

Hip Morphology and Articular Cartilage Damage

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Summary:

Hip morphology influences the pattern of articular cartilage damage.

Abstract:

INTRODUCTION

To provide reliable data on chondral damage and compare the damage patterns of hip disorders, we observed cartilage lesions in 100 consecutive hip arthroscopies

METHODS

Data were collected at 100 consecutive arthroscopies (34 men and 66 women, with a median age of 47.2 years) and chondral lesions were recorded on anatomic articular maps divided into different anatomical zones. The reasons for hip arthroscopy were FAI in 54, hip joint laxity in 20, borderline dysplasia in 16 and hip dysplasia in 10. The chondral lesions were recorded on anatomic articular maps using the geographic zone method. The depths of cartilage defects were classified according to the International Society for Cartilage Repair (ICRS) grading system. The incidence of cartilage injury and its degree in each grid were calculated. Differences among groups were assessed by ANOVA with Tukey's honestly significant difference test to identify individual group differences. Differences were deemed statistically significant at $p < 0.05$. Statistical analysis was performed with the Statistical Package for Social Science 9.0 version (SPSS Inc. Chicago, Illinois).

RESULTS

There were 819 chondral lesions in 96 patients correlated with associated lesions, including 100 acetabular labral tears and 68 ruptures of the ligamentum teres. In the acetabulum, the most commonly affected zone was the anterior superior zone (80.0%) and the incidence of full thickness defects was high (19.0% in grade 3 and 27.0% in grade 4). The other zones most commonly affected were the middle superior zone (66.0%) and middle inferior zone (46.0%). In the femoral head side, the cartilage injuries were centered in the superior to lateral areas of the anterolateral (51.0%) and lateral zones (48.0%). The apex of the femoral head was also commonly affected (40%), however, partial thickness defects were dominant (27.0% in grade 1, 11.0% in grade 2, 2.0% in grade 3). The distribution and degree of the chondral defects showed a hip morphology-specific pattern. On the acetabular side, there were high incidences of full thickness defects in the anterior superior zone and the middle superior zone in patients with FAI and borderline dysplasia. However, in patients with joint laxity, partial thickness defects were dominant ($p < 0.01$). In patients with acetabular dysplasia, full thickness defects extended even to the posterior superior zone ($p < 0.01$). A high incidence in the middle inferior area was also characteristic for patients with borderline dysplasia (81.2%). On the femoral head side, the incidence of cartilage injuries was high in patients with FAI and borderline dysplasia compared to those with joint laxity and acetabular dysplasia. Several patients with FAI, borderline dysplasia and hip joint laxity had full thickness defects in the superior to lateral areas of the anterolateral and lateral zones ($p < 0.01$).

DISCUSSION

By evaluation of chondral damage using the geographic zone method, we clarified that hip morphology influences the pattern of cartilage damage. Understanding of hip disorder-specific chondral damage patterns may be useful for

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the development of arthroscopic classification of hip disorders.