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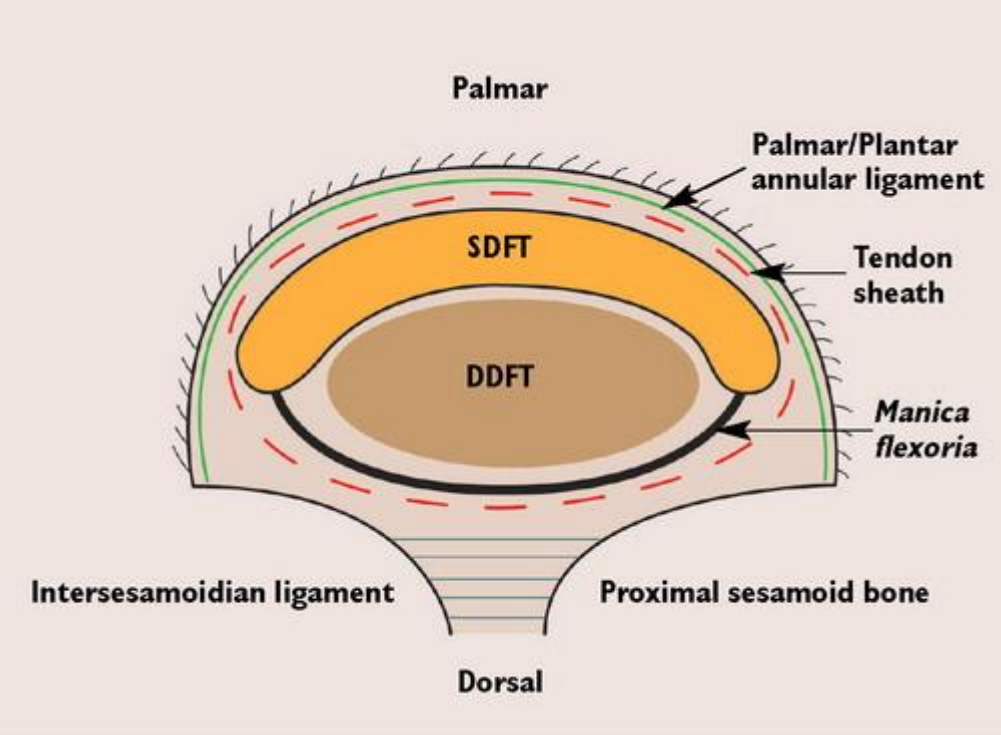
The Digital Flexor Tendon Sheath and Annular Ligament

The Digital Flexor Tendon Sheath (DFTS) is a synovial compartment which runs from mid cannon down the back of the leg. The sheath contains the superficial and deep digital flexor tendons and helps stabilise and lubricate the passage of these tendons as they pass over the back of the highly mobile fetlock. Above the level of the fetlock there is a structure called the manica flexoria which is a tendinous ring that extends off the superficial digital flexor tendon and wraps around the deep digital flexor tendon, providing further stability. Additionally within the sheath there are small mesotendons, which connect the tendons to the sheath lining and are an important in transferring nutrients and oxygen to the tendons.

Just above the fetlock there is a structure called the palmar/plantar annular ligament (PAL) which runs horizontally across the back of the fetlock and attaches to the proximal sesamoid bones. It is a fibrous band which sits between the DFTS sheath and skin to keep the sheath in position as it courses over the back of the fetlock.

The cross sectional diagram below shows how these structures are interlinked:



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Inflammation of the DFTS is known as DFTS tenosynovitis. It can be common in a lot of horses in some will be clinically insignificant – in these cases they are often referred to as “windgalls”. However when the DFTS tenosynovitis is associated with lameness we need to investigate the cause of this, which can fit into one of the following categories:

a) Primary Tenosynovitis:

Inflammation of the sheath lining or inflammation of the fluid within the sheath with no apparent cause.

b) Secondary Tenosynovitis:

This can occur when there is inflammation within the sheath due to injury to the sheath lining or a soft tissue structure within the sheath

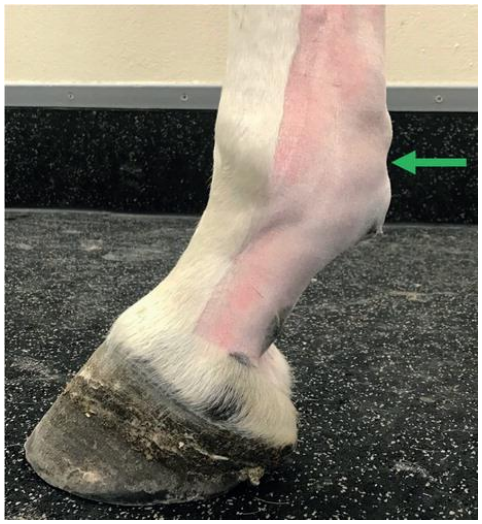
c) Primary Annular Ligament Desmitis:

Inflammation of the PAL is a common problem in older heavy horses. Thickening of this tight band round the back of the fetlock can occur due to repetitive strain, trauma or scarring and causes a reduction in the space for the tendon sheath beneath it, putting pressure on the structures within it and causing lameness.

d) Secondary Annular Ligament Desmitis:

Chronic DFTS tenosynovitis or enlargement of the tendons can result in physical restriction to the fetlock movement and secondary inflammation of the PAL.
A single horse may have one of the above condition or a combination of them e.g. tenosynovitis and secondary annular ligament desmitis and it can be difficult to determine a primary and secondary problem especially in the early stages.

How do we diagnose this problem?
Our clinical examination may make us suspicious of this area due to a DFTS swelling and a ‘tight’ annular ligament causing a notch as seen in the image to the right (green arrow). Initially we need to confirm where the lameness is coming from either with a regional or intra DFTS injection of local anaesthetic.



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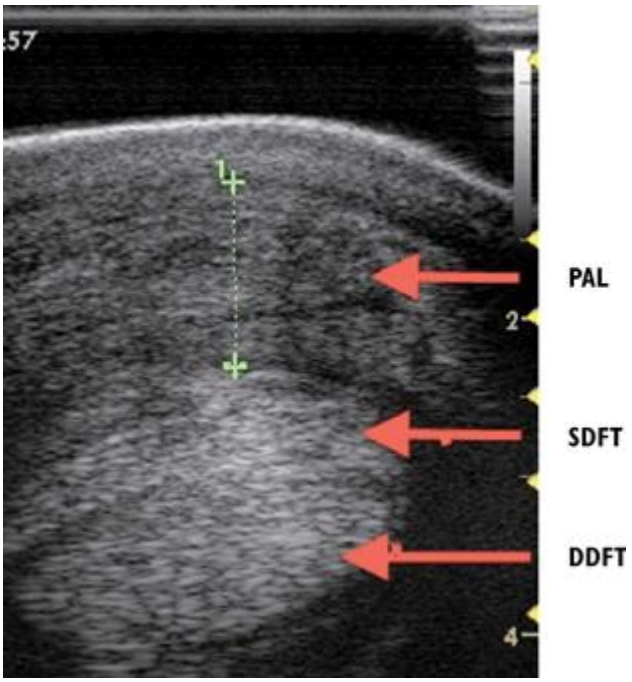
Following this we will image the area with a combination of radiography and ultrasonography. Radiography specifically looks for any bone pathology of the fetlock as the PAL inserts onto the proximal sesamoid bones which sit at the back of the fetlock joint. Ultrasonography is used to assess the fluid and tendons within the tendon sheath and the sheath lining. The PAL can also be assessed to determine its size and the presence of any thickening and inflammation (desmitis). The image to the right shows an ultrasound picture taken from the back of the limb just above the fetlock joint. The PAL is very thickened and inflamed confirming a diagnosis of PAL desmitis. Unfortunately it can be difficult to completely rule out a problem within the DFTS with imaging alone. The manica flexoria in particular is a difficult structure to examine but injury of this structure can be a cause of secondary tenosynovitis. Additionally when the DFTS is very inflamed this can distort the image and make a specific diagnosis difficult until the inflammation subsides. Thick skinned horses add another challenge for ultrasonography in particular!



How do we treat the problem?

This will depend whether what we have diagnosed. For a tenosynovitis without an obvious cause we often use corticosteroid injection into the DFTS to reduce pain and inflammation, and advise rest and controlled exercise initially. We will then repeat imaging once the DFTS is less inflamed to double check there is no obvious injury and then slowly reintroduce controlled exercise and monitor the horse's response.

When there is an injury within the DFTS that is seen on imaging or a horse has failed to respond long term to medication of the DFTS, we may recommend tenoscopy- this is where a camera is placed into the DFTS to aid in further diagnostic evaluation and in a lot of cases treatment can then be performed to remove damaged and inflamed tissue. This is performed under general anaesthetic and the rehabilitation from this will depend on what is diagnosed.

For PAL conditions often surgery to cut the PAL is recommended (PAL desmotomy). This is because fibrosis of this structure is commonly irreversible and will continue to cause constriction and lameness. An incision into the PAL releases the ligament and therefore the constriction. This procedure can sometimes be combined with a tenoscopy to evaluate the DFTS. The prognosis following a PAL desmotomy this is usually very good but cosmetically the area will often remain thickened.

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