

Bowed Tendons & Ligament Strain

By Dr John Kohnke BVSc RDA

The structure and load bearing capacity of flexible elastic tendon tissue is influenced by exercise and aging, with tendons and the suspensory ligament of the front limbs operating near to their functional limit during exercise. Both cartilage in joints and the structural matrix (fibril bonding and strengthening material) of tendons and ligaments have very limited, if any, capacity to regenerate after injury. However, the tendons and the suspensory ligament can repair to retain their loading capacity with fibrous, less elastic scar tissue if carefully managed in a rehabilitation program.

A step-wise program to increase loading after tendon and suspensory injury is now known to increase the long term success of rehabilitation.

Causes of Tendon and Suspensory Ligament Injury

A strained tendon or suspensory ligament results most commonly from tearing of the internal fibres of the Superficial Digital Flexor Tendon (SDFT) and occasionally, the Deep Digital Flexor Tendon (DDFT), or in severe cases, one or both of the divisions of the suspensory ligament where it divides above the fetlock to join into the sesamoid bones on each side. Another site of injury is the rear of the cannon bone midway up the limb and also under the back of the knee joint where the suspensory ligament attaches to the top of the cannon bone. Strain is caused by sudden peak overloading and over-stretching of the elastic fibrils, which are organised into bundles within the ligament 'strap', surrounded by a lubricating sheath. The tendons can therefore tear within their own structure along the length, or in the case of the suspensory ligament, tear away from the insertion onto the top of the cannon bone or the sesamoid bones.

Repeated overloading of the ligament triggers internal destructive changes, resulting in stretch 'fatigue' and loss of strength and rebound elasticity, with cumulative micro damage of the fibril matrix. **Over galloping a horse in training, or having low heels in a harness horse, for example, combined with heavy front shoulders, heavy work riders, shifting track surfaces and inadequate intake of collagen repair nutrients from the diet, can all reduce tendon and ligament resilience and loading capacity.**

Handy Hint

Horses with 'weak' limb conformation, such as 'back at the knee', long pasterns, low heels and previous history of a tendon or suspensory injury have a lower chance, particularly if they are raced hard, or are over 6 years of age, of remaining sound for race training. Careful evaluation to determine the likelihood of further injury should be carried out before starting a long term 'rehab' program.

Prompt First Aid is Essential to Reduce Long Term Damage

Overload and strain cause tearing with inflammation, internal haemorrhage within the fibril bundles, matrix damage and fibril rupture, which all act to slow the repair of the tendons and the suspensory ligament or strength of its attachment sites. Tendons cannot regenerate new collagen type 1 fibrils, but repair with fibrous, non-elastic collagen type 2 scar tissue, leaving a potentially weak, less elastic zone at the site of injury.

Cold Therapy

Ice blocks in a plastic bag, or a thick gel cold pack, under an elastic pressure bandage applied promptly after suspensory swelling appears, will help limit the disruptive internal haemorrhage - apply for 10 minutes, repeat every 10-15 minutes to prevent blood leakage over a 6-8 hour period. Keep the limb and the **adjacent leg bandaged** for support with an elastic pressure bandage for at least 7 days. Do not work the horse. Consult your vet for advice.

Anti-inflammatory Medication

Administer anti-inflammatory medication, such as 'Bute', to help limit swelling and destructive enzyme release which would otherwise disrupt fibril alignment and weaken the matrix structure. Consult your vet for advice.

Rest and Confinement

Confine the horse to a stable or small yard - bandage to support the 'good' limb - confine the horse for up to 4 weeks initially to reduce the risk of further strain. Cut back on grain and avoid weight gain. **Warning: Do not turn out or 'bush' the horse out into a paddock, where it is likely to gallop around and cause further disruption and haemorrhage within the damaged tendon or suspensory structure. Studies have shown that the tendon structure must be given time without exercise loading to reorganise and commence repair over a 4-6 week period.**

Handy Hint

Studies have indicated that supplements of Retinol (Vitamin A) at 50,000 IU (15mg Retinol) daily given to race horses on grain and cereal hay diets can significantly reduce the incidence of tendon and ligament failure. A daily supplement of 40g **Kohnke's Own Cell-Vital**, or 60g **Kohnke's Own Harness Special** or 120g **Kohnke's Own Cell-Vital PREMIUM** contains more than 50,000 IU of Retinol, as well as zinc, copper and micronutrients to help maintain collagen strength. The individual Supplets® of vitamins and separate trace-mineral pellets in the Kohnke's Own products help ensure that the potency of all vitamins, including Vitamin A, is maintained during storage and when mixed into feed. Many trainers also supplement with **Kohnke's Own BCS** (2 scoopsful per day) which provides nutrients which have a role in the maintenance of collagen and elastic tissue in the lungs, tendons and ligaments.

Ultrasound Scan and Cutting the 'Check' Ligament

An ultrasound of the internal structure and degree of disruption, which appears as a 'black hole' will help determine the severity of the matrix and fibril damage. In the case of a severe suspensory strain, an X-ray of the sesamoid bones is also recommended to check for internal weakness of the sesamoids and surface periosteal damage, as well as the attachment to bone at the rear of the cannon bone for high suspensory injuries. Discuss the option of cutting the check ligament at the attachment to the suspensory ligament with your vet. It can improve the chances of return to full racing by up to 10% in harness horses. The following week to week rehabilitation program is recommended to help improve the chances of return to full exercise and racing/competition by up to 80% combined with progressive loading.

First 4-6 Weeks

Confinement to avoid risk of overloading by paddock exercise. Overnight application of a magnetic wrap may be useful to improve blood supply and rate of healing after the first 7 days of ice-packing and anti-inflammatory medication to limit haemorrhage and swelling.

Weeks 7-10

Hand walking exercise 5-10 minutes daily, increasing to 15-20 minutes daily by machine or hand walking to load the suspensory tendons. Horses may be let out into a yard during the day and stabled at night. Apply magnetic field bandage wraps overnight to the tendon fibrils and matrix to help increase the blood supply, to ultimately improve strength and matrix repair in direct response to controlled, progressive loading. Where the attachment to bone is torn, then X-rays may be recommended by your vet to check on the progress of re-attachment.

Weeks 11-16

Rescan after 10-12 weeks to determine the rate of the repair processes. Daily trotting exercise from a lead pony or light jogger cart (pacers) for 10 minutes, increasing to 15-20 minutes, will help to progressively load the tendons to stimulate repair. A firm even surface is important to provide controlled 'jarring' to facilitate tendon repair and increase the strength of the healing fibrils.

Weeks 17-20

Daily trotting for 5-10 minutes, increasing to 15-20 minutes. Continue confinement to a larger yard, with stabling overnight and magnetic field bandage wraps.

Weeks 21-26

Trotting exercise to load tendons for 20-30 minutes. Rescan after 24 weeks to evaluate repair processes. Trotting (or pacing), cantering and galloping exercise, including ½ pace around bends to progressively load the tendons. Rescan after 32 weeks to determine success of the rehab program.

Day to Day Management in Training

1. **Ensure long toes and low heels are corrected** - consult your farrier.
2. **Examine tendons and suspensory ligament for heat, swelling and soreness** each morning before exercise. Do not apply cold packs prior to exercise as elasticity will be reduced until the horse warms up.
3. **Provide a supplement of Vitamin A** (50,000 IU or 15mg Retinol) daily, as well as cartilage trace-minerals (copper, zinc, manganese) to help improve tendon elasticity and healing during training.
4. **Trot the horse steadily on a hard, even surface**, such as a roadway, for up to 1km daily as a warm-up exercise each day to 'jar' the tendons and suspensory ligament in a controlled manner which will help improve strength and resilience.

Keypoints

- Confine to stable or yard for 3-4 weeks - do not turn out into a paddock
- Apply cold packs and give anti-inflammatory medication to reduce swelling and internal bleeding as soon as possible after the injury - within 30 minutes or so.
- Apply bandages to support the adjacent 'good' limb.
- Have the tendons or suspensory ligament scanned, and the sesamoids X-rayed, to determine the extent of the internal fibril disruption and bony reaction at the suspensory attachment.
- Adopt a step-wise rehabilitation program over a 4-6 month period.

New therapies including stem cell injections from bone marrow and tail-butt fat tissue, shock-wave therapy and collagen implants are also used to improve the rate of repair and regeneration of tendons. Consult your vet for advice.

The information in this fact sheet, or part thereof, downloaded from the website www.kohnkesown.com, can be used in newsletters and other horse/pony club or association bulletins, provided that the source of the fact sheet is acknowledged as courtesy of the author, Dr. John Kohnke BVSc RDA, from the website www.kohnkesown.com. The information cannot be used for magazine publication unless permission is sought from the author by email info@kohnkesown.com prior to publication.

Kohnke's Own®

©Copyright 2013

FREECALL 1800 112 227 - www.kohnkesown.com - email: info@kohnkesown.com