

# Healing the Bowed Tendon

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*Lameness: Tendon and Ligament Problems - Jul 10th, 02*

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When people say a horse is "bowed" or that it has a "bowed tendon", they are generally referring to the tearing of the superficial digital flexor tendon in the middle of the cannon bone region. This tear causes a curved, bow-like swelling on the back of the leg between the knee and the ankle. Although the swelling is usually in the middle of the cannon bone, it may be behind the knee, at the level of the ankle, or it may extend from the knee to the pastern.

Most people think tendon injuries such as "bowed tendons" only happen to racehorses. In reality, any breed or type of horse, performing almost any activity, can be at risk for tendon injury. Tendon injuries can be more serious than some types of fractures because the tendon heals very slowly and replaces torn tendon fibers with fibrous scar tissue. The healed tendon is less elastic, leaving the tendon vulnerable to re-injury.

When there is a significant injury, the horse may not be able to return to its previous level of performance due to persistent weakness of the tendon. The superficial digital flexor tendon is made of protein fibers that are arranged longitudinally, forming a long attachment between the muscle above the knee, and the long and short pastern bones just above the hoof. The tendon fibers are somewhat elastic, but will tear if stretched or loaded beyond their limits. Improper positioning of the leg in relation to the horse's body weight can tear the tendon fibers. This configuration may occur when the horse lands after a fence or as the horse becomes

tired and changes its gait. Any unbalanced loading of the tendon, uneven footing, poor conformation, and/or improper shoeing can also contribute to tendon damage. In some cases this overload can be the result of a single misstep, and in other cases it can be the result of cumulative stress or fatigue of the fibers.

Once the tendon fibers tear, bleeding within the tendon causes acute swelling, heat, and pain. The horse may or may not exhibit lameness. In fact, many horses with serious tendon damage are never lame. Swelling also occurs around the tendon due to an accumulation of fluid (edema). In the short term, ice or cold hosing and bandaging the leg should decrease the local inflammation and swelling. The horse should be confined to its stall with only hand walking exercise. If the horse is sore or significant swelling is present, consider speaking to a veterinarian about using a nonsteroidal anti-inflammatory medication such as oral phenylbutazone, Equioxx or flunixin meglumate for a short period of time to decrease the swelling and discomfort.

Since palpation of the leg is not a reliable method of determining the presence of tendon damage, contact a veterinarian to make arrangements for an ultrasonographic evaluation of the swelling. Ultrasonography allows a veterinarian to evaluate the integrity of the tendon fibers as well as other important parameters, including the cross-sectional area of the tendon, the alignment of its fibers, and its echogenicity. The echogenicity of the tendon is related to its density. The normal tendon appears bright white or echogenic, and the abnormal tendon appears various shades of gray (hypoechoic) or black (anechoic). Based on the ultrasonographic findings, a veterinarian can confirm the presence of tendon damage and determine its severity. It is best to schedule the ultrasound exam about five to seven days from the time of injury to allow the tendon to look its worst at the time of examination.

Subtle tendon damage may display an increase in the tendon cross-sectional area due to edema, without actual fiber tearing. Serious damage may consist of total tendon rupture with complete loss of the tendon fibers, a marked increase in tendon cross-sectional area, and loss of support in the limb. Most tendon injuries fall somewhere in between with a discrete area of fiber tearing visible on the ultrasound image (black or dark gray hole), and enlargement of the total tendon cross-sectional area. The hole seen on the ultrasound is actually an accumulation of blood and granulation tissue within the tendon where the tendon fibers have torn apart.

If your horse has suffered a tendon injury, a veterinarian will work with you to develop a rehabilitation plan. Most horses need stall rest with restricted exercise for at least two months (possibly up to eight months), depending on the degree of injury and the horse's temperament. This confinement, coupled with a controlled exercise program, will encourage healing of the tendon while preventing re-injury. Initially, the horse should only be walked in hand. Once the tendon has been cooled out, cold hosing is no longer necessary or helpful. Topical application of DMSO may help decrease residual swelling in the leg, but the tendon will remain persistently thickened in the majority of cases.

A veterinarian will need to ultrasound the horse's leg approximately every sixty days after the initial exam to determine if the tendon has healed enough to allow for an increase in exercise. An increase in exercise may entail up to five minutes of jogging exercise or turnout in a small paddock. This exercise will gradually increase over a period of months; depending on the improvements seen during the follow-up ultrasound exams. Tendon rehabilitation is a slow process that can be frustrating if your horse suffers any setbacks due to re-injury. Monitoring the horse's progress with regular ultrasounds can eliminate these setbacks.

Recent research in veterinary medicine has focused on ways of improving the outcome of tendon injuries with the use of regenerative medicine. Stem cells or plasma products derived from your horse are injected directly into the tendon lesion and are being more widely used in an effort to improve the quality of tendon repair. Surgical treatments that include tendon splitting and superior check ligament desmotomy are still useful techniques to consider in some cases and can be used in conjunction with tendon injections. Other treatment modalities such as therapeutic ultrasound, low-power laser, acupuncture, hydrotherapy and electromagnets are also thought to promote tendon healing. Your veterinarian can help choose the best treatment for each individual horse. Although tendon injuries are serious, most horses can recover and return to athletic function if given enough time. Even in the case of a severe tear, it is likely that a horse will be able to return to a less strenuous activity. The best way to ensure a successful outcome is through prompt ultrasonographic diagnosis, treatment, and careful monitoring of the tendon by a veterinarian.

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