

Stem cell therapy for tendon and ligament injuries –

Clinical results

R.K.W. Smith

“there is a ‘window of opportunity’ for treatment –
after the inflammatory
phase has subsided and a granulation bed had formed
to support the implanted cells but before substantial
fibrosis occurs.”

“In summary, experimental studies and
a controlled trial are planned to give proof of efficacy,
but the technique so far appears encouraging.”

Equine Vet J. 2007 Mar;39(2):172-80.

Mesenchymal stem cell therapy in equine musculoskeletal disease: scientific fact or clinical fiction?

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- The goal in the therapeutic use of mesenchymal stem cells (MSCs) in musculoskeletal disease is to harness the regenerative nature of these cells focussing on their potential to grow new tissues and organs to replace damaged or diseased tissue. Laboratory isolation of MSCs is now well established and has recently been demonstrated for equine MSCs.

Effect of adipose-derived nucleated cell fractions on tendon repair in horses with collagenase-induced tendinitis

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Conclusions and Clinical Relevance—ADNC injection improved tendon organization in treated tendons. Although biochemical and molecular differences were less profound, tendons appeared architecturally improved after ADNC injection, which was corroborated by improved tendon COMP expression. Use of ADNC in horses with tendinitis appears warranted.

J Hand Surg Am. 2007 May-Jun;32(5):597-605.

A comparison of tenocytes and mesenchymal stem cells for use in flexor tendon tissue engineering.

[Kryger GS](#), [Chong AK](#), [Costa M](#), [Pham H](#), [Bates SJ](#), [Chang J](#).

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- **CONCLUSIONS:** This study suggests that the four cell types may be successfully used to engineer tendons. Adipoderived mesenchymal stem cells proliferate faster in cell culture, but the cell types were similar in other respects. All could be used to successfully repopulate acellularized tendon in vivo as flexor tendon grafts

COMPARISON OF TREATMENTS WITH AUTOLOG; CULTURED STEM CELLS FROM ADIPOSE TISSUE OR BONE MARROW

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Both treatments have advantages and disadvantages. The advantage of stem cells from the bone marrow is the first injection of native bone marrow. This native bone marrow includes a few stem cells and growth factors. Both are positive for the regeneration of the suspensory ligament. The disadvantage of this method is it is difficultly and risk of puncture the sternum collecting the bone marrow.

The advantage of the stem cells from the adipose tissue is the easier collection of the sample and the culturing of more stem cells of better quality. But you cannot inject the adipose tissue in the lesion so you lose time and you can not use the advantage of the growth factors of the bone marrow.

Adipose-Derived Stem Cells for Regenerative Medicine

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ISSN: 0009-7330.

Abstract—The emerging field of regenerative medicine will require a reliable source of stem cells in addition to biomaterial scaffolds and cytokine growth factors. Adipose tissue represents an abundant and accessible source of adult stem cells with the ability to differentiate along multiple lineage pathways.

Curr Stem Cell Res Ther. 2010 Jun;5(2):161-7.

Tendon regeneration and repair with adipose derived stem cells.

[Uysal AC](#), [Mizuno H](#).

The enhancing effect of ASCs on tendon repair and tendon defects might enable better clinical outcomes in musculoskeletal system reconstruction. Advances in biomaterial technology will improve the methodology in tendon regeneration however, up to date, ASCs present an ideal cell source for experimental and clinical research on tendon engineering.

Equine adipose-tissue derived mesenchymal stem cells and platelet concentrates: their association in vitro and in vivo.

[Del Bue M](#), [Riccò S](#), [Ramoni R](#), [Conti V](#), [Gnudi G](#), [Grolli S](#).

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- Expanded AdMSC were inoculated into the damaged tendon after their dispersion in activated platelet-rich plasma (PRP), a biological scaffold that plays an important role in maintaining cells in defect sites and contributes to tissue healing. Fourteen out of sixteen treated horses showed a functional recovery and were able to return to their normal activity.

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ADNC injection improved tendon organization in treated tendons. Although biochemical and molecular differences were less profound, tendons appeared architecturally improved after ADNC injection, which was corroborated by improved tendon COMP expression. Use of ADNC in horses with tendinitis appears warranted

Adipose-derived adult stem cells for cartilage tissue engineering

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Overall, ADAS cells show significant promise for the development of functional tissue replacements for various tissues of the musculoskeletal system.

Effect of Intraarticular Injection of Autologous Adipose-Derived Mesenchymal Stem and Regenerative Cells on Clinical Signs of Chronic Osteoarthritis of the Elbow Joint in Dogs*

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Sarit Dhupa, BVSc, DACVScd

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Fourteen dogs were recruited. Veterinarians assessed each dog for lameness, pain on manipulation, range of motion, and functional disability using a numeric rating scale at baseline and specified intervals up to 180 days after treatment. Statistically significant improvement in outcome measures was demonstrated.