Regenerative Medicine, Part 1

By Ruth-Anne Richter, BSc (Hon), DVM, MS

Over the past few years, we have been fortunate to witness the development of a new phase in therapeutics for equine orthopedic disorders. Termed Regenerative Medicine, this aspect of equine orthopedics and sports medicine incorporates the use of autogenous factors (from the horse's own tissue) for the treatment of soft tissue as well as joint injuries. These treatments include the use of Platelet-Rich Plasma (PRP), Inerlueukin-1 Receptor Antagonist Protein (IRAP) also called Autologous Conditioned Serum (ACS), and stem cells.

Stem cells can be harvested from bone marrow as well as adipose tissue (fat). The adipose-derived stem cells are harvested from adipose tissue collected from the horse, usually the tail head area, and are processed over a 24-hour period for subsequent injection. While bone marrow-derived stem cells possess growth factors as well as mesenchymal stem cells, adipose-derived stem cells may be more convenient because bone marrow stem cells may take weeks to be cultured. The collection site is left with a small incisional scar, but recently the development of a liposuction technique minimizes this blemish. The procedure is a 3-day process. On the first day, adipose tissue is collected through an incision just to the side of the tail head. It is useful to ultrasound the area to determine the depth of the fat to be collected. The horse is sedated and an inverted 'U' block is done to desensitize the area. After sterile preparation of the site, a small incision is made and adipose tissue is collected. A minimum of 30 grams of fat is required, but it is often prudent to collect as much fat as possible to be sure that there are additional samples retained for future use. The tissue is then sent overnight to the lab where it is processed and returned to arrive on the third day. The stem cells arrive in the quanitity determined by the size of the lesion and the number of sites that require injection. The cells are then injected into the affected

tendon or ligament using sterile technique with ultrasound guidance. Cells can also be injected into joints in certain cases.

The impression has been that horses treated with one of the regenerative techniques may show earlier filling in of the tendon or ligament defect on the ultrasound than those that are treated conservatively. This may imply that the structure has healed sooner, but in reality the tissue that is present when the horse is examined with the ultrasound is still quite immature and the appropriate period of rest still applies. Regenerative treatments may not shorten the rehabilitation period, but it is the quality of the repair that is the benefit to using one of these treatments. With conservative treatment (rest) alone, there is more potential for the tendon or ligament to heal with some fibrous (scar) tissue. The fibrous tissue is less than ideal for the optimal function of the tendon/ligament as it does not possess the elastic properties that normal collagen fibers do and is more prone to re-injury.
Regenerative techniques show a lot of promise and horses that have had tendons/ligaments and joints treated thus far at Brandon Equine Medical Center have had favorable outcomes.

Contact Brandon Equine Medical Center at 813-643-7177 or email info@brandonequine.com with any questions regarding this topic.

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