History

A 1-week-old Quarter Horse foal was examined prior to treatment for bilateral flexural deformity of the distal portions of the forelimbs. The foal was successfully treated and discharged with instructions to introduce it to paddock exercise. At that time, no abnormal flexural or angular deformities of the carpi were noticed. At 3 weeks of age, the foal was readmitted because of a sudden onset of non-weight-bearing lameness on the left forelimb. Physical examination of the foal's left forelimb elicited signs of severe pain during flexion of the carpus and there was noticeable laxity within the joint, allowing lateral deviation of the metacarpus, which was associated with a mild crepitus. Carpal valgus (16°) was evident in the same limb. Mild effusion was noticed in the radiocarpal and intermediate carpal joints. Results of a CBC and serum biochemical analyses, as well as the cell counts and protein concentrations in fluid obtained from both joints by arthrocentesis, were within reference ranges. After standard radiographic views of the carpus were obtained, slightly oblique views were also obtained to better detect any pathologic lesions (Figure 1).

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

Figure 1—Dorsopalmar (A) and slightly oblique dorsolateral (D75°-PaMO; B) radiographic views of the left carpus of a foal with bilateral flexural limb deformity.
Diagnostic Imaging Findings and Interpretation

A large, irregularly shaped bone fragment is visible at the palmar aspect of the proximal carpal row on the dorsolateral oblique radiographic view. The exact origin of the fragment is difficult to determine because of the superimposition of the 3 carpal bones in that region. However, its origin at the intermediate carpal bone is clearly evident in the 2-dimensional computed tomographic (CT) images (Figure 2). Some additional fragmentation is also associated with the intermediate carpal bone fracture. Radiographic evidence of a palmar C3 slab fracture and some fragmentation on the lateral aspect of C3 are evident in the 3-dimensional CT images. The degree of fragmentation of these fractures is hardly noticeable on the conventional radiographic views of the carpus.

Comments

The cause of the acute onset of lameness and reduction in carpal range of motion associated with the sudden appearance of angular deformity of the carpus was most likely traumatic. However, septic pathologic lesions should be ruled out to ensure an appropriate treatment regimen. Palmar carpal bone fractures have been described to be the consequence of injury during recovery from general anesthesia and during events in which horses collapse onto their carpi and thereby compress the palmar aspect of the carpal bones.1 The recognition of these injuries is often delayed because they are radiographically inconspicuous.1 Computed tomography is therefore a useful diagnostic tool because it allows detailed evaluation of the fracture location and severity regardless of overlying structures. The palmar aspect of the carpal bones is a region of complex radiographic anatomy where skyline views cannot be performed. In the foal of this report, the origin of the bone fragments could not be accurately determined even with supplementary oblique radiographic views. For optimal surgical planning, 3-dimensional CT reconstructions can also aid the surgeon’s visual comprehension of complex anatomic locations. It is noteworthy that foals can undergo CT without having to use special tables because their body weight does not exceed the table weight limit of conventional units.

Surgical removal of the carpal fragments was successfully achieved in the foal of this report by use of a palmar approach through the carpal canal.2 An arthroscopic approach was deemed less rewarding because of the size of the C3 slab fracture and because the intermediate carpal bone is not visible in the medial approach to the palmar aspect of the radiocarpal joint.3 Management of the angular carpal deformation caused by traumatic damage to the medial collateral ligaments entailed placement of a bivalved tube cast for carpal support after manually straightening the limb. This concurrent injury was believed to worsen the prognosis for this foal as an athlete.2 However, the foal recovered well, as the carpal angular deformation resolved within 3 months, and the foal returned to pasture without signs of lameness on the left forelimb.