

Background

- Fascial adhesions in the body have been hypothesized to develop from an abnormal healing process that occurs with injury. Adhesions form for various reasons including inadequate stretching, injuries, or repeated micro trauma caused by activities such as athletic overtraining. Formation of adhesions may result in decreased flexibility, range of motion, or even pain. (Vernon 2009)
- Several studies including Grieve et al 2011, Grieve et al 2012, and George et al 2006, found increased AROM and flexibility following a single session of various forms of myofascial release such as trigger point release therapy and active release technique.
- The intervention of interest in this study is AquaStretch, an aquatic myofascial release intervention that combines manual therapy and active assisted movements in a gravity-reduced environment, water between 3'6" and 3'9" in depth.
- One recent study on AquaStretch found a statistically significant improvement in 4 of 16 (25%) lower extremity ROM measurements following a single AquaStretch session in healthy college aged students. (Sherlock and Eversaul 2013)

Purpose

- Investigate the effects of AquaStretch, an aquatic manual therapy technique, on the restoration of lost ROM in serious recreational athletes with lower extremity injury.

Methods

- 20 total participants between the ages of 18 and 60
- Inclusion Criteria: Currently training at least 7 hours/ week for sport or exercise, or involved in intense training (such as CrossFit) for 4 hours/week; have experienced ongoing lower extremity pain in the last 6 months; deficits in any active lower extremity ROM values compared to contralateral extremity; ROM impairments/asymmetries determined by Ober's Test, popliteal angle measurement, Modified Thomas Test, and functional deep squat; Functional limitations determined by FAAM Sports Subscale and LEFS questionnaires.
- Exclusion Criteria: Surgery in last 6 months; ligament, tendon, or meniscus tear; and aquatic precautions/contraindications.
- Subjects filled out LEFS and FAAM sports subscales before and the day after tx.
- Measurements were taken prior to and immediately following treatment.



Methods (cont.)

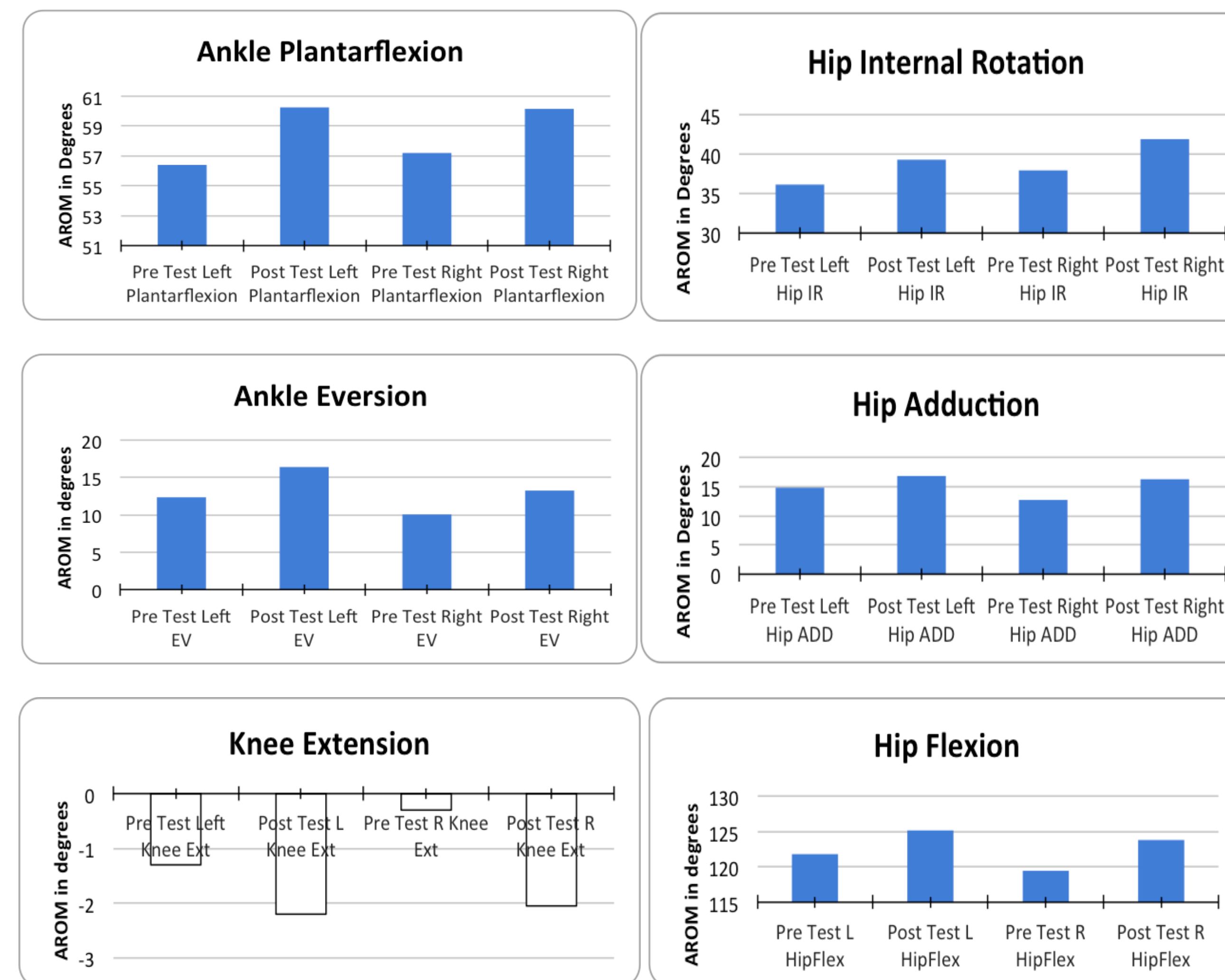
- Pre and post treatment measurements consisted of:
 - Ankle plantarflexion, dorsiflexion, inversion, and eversion AROM
 - Knee flexion and extension AROM
 - Hip flexion, extension, internal/external rotation, adduction, and abduction AROM
 - Popliteal Angle, Ober's Test, and Modified Thomas Test, measured by goniometry
 - Deep Squat functional test measured using the goniometry function of the Hudltechnique™ app

Procedure

- Wall Hang: Foot grip, Ankle grip, Toe grip, IT band pump, Hip Rock and Roll
- One Leg Standing: Foot grip with traction and Hip Fulcrum
- Two Heavy Feet: Lean back, Arch forward, Back against wall, Assume the position,
- Head Hang, and Shoulder Roll
- 5 lb to 15 lb water weights were used to maintain contact with the floor and increase therapist resistance with active movements.

Results

- 20 participants: 13 males and 7 females with a mean age of 27.4.
- Results of a dependent samples t test (2 tailed) showed a statistically significant increase in 23 of 32 (72%) range of motion measurements, including the following:



Results (cont.)

- Results of the questionnaires reporting the participants perceived debility showed a statistically significant increase per paired samples statistics:

Lower Extremity Functional Scale

		Paired Samples Statistics				
		Mean	N	SD	SE	Significance
LEFS	PRETEST TOTAL	69.44	25	11.027	2.205	
	POSTTEST TOTAL	74.24	25	8.904	1.781	.004

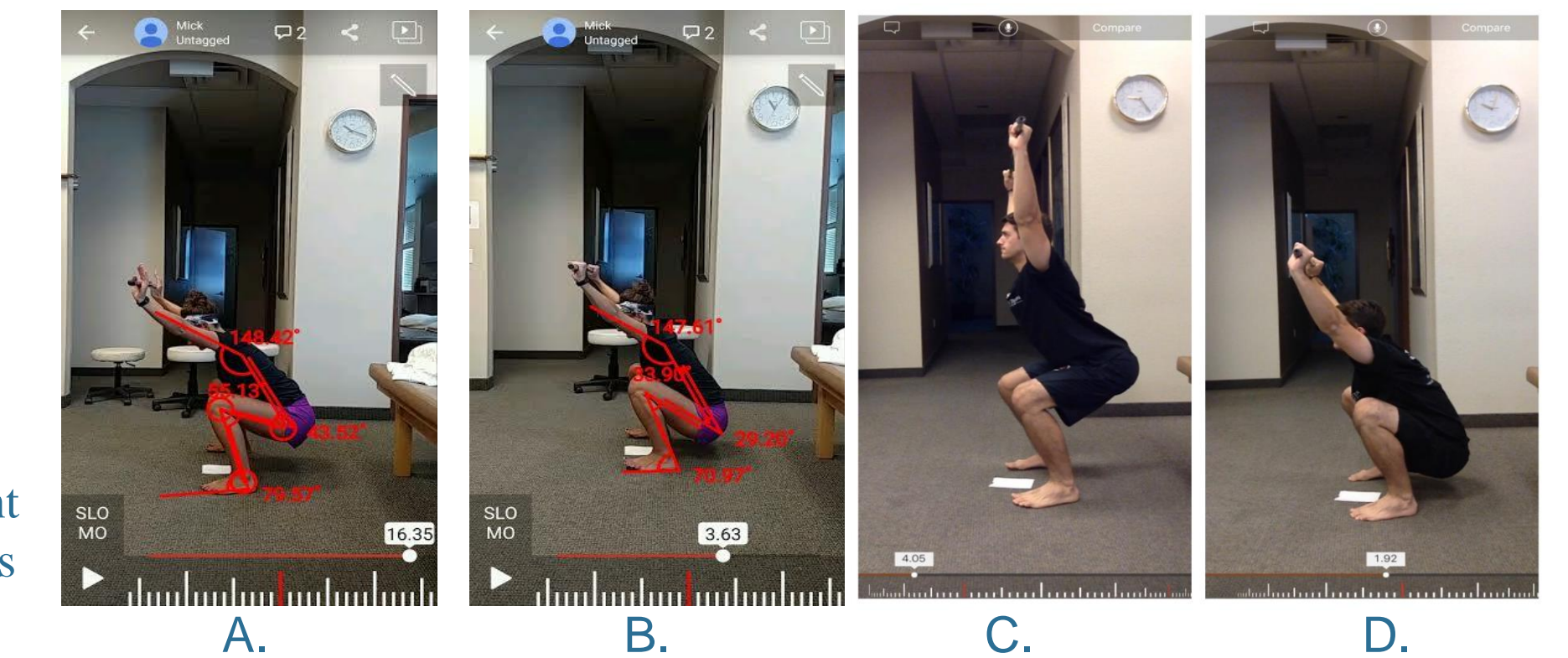
Foot and Ankle Activity Measure

		Paired Samples Statistics				
		Mean	N	SD	SEM	Significance
FAAM	PRETEST TOTAL	7.20	25	7.670	1.534	
	POSTTEST TOTAL	4.36	25	6.264	1.253	.025

Deep Squat Pictures:

(A) Pre Treatment and (B) Post treatment Deep Squat with measurements from Hudltechnique™ app

(C): PreTest Deep Squat without measurements (D): Post Treatment Deep Squat without measurements



Discussion

The results of this study showed increased statistical improvement in more lower extremity ROM measurements (72%) compared to a prior study by Sherlock & Eversaul 2013 (25%). The mean of every ROM test improved, as was also the case in Sherlock. Every subject also demonstrated an improved quality of movement per FMS deep squat. The results suggest AquaStretch is effective in restoring range of motion after injury with athletes.

Conclusion

An AquaStretch session resulted in a statistically significant improvement in 72% of range of motion measurements and subjective perceived debility by participants. This intervention has shown consistency in restoring flexibility and improving function. The results of this study suggest AquaStretch is an effective means of myofascial release that seem to significantly affect lower extremity function and ROM after one 30 minute treatment.

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