Case Studies

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1. Case Study #1: Medial Collateral Desmitis of the Distal Interphalangeal Joint

Signalment
The subject is a 14-yr-old New Zealand Thoroughbred gelding used for three-day eventing.

History
The gelding presented for acute, severe right forelimb lameness of 5 days duration. Grade 4 of 5 right forelimb lameness was present at the trot. There was diffuse swelling over the pastern and coronary band, and significant heat was palpable over the dorsal hoof wall. The horse was negative to hoof testers. No sensitivity was appreciated on palpation of the soft tissue structures. A palmar (abaxial sesamoid) nerve block of the right forelimb resolved the lameness. The shoe was removed, and a large corn was evident in the medial aspect of the sole. Smaller corns were evident at the medial and lateral quarters.

Radiographs of the foot revealed soft tissue mineralization palmar to the navicular bone (Fig. 1). The gelding was treated with the suspicion of a subsolar or coronary-band abscess. A recheck evaluation three days later revealed that the swelling had localized over the medial aspect of the coronary band. The lameness had only mildly improved. Substantial SC swelling was noted over the coronary band. Fluid distortion made evaluation of the collateral ligaments of the distal interphalangeal joint difficult to visualize. A working diagnosis of a coronary-band abscess was maintained and treated accordingly.

The gelding was reevaluated 3 wk later, and the lameness had not improved (grade 4 of 5). Very firm swelling was noted over the medial aspect of the coronary band. Radiography and ultrasonography of the right-front foot were repeated. Radiographs revealed soft tissue opacity within the medial aspect of the foot at the level of the coronary band. Significant bony remodeling was evident at the mid dorsal aspect of the middle phalanx. Ultrasonography revealed significant bony reaction at the distal dorsal aspect of the middle phalanx (Fig. 1.2B). Hypoechoic fluid was still evident over the medial aspect of the coronary band (Fig. 1.2A). The collateral ligaments of the distal interphalangeal (DIP) joint could not be well visualized. A magnetic resonance imaging (MRI) evaluation was performed.

MRI Findings
Increased signal intensity and significant enlargement of the medial collateral ligament of the DIP joint was evident in the transverse T1- and T2-weighted images and in the STIR sequences (Fig. 1.3, A and B). Significant soft tissue thickening
Fig. 1. Lateromedial radiographic view of the right-front foot at presentation. Note the soft tissue mineralization (black arrow) palmar to the navicular bone (incidental finding). Fig. 1.2. (A) Transverse and (B) sagittal ultrasonographic examination of the collateral ligaments of the DIP joint of the right forelimb 3-wk post-injury. (A) Significant edema is present over the dorsomedial aspect of the coronary band, and anechoic shadows distort the cross section of the medial collateral ligament of the DIP joint. (B) Bony reaction is present at the distal dorsomedial aspect of the middle phalanx at the origin of the medial collateral ligament of the DIP joint on sagittal view. Fig. 1.3. (A) Transverse T2-weighted and (B) STIR low-field MRIs of the right-front foot at the level of the distal aspect of the middle phalanx. Medial is to the left. There is increased signal intensity and enlargement of the medial collateral ligament (arrow) of the DIP joint. Fig. 1.4. Follow-up transverse ultrasonographic examination of the collateral ligaments of the DIP joint of the right-front foot ~3.5 mo post-injury. The medial collateral ligament is enlarged and only slightly hypoechoic.
and increased signal intensity was noted over the medial collateral ligament in all sequences.

Diagnosis
Severe medial collateral desmitis of the DIP joint of the right forelimb was the diagnosis.

Treatment
A shoe with a wide branch on the medial aspect of the foot was applied. Shock-wave therapy was initiated 30 days after the MRI procedure when most of the SC swelling had resolved. A series of three treatments at 3-wk intervals was performed. A one-half grade to one grade improvement in lameness was noted at each shock-wave treatment.

Follow Up
Three and a half months post-MRI, the gelding underwent a follow up ultrasonographic examination. The horse had acute bilateral swelling of both forelimbs, unrelated to his original diagnosis. The right forelimb lameness was improved (grade 1.5 of 5). He was not evaluated on a circle because of the significant swelling of the forelimbs. Ultrasonography revealed improvement of fiber pattern; however, the ligament was still diffusely enlarged (Fig. 1.4). Walking under saddle exercise was recommended, and progress is still being evaluated.

2. Case Study #2: Puncture Wound to the Foot

Signalment
The subject is a 7-yr-old Welsh cross gelding used as a show hunter.

History
The pony was referred for a 3-wk history of non-weight-bearing right forelimb lameness localized to the foot with a palmar (abaxial sesamoid) nerve block. The lameness was treated initially as a subsolar abscess; however, no drainage was ever observed, and the lameness persisted. Plain radiographs did not reveal any abnormalities. Digital radiographs showed gas lucency over the heel region (Fig. 2.1). A bone scan of the carpi and distal forelimbs was performed to rule out an occult fracture. Nuclear scintigraphy showed intense diffuse increased radiopharmaceutical uptake throughout the entire distal phalanx and the navicular bone. Ultrasonography of the right-front foot revealed hyperechoic change within the deep digital flexor tendon at the level of the proximal one-third of the navicular bone on T2 W 3D SAG images (Fig. 2.3A). Focal circular decreased signal intensity was noted within the digital cushion in the lateral aspect of the foot on T1 W 3D GE and T2W 3D GE images in all planes, which is indicative of previous hemorrhage (Fig. 2.3, A and B). Increased signal intensity was noted within the lateral lobe of the deep digital flexor tendon on T1 3D GE, T2W 3D GE, and STIR sequences (Fig. 2.3C). Increased signal intensity was also noted within the cortex and medullary cavity of the navicular bone on STIR sequences.

Diagnosis
The diagnosis was a puncture wound of the right-front foot with involvement of the deep digital flexor tendon and secondary inflammation of the navicular bone and distal phalanx.

Treatment
The pony was placed on long-term antibiotics, supportive shoeing, and stall rest. The referring veterinarian reports that the pony has improved; however, it is not back in work at 16 mo post-diagnosis.

3. Case #3: Superficial Digital Flexor Tendonitis

Signalment
The subject is a 22-yr-old Warmblood gelding used as a show hunter.

History
The gelding was referred for full-body nuclear scintigraphy after a history of left forelimb lameness for 1.5 mo that had been partially alleviated with intra-articular anesthesia of the bicipital bursa. However, there had been no response to corticosteroid treatment of the bicipital bursa. Previous nerve blocks up through the fetlock had also been performed with no improvement in the lameness. Increased radiopharmaceutical uptake was noted at the medial aspect of the carpus in the region of the middle carpal joint, in the mid radial cortices, and in the distal aspect of the radius of the left forelimb (Fig. 3.1). Radiographs of the left carpus and shoulder were unremarkable. After the nuclear scintigraphic examination, a lameness examination was performed. The gelding was a grade 2.5 of 5 lame on the left forelimb circling to the left. Moderate to severe responses were elicited on lower limb and carpal flexions and shoulder extension. The lower limb was negative to palpation. Intra-articular analgesia of the middle carpal and antebrachio-carpal joints was performed, and no change was noted in the lameness. Ultrasonography of the left shoulder was performed with only mild changes noted. Because the changes did not correlate to the degree of lameness, ultrasonography of the carpal canal region was performed. On clip-
Fig. 2.1. Lateromedial radiographic view of the right-front foot showing very faint gas lucency in the heel region (black arrows).

Fig. 2.2. Nuclear scintigraphic (A) solar and (B) lateral images of the right-front foot showing diffuse increased radiopharmaceutical uptake in the distal phalanx and the navicular bone (white arrow), which indicates diffuse regional inflammation of the foot. Fig. 2.3. Sagittal ultrasonographic examination of the right-front foot between (A) the heel bulbs and through (B) the frog. Hyperechoic change within the deep digital flexor tendon just proximal to the navicular bone and hypoechoic change and swelling of the deep digital flexor tendon at its insertion to the distal phalanx is evident. Fig. 2.4. (A) T2 W 3D SAG and (B and C) T2 W 3D GE OBL MRIs of the right-front foot. There is diffuse decreased signal within (A) the navicular bone, (A and B) focal decreased signal within the digital cushion (white arrow), and (C) focal increased signal within the lateral lobe of the deep digital flexor tendon (black arrow).
ping the gelding (which had extremely thick hair on his legs), a small convex profile was noted at the very proximal aspect of the metacarpal region just below the accessory carpal bone. Ultrasonography revealed a large focal hypoechoic lesion within the superficial digital flexor tendon from the accessory carpal bone to zone 1A (Fig. 3.2, A and B). The lesion then became more diffuse as it moved distally into zone 1B/2A.

**Diagnosis**
The diagnosis was severe superficial digital flexor tendonitis of the left forelimb from the accessory carpal bone to zone 2A.

**Treatment**
Because of the age of the horse, the owner elected to retire the gelding and institute long-term rest rather than attempt to treat the tendonitis.