

ORIGINAL RESEARCH

IMPROVEMENTS IN KNEE EXTENSION STRENGTH ARE ASSOCIATED WITH IMPROVEMENTS IN SELF-REPORTED HIP FUNCTION FOLLOWING ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT SYNDROME

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ABSTRACT

Background: Recovery of strength is critical for return to sport, and is a known predictor of functional outcomes in post-surgical orthopedic populations. Muscle weakness is a known impairment in patients with femoroacetabular impingement syndrome (FAIS) but whether improvements in muscle strength after arthroscopy are associated with improved hip function is unknown.

Hypothesis/Purpose: To examine the relationships between changes in hip and thigh muscle strength and self-reported function in athletes undergoing arthroscopy for FAIS.

Study Design: Single cohort descriptive and correlational study

Methods: Twenty-eight athletes underwent strength testing and completed the Hip Outcome Score Activities of Daily Living (HOS-ADL) and Sports (HOS-S) subscales prior to and six months after surgery. Isokinetic knee extension and flexion strength were measured using a Biodex dynamometer at 60°/s and 300°/s. Isometric hip abduction strength was measured using a custom dynamometer. Changes in strength, limb symmetry, and HOS scores were assessed using paired t-tests. Spearman's rank correlations were used to examine relationships between change in involved limb strength and change in HOS scores.

Results: Subjects were tested an average of 32 days before and 178 days after surgery. HOS-ADL and HOS-S subscales improved by a mean of 19.0 ±21.1 and 23.8±31.9, respectively, over time ($p < 0.001$). Hip abduction strength did not increase over time in either limb ($p \geq 0.27$). Involved limb knee flexion and extension strength did not increase significantly over time (p -values: 0.10-0.48) with the exception of knee extension at 300°/s ($p = 0.04$). Uninvolved limb knee extension strength at both velocities and knee flexion strength at 60°/s improved significantly over time ($p < 0.012$). Increases in knee extension strength (60°/s) of the involved limb were significantly correlated with improvements on the HOS-ADL ($r = 0.431$; $\rho = 0.025$) and HOS-S ($r = 0.439$; $p = 0.025$). There were no significant relationships between changes in involved limb hip abduction or knee flexion strength and HOS subscales ($p \geq 0.123$).

Conclusion: Improvements in knee extension strength were associated with improvements in self-reported hip function in athletes following arthroscopy for FAIS. Individuals with knee extension strength deficits prior to surgery may benefit from targeted knee extension strengthening during post-operative rehabilitation to improve functional outcomes.

Level of Evidence: Level III (non-randomized controlled cohort study)

Key Words: femoroacetabular impingement syndrome, hip strength, knee strength

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