

Using MRI to identify the anatomic predictors of hip impingement

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Video Abstract

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Abstract

A new report in The American Journal of Sports Medicine sheds light on the anatomic features that predispose certain individuals to develop hip impingement, helping answer a question that's perplexed orthopedic specialists for years. Femoroacetabular impingement, or FAI, occurs when extra bone grows along the hip, causing friction in the joint that can lead to symptoms ranging from pain to premature osteoarthritis. What's perplexing is that many individuals with bone deformities assumed to be linked to FAI never go on to develop symptoms of the disorder. That's made it difficult to distinguish what aspects of joint morphology actually give rise to FAI. To uncover the factors that may predict a symptomatic state, an international team of researchers turned to three-dimensional magnetic resonance imaging, which they used to examine the interplay between hip anatomy and various factors relating to the pelvis and also to the spine, that are termed spinopelvic parameters. The hip joints are part of the bony pelvis, which moves around the bicoxofemoral axis, leading to dynamic tilting in different situations. This suggests that interactions between the hip and spinopelvic region may have an important role in FAI pathology. The team imaged 548 individuals. Approximately one third of the group had symptomatic FAI, and the others did not have hip complaints. The results revealed that the symptomatic participants had larger cam deformities, smaller acetabular coverage, and larger pelvic incidence/sacral slope angles than the asymptomatic group. Statistically speaking, the factors that were predictive of a symptomatic state included sacral slope, acetabular inclination, alpha angles measured at 2:00 o'clock and the omega angle. Together, these factors correctly classified 85% of cases. Overall, these findings make it clear that hip morphology should not be considered in isolation when evaluating a patient for potential FAI. Femoral and acetabular factors as well as spinopelvic parameters are also important to accurately assess the likelihood of future symptomatic disease.