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Abstract Submission Form

Poster Title: **Altered Squat Biomechanics in the context of FAI: A Systematic Review**

Authors: **Joshua Wiener, Andrew Moyal MD, Jacob Calcei MD, Michael Salata MD**

Presenter's Name: **Joshua Wiener**

Location of Laboratory: **University Hospitals**

Category: **Clinical Research**

Objective: Femoroacetabular Impingement (FAI) is a common orthopedic condition, present in 10-15% of the general adult population. Symptoms are most pronounced at a deeply flexed hip posture while weight bearing – this typically presents as severe pain in squatting movements. This literature review aims to characterize the changes in squat kinetics and kinematics on account of FAI. In doing so, specific attention will also be paid to physical manifestations of FAI, mobility, and bony contact forces contributing to such changes.

Methods: A systematic review was conducted using the Preferred Reporting Items for Systematic reviews and Meta-Analyses Guidelines (PRISMA). The literature relevant to FAI, deep squats, single leg squats, contact forces, muscle strength, and mobility were evaluated, using the MeSH search terms: *femoracetabular impingement*, *biomechanical phenomena*, as well as titles/abstracts including *femoroacetabular impingement*, *kinematics*, and *squat*.

Results: The PubMed search resulted in 23 citations for initial identification. After applying inclusion and exclusion criteria to the titles and abstracts, 19 citations were eligible for analysis and full text versions were obtained for evaluation. Pain is increased in symptomatic patients with FAI as evaluated in all available metrics as compared to control groups. Surgical management is shown to improve these self-reported scores to a level that is not statistically different than control patients. Grossly, FAI is shown to reduce squat depth, and both descending and ascending speed compared to control groups. Adduction and abduction moments are not shown to differ in patients with FAI compared to controls. Flexion moments, however, are shown to be significantly reduced in patients with FAI as compared to controls. Combined with reduced moments of hip extension, the flexion to extension ratio is noticeably reduced.

Conclusions: This is the first systematic review to focus exclusively on the squat in the context of FAI, and to include both functional and structural changes as a result of the pathology. Such results indicate a starting point for clinicians and therapists to better understand management and recovery of FAI patients past pain alone and highlight the need for future prospective studies optimizing FAI specific peri-operative care and training protocols.