ACHILLES TENDON TEARS
AND THE QUICKEST RETURN
TO SPORTS

Fernando A. Peña, MD
Assistant Professor
Dept. of Orthopaedic Surgery
University of Minnesota
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• No conflict of interest

• No disclosures to reveal

• No mention of off-label use of devices
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Treatment options:

• Surgical repair: open, percutaneous, minimally invasive.

• Conservative treatment
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What is the goal?

• Return to sports as quickly as possible

• AND... with as few complications as possible
  - Re-ruptures
  - Residual pain
  - Weakness
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Two main variables are:

• Type of treatment: Surgical vs. non-surgical

• Type of rehabilitation after either treatment
  – Immobilization vs. functional rehabilitation
Deficits in Heel-Rise Height and Achilles Tendon Elongation Occur in Patients Recovering From an Achilles Tendon Rupture

Karin Grävare Silbernagel, PT, ATC, PhD, Robert Steele, MD, FRCS, and Kurt Manal, PhD
Investigation performed at University of Delaware, Newark, Delaware

Main functional goal: Achilles final length
8 Achilles tendon ruptures 10 controls
Achilles tendon length measured by US
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Main functional goal: Achilles final length

- How much extra length is well tolerated?
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Predictive factors:

Predictors of Clinical Outcome After Acute Achilles Tendon Ruptures

Nicklas Olsson,*+ MD, PhD, Max Petzold,** MD, Phd, Annelie Brorsson,** PT, Jón Karlsson,** MD, PhD, Bengt I. Eriksson,** MD, PhD, and Karin Grävare Silbernagel,§ PT, PhD

Investigation performed at the Institute of Clinical Sciences at Sahlgrenska Academy, Sahlgrenska University Hospital, University of Gothenburg, Mööndal, Sweden

N=93  Mean age= 39.7yo  BMI=26
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Predictors of Clinical Outcome After Acute Achilles Tendon Ruptures

Nicklas Olsson,† MD, PhD, Max Petzold,‡ PhD, Annelie Brorsson,‡ PT, Jón Karlsson,‡ MD, PhD, Bengt I. Eriksson,‡ MD, PhD, and Karin Grävare Silen,§ PT, PhD

Investigation performed at the Institute of Clinical Sciences at Sahlgrenska Academy, Sahlgrenska University Hospital, University of Gothenburg, Mölndal, Sweden

Age= Decreased functional results
BMI= Greater degree of symptoms
Increased level of activ.= More symptoms at 12m
Pain= No correlation with function
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When will I return to sports, doc?

Recurrence of Achilles tendon injuries in elite male football players is more common after early return to play: an 11-year follow-up of the UEFA Champions League injury study

Mariann Gajhede-Knudsen, Jan Ekstrand, Henrik Magnusson, Nicola Maffulli

• More than one million hours of exposure
• 8029 injuries. 2.5% were Achilles related - 4% were ruptures (8 out of 203)
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Recurrence of Achilles tendon injuries in elite male football players is more common after early return to play: an 11-year follow-up of the UEFA Champions League injury study

Mariann Gajhede-Knudsen,1,2 Jan Ekstrand,1,2,3 Henrik Magnusson,2,4 Nicola Maffulli5,6

Return to play= 169 days
Rugby= 185   Turkish football league= 180
Symptoms prior to rupture= None
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When will I return to sports, doc?

N=9    7 back to NFL    Average= 273 days

One athlete back at 166 days
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Surgical vs. Non-surgical

N = 816  Mean age: 39.8 years
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• Same calf girth, ROM, strength, and functional outcomes.
• Risk difference for re-rupture: 5.5
  – Drops to 1.7 if functional rehabilitation
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Surgical vs. Non-surgical

Rerupture Rate after Early Weightbearing in Operative Versus Conservative Treatment of Achilles Tendon Ruptures: A Meta-analysis

Dorien M. van der Eng, MD¹, Tim Schepers, MD, PhD², J. Carel Goslings, MD, PhD², Niels W.L. Schep, MD, PhD, MSc²

¹Department of Surgery, Academic Medical Centre, Amsterdam, The Netherlands
²Trauma Unit, Department of Surgery, Academic Medical Centre, Amsterdam, The Netherlands

N=576 No mention of demographics
No difference on strength between groups
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1 Department of Surgery, Academic Medical Centre, Amsterdam, The Netherlands
2 Trauma Unit, Department of Surgery, Academic Medical Centre, Amsterdam, The Netherlands

Re-rupture rate: 5% vs. 11%
Complications: Minor 11% vs. 5%
Major 17% vs. 8%
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Immobilization vs. functional rehabilitation

- Meta-analysis of 12 studies
- Look at WB vs. NWB
- Look at immobilization vs. early ROM
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Immobilization vs. functional rehabilitation

- Immobilization (27)
  - 0-2 wks: BKA (below knee amputation), NWB
  - 2 wks: full weight bearing (FWB)

- Combined functional treatment (28)
  - 0-6 wks: BKA (below knee amputation), FWB
  - 3-6 wks: full plantar flexion

- Combined functional treatment (29)
  - 0-2 wks: BKA (below knee amputation), FWB
  - 2-6 wks: full plantar flexion

- Combined functional treatment (12)
  - 1-2 wks: orthosis (15° > 1 heel wedge), FWB
  - 3-6 wks: orthosis (15° > 1 heel wedge), FWB

- Combined functional treatment (11)
  - 0-3 wks: orthosis (15° > 1 heel wedge), FWB
  - 3-6 wks: orthosis (15° > 1 heel wedge), FWB
# Achilles Tendon Tears

## Immobilization vs. Functional Rehabilitation

<table>
<thead>
<tr>
<th>Study/Method</th>
<th>Partial Weight Bearing</th>
<th>Full Weight Bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knapjan et al. [29]</td>
<td>Early mobilization (25)</td>
<td>Non weight bearing (23)</td>
</tr>
<tr>
<td>Kang et al. [21]</td>
<td>Early mobilization (19)</td>
<td>Non weight bearing (23)</td>
</tr>
<tr>
<td>Watanen et al. [27]</td>
<td>Early mobilization (19)</td>
<td>Non weight bearing (23)</td>
</tr>
<tr>
<td>Morsen et al. [24]</td>
<td>Early mobilization (19)</td>
<td>Non weight bearing (23)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 wk</td>
<td>BCC (planter flexion), NWB</td>
</tr>
<tr>
<td>2-6 wk</td>
<td>BCC (C), NWB</td>
</tr>
<tr>
<td>6-12 wk</td>
<td>NWB</td>
</tr>
</tbody>
</table>

*Note: BCC = Below the Knee Cast, NWB = Non Weight Bearing.*
# Achilles Tendon Tears

## Immobilization vs. Functional Rehabilitation

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<tr>
<th>Study</th>
<th>Treatment</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suchak et al. [11]</td>
<td>Full weight bearing (54)</td>
<td>0–2 w: EKC, NWB. 3–6 w: orthosis (20° to 0° in 3 w). PWB</td>
</tr>
<tr>
<td>Non weight bearing (55)</td>
<td>0–2 w: EKC, NWB</td>
<td></td>
</tr>
<tr>
<td>Costa et al. [13]</td>
<td>Full weight bearing (23)</td>
<td>0–8 w: orthosis (3 &gt; 2 &gt; 1 &gt; 0). Heel wedges (2 w), PWB</td>
</tr>
<tr>
<td>Non weight bearing (25)</td>
<td>0–8 w: EKC natural equinus to 0° in 2 w intervals. NWB</td>
<td></td>
</tr>
<tr>
<td>Costa et al. [14]</td>
<td>Full weight bearing (28)</td>
<td>0–8 w: orthosis (3 &gt; 2 &gt; 1 &gt; 0). Heel wedges (2 w), PWB</td>
</tr>
<tr>
<td>Non weight bearing (11)</td>
<td>0–8 w: EKC natural equinus to 0° in 2 w intervals. NWB</td>
<td></td>
</tr>
<tr>
<td>Moffelli et al. [10]</td>
<td>Full weight bearing (28)</td>
<td>0–2 w: EKC (natural equinus). PWB</td>
</tr>
</tbody>
</table>
# Achilles Tendon Tears

**Immobilization vs. functional rehabilitation**

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Accelerated rehabilitation following Achilles tendon repair after acute rupture – Development of an evidence-based treatment protocol

Mareen Brumann, Sebastian F. Baumbach, Wolf Mutschler, Hans Polzer

Munich University Hospital, Department of Trauma Surgery, Ludwig-Maximilian-University. Nussbaumstr. 20, 80337 Munich.

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## Evidence-based rehabilitation protocol after Achilles tendon repair

<table>
<thead>
<tr>
<th></th>
<th>Week 0 - 2</th>
<th>Week 3 - 6</th>
<th>Week 7 -</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROM</strong></td>
<td>None</td>
<td>0° / 0° / 30° DF / PF</td>
<td>Free</td>
</tr>
<tr>
<td><strong>Orthesis</strong></td>
<td>Fixed PF at 30°</td>
<td>30° PF to 0°</td>
<td>None</td>
</tr>
<tr>
<td><strong>Weight bearing</strong></td>
<td>Full weight bearing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fig. 2.** Evidence-based accelerated rehabilitation protocol following operative repair of acute Achilles tendon ruptures: **DF**: dorsiflexion, **PF**: plantar flexion, **ROM**: range of motion.
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• Presenter’s method:
  – Present both options to the patient
    • Important to remember that both options have the same length of recovery
  – Who chooses surgical?
    • Young, athletic, weekend warriors
  – Non-surgical option provides good results if expectations are adjusted.
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• Conservative treatment option.
  – Placed in a short leg cast in plantarflexion
  – Advance the dorsiflexion every 2 weeks with the goal of reaching neutral by the 6 week appointment
  – 6-12 weeks: PT to match dorsiflexion of the opposite side and isometric strengthening
  – After 12 weeks: no restrictions
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• Surgical treatment option.
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ACHILLES TENDON TEARS

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• Surgical treatment option.
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Advantages of the surgical treatment:

• Full re-approximation of the tendon
• Decrease the chances for excessive elongation
• Decrease the amount of interposed scar tissue
• SHORTER healed Achilles tendon
THANK YOU

pena0013@umn.edu