Automated IASTM for Lateral Epicondylitis Shows Efficacy in Reducing Pain, Increasing Grip Strength and Improving Arm Function

Lateral epicondylitis affects up to 10 million people annually in the United States. Although it's known as tennis elbow, this overuse injury afflicts more than just tennis players, including golfers, fitness enthusiasts, gamers and construction and manufacturing workers.

Cause and Symptoms. Repetitive movements can cause damage to the wrist extensor tendon near the attachment at the lateral epicondyle of the elbow. Symptoms include pain at the elbow, difficulty gripping and lifting, achiness, burning pain and chronic pain while sleeping.

IASTM Treatment. One clinically proven treatment is instrument-assisted soft tissue mobilization (IASTM), also called Graston Technique®, HawkGrip® or Gua Sha. By inducing controlled microtrauma, IASTM breaks down scar tissue, releases adhesions and elicits a local inflammatory response that promotes the synthesis of new collagen and remodeling of connective tissue.[1] Typically administered by physical therapists, chiropractors or other healthcare professionals, IASTM is reported to significantly improve soft tissue function and range of motion, reduce pain and shorten the time to return to activity.[2]

Evaluation of automated IASTM

The new Fiix Elbow device from Fiix Body™ automates IASTM for convenient, efficient home self-care. This wearable unit delivers repetitive linear strokes to the forearm to increase blood flow and collagen production to promote healing.

Therapeutic protocol includes using the Fiix Elbow device for 10 minutes per day, three times per week for eight weeks, plus performing stretching and strengthening exercises. To evaluate the effectiveness of the Fiix Elbow through a patient trial, Fiix Body (d.b.a. Sta Active LLC) consulted with the School of Kinesiology at the University of Minnesota, Minneapolis-St. Paul.

Study Overview. The study was a single intervention group pre-post-test design with no control group. Two-thirds of the subjects were male, and one-third female; 59% were 45-54 years old, 33% were ages 55-64 and 8% were 35-44. The majority were chronic tennis elbow sufferers, with 83% dealing with it for more than three months.
Consistent with published studies, racquet sports were not the leading cause of this injury. Instead, subjects cited exercise and weightlifting (50% of participants), computer work (33%), non-racquet sports (29%) and manual labor (17%).

During the 10-week trial, subjects were instructed to continue doing activities tolerated prior to implementing the Fiix Elbow treatment, provided that their pain level did not exceed a 6 on a 0-10 pain scale, with 0 being no pain and 10 being maximum pain.

Data was collected on three continuous dependent variables: grip strength, arm function and pain score.

Results

Jürgen Konczak, Ph.D., and his associates at the University of Minnesota conducted statistical analysis of the data. Primary analyses compared the mean (paired-samples t-test) or median (Wilcoxon singed-rank test) differences; a secondary analysis determined the correlation between variables at Baseline and Week 10. Significance was accepted at p=0.05 level.

Appropriate corrections to this p-value for repeated testing were made using the Holms-Bonferroni method; and data were analyzed using SPSS Statistics 26.0.[3]

Grip Strength. Participants' grip strength was measured with a handheld dynamometer at Baseline and Week 10. Use of the Fiix Elbow device was associated with significantly higher grip strength after the treatment, with a median of 90 pounds post-treatment, compared to a median of 60 pounds at Baseline. **Overall, there was a mean relative improvement in grip strength of 84.9%.**

Arm Function. The Upper Extremity Functional Index (UEFI) is a patient-recorded outcome measure used to assess the functional impairment in individuals with a musculoskeletal upper limb dysfunction. In absolute terms, the mean change in UEFI was 26 (standard deviation = 17.3), which corresponds to **a mean relative improvement of 75.6% in functional activities.** The Fiix Elbow intervention demonstrated a statistically significant increase in the mean UEFI scores from Baseline to Week 10, indicating greater arm functionality.

Pain Score. Using a visual analog scale for the level of pain prior to and post intervention (0=no pain, 10=maximum pain), subjects self-reported scores at Baseline and Week 10. Results showed a statistically significant decrease in reported pain scores after the use of the Fiix Elbow device, with **96 percent of all participants experiencing reduced pain**.

Control Group. Although this trial did not include a control group, the scientific literature for a rest-and-wait approach to lateral epicondylitis shows minimal, if any, improvement. For instance, one study found a 0.33% increase in average grip strength in the rest-and-wait group in 10 weeks, with a 5.87% increase in the exercise group.[4]

One Year Follow-up. Participant follow-up was conducted during the one year period following study completion to assess long term outcomes. Overall, **93% of subjects reported 1-year pain scores equal to or better than their Week 10 scores**.

Furthermore, in another study that compared the efficacy of physiotherapy with rest-and-wait or a corticosteroid injection over 52 weeks to treat lateral epicondylitis, researchers reported, "An approach combining elbow manipulation and exercise has a superior benefit to wait-and-see and corticosteroid injection protocols."[5]

The Fiix Elbow protocol incorporates both a proven clinical manipulation therapy (IASTM) and exercise for improved overall outcomes.

Conclusion

Trial evidence demonstrates that use of the Fiix Elbow by Fiix Body to treat lateral epicondylitis over 10 weeks, along with stretching and strengthening exercises, results in significant improvements in patient functionality and well-being, including increased grip strength, greater arm function and reduced pain. Furthermore, these improvements lasted through a 1-year post intervention follow-up period.

References

[1] Baker, R.T., DAT, ATC; A. Nasypany, EdD, ATC, LAT; J.G. Seegmiller, EdD, ATC, LAT; and J.G. Baker, DPT, ATC, PT. Instrument-assisted soft tissue mobilization treatment for tissue extensibility. *International Journal of Athletic Therapy & Training.* September 2013*;* 18 (5): 16-21.

[2]Kim, J., D.J. Sung and J. Lee. Therapeutic effectiveness of instrument-assisted soft tissue mobilization for soft tissue injury: mechanisms and practical application. *Journal of Exercise Rehabilitation*. February 2017; 13(1): 12–22.

[3]Konczak, Jurgen, PhD. Technical report on Stā Active device to treat elbow pain. School of Kinesiology, University of Minnesota, Minneapolis-St. Paul. December 2020.

[4] Peterson, M., S. Butler, M. Eriksson and K. Svärdsudd. A randomized controlled trial of exercise versus wait-list in chronic tennis elbow. *Upsala Journal of Medical Sciences*. 2011; 116:4, 269-279.

[5] Bisset, L. E. Beller, G. Jull, P. Brooks, R. Darnell and B. Vicenzino. Mobilisation with movement and exercise, corticosteroid injection, or wait and see for tennis elbow: randomized trial. *BMJ*. September 2006; doi: 10.1136.