

Differences and Similarities Between Hip and Knee Indications for the Arthroscopic Management of Chondral Defects

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Summary:

This systematic review identified differences and similarities in patient- and lesion-specific characteristics between hip and knee chondral defects treated by arthroscopic techniques.

Abstract:

Introduction: Hip-specific indications for arthroscopic management of chondral defects are poorly defined in the literature. The principles for treating these defects in the knee are currently applied in hip arthroscopy; however, the fundamental differences in hip anatomy and biomechanics may limit the applicability of cartilage preservation techniques used in the knee. The purpose of the present study is to review the indications for current cartilage preservation techniques in the hip and the knee to better define efficacious strategies for cartilage preservation.

Methods: A systematic literature review was performed using PubMed and Web of Science for studies investigating the effect of arthroscopic management of chondral defects in both the hip and knee. Case reports, open techniques, and non-English manuscripts were excluded. The selected studies were reviewed to specifically assess sample size, patient demographics, body mass index, defect location, Outerbridge severity grades, size of chondral defects, and the surgical technique for repair. Duration of symptoms, associated injuries, follow-up time, and outcome measures were recorded. Study cohorts were categorized based on surgical technique [microfracture vs autologous chondrocyte implant/transplantation (ACT)] and joint (hip vs knee). Statistical analysis was performed using Students t-test to compare means, as well as regression analysis to assess the impact of patient- and lesion-specific characteristics on arthroscopic management of chondral defects. A p-value of < 0.05 denoted statistical significance.

Results: A total of 49 clinical studies, comprising 3,207 patients undergoing hip and knee arthroscopy for chondral defects were included in this analysis. After pooling data, there were 992 (53.2%) microfractures and 874 (46.8%) ACTs performed in patients with knee chondral defects and 279 (88.3%) microfractures and 37 (11.7%) ACT performed in patients with hip chondral defects. Patients treated with microfracture for hip chondral defects demonstrated smaller lesion size (149.5 ± 20.7 vs 296.9 ± 89.2 mm², $p=0.007$) and a greater proportion of males (77.0 ± 20.4 % vs 56.5 ± 13.3 %, $p=0.013$) compared to knee chondral defects treated with microfracture. There were no significant differences in patient characteristics, clinical symptoms, and lesion size between hip and knee chondral defects treated with ACT. All cohorts demonstrated improvements after both microfracture and ACT. Regression analysis demonstrated that lesion size was a significant predictor for arthroscopic technique. While the odds of undergoing microfracture decreased with increasing lesion size (OR:0.33, 95%CI:0.16-0.70, $p=0.004$), the odds of undergoing ACT increased with greater lesion size (OR:3.4, 95%CI:1.5-7.4, $p=0.002$).

Discussion and Conclusions: This systematic review demonstrated significant differences in patient- and lesion-specific characteristics between hip and knee chondral defects treated with microfracture. In the hip, gender and lesion size may play a role in developing hip-specific indications for arthroscopic microfractures. In contrast, no significant differences were identified between hip and knee patient parameters and chondral defects treated with ACT. Understanding the differences and similarities between joint-specific algorithms for the management of

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chondral defects will help optimize existing hip preservation strategies.