Case File: Pastern Laceration

**Signalment and History**
- “Tana (Fig. 1)”
- 9-year-old Quarter Horse mare
- Used for trail and pleasure riding
- Found in the pasture grade 5 out of 5 lame in the right forelimb with a wound on the medial aspect of the pastern
- The wound was cleaned and bandaged
- UNIPRIM and Banamine were administered
- Presented to CSU-VTH the following day on emergency

**Physical Exam**
- Temperature, pulse, and respiratory rate were all within normal limits
- Lameness grade 4 out of 5 on the right forelimb (had received 2.5 grams of phenylbutazone orally prior to presentation)
- Wound was noted over the medial aspect of the pastern region

**Diagnostic Test**

_Wound Exploration and Arthrocentesis_

A 6-cm laceration (Fig. 2) was present on the medial aspect of the proximal interphalangeal (PIP) joint. Probing of the wound revealed its extension down to bone. The wound did not dissect under the skin caudally, but did slightly extend in dorsodistal direction. Arthrocentesis of the distal interphalangeal (DIP) joint via a dorsolateral approach was negative for communication with the wound; however, arthrocentesis of the PIP joint via a palmolateral approach was found to communicate with the wound. Unfortunately, a synovial fluid sample was unable to be collected prior to distension of the joint.

Fig. 1: “Tana”

Fig. 2: Laceration present on the medial aspect of the pastern region.
Radiographs
Pastern, full exam
- Acute avulsion fractures of the proximomedial aspect of P2 and distal medial aspect of P1 suspected to be associated with the medial collateral ligament of the PIP joint (Fig. 3)
- Stressed view of the right fore revealed subtle increased joint space of the PIP joint medially, suggestive of possible instability of the medial collateral ligament
- Comparison stress view of the opposite limb could not be taken due to right forelimb lameness
- Ultrasound evaluation was not performed due to the presence of gas surrounding the wound

Treatment
Wound Management and Antibiotic Therapy
- Through and through joint lavage of the PIP was performed (Fig. 4)
- Intra-articular administration of 100 mg gentamicin
- Regional limb perfusion with 1 gram of gentamicin
- Doxycycline at 10 mg/kg PO q12h
- Phenylbutazone 1 g PO q12h

Arthroscopic Surgery
- Performed the following day under general anesthesia in dorsal recumbency (Fig. 5)
- Both the palmar (Fig. 6) and dorsal (Fig. 7) aspects of the PIP joint were explored
- No foreign material or significant cartilage damage was found
- Synovial resector was used to debride a small amount of fibrin and proliferative synovium from around the wound entrance within the palmar aspect of the PIP joint
- The PIP joint was thoroughly lavaged throughout the procedure with 10 liters of saline
- Wound was debrided and closed with non-absorbable skin sutures
- Bandage cast was placed for recovery

Fig. 3: DP radiograph of the right distal forelimb demonstrating avulsion fragments (arrows) from the medial collateral ligament of the PIP joint.
Fig. 4: Standing lavage of the proximal interphalangeal joint via a dorsolateral and palmolateral approach.
Fig. 5: (A) Arthroscopic portal placement in the palmar pouch of the PIP joint; (B) Arthroscopic view of the palmar pouch of PIP joint; (C) Arthroscopic views of the dorsal pouch of the PIP joint.
Post-Operative Management
- Bandage cast maintained for support due to suspected collateral ligament injury (Fig. 8)
- Continuation of doxycycline for a total of 14 days
- Continuation of Phenylbutazone for a total of five days
- Repeat regional limb perfusion with 1 gram of gentamicin for a total of three perfusions
- Discharged two days post operatively with stall rest and monitoring of the cast

Two-Week Post Operative Recheck
- No lameness noted at walk
- Bandage cast was removed
- Pastern wound and arthroscopy portals were healed and sutures removed

Ultrasound
Pastern, full exam
- Partial avulsion of the medial collateral ligament of the PIP joint (Figs. 9 and 10) with approximately 50 percent fiber disruption
- Medial abaxial ligament was thickened and blended indistinctly with surrounding tissue
- Moderate subcutaneous tissue and mild digital tendon sheath thickening

Discharge Instructions
- Palmar splint applied for additional four weeks, with bandage/splint changes q3-4 days
- Continued stall rest

Fig. 6: Arthroscopic images from palmar PIP joint (*Images from Kamm et al, 2011; submitted Vet Surg).

Fig. 7: Arthroscopic images from dorsal PIP joint (*Images from Kamm et al, 2011; submitted Vet Surg).

Fig. 8: Distal limb bandage cast placed for recovery and post-operative management of collateral ligament injury.
Six-Week Post Operative Recheck

- No lameness noted at walk
- Splint removed
- Recheck ultrasound revealed slight improvement in the medial collateral ligament of the PIP joint and resolved digital tendon sheath effusion
- Platelet rich plasma was injected into the area surrounding the affected medial collateral ligament and medial palmar abaxial ligament
- Continued stall rest for additional six weeks
- Hand walking was also introduced and recommended to be gradually increased each week
- Maintain bandage following three days

Eleven-Week Post Operative Recheck

- No lameness noted at walk
- Mild thickening of the right front pastern was noted with minimal scarring at wound site
- Recheck ultrasound revealed mild to moderate fiber pattern improvement of the medial collateral ligament of the PIP joint, but persistent desmopathy of the medial palmar abaxial ligament and moderate periligamentous thickening of surrounding these ligaments
- Radiographs revealed slight osseous irregularities of the dorsal margin of the PIP joint, consistent with development of mild osteoarthritis (OA)
- Discharge instructions were to start with two days of riding at the walk and two days of handwalking with gradual increases in exercise duration

Twenty-Week Post Operative Recheck

- No lameness noted at walk or trot in the right forelimb
- Current exercise included pasture turnout and light riding at walk-trot
- Recheck ultrasound (Fig. 11) demonstrated mild improvement in fiber pattern of the medial collateral ligament of the PIP joint, but it was suspected to be unlikely to have complete return to normal fiber pattern

Fig. 9: Ultrasound image of the medial collateral ligament of the PIP joint. Enlargement of the ligament and disruption of the fiber pattern is present.

Fig. 10: Ultrasound image from the lateral (left) and medial (right) collateral ligament of the PIP joint. Note the irregular surface of P1 and disrupted fibers of the collateral ligament at its insertion.
- Recheck radiographs (Fig. 12) revealed persistent enthesopathy of the medial collateral ligament of the PIP joint, persistent osseous fragments within the medial soft tissues of the pastern, and mild OA of the PIP joint.

- Discharge instructions were to continue with gradual increases in exercise, maintain oral joint supplement and/or maintenance injections Adequan or Legend, and consider PIP joint injections if lameness should occur in the right forelimb (Fig. 13).

Fig. 11: Ultrasound images from the PIP joint. (A) Note the irregular surface of the dorsal aspect of the PIP joint, which indicates the development of arthritis; (B and C) Irregular surface of bone with avulsion fragment; (C) and remaining disrupted fibers of the medial collateral ligament which can be compared to the lateral collateral ligament (D).

Fig. 12: Radiographs demonstrate persistent enthesopathy of the medial aspect of the PIP joint on both distal P1 and proximal P2.
Overall Comments

Although arthroscopy of the pastern joint has been described, it is not a joint where surgery is often performed. Drs. Laurie Goodrich and Lacy Kamm have been conducting a study that has recently been submitted to the journal of *Veterinary Surgery* describing in detail the equine pastern joint, with particular reference to pertinent arthroscopic anatomy.¹ Early and aggressive treatment of a septic joint is known to result in overall better outcomes. Arthroscopy allows for the evaluation of the cartilage, and to check for foreign debris and fibrin, as well as for large bore through and through lavage. Regional limb perfusions have become commonplace, are considered an important part of therapy, and are believed to be one reason for the increased number of improved outcomes in cases of septic synovial structures.

The collateral ligament injury in this case, although not completely healed ultrasonographically, was considered to be clinically healed and stable. The use of a bandage cast and splint was incorporated into the treatment to minimize movement of the PIP, limit the development of OA, and prevent further disruption. The use of PRP was thought to subjectively result in some improvement in ultrasonographic fiber pattern of the medial collateral ligament. The mild radiographic OA changes demonstrated at the 20-week re-evaluation were not surprising; however, on the last evaluation this did not appear to be a clinical problem and should be manageable.

Overall, Tana’s success is due to her owner’s commitment in providing her with aggressive treatment and judicious rehab based off her recheck evaluations.

*Special thanks to Tammy Wilson, D.V.M. (owner), and Tana for allowing us to present this case.*

¹*A DESCRIPTIVE STUDY OF THE EQUINE PROXIMAL INTERPHALANGEAL JOINT USING MAGNETIC RESONANCE IMAGING, CONTRAST ARTHROGRAPHY, AND ARTHROSCOPY; J. Lacy Kamm, D.V.M.; Laurie R. Goodrich, D.V.M., Ph.D., DACVS; Natasha M. Werpy, D.V.M., DACVR; C. Wayne McIlwraith, BVSc, Ph.D., DSc, FRCVS, DACVS, DACVSMR; Submitted Vet Surg 2011*

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