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, <.05), both indicators of improved tendon healing, in horses treated with adipose-derived stem and regenerative cells compared to controls. Since 2003, veterinarians have used adipose-derived regenerative cells (Vet-Stem, 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 Vet-Stem 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 (Vet-Stem, 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. 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):

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

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 involvement 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% 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.

REFERENCES:

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