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What Is Your Diagnosis?

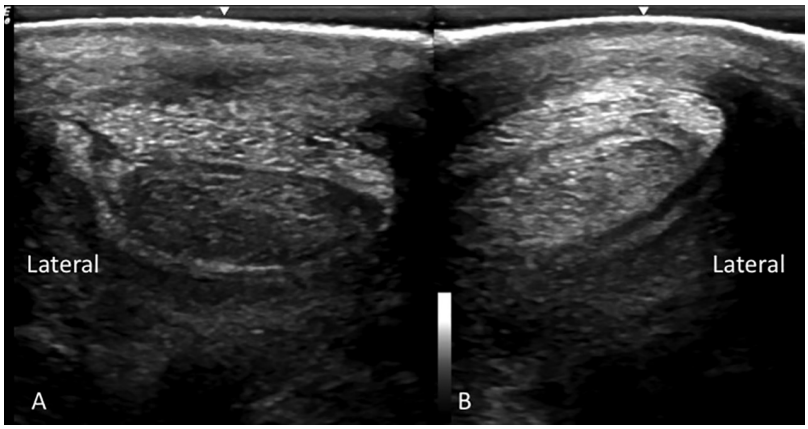

Figure 1—Transverse ultrasonographic images of the left (A) and right (B) hind limbs at the level of the distal portion of the metatarsus in a 13-year-old 626-kg (1,377-lb) Georgian Grande gelding used for dressage and with a history of left hind limb lameness that had progressed from mild lameness noticed approximately 4 weeks before referral to acutely severe lameness (grade 4 on a scale of 0 to 5) with swelling in the region of the metatarsophalangeal joint (fetlock joint) approximately 3 weeks before referral. Plantar is toward the tops of the images.

History

A 13-year-old 626-kg (1,377-lb) Georgian Grande gelding used for upper-level dressage was referred for evaluation because of left hind limb lameness that had progressed from mild lameness noticed approximately 4 weeks before referral to acutely severe lameness (grade 4 on a scale of 0 to 5) with swelling in the region of the metatarsophalangeal joint (fetlock joint) approximately 3 weeks before referral. On referral examination, the gelding had moderate to marked effusion and thickening of the left hind limb digital flexor tendon sheath and signs of sensitivity to palpation of the digital flexor tendons just proximal to the fetlock joint. The gelding had a grade 2 lameness (on a scale from 0 to 5) in the left hind limb when evaluated on the straightaway on soft ground. This lameness was exacerbated when circling on soft ground, particularly when circling to the right. Flexion tests resulted in moderate exacerbation of the left hind limb lameness. Intrathecal analgesia of the left hind digital flexor tendon sheath with 2% mepivacaine hydrochloride[a] (10 mL total) improved the lameness by 70% to 80%. Ultrasonography of the affected digital flexor tendon sheath was performed with a linear 6- to 12-MHz transducer[b] with the frequency set at 8 to 10 MHz **(Figure 1)**.

Formulate differential diagnoses and treatment strategies from the history, clinical findings, and Figure 1—then turn the page →

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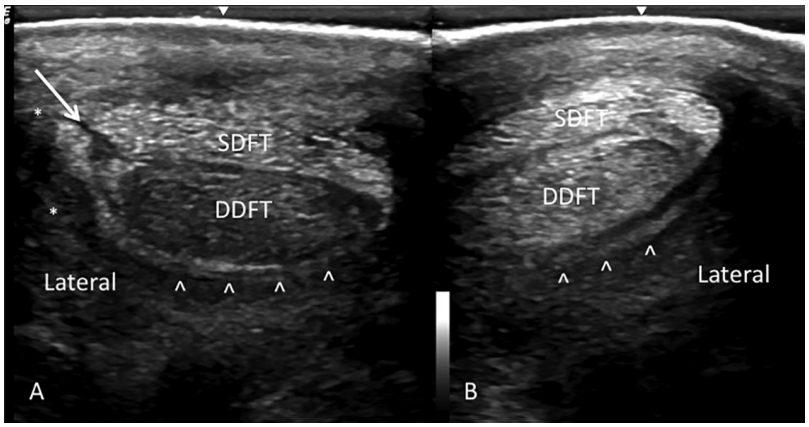

Figure 2—Same images as in Figure 1. The left hind limb (A) has a hypoechoic line (arrow; A) between the lateral aspect of the superficial digital flexor tendon (SDFT; A and B) and the manica flexoria (arrowheads; A and B) and moderate synovial proliferation in the lateral aspect of the digital flexor tendon sheath (asterisks; A). The left hind limb (A) is imaged mildly off-angle, whereas the right (B) is imaged on-angle. DDFT = Deep digital flexor tendon.

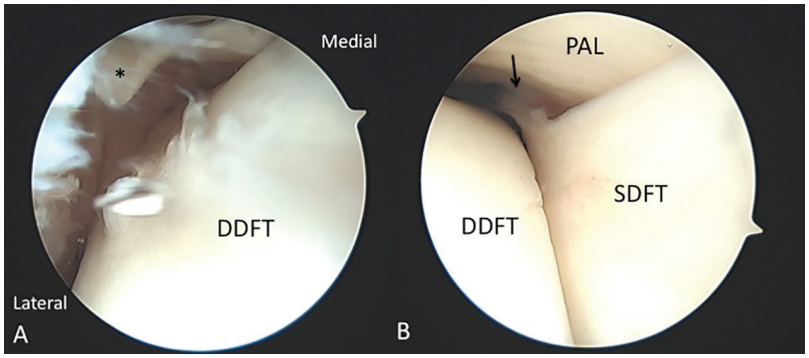

Figure 3—Tenoscopic images of the left hind digital tendon sheath viewed from distal to proximal (A) at the distal margin of the manica flexoria (asterisk; A) and from proximal to distal (B) between the DDFT and SDFT. A—There is mild fibrillation of the dorsal margin of the DDFT and bunching of the manica flexoria as a result of loss of tension because of a torn lateral margin. Lateral is toward the lower left of the image. B—A tear (arrow) of the plantarolateral margin of the SDFT is shown. Lateral is toward the upper left of the image. PAL = Plantar annular ligament.

Diagnostic Imaging Findings and Interpretation

Ultrasonography revealed moderate to marked effusion and moderate synovial proliferation in the digital flexor tendon sheath, particularly in the lateral aspect **(Figure 2)**. Synovial proliferation was present at the attachment of the lateral aspect of the manica flexoria (MF) to the superficial digital flexor tendon (SDFT). At this location, there was a linear tear extending through the lateral margin of the SDFT, and the attachment of the MF to the SDFT could not be seen clearly. Therefore, a tear of the MF at the attachment to the lateral border of the SDFT was also suspected. Tenoscopy of the digital flexor tendon sheath was recommended for a definitive diagnosis as well as treatment.

Treatment and Outcome

Tenoscopy of the left hind digital flexor tendon sheath **(Figure 3)** was performed 2 weeks after referral examination and revealed moderate to marked tenosynovitis with tearing and fibrillation of the plantarolateral margin of the SDFT, just distal to the plantar annular ligament, and a complete tear of the lateral attachment of the MF to the SDFT body. Mild fibrillation of the plantarolateral margin of the deep digital flexor tendon (DDFT) was also present at the level of the MF tear. Tenoscopic findings were consistent with a chronic injury. The MF was resected, and the torn tendon margins were debrided. A series of 3 once-weekly intrathecal injections with autologous conditioned serum were performed, commencing 2 weeks after surgery. The gelding was also started on rehabilitation exercises, including hand walking, passive range of motion of the left hind digit, and core-strengthening exercises. At 8 weeks after surgery, the gelding had improved, with no signs of pain on palpation of the left hind limb flexor tendons, less effusion of the digital flexor tendon sheath, and reduced lameness (grade 2/5) of the left hind limb.

Comments

The proximal MF is tendinous tissue that originates from the medial and lateral borders of the SDFT where it surrounds the DDFT within the proximal aspect of the digital flexor tendon sheath. The main function of the MF is to maintain the flexor tendons in alignment as they pass over the palmar or plantar aspect of the metacarpo- or metatarsophalangeal joint, respectively, particularly during hyperextension.[1,2] The MF consists of 2 tissue types: a tendinous portion located distally and a nontendinous reflection of areolar tissue located proximally.[1]

In contrast to findings in the gelding of the present report, the medial aspect of the MF is more commonly torn than the lateral aspect.[3] In addition, ultrasonography has a low sensitivity for identifying MF tears,[4] likely owing to the synovial proliferation that occurs within the digital flexor tendon sheath following injury, making distinction of the MF difficult. Use of intrathecal contrast radiography increases the ability to identify MF tears, with a sensitivity and specificity of 96% and 80%, respectively.[5] A recent study[6] shows that performing ultrasonography during flexion and extension of the limb (dynamic ultrasonography) can increase clinical suspicion of MF tears.

However, tenoscopy remains the gold standard for diagnosing these tears, and it affords debridement of the lesion at the same time.[5]

Tearing of the MF has been reported as the second most common cause of nonseptic tenosynovitis of the digital flexor tendon sheath (pathological change of the DDFT is most common).[4] The gelding of the present report also had mild fibrillation of the lateral margin of the DDFT, and a study[4] shows such is a common (44/76 [58%] horses) finding and often associated with ipsilateral injury to other soft tissue structures in the tendon, rather than a primary injury. In that same study,[4] MF tears occurred in 23 of 76 (30%) horses with nonseptic tenosynovitis. Other studies[3,5] show that tears in the MF occur more commonly in hind limbs versus forelimbs, which may be explained by anatomic differences (longer nontendinous portion of the MF in the hind limbs vs forelimbs[1]) and kinematic differences (more sliding motion and hyperextension of the fetlock joint in the hind limbs vs forelimbs[7]).

Intrathecal analgesia in the gelding of the present report resulted in 70% to 80% improvement in lameness; however, studies[3,5] suggest that lameness associated with tearing of the MF improves more with low 4-point analgesia (analgesia of the palmar and palmar metacarpal nerves or plantar and plantar metatarsal nerves). In addition, horses with MF tears are less likely to improve following intrathecal analgesia than are horses with tears in the DDFT.[5]

In a study[3] of 53 horses with tears of the MF, 42 (79%) were able to return to their previous level of work following tenoscopic debridement. In contrast, only 37 of the 98 (38%) horses with DDFT tears as the primary underlying cause of lameness returned to their previous level of work following tenoscopic debridement.[8] Despite the proposed function of the MF to maintain flexor tendon alignment, horses do well following complete resection of the MF.[3] Therefore, when treating horses with lameness localized to the digital flexor tendon sheath, use of diagnostic imaging such as ultrasonography and tenoscopy, as used in the gelding of the present report, is important for distinguishing between tears in the MF alone and tears to the MF and the DDFT, the latter of which has a poorer prognosis.

Footnotes

a. Carbocaine-V, Zoetis Inc, Troy Hills, NJ.
b. NextGen LOGIQ e Ultrasound System, GE Healthcare, Chicago, Ill.

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