

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

- The opinions, viewpoints and recommendations contained in this presentation represent those of the authors alone and do not represent the opinions, view points or recommendations of any organization in which the author(s) may be affiliated, including, without limitation, the USOC or CCOE.
- 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

Journal of Athletic Training 2013;48(4):528–545
 doi: 10.4085/1062-6050-48.4.02
 © by the National Athletic Trainers' Association, Inc
 www.natajournals.org

National Athletic Trainers' Association Position Statement: Conservative Management and Prevention of Ankle Sprains in Athletes

Thomas W. Kaminski, PhD, ATC, FNATA, FACSM*; Jay Hertel, PhD, ATC, FNATA, FACSM†; Ned Amendola, MD‡; Carrie L. Docherty, PhD, ATC, FNATA§; Michael G. Dolan, MA, ATC||; J. Ty Hopkins, PhD, ATC, FNATA¶; Eric Nussbaum, MEd, ATC#; Wendy Poppy, MS, PT, ATC§; Doug Richie, DPM**

*University of Delaware, Newark; †University of Virginia, Charlottesville; ‡University of Iowa, Iowa City; §Indiana University, Bloomington; ||Canisius College, Buffalo, NY; ¶Brigham Young University, Provo, UT; #Freehold (New Jersey) Regional High School District; **California School of Podiatric Medicine, Samuel Merritt University, Oakland



The Mulligan Concept (MC)

- Theory

- Positional Fault

- Hubbard, Hertel, & Sherbondy (2006)
 - Hubbard & Hertel (2008)

Manual Therapy 13 (2008) 63–67

Original article

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

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

^a*Department of Kinesiology, University of North Carolina, 9201 University City Blvd., Charlotte, NC 28223, USA*

^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



Manual Therapy (1998) **3**(2), 78–84
© 1998 Harcourt Brace & Co. Ltd

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



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)



Numeric Pain Rating Scale

	Best Pain	Worst Pain
Pre-Test	2.6±1.6	7.1±1.7
Post-Test (24 hr.)	0.8±1.2	4.7±2.4



Numeric Pain Rating Scale

WORST		Change in NPRS
Pre-Test	24-Hr Post-Test	-2.4*

BEST		Change in NPRS
Pre-Test	24-Hr Post-Test	-1.8



Numeric Pain Rating Scale

CURRENT		Change in NPRS
Pre-Test	Immediate Post-Test	-2.3*
Pre-Test	24-Hr Post-Test	-2.7*
Immediate Post-Test	24-Hr Post-Test	-0.4
*Denotes Clinically Significant Change		



GROC

- Global Rating of Change

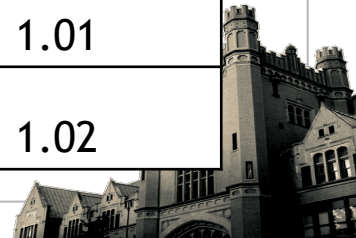
- 24-hr Post: **5.1±1.5**

- | | | |
|---|---|---|
| <input type="checkbox"/> A very great deal worse (-7) | <input type="checkbox"/> About the same (0) | <input type="checkbox"/> A very great deal better (7) |
| <input type="checkbox"/> A great deal worse (-6) | | <input type="checkbox"/> A great deal better (6) |
| <input type="checkbox"/> Quite a bit worse (-5) | | <input type="checkbox"/> Quite a bit better (5) |
| <input type="checkbox"/> Moderately worse (-4) | | <input type="checkbox"/> Moderately better (4) |
| <input type="checkbox"/> Somewhat worse (-3) | | <input type="checkbox"/> Somewhat better (3) |
| <input type="checkbox"/> A little bit worse (-2) | | <input type="checkbox"/> A little bit better (2) |
| <input type="checkbox"/> A tiny bit worse (-1) | | <input type="checkbox"/> A tiny bit better (1) |



Y-Balance Test

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



Y-Balance Test

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

No statistically significant
changes

	p =
Ant-Injured	0.25
Ant-Uninjured	0.89
PM-Injured	0.08
PM-Uninjured	0.19
PL-Injured	0.71
PL-Uninjured	0.29



Active Range of Motion

	PRE-UIIJ	PRE-INJ	POST-INJ
DFCT	24.22±1.84	20.56±5.27	23.33±1.18
DF	28±9.78	25.3±10.53	25.1±8.4
PF	31.7±9.07	29.2±9.35	31.5±6.31
IN	24.6±7.21	28.5±13.95	32.4±8.41
EV	20±5.46	17.3±6.63	21.6±7.31



Active Range of Motion

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

No clinically significant
change

	% Change
DF	2.77
PF	-0.2
IN	2.3
EV	4.3



Active Range of Motion

- Paired t-Test
– $\alpha = 0.05$

No statistically significant
changes

DFCT	$p = 0.095452009$
DF	0.961475518
PF	0.393992522
IN	0.179728916
EV	0.176643629



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



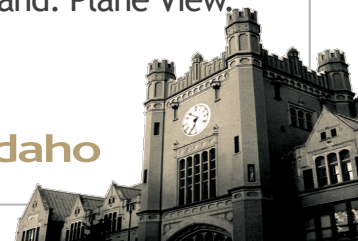
References

- Chimera, N. J., Smith, C. A., & Warren, M. (2015). Injury history, sex, and performance on the functional movement screen and y balance test. *Journal of Athletic Training*, 49(6), 150311075223009.
- Doherty, C., Delahunt, E., Caulfield, B., Hertel, J., Ryan, J., & Bleakley, C. M. (2014). The incidence and prevalence of ankle sprain injury: A systematic review and meta-analysis of prospective epidemiological studies. *Sports Medicine (Auckland, N.Z.)*, 44(1), 123-40.
- Elveru, R. A., Rothstein, J. M., & Lamb, R. L. (1988). Goniometric reliability in a clinical setting. Subtalar and ankle joint measurements. *Physical Therapy*, 68(5), 672-7.
- Functional Movement Systems. (2015). Y balance test. Retrieved from <http://www.ybalancetest.com/>
- Hing, W., Hall, T., Rivett, D., Vincenzino, B., & Mulligan, B. (2015). *The Mulligan concept of manual therapy: Textbok of techniques*. New York, N.Y.: Elsevier.
- Horn, K. K., Jennings, S., Richardson, G., van Viliet, D., Hefford, C., & Abbott, J. H. (2012). The Patient-Specific Functional Scale: Psychometrics, Clinimetrics, and Application as a Clinical Outcome Measure. *Journal of Orthopaedic & Sports Physical Therapy*, 42(1), 30-40. <http://doi.org/10.2519/jospt.2012.3727>
- Hubbard, T. J., & Hertel, J. (2008). Anterior positional fault of the fibula after sub-acute lateral ankle sprains. *Manual Therapy*, 13(1), 63-67.
- Hubbard, T. J., Hertel, J., & Sherbondy, P. (2006). Fibular position in individuals with self-reported chronic ankle instability. *The Journal of Orthopaedic and Sports Physical Therapy*, 36(1), 3-9.



References <cont.>

- Kaminski, T. W., Hertel, J., Amendola, N., Docherty, C. L., Dolan, M. G., Hopkins, J. T., ... Richie, D. (2013). National Athletic Trainers' Association position statement: Conservative management and prevention of ankle sprains in athletes. *Journal of Athletic Training*, 48(4), 528-45.
- Kamper, S. J., Maher, C. G., & Mackay, G. (2009). Global rating of change scales: A review of strengths and weaknesses and considerations for design. *The Journal of Manual & Manipulative Therapy*, 17(3), 163-170.
- Konor, M. M., Morton, S., Eckerson, J. M., & Grindstaff, T. L. (2012). Reliability of three measures of ankle dorsiflexion range of motion. *International Journal of Sports Physical Therapy*, 7(3), 279-87.
- Martin, R. L., & Mcpoil, T. G. (2005). Reliability of ankle goniometric A literature review. *Journal of the American Podiatric Medical Association*, 95(6), 564-572.
- Mau, H., & Baker, R. (2014). A modified mobilization with movement to treat a lateral ankle sprain. *International Journal of Sports Physical Therapy*, 9(4), 540-548.
- Moiler, K., Hall, T., & Robinson, K. (2006). The role of fibular tape in the prevention of ankle injury in basketball: A pilot study. *Journal of Orthopaedic & Sports Physical Therapy*, 36(9), 661-668. <http://doi.org/10.2519/jospt.2006.2259>
- Mulligan, B. (1993). Mobilisations with movement (MWM'S). *Journal of Manual & Manipulative Therapy*, 1(4), 154-156.
- Mulligan, B. (2010). *Manual Therapy: NAGS, SNAGS, MWMS etc.* (6th ed.). Wellington, New Zealand: Plane View.



References <cont.>

- O'Brien, T., & Vicenzino, B. (1998). A study of the effects of mulligan's mobilization with movement treatment of lateral ankle pain using a case study design. *Manual Therapy*, 3(2), 78-84.
- Penso, M. (2008). The effectiveness of mobilisation with movement for chronic medial ankle pain: A case study. *South African Journal of Physiotherapy*, 64(1), 13-16.
- Plisky, P. J., Rauh, M. J., Kaminski, T. W., & Underwood, F. B. (2006). Star excursion balance test as a predictor of lower extremity injury in high school basketball players. *The Journal of Orthopaedic and Sports Physical Therapy*, 36, 911-919.
- Reordan, D. (2014). The Mulligan concept: The upper quadrant. Moscow, ID.
- Smith, C. A., Chimera, N. J., & Warren, M. (2015). Association of Y balance test reach asymmetry and injury in division I athletes. *Medicine and Science in Sports and Exercise*, 47(1), 136-141.
- Snyder, A. R., Perotti, A. L., Lam, K. C., & Bay, R. C. (2010). The influence of high-voltage electrical stimulation on edema formation after acute injury: A systematic review. *Journal of Sport Rehabilitation*, 19(4), 436-451.
- Stratford, P., Gill, C., Westaway, M., & Binkley, J. M. (1995). Assessing disability and change on individual patients: A report of a patient specific measure. *Physiotherapy Canada*, 47(4), 258-263.



References <cont.>

- Vicenzino, B., Branjerdporn, M., Teys, P., & Jordan, K. (2006). Initial Changes in Posterior Talar Glide and Dorsiflexion of the Ankle After Mobilization With Movement in Individuals with Recurrent Ankle Sprain. *Journal of Orthopaedic & Sports Physical Therapy*, 36(7), 464-471. <http://doi.org/10.2519/jospt.2006.2265>
- Vicenzino, B., Prangley, I., & Martin, D. (2001). The initial effect of two Mulligan mobilisation with movement treatment techniques on ankle dorsiflexion. In *2001: A Sports Medicine Odyssey Challenges, Controversies & Change. Australian Conference of Science and Medicine in Sport* (pp. 23-27). Perth, WA.
- Wester, J. U., Jespersen, S. M., Nielsen, K. D., & Neumann, L. (1996). Wobble board training after partial sprains of the lateral ligaments of the ankle: a prospective randomized study. *J Orthop Sports Phys Ther*, 23(5), 332-336. <http://doi.org/10.2519/jospt.1996.23.5.332>
- Wilkerson, G. B., & Horn-Kingery, H. M. (1993). Treatment of the inversion ankle sprain: Comparison of different modes of compression and cryotherapy. *The Journal of Orthopaedic and Sports Physical Therapy*, 17(5), 240-6.
- Williamson, A., & Hoggart, B. (2005). Pain: A review of three commonly used pain rating scales. *Journal of Clinical Nursing*, 14(7), 798-804.

