Improved Squat and Gait Biomechanics 6-Months Post-Arthroscopic Surgery for Femoroacetabular Impingement

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Introduction

• Femoroacetabular impingement (FAI) is a pathomorphology of the hip joint and thought to be a precursor to hip osteoarthritis (OA).1
• Motion analysis studies conducted in symptomatic FAI patients before and 1 year after hip arthroscopy have shown conflicting results,2
• Six-months post surgery for FAI patients are often able to return to sports,3 however this time-point has not been evaluated biomechanically.

Purpose: To investigate gait and squat biomechanics in the hip 6-months after arthroscopic surgery for FAI.

Methods

• Subjects: 15 subjects scheduled for primary hip arthroscopy for FAI and 9 healthy age- & BMI-matched controls were recruited (Table 1). Subjects with a history of back or lower extremity pathologies and radiographic evidence of OA were excluded.
• Motion Analysis: Motion analysis was performed using passive reflective markers on bony landmarks.4 The average of five normal speed walking and three squat trials from the surgical-side and a randomly selected limb from the controls were analyzed. Data were normalized to percent body weight multiplied by height (%BWH).

Results

• Figures 1 and 2 present kinematic and kinetic data
• Pre vs. Post Operative: Hip arthroscopy improved maximum hip extension during squat (p=0.011), with trends toward improved hip external rotation moment during gait (p=0.056) and decreased hip adduction moment during squat (p=0.059).
• Preop FAI vs. Control: FAI patients had reduced hip external rotation moment during gait (p=0.024), with a trend toward reduced hip abduction moment during squat (p=0.082).
• Postop FAI vs. Control: No differences at 6 months.

Statistical Analysis: Independent t-tests (patient vs. control) and paired t-tests (pre vs. post operative) were used between groups.

Discussion

• Gait and squat motion analysis at 6-month post-arthroscopy for symptomatic FAI revealed a tendency to improve external hip rotation moment during gait and maximum hip extension and hip adduction moment during squat.
• The present study is in keeping with prior literature,2 as we found preoperative FAI patients had abnormal hip external rotation moments during gait and hip abduction moments during squat compared to healthy controls.

Clinical Relevance: Arthroscopic surgery for FAI may help to restore the altered gluteal function in FAI patients by the 6 months postoperative time-point.