

## Does Grip and Shoulder Strength Relate to Shoulder Rotator Cuff Tear Dysfunction?

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**PURPOSE:** Determining a means to better preoperatively define extent of rotator cuff (RTC) dysfunction is desired. A surrogate to replace invasive arthroscopy or expensive diagnostic testing would be valuable. The purpose of this research study was to prospectively examine the relationships between the percent loss (affected compared to unaffected) of hand grip and shoulder strength, and RTC tear dysfunction in those with proven tears.

**METHODS:** Subjects were chosen from a single orthopedic surgeon specializing in shoulder surgery who were deemed through examination to have a RTC tear and elected to undergo repair. Prior to surgery each subject was assessed bilaterally for hand grip strength, shoulder external rotation (ER) and abduction (ABD) strength using dynamometry, and subjective patient reported outcome measures. Additionally, actual surgically reported RTC tear size via arthroscopy was gathered following repair. Descriptive statistics and Pearson correlation coefficients were used to analyze data.

**RESULTS:** A Pearson correlation coefficient of -0.440 was calculated between ASES Function score and ABD strength, suggesting a moderate correlation; -0.466 between ASES Function score and ER strength, suggesting a moderate correlation; -0.511 between ASES Function score and number of tendons torn, suggesting a strong correlation; and -0.418 between ASES Index score and ER strength, suggesting a moderate correlation. Data suggests weak and non-significant correlations between grip strength and RTC dysfunction. The p-value was set to  $\leq 0.05$ .

**DISCUSSION:** An inverse relationship was found between ASES Function scores, and shoulder strength and number of RTC tendons torn. This suggests that ASES Function score decreases as the percent difference between affected and unaffected shoulder ABD and ER strength and number of tendons torn increases. Also, an inverse relationship was found between ASES Index scores and ER strength, suggesting that ASES Index score decreases as the percent difference between affected and unaffected shoulder ER strength increases.

**CONCLUSION:** The results suggest lower ASES Function and Index scores implicate an increased percent of ABD and ER strength loss and an increased number of torn tendons when compared bilaterally. Weak relationships were found between grip strength and RTC dysfunction.