The Immediate Effects of the Posterolateral Fibular Glide Mobilization with Movement Following a Lateral Ankle Sprain

Jessica Nash DAT, LAT, ATC
Kevin M. Schroeder DAT, ATC
Disclosures

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• The author(s) have no conflicts of interest or financial connection to any of the techniques discussed herein.
Outline

• Introduction & Background
• Mulligan Concept
  – Positional Fault Theory
  – Mobilization with Movement
  – Guiding Principles
  – Posterolateral Fibular Glide
  – Fibular Repositioning Tape

• Case Series
  – Patients/Researchers
  – Outcome Measures
  – Intervention
  – Results

• Conclusion
• Prevalence of Ankle Sprains  
  – Doherty et al 2014

• Treatment of Ankle Sprains  
  – Kaminski et al 2013
The Mulligan Concept (MC)

• Theory
  – Positional Fault
    • Hubbard, Hertel, & Sherbondy (2006)
    • Hubbard & Hertel (2008)

Original article

Anterior positional fault of the fibula after sub-acute lateral ankle sprains

Tricia J. Hubbard\textsuperscript{a,}\textsuperscript{*}, Jay Hertel\textsuperscript{b}

\textsuperscript{a}Department of Kinesiology, University of North Carolina, 9201 University City Blvd., Charlotte, NC 28223, USA
\textsuperscript{b}Kinesiology Program, University of Virginia, Charlottesville, VA 22904, USA
Mobilizations with Movement (MWM)

Sustained passive accessory force/glide to resolves the patient’s pain as they actively move the body part through the previously painful movement

Mulligan 1993, 2010
Guiding Principles

**PILL**
- Pain-free
- Immediate
- Long
- Lasting

**CROCKS**
- Contraindications
- Repetitions
- Over-Pressure*
- Communication
- Knowledge
- Sustained

*Hing et al 2015, Mulligan 1993, 2010
Posterolateral Fibular Glide (PLFG)

• **Position:**
  - Patient: Supine or long seated with foot and ankle off the table
  - Clinician: at the foot end of the patient
    - Medial hand: stabilize
    - Lateral hand: using the thenar eminence, glide the distal end of the fibula obliquely (posterior, lateral, proximal)

• **MWM**
  - Patient actively inverts while in plantar flexion*
  - Clinician sustains the glide

Mulligan 1993, 2010; Hing et al 2015
Fibular Repositioning Tape (FRT)

- Positions: same as treatment
- Tape applied obliquely
  - Start anterior distal fibula
  - Spiral posteriorly and cranially around the lower leg

Mulligan 1993, 2010; Hing et al 2015
Original article

A study of the effects of Mulligan’s mobilization with movement treatment of lateral ankle pain using a case study design

T. O’Brien, B. Vicenzino

Department of Physiotherapy, University of Queensland, Brisbane, Australia
The Role of Fibular Tape in the Prevention of Ankle Injury in Basketball: A Pilot Study

Kym Moiler, BSc¹
Toby Hall, MSc, Postgrad Dip Manip Ther²
Kim Robinson, BSc, Grad Dip Manip Ther²
CASE REPORT

A MODIFIED MOBILIZATION-WITH-MOVEMENT TO TREAT A LATERAL ANKLE SPRAIN

Heather Mau, MS, ATC¹
Russell T. Baker, DAT, ATC²
Case Series

Purpose:
To examine the immediate effect of the Mulligan Concept posterolateral fibular glide MWM on pain and function in patients who met the criteria for a Grade I lateral ankle sprain.
Methods

• Patients
  – Assessed with Grade I lateral ankle sprain
  – All athletically active
  – Sustained injury during participation

• Clinicians
  – Completion of multiple Mulligan Concept courses

Doctor of Athletic Training Program
Outcome Measures

- Numeric Pain Rating Scale (NPRS)
- Range of Motion (ROM)
- Y-Balance Test (YBT)
- Global Rating of Chance (GRoC)*

*only administered 24-hours post-intervention
• Assessment
• Intervention:
  – Mulligan Concept PLFG MWM
  – Fibular Repositioning Tape
• 24-hour follow-up
Results

• N=10 (8 male, 2 female)
• Participated within 2.5±2.1 days of the inciting injury
  – No physical activity for 24-hr
Results

• MCIDs:
  – YBT: 3.5%  (Chimera 2015)
  – ROM: ankle DF 3.7-3.8 degrees  (Konor 2012)
  – GROC: 1.3-2.7  (Kamper 2009)
  – NPRS: 2  (Farrar 2001)
<table>
<thead>
<tr>
<th>Time</th>
<th>Best Pain</th>
<th>Worst Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>2.6±1.6</td>
<td>7.1±1.7</td>
</tr>
<tr>
<td>Post-Test (24 hr.)</td>
<td>0.8±1.2</td>
<td>4.7±2.4</td>
</tr>
</tbody>
</table>
# Numeric Pain Rating Scale

<table>
<thead>
<tr>
<th>WORST</th>
<th>Change in NPRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>24-Hr Post-Test</td>
</tr>
<tr>
<td></td>
<td>-2.4*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BEST</th>
<th>Change in NPRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>24-Hr Post-Test</td>
</tr>
<tr>
<td></td>
<td>-1.8</td>
</tr>
</tbody>
</table>
# Numeric Pain Rating Scale

<table>
<thead>
<tr>
<th>CURRENT</th>
<th>Change in NPRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>Immediate Post-Test</td>
</tr>
<tr>
<td>Pre-Test</td>
<td>24-Hr Post-Test</td>
</tr>
<tr>
<td>Immediate Post-Test</td>
<td>24-Hr Post-Test</td>
</tr>
</tbody>
</table>

*Denotes Clinically Significant Change
GRoC

• Global Rating of Change
  – 24-hr Post: 5.1±1.5

☐ A very great deal worse (-7) ☐ About the same (0) ☐ A very great deal better (7)
☐ A great deal worse (-6)
☐ Quite a bit worse (-5)
☐ Moderately worse (-4)
☐ Somewhat worse (-3)
☐ A little bit worse (-2)
☐ A tiny bit worse (-1)

☐ A great deal better (6)
☐ Quite a bit better (5)
☐ Moderately better (4)
☐ Somewhat better (3)
☐ A little bit better (2)
☐ A tiny bit better (1)
## Y-Balance Test

<table>
<thead>
<tr>
<th></th>
<th>Pre-</th>
<th>Post-</th>
<th>Difference in Means</th>
<th>% Change in Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ant-Injured</td>
<td>52.85±20.55</td>
<td>58.8±9.66</td>
<td>5.95</td>
<td>1.11</td>
</tr>
<tr>
<td>Ant-Uninjured</td>
<td>60.3±7.20</td>
<td>60.1±6.31</td>
<td>-0.2</td>
<td>1.00</td>
</tr>
<tr>
<td>PM-Injured</td>
<td>75.85±29.91</td>
<td>94.25±13.15</td>
<td>18.4</td>
<td>1.24</td>
</tr>
<tr>
<td>PM-Uninjured</td>
<td>89.85±11.49</td>
<td>92.55±13.94</td>
<td>2.7</td>
<td>1.03</td>
</tr>
<tr>
<td>PL-Injured</td>
<td>96.1±13.66</td>
<td>97.05±11.48</td>
<td>0.95</td>
<td>1.01</td>
</tr>
<tr>
<td>PL-Uninjured</td>
<td>97.7±11.75</td>
<td>99.75±15.1</td>
<td>2.05</td>
<td>1.02</td>
</tr>
</tbody>
</table>
Y-Balance Test

• Paired t-Test
  – \( \alpha = 0.05 \)

<table>
<thead>
<tr>
<th></th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ant-Injured</td>
<td>0.25</td>
</tr>
<tr>
<td>Ant-Uninjured</td>
<td>0.89</td>
</tr>
<tr>
<td>PM-Injured</td>
<td>0.08</td>
</tr>
<tr>
<td>PM-Uninjured</td>
<td>0.19</td>
</tr>
<tr>
<td>PL-Injured</td>
<td>0.71</td>
</tr>
<tr>
<td>PL-Uninjured</td>
<td>0.29</td>
</tr>
</tbody>
</table>

No statistically significant changes
# Active Range of Motion

<table>
<thead>
<tr>
<th></th>
<th>PRE-UINJ</th>
<th>PRE-INJ</th>
<th>POST-INJ</th>
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</thead>
<tbody>
<tr>
<td>DFCT</td>
<td>24.22±1.84</td>
<td>20.56±5.27</td>
<td>23.33±1.18</td>
</tr>
<tr>
<td>DF</td>
<td>28±9.78</td>
<td>25.3±10.53</td>
<td>25.1±8.4</td>
</tr>
<tr>
<td>PF</td>
<td>31.7±9.07</td>
<td>29.2±9.35</td>
<td>31.5±6.31</td>
</tr>
<tr>
<td>IN</td>
<td>24.6±7.21</td>
<td>28.5±13.95</td>
<td>32.4±8.41</td>
</tr>
<tr>
<td>EV</td>
<td>20±5.46</td>
<td>17.3±6.63</td>
<td>21.6±7.31</td>
</tr>
</tbody>
</table>
### Active Range of Motion

- **Paired t-Test**
  - $\alpha = 0.05$

<table>
<thead>
<tr>
<th></th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>2.77</td>
</tr>
<tr>
<td>PF</td>
<td>-0.2</td>
</tr>
<tr>
<td>IN</td>
<td>2.3</td>
</tr>
<tr>
<td>EV</td>
<td>4.3</td>
</tr>
</tbody>
</table>

No clinically significant change
Active Range of Motion

• Paired t-Test  
  – $\alpha = 0.05$

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DFCT</td>
<td>p</td>
<td>0.095452009</td>
</tr>
<tr>
<td>DF</td>
<td></td>
<td>0.961475518</td>
</tr>
<tr>
<td>PF</td>
<td></td>
<td>0.393992522</td>
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<tr>
<td>IN</td>
<td></td>
<td>0.179728916</td>
</tr>
<tr>
<td>EV</td>
<td></td>
<td>0.176643629</td>
</tr>
</tbody>
</table>

No statistically significant changes
Results

• Clinically significant change in pain
  – Worst pain (pre- to 24-hr post): 2.4
  – Current Pain:
    • Pre- to Immediate post: 2.3
    • Pre- to 24-hour post: 2.7
  – NPRS MCID: 2  Farrar 2001
Conclusion

- Positional fault presence
- Importance of pain as a limiting factor
- Need for higher quality studies
  - RCT
Questions?

Email: kmsatc@gmail.com

Email: jessica.nash@bmhs.org

Doctor of Athletic Training Program

University of Idaho
References

References <cont.>

References <cont.>

References <cont.>