

ABOUT TENDONS AND LIGAMENTS

Tendons and ligaments are structurally very similar. The difference is in composition and quantity of collagen and extracellular matrix, and various proteoglycans, and other proteins (trombosponidin 4, tenzecin-C, fibronectin, hyaluronic acid, elastin). However, the real difference is in their function - the tendons connect muscle to bone, while ligaments connect two adjacent bones.

The most common injuries in sport horses are happens on the front legs, from the anatomical and biomechanical reasons: horses carry up 60% of its weight on the front legs; in gallop at one phase the whole body weight switches to a single front leg.



Therefore, over 80% of all limb injuries are happens on superficial flexor tendon, and suspensor ligament of the front leg. Theirs overload during maximum extension of the fetlock joint, leading to the fiber breakage. Another way of injury is the laceration in that region.

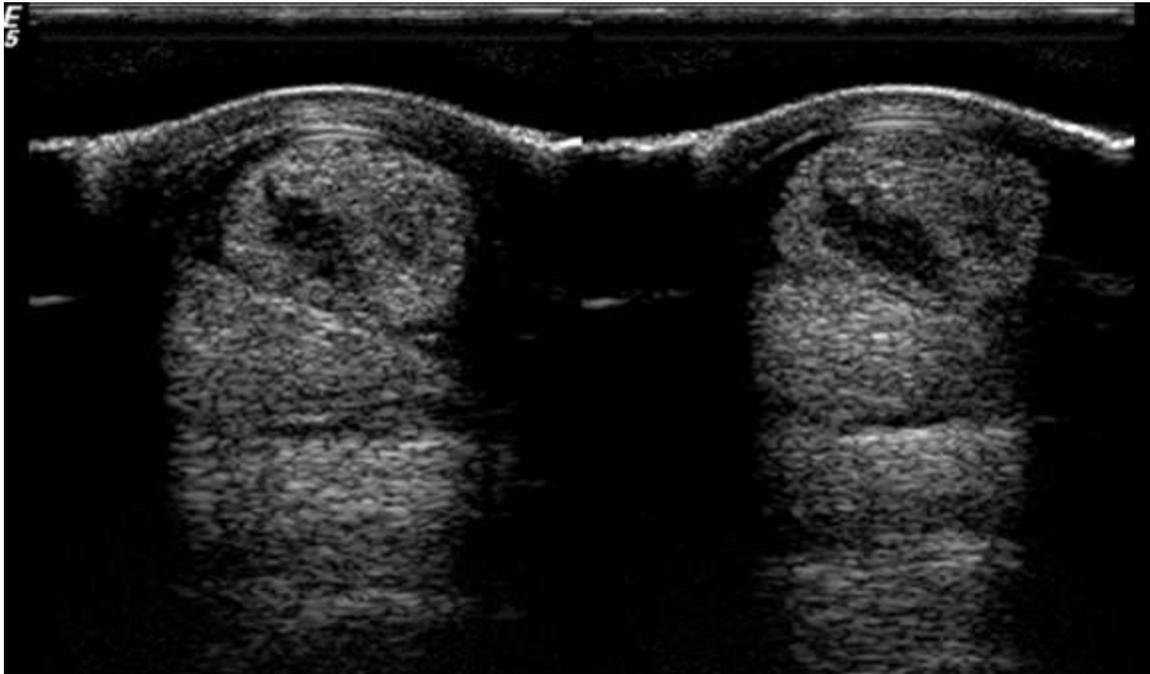
Conformation of limb also can be predisposition for the occurrence of injury: long steep pastern and long second phalanx bone... Additional reasons are fatigue of muscles, tendons overheating due the strong and

sudden muscle contraction, improper trimming and shoeing, animal overweight, inadequate track for training, and inadequate training.

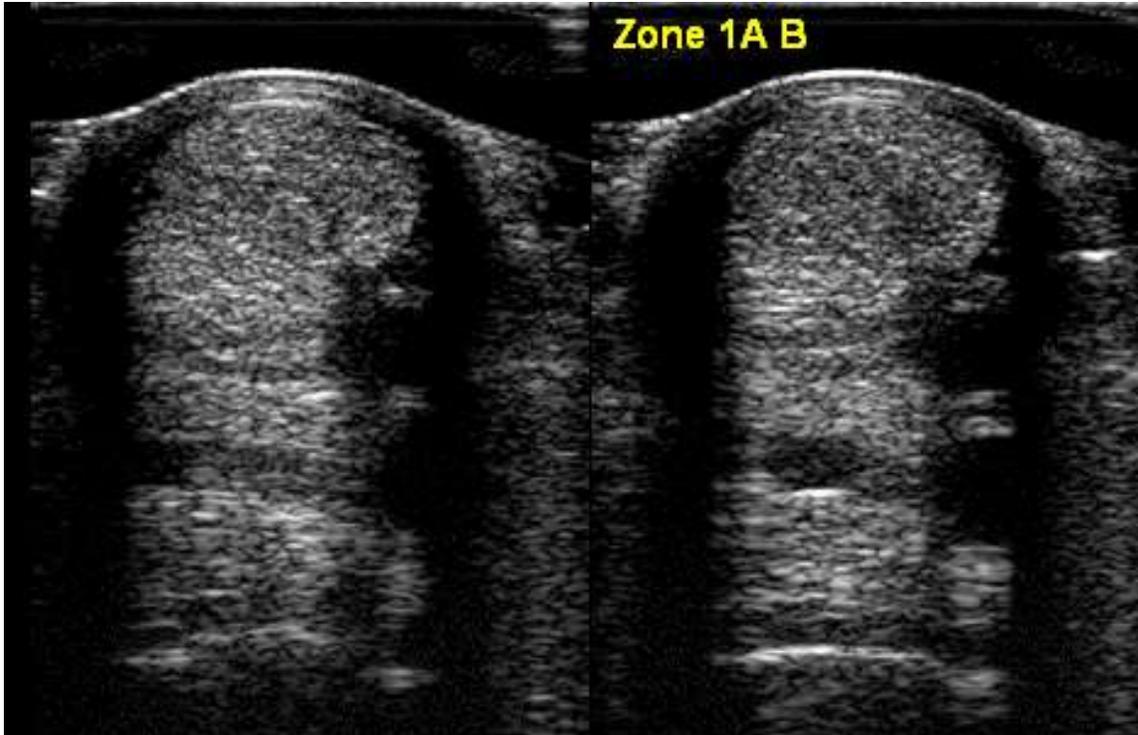
Tendon injury occurs often in the mid-shin level, where the tendon is the narrowest with small number of blood vessels that nourish the cells.

The most common factor when it comes to injury is when the horse from the rest phase moves to the basic training phase. Also, it is occur likely in young horses than older.

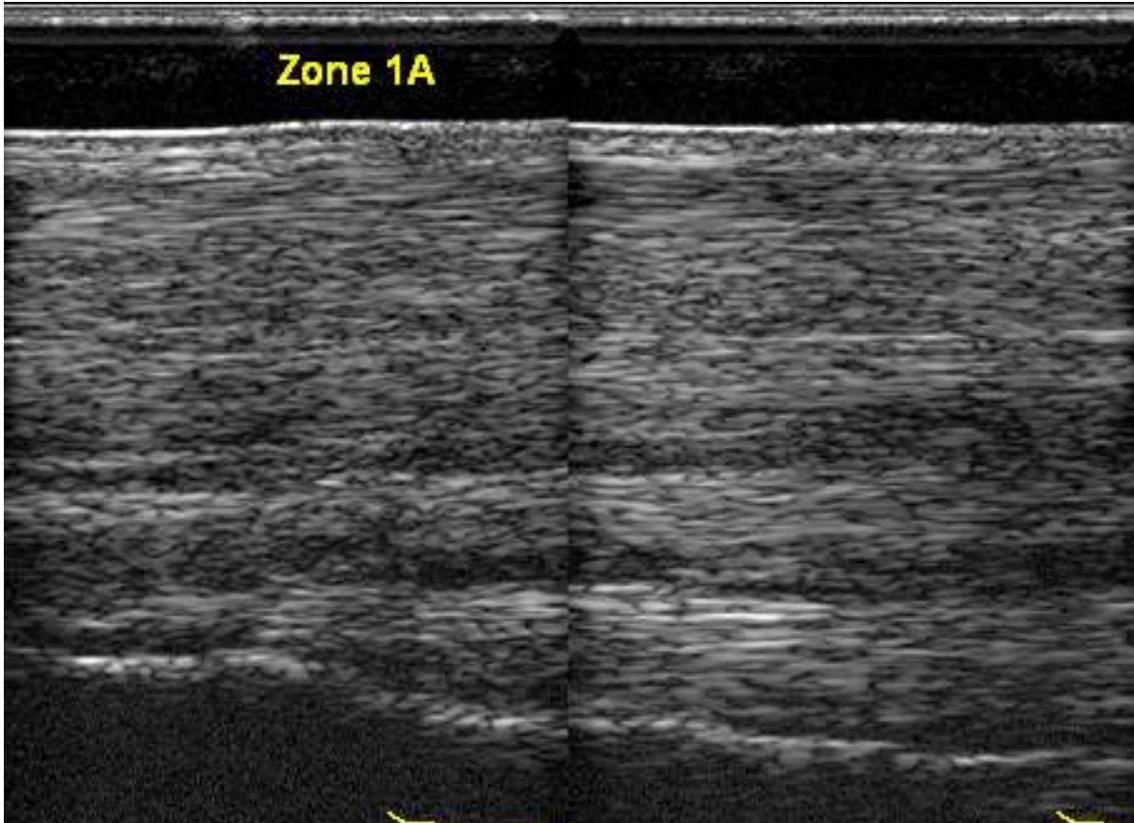
Any injury first goes through a phase of degeneration of the tendon fibers, which is not visible, and it is difficult to diagnose that even with the ultrasound. Through out this phase pass the tendons of both front legs. It is also called the 'molecular inflammation', and does not cause tissue repair process, but progressively weakens the tendon itself. An injury, clinically visible, occurs when on the weakened tendon comes a normal stress and load.



In the acute phase of inflammation, tendon fibers rupture, capillary breakdowns and leakage of blood into a new cavity. Plasma cells, eosinophils, macrophages, and lymphocytes are activated, and secrete mediators of inflammatory reactions. The tendon (or ligament) is swollen, tender, and painful to the touch and can be determined by ultrasound (hypoechoogenicity). The acute phase also means activation of reparatory processes.



In the subacute phase reparative processes are expressed. The mass of platelets that secrete growth factors can be found at the site of the defect. A lot of fibroblasts were also there. They will replace ruptured tendon fibers. There is an increase production of the extracellular matrix as well.



In the chronic phase, fibroblasts transform into fibrocytes, which makes a scar at the site of the injury. The creation of scar tissue is consequences of small number of blood vessels, and poor nutrition of tendon and ligament cells. However, the scar does not have the power to stretch, as a healthy fiber.

The tendon may appear healed completely at rest, but the scar tissue fibers don't have the same elasticity as before the injury. This is the reason why there are renewals of such injuries: horse back to the training as he had no injury, and when he goes to intensive training, fibrous (scar) fibers breaks down, in place of the primary damage.