

Healing & Rehabilitating Tendon and Ligament Injuries

Historically, the horse with the bowed tendon or strained suspensory ligament has represented a grave challenge to horsemen trying to overcome those injuries. Tendons and ligaments, despite the simple arrangement of the fibers that make them, undergo a complicated healing process that is further hampered by the simple fact that the horse, no matter what we do, must continue to use those structures WHILE healing occurs.

“Dr. Green” (also known as pasture turn-out or time-off) seemed for awhile to have almost equal success to the various therapies used for healing tendon and ligament injuries. Veterinarians and horsemen have used all sorts of counter-irritants, pin-firing, poultices, injectables, and exercise regimens and other means to achieve the “healing trinity” of tendon healing.

The healing trinity of tendon or ligament healing from the perspective of the horsemen may be defined as quality of repair over a shorter time with complete return to service. Much of the research and effort currently underway in sport horse medicine is aimed at achieving that trinity.

Quality of repair is now thought to be improving through use of regenerative medicine including stem cells, platelet rich plasma (PRP), autologous conditioned serum (ACS), and extracellular matrix (ECM). The idea of using these devices for tendon or ligament repair is to improve quality and reduce time of healing by influencing the body’s own wound repair process.

Stem cells, when injected into the lesion, are thought to take on the characteristics of the original, healthy tissue. Platelet rich plasma, in humans and other animals, has been demonstrated to decrease pain and reduce time of healing as well as recruit stem cells into the lesion. Autologous conditioned serum (also known as IRAP or interleukin-1 antagonist protein) markedly reduces swelling and pain, and ECM has been shown to provide a scaffolding for quicker repair. Using these regenerative techniques, alone or in combination, with tendon and ligament injuries appears to be improving the recovery rate and return to performance of horses in a wide range of disciplines.

With regenerative medicine, these lesions appear to heal with more parallel fiber alignment and similar architecture to the original tendon (as viewed on ultrasound). Without regenerative medicine, lesions of the tendon or ligament tend to take longer to heal, with less parallel orientation of the fibers, and often incompletely, leaving pockets of fluid surrounded by irregular scar tissue. Such tendons or ligaments are not as functional as the original, un-injured organ.

Even with the advances made in the field of regenerative medicine, the task of rehabilitating the injured horse remains a challenge. Simply turning a horse out into a pasture or standing it in a stall for months on end is probably not the answer. Once the tendon or ligament begins to heal, architectural restoration alone will not resolve the problem. Those new cells must be conditioned (or “taught”) to function as well as or better compared to the original.

More importantly, these animals frequently become injured when they are at the peak of performance and physical condition. The process of injury, healing, and repair often takes its toll on performance and condition adding more time to the goal of return to service.

For some time, horsemen have been using swimming pools and underwater treadmills to maintain physical fitness on rehabilitating horses while also conditioning the healing tendon, ligament, or other injury. Swimming pools and underwater treadmills offer “no-impact” or “low-impact” exercise, and, with veterinary guidance, can be tailored to the horse and the injury to effect a shorter rehabilitation period.

A possible disadvantage to swimming-alone is the total lack of impact during the training. In other words, the horse becomes very fit, but the healing tendon or ligament does not experience impact. It is akin to having a very powerful motor in a car with bad tires. Swimming pools for horses are, however, very important for certain types of injuries.

Underwater treadmills, however, do allow for some impact while providing the buoyancy of water, thereby protecting the injured structure. While underwater treadmills are better at providing some impact, some are better than others at allowing for control of exercise. One example of better control is the tank-type, underwater treadmill (such as the Aqua Pacer). The tank-type underwater treadmill allows the operator to control not only the speed of the treadmill but also the depth of the water allowing for a much wider range of motion, stride length, and greater distribution of muscles actually affected.

Recently, Steve and Bert McGill installed an Aqua Pacer in their new facility called the Annadale Equine Center just outside Sanger, California. According to Bert McGill, the Aqua Pacer will not only improve the performance of a healthy horse needing condition, but also may reduce the recovery time for injured horses by as much as 50-60%.

McGill demonstrated the machine to me using a 20 year-old roping horse that had lost some condition. McGill described the horse before the conditioning program as a body condition score of 4 out of 10 (just less than ideal) despite a high plane of nutrition and 45 days of standard exercise program in the round pen and arena. The horse just wouldn't fill-out along the top line or through the hindquarters, and he lacked stamina and enthusiasm.

After 60 days on the Aqua Pacer, that old rope horse had really turned the corner with increased muscle and stamina. He is now a BCS 6 and works out in the Aqua Pacer on almost a daily basis. The change was impressive and rapid, and appears to be possible for horses recovering from surgery or soft tissue injury, as well. Thus, the healing trinity is possible with a quality repair, healing faster, and returning a fit and sound performance horse back to the arena.

Complimentary to any conditioning or rehabilitation program is the European-style exercisers. These machines are often automated and feature the horse standing in a revolving box-stall at variable rates. Similar in action to the well-known mechanized hot-walker, the Eurociser is different because the horse moves freely and more naturally within its box.

In addition to the underwater treadmill, rehabilitation may be enhanced by hyperbaric oxygen chambers which, when used properly, increase the amount of oxygen available to injured tissues and therefore facilitate faster healing.

Of course, the old "tried and true" still work, too. Ice, poultices, and bandaging are the mainstays of any rehabilitation program. Conditioning still requires the elbow grease of hand-walking on firm ground and time under-saddle.

For some horsemen, more is available, of course, when one considers shockwave, massage therapy, acupuncture, chiropractics, and other alternatives. While these are often used, and I have seen improvement in patients using these therapies, the improvement is sometimes more subjective, at best, to measure.

The real key to achieving the healing trinity for tendons and ligaments is having a plan and using a teamwork approach towards achieving results. The owner, trainer, veterinarian, rehabilitator, and farrier must all have a part, know their part, and communication between teammates is vital to success. All the fancy equipment and foul smelling poultices in the world won't help if a plan isn't made and the team doesn't work, together.

For more information about Annadale Equine Center, please call or write to Steve and Bert McGill, 17300 East Annadale Avenue, Sanger, California 93657. (559) 876-3700.

This article was written by Danny W. Dutton DVM, associate veterinarian at Pacific Crest Equine in Exeter, CA.