The STAMP Test: A Novel Clinical Test in Diagnosing Achilles Tendon Ruptures

Jonathan Kaplan, MD\textsuperscript{1}
William Lundergan, MD\textsuperscript{1}
Timothy Charlton, MD\textsuperscript{2}

\textsuperscript{1}University of Southern California. Department of Orthopaedic Surgery. Los Angeles, California
\textsuperscript{2}Cedars-Sinai Medical Center. Department of Orthopaedic Surgery. Los Angeles, California
The STAMP Test:
A Novel Clinical Test in Diagnosing Achilles Tendon Ruptures

Jonathan Kaplan, MD
William Lundergan, MD
Timothy Charlton, MD

Our disclosure is in the Final AOFAS Mobile App.

We have no potential conflicts with this presentation.
STAMP
Stand And Maintain Plantarflexion

Double Leg Heel Rise

Lift Uninjured Side

Maintain 5 Seconds
TAR
Tendo-Achilles Rise

Wall Assist

Single Leg Heel Rise

Maintain 5 Seconds
Methods

- Prospectively collected data over 8 year period

- Inclusion criteria:
  - Mid-substance
  - Confirmed on MRI or surgery
  - Complete charting

- Exclusion criteria:
  - Bilateral
  - Prior ipsilateral Achilles tendon surgery
  - Posterior tibial tendon insufficiency
  - Incomplete charting

Data Collected

- Mechanism
- Laterality
- Ability to ambulate
- Resting tension
- Thompson test
- STAMP
- TAR
- Time to evaluation
  - Acute <4 weeks
  - Chronic >4 weeks
Total Ruptures  
\[ n = 50 \]

- Acute  
  \[ n = 35 \]
  - Excluded  
    \[ n = 3 \]
    Insufficient Charting
  - Included  
    \[ n = 32 \]
    \( \rightarrow \) 32 surgical

- Chronic  
  \[ n = 15 \]
  - Excluded  
    \[ n = 1 \]
    Insufficient Charting
  - Included  
    \[ n = 14 \]
    \( \rightarrow \) 13 surgical, 1 nonop (MRI)

*No bilateral ruptures, PTTI, or prior surgery

Statistics:
- Two-tailed Fisher exact test
- A priori power analysis: 22 patients total
<table>
<thead>
<tr>
<th></th>
<th>Acute</th>
<th>Chronic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>32</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Males : Females</td>
<td>29 : 3</td>
<td>12:2</td>
<td>p = 0.63</td>
</tr>
<tr>
<td>Mechanism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>28 (88%)</td>
<td>6 (43%)</td>
<td>p = 0.001</td>
</tr>
<tr>
<td>Low Energy (ie: fall)</td>
<td>3 (10%)</td>
<td>8 (57%)</td>
<td></td>
</tr>
<tr>
<td>High Energy (ie: mva)</td>
<td>1 (1%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Laterality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left : Right</td>
<td>15 : 17</td>
<td>8 : 6</td>
<td>p = 0.75</td>
</tr>
</tbody>
</table>
## Acute Ruptures

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
<th>Sensitivity</th>
<th>Power Compared to STAMP/TAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased Resting Tension</td>
<td>32</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Inability to Ambulate</td>
<td>16</td>
<td>16</td>
<td>50%</td>
</tr>
<tr>
<td>Thompson Test</td>
<td>26</td>
<td>6</td>
<td>81%</td>
</tr>
<tr>
<td>STAMP</td>
<td>32</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>TAR</td>
<td>32</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>
# Chronic Ruptures

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Negative</th>
<th>Sensitivity</th>
<th>Power Compared to STAMP/TAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased Resting Tension</td>
<td>10</td>
<td>4</td>
<td>71%</td>
<td>P = 0.1</td>
</tr>
<tr>
<td>Inability to Ambulate</td>
<td>4</td>
<td>10</td>
<td>29%</td>
<td>P = 0.0002</td>
</tr>
<tr>
<td>Thompson Test</td>
<td>7</td>
<td>7</td>
<td>50%</td>
<td>P = 0.006</td>
</tr>
<tr>
<td>STAMP</td>
<td>32</td>
<td>0</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>TAR</td>
<td>32</td>
<td>0</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
Thompson Test

- Maffulli: 93% sensitivity in acute ruptures

- Barnes & Hardy: 23% sensitivity in chronic ruptures

- Villarreal: 96% of orthopaedic surgeons use Thompson test for chronic ruptures

Conclusion

- Statistically significant increased sensitivity of STAMP & TAR compared to Thompson test and ability to ambulate in acute and chronic Achilles tendon ruptures

- Easy exams for PCP or ED doctor

- Caution exercised with other causes of weak heel rise
References