Desmitis of the Distal Interphalangeal Collateral Ligaments: 22 Cases

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Desmitis of the collateral ligaments of the distal interphalangeal joint should be considered as a differential diagnosis for foot lameness in the horse. The diagnosis is made through ultrasonography. Although the lameness is relatively uncommon, it occurs frequently enough to be a common cause of distal interphalangeal joint injection failure. Treatment consists of rest and controlled exercise. The prognosis is good for return to work. Authors’ address: Department of Clinical and Population Sciences, University of Minnesota, 225 VTH, 1365 Gortner Avenue, St. Paul, MN 55108. © 2002 AAEP.

1. Introduction
Desmitis of the distal interphalangeal (DIP) collateral ligament has been suggested as a possible differential diagnosis for foot lameness. However, no information is available on the frequency of occurrence, the types of lesions that may be seen, the clinical presentation of the cases, or the prognosis. The purpose of this paper is to review the signalment, clinical signs, radiographic and ultrasonographic findings, treatment options, duration of recovery, and overall general prognosis.

2. Materials and Methods
Records of horses seen for foot lameness at the University of Minnesota from December 1998 through December of 2001 were reviewed. Cases where a diagnosis of injury to the collateral ligament of the distal interphalangeal joint was made were further evaluated for signalment, clinical findings including hoof balance, imaging findings, treatment, and outcome.

In each case, a thorough physical examination was performed according to a standard protocol. Lameness was isolated to the foot on the basis of clinical signs and response to diagnostic analgesic injections. Five radiographic projections were made of the injured foot; in some select cases, navicular bursography was performed. Ultrasonographic examination of the DIP collateral ligaments and joint capsule was performed using a 7.5-MHz convex linear or straight linear probe after a previously described protocol. The area of the coronary band was clipped, and the ligaments were located at the 10 and 2 positions along the hair–hoof interface (Figs. 1-4).

3. Results
Six hundred thirty-three horses were evaluated for foot-related lameness at the University of Minnesota Veterinary Teaching Hospital between December 1998 and December 2001. Twenty-two horses were diagnosed with DIP collateral desmitis. There were 13 geldings and 9 mares. The horses ranged in age from 5- to 21-yr old. They consisted of 10 Quarter Horses, 4 Thoroughbreds, 4 Warmbloods, and 4 crossbreds. Five horses were used for
barrel racing or team penning, five were used for eventing, four were used for dressage, four were used as hunter/jumpers, and four were used as pleasure horses. Ten horses had previously had their DIP joints injected with a corticosteroid, but the injection failed to relieve the lameness. The duration of lameness in these cases ranged from 2 wk to 1 yr.

Thirteen horses were lame in the right forelimb only, five were lame in the left forelimb only, one was lame in the left rear limb only, and three were bilaterally forelimb lame. The grades of lameness were grade II/V (4 horses), grade III/V (16 horses), and grade IV/V (2 horses). Hoof tester examination was highly variable and negative in most cases. Distal limb flexion was positive in 18 of the 22 cases. Analgesic injection of the DIP was not performed in two cases. In the remaining 20, the injection eliminated the lameness in 16 horses, improved the lameness in 2 horses, and had little to no effect in 2 horses.

Only 9 of the 22 horses had hoof imbalance. Evaluation revealed 5 of 22 had variations of medial lateral hoof imbalance, 2 horses had underrun heels, 1 horse had a broken back hoof axis, and 1 horse’s hoof was overgrown.
Radiographic examination of the horses revealed few changes from the first examination. The most common radiographic finding was also the most subtle: slight osteolysis or bony irregularity around the origin of the collaterals on the third phalanx. This was noted in 11 of the 22 cases. Two horses showed enlarged synovial fossa in the navicular bone, two horses showed osteophyte formation along the extensor process on initial radiographic examination, and four horses showed mild new bone growth along the body of the second phalanx where the collateral attaches. Additionally, six horses were assessed using navicular bursography. Three of these studies were normal; one showed irregularity along the tendon margin, and two horses showed communication between the bursa and the DIP joint, which is unusual (previous studies suggested a 3% occurrence of communication). Six horses were radiographed at multiple intervals after the initial diagnosis of DIP collateral desmitis. In these cases, more radiographic changes were noted in only two cases, consisting of increased bony irregularity along the insertion of the collaterals on the second phalanx and osteophyte formation around the DIP joint in one case and DIP osteophytes in another case. In one horse, the bony irregularity on the second phalanx disappeared; however, the radiographs were taken 2 yr apart.

Ultrasonography of the collateral ligaments was performed following a previously described protocol. Cross-sectional areas of the diseased ligaments varied widely, ranging from 0.75 to 1.04 cm² (normal, 0.62 cm²) (Fig 4). The ligaments showed various amounts of hypoechoogenicity and parallel fiber malalignment. Five horses exhibited a specific anechoic core lesion, and one horse had nearly completely ruptured the medial collateral ligament. All horses showed various mottled appearances to the ligaments, with hypoechoogenicity and poor fiber alignment. Both ligaments (medial and lateral) were affected in 4 cases, the lateral collateral was injured in 7 cases, and the medial collateral was injured in 11 cases.

Treatment consisted of stall rest in all cases, with controlled exercise for a minimum of 2 mo. Follow-up ultrasonographic examinations were made to help modulate the exercise level. Ultrasonographic evidence of healing was apparent from 2 mo to 1 yr. The average duration for the ultrasonographic healing was 4.67 mo. The resolution of lameness averaged 4.67 mo as well. However, lameness did not completely resolve in 4 of the 22 cases. Two of the horses became sound after palmar digital neurectomy. The other two were retired. Both of these horses developed radiographic evidence of osteoarthritis. Two other horses suffered re-injuries after initial resolution of the lameness and healing of the injured collateral. In one case, the re-injury was of the same ligament. The other case involved injury of the other collateral ligament. Beyond rest, the other most common adjunctive treatments were polysulfated glycosaminoglycan therapy (500 mg/wk IM for four treatments) and 10–20 mg of intra-articular hyaluronic acid. For those horses affected by hoof imbalance, the balance problems were corrected. Otherwise, most horses were shod in half-round shoes.

4. Discussion

The occurrence of DIP collateral desmitis as a cause of lameness in horses is relatively rare (3.5% of the foot cases in a referral institution). The disease also seems to affect Western agility horses and entertainers more than other horses. Furthermore, contrary to what one might expect, hoof imbalance was not associated as a predisposing cause to this injury. Horses affected with navicular disease have greater than a 90% incidence of hoof imbalance compared with these cases, which had only 41% incidence of hoof imbalance. This leads one to speculate that the injury is more related to footing and what is asked of the horse rather than a physical problem with the horse. Another interesting historical finding is that 10 of 22 horses in this study (45%) had previously been injected with DIP intra-articular corticosteroids, but the injection had failed to give the expected relief. In fact, one may speculate that the use of the anti-inflammatory in the presence of a pre-existing injury could have exacerbated the injury.

Most horses were significantly improved by analgesic injection of the DIP joint. This most likely reflects joint capsulitis/synovitis of the DIP joint as a result of the injury to the collateral ligament. The two cases that were only slightly improved by DIP analgesic injection also showed evidence of inflammation in the pastern joint and required analgesic injection of the pastern joint to improve the lameness. These cases probably reflect a torque injury of the entire distal limb. The other two cases that were not improved by DIP analgesic injection were both chronic in nature (lame for 1 yr). It may be that these cases no longer suffer from capsulitis because they are chronic, and the chronic nature caused more structures to be involved.

Radiography was of limited value in these cases. However, osteophyte formation or osteolysis around the origins or insertions of the collateral should make one suspicious of collateral desmitis. In addition, DIP and navicular bursa communication, as seen on navicular bursography, should be considered as evidence. Two of six bursograms showed communication versus 3 of 97 cases of palmar foot pain. The communication most likely represents joint capsule trauma.

Ultrasonography is the method of choice to diagnose DIP collateral desmitis. All cases need to be evaluated for cross-sectional area, fiber alignment, and echogenicity. Routine examination at 30-day intervals can be used to regulate the recovery process. Using this approach, the ligament can be

AAEP PROCEEDINGS / Vol. 48 / 2002 345
followed for decreasing cross-sectional area, improvement in fiber alignment, and echogenicity.

Rest and controlled exercise were used to allow time for the ligament to heal. In addition, the horses were shod with half-round shoes to reduce friction and torque on the hoof capsule. Other treatments included the use of glycosaminoglycans for their chondroprotective properties. It could be expected that collateral desmitis could be associated with joint instability and could predispose to cartilage damage. Furthermore, many horses were injected intra-articularly with hyaluronic acid for its anti-inflammatory and boundary lubricating properties.

Collateral ligament injuries do heal, but they require time and rest. Controlled exercise should help maintain joint capsule flexibility and range of motion. In addition, the exercise probably helps ameliorate some of the horse’s anxiety from stall rest. Clients should be advised that healing is going to take about 5 mo. The horse needs to be slowly reconditioned, and care needs to be taken not to push the horse too quickly because re-injury is possible. Footing in the horse’s work area and turn-out area should be optimized to help prevent re-injury.

5. Conclusions
DIP collateral desmitis should be considered in the differential diagnosis of foot lameness, particularly in those cases that respond to DIP analgesic injections. Further, ultrasonography should be used routinely to rule out the presence of desmitis. This injury carries a reasonable diagnosis.

References