Annular Ligament Constriction Syndrome (ALCS)

In cases in which the palmar/plantar annular ligament (PAL) is implicated as the primary cause of lameness, there is demonstrable constriction of the flexor tendons within the palmar digital sheath as a consequence of fibrosis (scarring) and thickening of the annular ligament. The annular ligament itself, however, is not considered the only source of pain; its binding of the superficial and deep digital flexor tendons within the digital sheath can precipitate synovial inflammation known as tenosynovitis. *In most cases of annular ligament constriction, secondary tenosynovitis is the predominant source of pain and lameness.*

Annular ligament fibrosis can also occur secondary to primary PD tenosynovitis, especially if sheath pathology is chronic (long-term) in nature. *This scenario is more common in our experience.*
DIAGNOSIS

_Ultrasonography is the most effective and readily available method of diagnosis._

In primary ALCS, no intrasynovial (tendon sheath) pathology is evident. The appearance of hypoechoic regions within the PAL combined with increased thickness are consistent with primary desmitis.

In secondary ALCS, ultrasonographic lesions associated with the flexor tendons and/or sheath structures are visible, confirming tenosynovitis to be the primary cause. Ancillary thickening of the PAL or subcutaneous tissues may also be apparent. _In the normal horse, the annular ligament is very difficult to distinguish from the outer layer of the digital tendon sheath using ultrasound._

**Annular ligament thickness of >2mm is diagnostic of ALCS.**

Dynamic ultrasonographic examination of the digital sheath and associated structures is often used to determine whether constriction of the annular ligament is the primary issue or whether tenosynovitis exists for some other reason.

Dynamic evaluation is performed by picking up the affected limb. With the front of the fetlock joint resting on the examiner's knee, the distal limb is flexed and extended during which time the distal limb along Zone 3C (i.e. at the level of the annular ligament) is imaged. The flexor tendons should slide back and forth easily and synovial fluid should be visible between the sheath lining and the tendon structure(s).

_In some cases, adhesions between the sheath lining and flexor tendon(s) is discerned via the inability of the structures to slide easily through the sheath._
Adhesions between the superficial and deep digital flexor tendons can be confirmed via the inability of the tendons to move independently of one another.

In other cases, constriction of the annular ligament is suspected via the inability to visualize fluid between the sheath lining and flexor tendon(s) at any point during limb flexion/extension.

Regardless of which (if any) of the above may be diagnosed, concurrent evidence of chronic inflammation (thickened annular ligament, excessive fluid within the sheath, thickened synovial membrane, etc.) is usually perceivable.

**TREATMENT**

Extracorporeal shock wave therapy (ESWT) has proved to be beneficial in alleviating desmitis, accelerating resolution of intraligamentous lesions, and enhancing overall PAL pliability and function.

*ESWT is often one of our first-line of treatments for ALCS at The Atlanta Equine Clinic.*

In cases refractory to other forms of treatment, annular ligament desmotomy (surgery) results in resolution (return to work) of 70% of uncomplicated cases of primary PAL thickening.

Obviously, the primary pathology must be successfully be addressed in cases of secondary ALCS. Supplemental desmotomy of the annular ligament may also reduce secondary PAL constriction, thus aiding return to soundness if the primary pathology can be controlled.

The surgical procedure to release PAL constriction was first described as using a skin incision that extended beyond the proximal and distal borders of the PAL. This technique permitted complete and open transection of the ligament [1,2]. Blind transection of the PAL through a 2-cm incision into the tendon sheath caudal to the neurovascular trunk over the proximal border of the PAL has been described for cases without complicating tenosynovial lesions [3]. A combination of tenoscopic evaluation and assisted transection of the PAL under direct vision by using a slotted intrasynovial cannula and knife has also been reported [4,5].

*It should be noted that intrasynovial techniques increase the risk of adhesion formation, damage to tendons within the sheath, synovial fistula formation, and tendon sheath sepsis. Specific postoperative procedures have been recommended to prevent these complications [3,6].*

*An approach for transection of the PAL through a 2-cm skin incision directly on the palmar/plantar midline over the PAL can be accomplished without entering the digital tendon sheath in most horses.* At The Atlanta Equine Clinic, extrasynovial PAL desmotomy is typically performed in your barn using aseptic technique with the horse standing, sedated and locally-anesthetized.

If you have any questions regarding ALCS in the horse please call our office at (678) 867-2577. We look forward to serving you!