Validation of the Modified Ligamentous-Fossa-Foveolar Complex (LFFC) Grading System with Clinical Correlation for Patients Undergoing Hip Arthroscopy

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INTRODUCTION: Pathology involving the acetabular fossa is often identified during hip arthroscopy, with many of the descriptive classification systems focusing on the ligamentum teres (LT). Recently, a novel grading system for Ligamentous-Fossa-Foveolar Complex (LFFC) lesions was introduced for open hip preservation surgery which included evaluation of the cotyloid fossa (CF) and perifoveal cartilage (PC). The purpose of the present study was to validate a modified version of the LFFC grading system and correlate these results to preoperative and intraoperative findings.

METHODS: High-resolution arthroscopic images of the central compartment were obtained identifying the LT, CF, and PC in a prospective series of patients undergoing hip arthroscopy. Each structure was graded according to increasing pathology on a scale of 0-4 based on a modified LFFC classification system. Five surgeons graded the images, which were then randomized and re-graded for intra-observer reliability. Agreement was quantified by the intra-class correlation coefficient (ICC) and kappa (κ) statistic to determine inter- and intra-observer reliability. Grading discrepancies were resolved in conference with the senior author and final LFFC grades were compared to preoperative clinical and radiographic data as well as intraoperative findings.

RESULTS: 93 patients were included in the study. LFFC component interobserver reliability for two rounds of grading resulted in LT ICC: 0.78-0.90, CF ICC: 0.85-0.93, and PC ICC: 0.78-0.87 with a LFFC total score ICC: 0.87-0.95. Intra-observer reliability resulted in LT ICC: 0.73-0.91, CF ICC: 0.84-0.95, PC ICC: 0.83-0.91, and LFFC total score ICC: 0.89-0.96. Severe central compartment pathology (LFFC total score >6) was significantly associated with age (48.2 vs. 34.4; p=0.0002), preoperative Tönnis grade 1 (43% vs. 4% p<0.0001), preoperative Tönnis angle (8.7 vs. 5.2; p=0.002), and intraoperative femoral head weight-bearing chondral lesions (14% vs. 0% p=0.02)

DISCUSSION: The modified LFFC grading system demonstrated satisfactory intra-observer and inter-observer reliability for patients undergoing hip arthroscopy that compares favorably to existing arthroscopic classification systems for the acetabular fossa. Increasing LFFC scores were found to be associated with known risk factors for inferior outcomes following hip arthroscopy providing enhanced clinical utility for this grading system.

SIFNIFICANCE/ CLINICAL RELEVANCE: By including the pulvinar tissue within the cotyloid fossa as well as the perifoveal cartilage in the femoral head in addition to the ligamentum teres, this study provides a validated, robust, and reliable grading system for all structures within the acetabular fossa. Further correlations with LFFC grades to preoperative risk factors for inferior outcomes following hip arthroscopy strengthen the clinical relevance of this grading system.