

THE RELATIONSHIP BETWEEN PRE-OPERATIVE AND TWELVE-WEEK POST-OPERATIVE Y-BALANCE AND QUADRICEPS STRENGTH IN ATHLETES WITH AN ANTERIOR CRUCIATE LIGAMENT TEAR

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ABSTRACT

Background: Pre-operative quadriceps strength may have a positive influence on post-operative function and outcomes at time of return to sport. Little consideration has been given to quadriceps strength during the early post-operative timeframes. Twelve-week post-operative anterior cruciate ligament reconstruction (ACL-R) is considered a critical time point for progression in the rehabilitation process. There is currently limited research looking at the relationship between clinical measurements pre-operatively and at 12-weeks following ACL-R.

Purpose/Hypothesis: The primary purpose of this study was to examine the differences between Y-Balance Test Lower Quarter (YBT-LQ) and isokinetic quadriceps strength tested pre-operatively and post-operatively following ACL-R (12-weeks).

Study Design: Within subject, repeated measures

Methods: Thirty-nine participants (15.6 ± 1.5 y/o) were diagnosed with an ACL tear and were undergoing rehabilitation to return to a sport requiring cutting and pivoting were included. YBT-LQ and isokinetic quadriceps strength were assessed pre-operatively and at 12-weeks after ACL-R. YBT-LQ composite scores were calculated bilaterally and isokinetic quadriceps strength was tested using the Biodex Multi-Joint Testing and Rehabilitation System. Paired T-tests were used to determine mean group differences between YBT-LQ and isokinetic quadriceps strength scores pre-operatively and at 12-weeks post-operative. A Pearson Correlation was performed to determine relationships between variables at both time points.

Results: There was a significant improvement in YBT-LQ composite scores from pre-operative to 12-weeks post-operative on both the involved (Pre-operative: 89.0 ± 7.7 ; 12-weeks: 94.1 ± 7.1 , $p < 0.001$) and uninvolved (Pre-operative: 92.6 ± 6.2 ; 12-weeks: 97.6 ± 6.8 , $p < 0.001$) limbs. Quadriceps strength decreased significantly from pre-operative to 12-weeks on the involved limb (Pre-operative: 82.3 ftlbs ± 38.6 ; 12-weeks: 67.9 ftlbs ± 27.4 , $p < 0.01$), but no differences were found on the uninvolved limb (Pre-operative: 117.3 ftlbs ± 42.0 ; 12-weeks: 121.7 ftlbs ± 41.5 , $p = 0.226$).

Conclusions: Involved limb quadriceps strength decreases from time of pre-operative to 12-weeks following ACL-R.

Level of Evidence: 3

Key words: Anterior cruciate ligament reconstruction, pre-operative, quadriceps strength, Y-balance test

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