Platelet-rich Plasma as an Effective Treatment for Proximal Hamstring Injuries

Robert J. Wetzel, MD
Ronak M. Patel, MD
Michael A. Terry, MD

ISAKOS Congress – Toronto, Canada
May 13th 2013
Disclosures

• Dr. Wetzel has no financial disclosures
• Dr. Patel has no financial disclosures
• Dr. Terry is a consultant for Smith & Nephew; fellowship support provided by Mitek
Background

• Proximal hamstring injuries are common in endurance sports and can be disabling when recalcitrant to conservative treatment\textsuperscript{1-4}

• Traditional conservative treatments (TCT) such as physical therapy, NSAIDs, and corticosteroid injections have all inconsistently reported successful outcomes\textsuperscript{3, 7-9}

• Platelet-rich plasma (PRP) has been reported as safe and effective in pathologies such as lateral epicondylitis

• We present the results of PRP injection into the proximal hamstrings muscle origin as a novel treatment
Methods

• Retrospective chart review of 17 hamstring injuries (15 pts)

• Inclusion criteria: diagnosis of tendinopathy, strain, or partial hamstring tear made by a Sports Medicine fellowship trained Surgeon confirmed by MRI

• Exclusion criteria: complete tears were excluded

• 12 injuries failed TCT and had persistent pain or incomplete return to pre-injury function and received a PRP injection at the proximal hamstring origin

• 5 injuries were successfully treated with TCT
Methods

- Pre- and post-treatment Visual Analog Scale (VAS) scores were compared.
- Functional outcomes were analyzed using the Nirschl Phase Rating Scale (NPRS)\(^3,13\).
- Return to sport was assessed.

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**Nirschl Phase Rating Scale**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Level of Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mild stiffness or soreness after activity with resolution of symptoms within 24 hours.</td>
</tr>
<tr>
<td>2</td>
<td>Mild stiffness or soreness prior to activity that is relieved by warm-up; symptoms are not present during activity but return afterward and resolve within 48 hours.</td>
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<tr>
<td>3</td>
<td>Pain that is present during activity without causing activity modification.</td>
</tr>
<tr>
<td>4</td>
<td>Pain with activity that causes modification.</td>
</tr>
<tr>
<td>5</td>
<td>Pain that is present during all activities and occurs with activities of daily living.</td>
</tr>
<tr>
<td>6</td>
<td>Intermittent rest pain that does not disturb sleep.</td>
</tr>
<tr>
<td>7</td>
<td>Constant rest pain that disturbs sleep.</td>
</tr>
</tbody>
</table>

*Adapted from Caccio et al\(^3\) and Nirschl and Ashman.\(^13\)*
Methods

- PRP Group – 8 F, 2 M, 9/10 competitive athletes
- TCT Group – 4 F, 1 M, 2/5 competitive athletes

- PRP group received one 6cc injection of PRP into the hamstrings origin near ischial tuberosity

- Activities were limited; hip flexion restricted to 30 degrees for 3 weeks

- Mean follow-up:
  - 4.5 months in the PRP Group
  - 2 months in the TCT Group
## Results

A P-value < 0.05 indicated statistical significance

All athletes return to pre-injury level of sport

<table>
<thead>
<tr>
<th></th>
<th>Age (yrs)</th>
<th>Pre-VAS</th>
<th>Post-VAS</th>
<th>P value</th>
<th>Pre-NPRS</th>
<th>Post-NPRS</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCT Group</td>
<td>42.8</td>
<td>8.2</td>
<td>0.7</td>
<td>p=0.06</td>
<td>5.5</td>
<td>1.5</td>
<td>p=0.06</td>
</tr>
<tr>
<td>PRP Group</td>
<td>37.1</td>
<td>7.4</td>
<td>1.2</td>
<td>p&lt;0.01</td>
<td>4.4</td>
<td>2</td>
<td>p&lt;0.01</td>
</tr>
</tbody>
</table>
Conclusions

• Treatment of proximal hamstring injuries can be challenging especially in cases refractory to TCT

• Corticosteroids have been shown to provide pain relief but can be complicated by complete tendon rupture\(^4,7,15\)

• Operative interventions including debridement, tenotomy, and open repair considered last resort and include inherent risks of surgery and anesthesia.
  – Good to excellent results in 88% of patients\(^4\)
Conclusions

• PRP has been shown to be safe but its efficacy has not yet been confirmed by long term outcome studies.

• Given minimal reported complications, PRP has been advocated for use in promoting tissue healing:\textsuperscript{12}
  – Rotator cuff repair
  – Anterior cruciate ligament reconstruction
  – Achilles’ tendon repair
  – Lateral epicondylitis of the elbow
  – Patellar tendonitis
  – Plantar fasciitis
  – Osteoarthritis of the knee
  – Subacromial decompression of the shoulder

• No study has confirmed a specific indication.
Conclusions

• Our study demonstrates efficacy of PRP in a small retrospective cases series

• Our data show significantly improved VAS and NRPS scores with PRP injection

• We describe an additional use of PRP in a growing number of small case series

• Limitations include retrospective nature, selection bias, no true control group, and low power due to small cohort
References


References


