

Los Olivos Veterinarian Contributes to Medical Science

By Jessica T. Schley

Anyone who has ever torn a ligament knows how long it takes for such an injury to completely heal. Sometimes the pain and swelling continue for months, even years. In some cases the injury never completely heals. Ligament injuries in horses have traditionally been even more difficult to heal. But a procedure developed by veterinarian Dr. Doug Herthel of Alamo Pintado Equine Medical Clinic in Los Olivos has revolutionized the treatment of equine ligament injuries. His procedure is now also being examined for possible use on human patients, and some early applications in Europe and Santa Barbara show great promise.

One of the reasons ligament injuries are so slow to heal is because there is very limited blood flow to ligaments. In a normally functioning mammal, such as a horse or a human being, an individual's bone marrow is constantly producing stem cells and sending them out into the blood stream. These stem cells travel throughout the body, replacing worn-out or damaged cells wherever they find them. That is a major part of the normal healing process, but it does not work very well in areas (e.g. ligaments and tendons) where there is limited blood flow to bathe the damaged tissues and provide the stem cells to heal them.

Herthel's veterinary practice specializes in treating equine lameness, and in 1995 he began to look for ways to help ligaments heal faster. He developed a procedure to inject some of the horse's own bone marrow into the site of its injury. He withdraws a quantity of bone marrow from a horse's sternum (or breastbone), and injects it directly into the damaged area. Since 1995, Herthel has used such injections to treat more than 800 horses and he estimates that over 2,000 have been done nation-wide. Herthel most commonly treats an injury called Suspensory Ligament Desmitis, or SLD. In his informative CD entitled, "Enhanced Suspensory Ligament Healing," Herthel explains that SLD is a "debilitating and often career ending lameness in the equine athlete." He goes on to say that SLD "affects virtually all types of performance horses at some level." He also explains that a horse's legs are fashioned with a complex series of ligaments called the "stay apparatus." The most important part of the stay apparatus is the suspensory ligament, which acts as a support for the horse's fetlock joint as it bends and straightens with every stride.

The procedure that Herthel has developed is non-surgical,



Dr. Doug Herthel of Alamo Pintado Equine Medical Clinic withdraws bone marrow from a horse's sternum.

Photo by Deedee Hatch

meaning the patient does not have to be 'cut open.' The horse is sedated and placed on its back on a supportive mattress to allow access to the horse's sternum, into which a needle is placed to extract the needed amount of bone marrow. The horse's legs are held up by padded ropes, and needles are pre-placed at the site of the injury, with the aid of ultrasound to identify the best location. The extracted bone marrow is immediately injected into the site and the needle removed. Special bandages are applied to keep any of the marrow from seeping out before it can do its job.

The recovery time until the horse is able to resume training after this procedure is usually two to four months—a major improvement from the year or more of layoff time previously needed for ligament damage to heal. The percentage rate of complete recovery has also been tremendously improved—up from 15% or less with the old methods, to 87% with stem cell injections.

In a recent interview, Herthel said that he has lectured to several medical conventions of orthopedic surgeons about his bone marrow injection treatments. Herthel also noted that orthopedic surgeons in Europe are already using bone marrow injections on hips damaged by osteoarthritis, with the hope that the tissues will regenerate and thus avoid the necessity of hip replacement surgeries. So far, the European treatments show great promise, but it will be some time before such procedures are approved for widespread use in the United States.

In the meantime, however, similar procedures are being used experimentally in the United States to treat a few people with injuries who otherwise would have little or no chance of healing. One of these is an orthopedic surgeon who had a chronic severe tear of his Achilles tendon. He was familiar with Herthel's work and had two of his col-

leagues perform a bone marrow infusion on his injured tendon just a few months ago. He is doing great and expects a full recovery.

Similar treatments are being used for Christopher Reeve, the Superman superstar who suffered spinal cord injuries in a 1995 horseback riding accident that left him a quadriplegic. The September 23, 2002 issue of *Time Magazine* describes Reeve's battle for mobility. He has shown astounding signs of recovery in recent months, due in part to his doctors' innovative use of stem cells harvested from Reeve's nasal passages and injected into his spine at the site of his injuries. These injections appear to be helping to re-grow the damaged parts of Reeve's spinal cord. Today he can move his fingers, his wrist and parts of his arms and legs. He can resist pushing against his feet and arms. He now has normal sensation in over 70 percent of his body, and in a pool, can take a step and push off the wall.

It is a strange irony, and somehow fitting, that Reeve was paralyzed in a horse accident in 1995, exactly the same year that Herthel began his experimental use of bone marrow injections to treat injuries in horses—and now a similar treatment appears to be helping to heal Reeve's injuries.



Herthel injects bone marrow into the site of a Thoroughbred race horse's suspensory ligament injury.

Photo by Deedee Hatch