 4 and 8 weeks after surgery. At 4 weeks, the dog was lame for a short while after rising each morning, otherwise it walked well. Radiography revealed that the orthopedic fixation was intact and that the ostectomy site was healing. At 8 weeks, radiography revealed union at the ostectomy site (Fig 3). The left tibia was 0.6 cm shorter than the right tibia. On physical examination, there was no evidence of valgus deformity of either hind limb and the dog was not lame. The owner reported that, at 14 months of age, the dog had no evidence of lameness or angular limb deformity.

From the Department of Small Animal Clinical Sciences, College of Veterinary Medicine, Michigan State University, East Lansing, MI 48824-1314. Dr. Jevens’ present address is Northview Animal Hospital, 223 Siebert Rd, Pittsburgh, PA 15237.

Figure 1—Dorsoplantar radiographic views of right and left tarsus of 4-month-old dog. Notice the fracture of the right distal fibular metaphysis (A—arrows), and the round radiolucent area in the left distal fibular physis (B—arrows).

1Zimmer (USA), Warsaw, Ind.
2Synthes (USA), Paoli, Pa.

JAVMA, Vol 202, No. 3, February 1, 1993

Clinical Reports 421
Premature closure of the distal ulnar, proximal radial, and distal radial physes are the most commonly reported causes of angular limb deformity in dogs. Anecdotal reference has been made to tibiotarsal angular limb deformities in Shetland Sheepdogs, but the cause of this condition is not known.

In a 2-bone system, such as the radius and the ulna or the tibia and the fibula, if one bone grows at an abnormally slow rate, the normal bone is forced to deviate toward the shortened bone. In the dog of this report, valgus deformity with the greatest angulation at the level of the distal portion of the tibia, and shortening of the left fibula, implicated closure of the distal fibular physis as the cause of the angular deformity. It is likely, considering the displacement of the right fibular head, that the dog also had premature closure of its right distal fibular physis. The fracture of the fibula documented by the referring veterinarian, however, may have prevented development of a deformity of the right hind limb, by releasing the restrictive tension on the growing tibia. The cause of the fracture of the right fibula was unknown.

Objectives of corrective osteotomy in the treatment of angular deformity are to return the foot to a functional position, restore proper articular alignment, and improve the appearance of the limb. When performing an osteotomy, the surgeon should attempt to correct the deformity at the site of greatest deformity. When the deformity is close to the end of the bone, internal fixation may be difficult to achieve at the osteotomy site. Because of the level of the osteotomy required in the dog of this report, only 2 screws were placed in the distal fragment. A closing wedge osteotomy was chosen to provide closer apposition between the osteotomy surfaces and thus minimize the stress placed on the bone plate and screws.