Title
The effect of manual inter-structural release on glenohumeral internal rotation range and gliding between the infraspinatus and posterior deltoid

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Purpose / Background
Shoulder pain in overhead athletes may be related to posterior tightness of the glenohumeral joint, which may be caused by the posterior deltoid, infraspinatus and teres minor along with the capsule. One method of relieving posterior tightness is “sleeper stretch” in which the arm is inwardly rotated during shoulder joint flexion. However, adhesion may require a more direct intervention such as manual inter-structural release (ISR) to improve the durability of post-intervention effects. This study investigated the effects of ISR between the posterior deltoid and infraspinatus on the gliding behavior of the muscles as well as the range of motion.

Method
This study was a single-blinded randomized control study in healthy volunteers. Twenty subjects were randomly allocated to the ISR or sleeper stretch (SS) group. Ultrasonic images of the posterior shoulder were obtained to visualize gliding between the posterior deltoid and infraspinatus minor during passive internal/external rotation at 90 degrees abduction and an angular velocity of 20 deg/s. Echolizer software (GLAB) was used to measure tissue movement on the ultrasonic images. Repeated measure two-way ANOVA and Tukey test were used to determine the inter- and intra-group differences.
Results
Mean value [95% CI] of the shoulder internal rotation range changed from 59.5 [54.9, 64.1]° to 67.3 [62.0, 72.6]° (p < .01) in the ISR group and from 52.6 [46.0, 59.2]° to 56.0 [50.2, 61.8]° (p = .10) in the SS group. Significant interaction was observed (p < .01).
Mean value [95% CI] of the gliding distance between the infraspinatus and deltoid changed from 0.10 [-0.03, 0.22]cm to 0.19 [0.02, 0.36]cm in the ISR group (p = .02), and from 0.20 [0.12, 0.29]cm to 0.18 [0.11, 0.25]cm in the SS group (p = .36). Significant interaction was observed (p = .04).

Conclusion
The data demonstrate that ISR effectively improved internal rotation range and inter-muscular gliding between the posterior deltoid and infraspinatus in young healthy individuals. Limitations would include a potential ceiling effect, the lack of data on the longitudinal effectiveness of ISR, and the lack of information on other potential limiting factors affecting range of motion or inter-muscular gliding.