

A Hip Labral Reconstruction Improves Distractive Stability After Cam Over-Resection

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INTRODUCTION: It is unclear how a combination of cam over-resection, labral repair, and labral reconstruction affects hip stability. The purpose of this study was to evaluate the change in hip distractive stability after a cam over-resection with either a labral repair or labral reconstruction. The hypothesis was that a labral reconstruction would partially restore hip stability and that a 10-mm labral reconstruction would restore the distractive stability to a greater extent than a 6-mm labral reconstruction or a labral repair.

METHODS: Institutional ethics review board approval was obtained required for the laboratory investigation of deidentified cadaveric specimens (HSREB #121404). Ten fresh-frozen human cadaveric hips were analyzed using a materials testing system to measure the force and distance required to disrupt the suction seal of the hip (1) with an intact capsule and labrum, (2) after a capsulectomy and labral repair, (3) after a capsulectomy, 5-mm cam over-resection and labral repair, (4) after a capsulectomy, 5-mm cam over-resection and labral tear, (5) after a capsulectomy, 5-mm cam over-resection and labrectomy, and (6) after a capsulectomy, 5-mm cam over-resection, and a 6- or 10-mm labral reconstruction (5 hips each). Each specimen was examined at 0° flexion, 45° flexion, and 45° flexion and 15° internal rotation and analyzed using non-parametric statistical methods.

RESULTS: The Friedman test of differences was significant among structural conditions and hip positions ($P = 0.001$). For all hip positions, the resistive force that opposed the disruption of the suction seal in an intact hip was significantly greater compared to all other conditions. The resistive force for the capsulectomy, 5-mm cam over-resection and labrectomy condition was significantly less compared to all other conditions. Although the 10-mm labral reconstruction condition trended towards a greater distractive stability compared to the 6-mm labral reconstruction, and labral repair conditions, it did not meet statistical significance.

DISCUSSION: The main finding of this study was that after a cam over-resection, hip distractive stability was improved following labral reconstruction, although neither reconstruction group was significantly different compared to labral repair. Comparing between reconstruction groups, a 10-mm wide ITB labral reconstruction graft trended towards an improved distractive stability compared to a 6-mm wide graft, but the difference did not reach statistical significance. Limitations were those common to all biomechanical cadaveric studies such as no tissue healing potential and iatrogenic pathologic tissue states. This study objectively affirms that labral reconstruction is a viable treatment option for cam over-resection, supporting a commonly held belief among hip arthroscopy surgeons.

SIGNIFICANCE/CLINICAL RELEVANCE: Labral reconstruction may be a viable treatment option for patients with ongoing symptoms after hip arthroscopy for FAI with evidence of a cam over-resection.

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