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Stem Cell Therapy Is Beneficial to Horses

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Stem cell therapy is beneficial to horses.

Human research has been around for decades. There are hundreds of kinds of human research that constantly receive successful results. Stem cell therapy in humans is just one treatment receiving great feedback (Black et al). Equine research has also been receiving successful feedback for years. Stem cell therapy research has proven successful in horses as well as humans (Black et al.) (Mayo Clinic Staff). Stem cell therapy can advance and grow to help other people, horses, and animals in the future.

Stem cell therapy can improve healing time in horses. Dr. Frisbie from Colorado State University summarized the success of using equine stem cells to repair various joint pathologies such as cartilage resurfacing, osteoarthritis, and damage to soft tissue structures (Frisbie). Cartilage resurfacing using mesenchymal stem cells was tested by researchers from Cornell University. Cartilage resurfacing was done by injecting the mesenchymal stem cells (MSC) into the joint thirty days after the injury. Results were recorded after twelve months of light work and exercise following the procedure. Tissue softening was observed; in addition, long-term effects were noticed when the cartilage tear improved and started healing after the mesenchymal stem cell treatment (Frisbie). MSC treatment was shown to have the ability to aid the regrowth of damages to the joint structure. The results showed improvement in the fluid confined within a joint space in response to the stem cells (Frisbie).

Mesenchymal stem cells can be used to treat disease. Data shows horses recovered more quickly with mesenchymal stem cell therapy rather than surgery alone (Frisbie). 77 % of the horses that received mesenchymal stem cell therapy returned to work, whereas horses that

received surgery alone had a 0.6% chance of returning to work(Frisbie). However, there was a 60% chance of all horses returning to work who received surgery aided with mesenchymal stem cell therapy (Frisbie).

R. K. W. Smith, a veterinary surgeon from London, and his team conducted a case study using mesenchymal stem cells on a polo pony who had suffered a superficial digital flexor tendon injury. The polo pony received treatment five weeks after the tendon injury. The stem cells were injected into the damaged tendon and then the leg was wrapped with standard bandages. Symptoms were recorded after the treatment and then again ten days and six weeks later. There was no swelling immediately observed after the stem cell injection. At the following check-up there was no added lameness at the walk; furthermore, the pain the horse felt when pressure to the tendon was applied, had disappeared by six weeks. The results indicated no disruption to the tendon and improve healing and comfort.

Another researcher and his team, Dr. Spass, conducted a clinical trial on peripheral blood stem cell therapy and its ability to improve wound healing (Spass, et. al). At a one-year follow-up from treatment, there was no evidence of wound recurrence and all four horses responded well. The horses suffered from assorted injuries to the leg varying between the surface of the tibia and the metatarsal bone. The horses were treated with conventional therapy including wound debridement for three months and no progress was noted (Spass et al). The team recorded crust formation two months after the peripheral blood stem cell treatment and it was later noted that no animals suffered from lameness, swelling of the legs, and no swelling to the abrasion site after the therapy. Images below show the progression of each horse's injury after treatment over time.



Figure one shows the injuries of (a) an 11-year-old mare and then (b) a 16-year-old gelding. Over time wound progression should be noted. Pictures were taken on the day they received treatment (day 0) and then three follow-ups after reviewing the therapy (Spass, et al). Image (a) presents a skin wound to the dorsal surface of the metatarsal bone in contrast, image (b) shows another skin wound injury but to the plantar surface of the metatarsal bone (Spass, et al.) Both injuries were acquired to the lower leg of the horse.



Figure two shows injuries of two 26-year-old geldings on the day of treatment (day 0), then at three different follow-ups after the treatment, (Spass, et al). Wound progression should be noted. This image (a) shows bone exposition at the surface of the tibia in comparison to image (b) shows injury to the metatarsal bone (Spass, et al). Both injuries were acquired to the lower leg of the horse.

In addition to healing success rates, stem cell therapy has multiple benefits for horses. It is cost-effective. Some stem cell therapy treatments can be costly at over \$4,000 (Black et al.). However, research supports that horses are more likely to recover with stem cell therapy than with surgery alone. Studies discussed above demonstrate that stem cell therapy cuts healing time in half. It is also recommended because it is proven less invasive. Not only that, but it heals with regular tissue rather than scar tissue (Black et al.). Regardless of the initial positive outcomes from stem cell therapy in horses, it continues to be researched and improved upon. Treatments are available through clinical trials and some veterinary hospitals including the University of Florida (Mayo Clinic Staff).

Stem cell therapy has proven fruitful in horses. Mesenchymal stem cell therapy showed success in multiple ways: cartilage resurfacing, supplemental to surgery, digital tendon injury, as well as being injected in joint spaces for improved mobility and range of motion. Peripheral blood stem cells showed positive results in improving wound healing. Case studies and clinical trials are helping heal horses. Scientists will continue to evolve stem cell therapy. With these early results from horses, researchers will continue to grow these methods and apply them to humans and likely other animals.

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