Articular Acetabular Cartilage Damage in Adolescents with Elevated Alpha Angles

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INTRODUCTION:

Purpose

To analyze the relationship between alpha angle and grade of articular acetabular cartilage damage in a cohort of adolescent patients.

METHODS: A retrospective multicenter hip arthroscopy registry was queried for patients from January 2016 to December 2023 from the ages of 14 to 25 who underwent primary hip arthroscopy. 222 patients fit the inclusion criteria. Patient alpha angle was recorded preoperatively, and degree of acetabular cartilage damage was recorded intraoperatively using the Beck classification system. Beck grades 1 and 2 were considered low-grade damage, and Beck grades 3 and 4 were considered high-grade damage. Patients were separated into the following groups based on alpha angle: below 55°, 55°-65°, 65°-75° degree, and 75° and above. $\chi 2$ analysis was performed to measure statistical differences in cartilage damage between groups.

RESULTS: There were significant differences in grade of acetabular articular cartilage damage between groups. The below 55° group saw 5.9% of patients with high grade cartilage damage. Compared to the 55°-65°, 65°-75° degree, and 75° and above groups, this percentage was 13.5%, 23.9%, and 53.6%, respectively. These differences are statistically significant, with a p-value of less than 0.00001.

DISCUSSION AND CONCLUSION:

In a cohort of adolescent patients, grade of acetabular cartilage damage was higher with increased alpha angle. Over half of adolescent patients with an alpha angle of 75° and above had high-grade acetabular cartilage damage, compared to just 5.9% of patients with alpha angles below 55°. Due to risks associated with high-grade acetabular cartilage damage, including the development of arthritis, more aggressive treatment should be considered in adolescents with high alpha angles, including arthroscopy with femoroplasty and cartilage treatment.