A RETROSPECTIVE STUDY OF 66 CASES OF TENDON INJURY IN THE EQUINE TREATED WITH ADIPOSE-DERIVED STEM AND REGENERATIVE CELL THERAPY

INTRODUCTION: Based on the therapeutic success of adipose-derived regenerative cell therapy in human medicine, there is considerable interest in recent years in the therapeutic use of regenerative cells for treatment of equine tendon injuries. A placebo-controlled, blinded study utilizing a collagenase-induced tendonitis model in horses demonstrated a statistically significant improvement in composite healing scores (<.05) and a statistically significant increase in cartilage oligomeric matrix protein (COMP, p<.05), both indicators of improved tendon healing, in horses treated with adipose-derived stem and regenerative cells compared to controls .[1] Since 2003, veterinarians have used adipose-derived regenerative cells (VetStem Biopharma, Inc) to treat equine orthopedic injuries. This retrospective study reviews equine superficial or deep digital flexor tendonitis in 66 cases treated with adipose-derived regenerative cells at a diverse group of equine practices in the United States during the period 2004-2005.

MATERIALS AND METHODS: All horses from the participating clinics that were treated for flexor tendonitis with autologous adipose-derived stem and regenerative cells were considered for analysis. Inclusion criteria included: (1) Complete and available medical records (reviewed by attending veterinarian or by a VetStem technical service veterinarian); (2) Follow-up owner survey for return-to-performance data (prior level, lower level, or unresponsive); (3) No other major confounding concurrent disease; (4) Performance discipline was not racing; (5) Greater than one year from treatment. The horses involved in this study were all treated intralesionally with adipose-derived stem and regenerative cells. The laboratory (VetStem Biopharma, Inc Poway, CA) isolated the cells from a sample of the horse's own adipose tissue using a combination of enzymatic digestion, washing, and centrifugation.[2] Injuries were categorized by location (superficial or deep digital flexor and front or rear), severity (mild, moderate or severe), and chronicity (acute or chronic).

RESULTS: The following table presents the return-to-work numbers and (percentage):

Location	Full Work-Prior Level	Full Work-Lower Level	Unresponsive	Totals
SDF – Fore	38 (81%)	6 (13%)	3 (6%)	47
DDF – Fore	7 (70%)	2 (20%)	1 (10%)	10
SDF – Rear	4 (80%)	1 (20%)	0 (0%)	5
DDF – Rear	2 (50%)	2 (50%)	0 (0%)	4
TOTALS	51 (77%)	11 (17%)	4 (6%)	66

Eighty-four percent (84%) (21/25) of horses with chronic injuries (those greater than three months in duration) and 73% (30/41) of horses with acute injuries returned to full work at their prior level of performance. The majority of the injuries (82%) resided in zones 2 or 3 of the tendon which corresponds to published data on location frequency for injuries in tendons. Lesion severity was based on a cross-sectional area (CSA) scale of tendon involved in the injury corresponding to: Mild = 0-25% CSA (18% of cases), moderate = 26%-50% CSA (51% of cases), and severe > 50% CSA (31% of cases). Seventy five percent (75%) of horses with mild tendon lesion severity, 83% of horses with moderate tendon lesion severity, and 79% of horses with severe tendon lesion severity returned to full work at their prior performance level.

DISCUSSION/CONCLUSIONS: This retrospective study focused on clinical cases of tendonitis treated across a number of progressive practices during a 2-year time interval to evaluate the efficacy of treating equine tendonitis with autologous adipose-derived stem and regenerative cells. Equine athletes treated with these regenerative cells had a 77% return to prior level of performance and 94% were sound one year or more after treatment. In contrast, only 40-60%[3,4] of horses with tendonitis treated with traditional therapies were determined sound one year after treatment. Although more controlled studies are needed to further support the efficacy of adipose-derived stem and regenerative cell therapy in equine tendonitis, this retrospective study suggests that adipose-derived stem and regenerative cell therapy is efficacious in facilitating horses returning to their prior level of performance with duration of effect of at least one year.

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