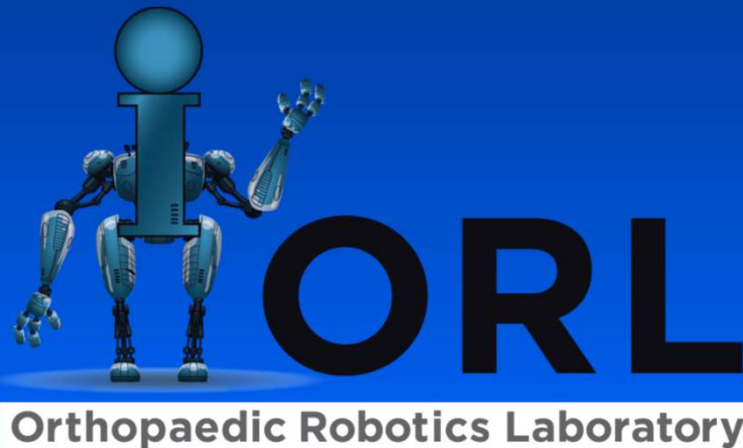


Structured Exercise Therapy Improves Shoulder Function and Patient Reported Outcomes Without Increasing Tear Size for Individuals with Isolated Supraspinatus Tear

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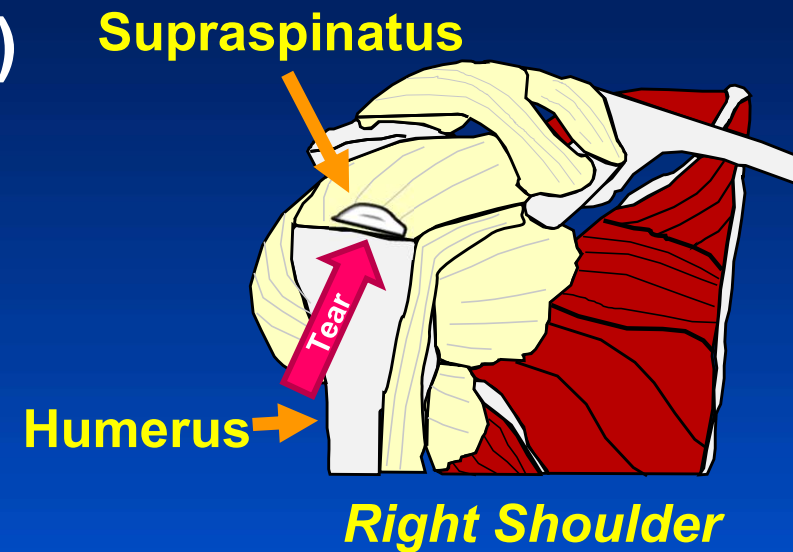
Disclosure

- **Luke T. Mattar, B.S. and co-authors:**
 - We have no financial conflicts to disclose.



Rotator Cuff Tears

- Exercise therapy fails \approx 25-50% (1-4)
- Failure rates non-operative treatment may be due to:
 - Lack of individualized approach
 - Inability to improve kinematics
 - Tear propagation



Objectives

- The objectives of the study were to evaluate the effectiveness of a 12-week structured and individualized exercise therapy approach for non-operative treatment of rotator cuff tears in respect to joint function, patient reported outcomes and tear size.



Recruitment

- 109 individuals (28.7 ± 5.0 BMI, 60.9 ± 9.9 years)
- Inclusion criteria
 - Symptomatic tear isolated to supraspinatus
 - >40 years old
- Exclusion criteria
 - Previous injury
 - Severe capsule tightness (<30 degrees IR/ER)

Clinical Variables

- Involved side passive range of motion (PROM)
 - Glenohumeral ABD
 - Glenohumeral Flexion
 - IR90°
 - ER90°
- Isometric strength of rotator cuff muscles (normalized to noninvolved side)
 - ER0°
 - IR0°
 - ER90°
 - Scaption

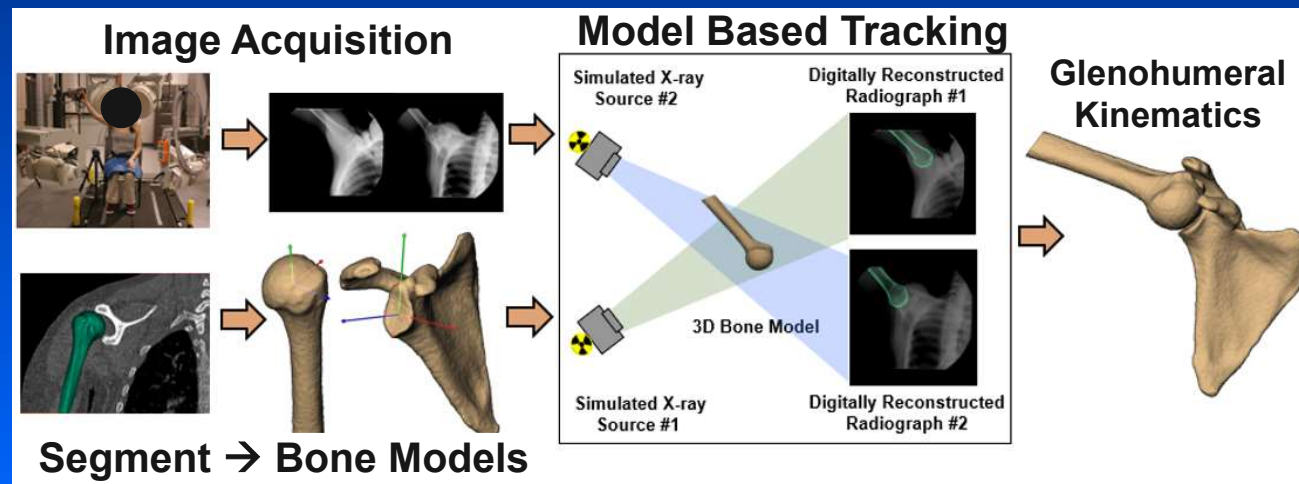


Patient Reported Outcomes/Tear Size

- **American Shoulder and Elbow Surgeons Score (ASES) & Western Ontario Rotator Cuff (WORC) Index**
 - Score ranges 0-100
 - Higher scores → better function and less pain
- **Tear size**
 - Anterior-posterior distance of tear measured perpendicular to line tangent to posterior edge of long head of biceps

Bi-Plane Radiography → Kinematics

- Scapular plane abduction → glenohumeral elevation & contact path length
- Accuracy $\pm 0.4\text{mm}$ and $\pm 0.5^\circ$ (5)



Statistics

- Compare pre- and post-exercise therapy values
- Normally Distributed Data
 - Paired t-test
- Non-normally distributed data
 - Wilcoxon Signed Rank Test
- $p < 0.05$

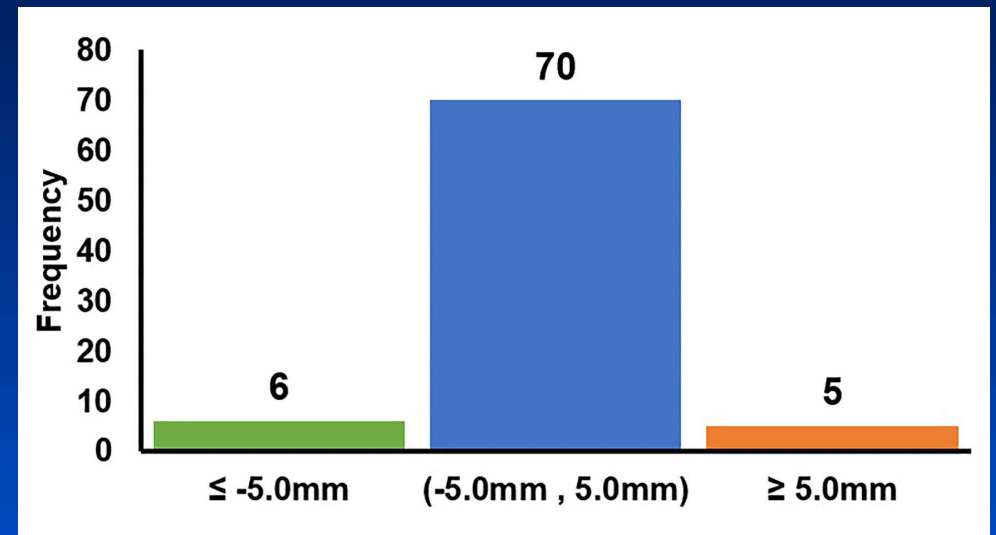


Improved Kinematics

- **92.7% individuals successfully completed exercise therapy**
- **Maximum glenohumeral elevation increased 4.5° ($p=0.001$)**
- **Contact path length decreased 6.5% ($p=0.001$)**

Post-Exercise Therapy Improvements

- Increased PROM & strength all measures ($p < 0.012$)
- Increased ASES and WORC scores ($p = 0.001$)
- No overall changes in tear size ($p = 0.313$)



Changes in tear size post-exercise therapy

Discussion

- **Structured exercise therapy program led to:**
 - Improved glenohumeral joint function
 - Improved patient reported outcomes
 - No increases in tear size
- **A 12-week exercise therapy program is a viable treatment option for individuals with symptomatic isolated supraspinatus tear**
 - Minimal risk of tear propagation

References/Acknowledgements

- 1) Itoi E, J Orthop Sci 2013
 - 2) Itoi E, Tabata S, Clinical Orthopaedics and Related Research 1992
 - 3) Kuhn JE et al. JSES 2009
 - 4) Kuhn JE et al. JSES 2013
 - 5) Bey MJ et al. J Biomech Eng 2006
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