

CAM Morphology May Influence Age At Which Patients Undergo Hip Arthroplasty

Brian Giordano, MD, USA
Russell LaFrance, MD, USA
Richard Bart Williams, MD, USA
Wes Madsen, MD, USA
Michael D. Maloney, USA
Christopher Drinkwater, MD, USA

University of Rochester
Rochester, New York, USA

Summary:

A retrospective review of the radiographs of 258 consecutive hip arthroplasties over a two-year period showed that patients younger than age 65 with degenerative arthritis were more likely to display CAM type morphology and have at least one radiographic abnormality consistent with FAI when compared to patients 65 or older.

Abstract:

Background:

Reports of pistol grip deformity of the proximal femur leading to hip pain and arthritis have appeared in the orthopaedic literature since the 1960's. More recently, the current concept of femoral acetabular impingement (FAI) has emerged as a mechanical cause of hip pain resulting from abnormal morphology of the proximal femur or the acetabulum. This is thought to lead to an anatomic conflict between the proximal femur and the acetabulum, resulting in chondral injury. The exact incidence of patients with osteoarthritis resulting from FAI is unknown and a causal relationship has not been established. The abnormal morphology typical of FAI is frequently seen in asymptomatic patients. The purpose of this study was to explore the relationship between radiographic markers of FAI in patients undergoing hip arthroplasty below and above the age of 65.

Methods:

We retrospectively reviewed the pre-operative radiographs of patients undergoing hip arthroplasty by a single surgeon over a two-year period. The patients were divided into two groups by age, those 65 and younger (group A) and those older than 65 (group B). Exclusion criteria included acetabular dysplasia, Perthes disease, slipped capital femoral epiphysis, rheumatoid or systemic inflammatory arthritides, post-traumatic arthritis, revision hip surgery, or patients without radiographs adequate for assessing FAI morphology. The radiographs were evaluated for morphology consistent with FAI including an alpha angle > 55, cross over sign, coxa profunda, acetabular protrusion, and ischial spine sign. All patients were evaluated for acetabular dysplasia and joint space narrowing. Three independent reviewers evaluated all radiographs. The incidence of CAM, Pincer, and mixed deformities were compared between the two groups.

Results:
255 patients with 258 hip arthroplasties were included in this analysis. Statistical analysis was performed on the data from each reviewer separately. We found group A to have a statistically significant greater number of patients with CAM morphology and a significantly greater number of patients with at least one radiographic abnormality consistent with a diagnosis of FAI. Linear regression analysis revealed that the alpha angle was greater in younger patients for all three reviewers. There was no difference between the two groups when analyzed for three or more radiographic signs of FAI or Pincer impingement.

Conclusion:

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Patients undergoing hip arthroplasty exhibit a high incidence of radiographic abnormalities consistent with FAI. CAM type morphology occurs in younger patients with advanced arthritis requiring hip arthroplasty more frequently than in older patients. This type of morphology is thought to cause a delaminating injury to the cartilage of the acetabulum and lead to degenerative changes. While our results do not establish a causal relationship, this study supports the notion that CAM type morphology is a risk factor for early development of degenerative arthritis of the hip.