

Editorial Commentary: When Is It Just a Labral Tear and Not Femoroacetabular Impingement?



Abstract: How often in medicine do we have a diagnosis or pathology to evaluate and treat that hasn't previously been described? With the introduction of the concept of femoroacetabular impingement in 1999, Ganz and colleagues effectively put forth a not-previously-described diagnosis in the field of orthopaedic surgery that has expanded into the biosphere of musculoskeletal care, where we can find now research on this subject in radiology, rheumatology, biomechanics, biomedical, physical therapy, and sports medicine journals.

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How often in medicine do we have a diagnosis or pathology to evaluate and treat that hasn't previously been described? With the introduction of the concept of femoroacetabular impingement in 1999, Ganz and colleagues¹ effectively put forth such a diagnosis—one that hadn't previously been described in the literature—in the field of orthopaedic surgery that has expanded into the biosphere of musculoskeletal care, where we can now find research on this subject in radiology, rheumatology, biomechanics, biomedical, physical therapy, and sports medicine journals. But do we really know how to differentiate between femoroacetabular impingement and isolated labral pathology, or even early-onset hip arthritis?

Hooper et al.² report a large series of 117 young adolescents who underwent hip arthroscopy for hip pain and/or labral tears at one center by a group of surgeons. This detailed clinical report provides insight into the cause of labral tears as well as gender differences in hip morphology associated with labral tears.

One of the key findings of Hooper et al.² is the higher prevalence of cam morphology (alpha angle $>55^\circ$) in male patients compared with female patients, 39% versus 1%,³ as well as the strong association between the presence of cam morphology and severity of acetabular cartilage damage.⁴ These findings corroborate another study,³ which reported that female patients were at a lesser risk of cam morphology and have

a different clinical presentation in regard to range of motion.⁵ This raises the question of why female patients would be at risk of labral tears in the absence of an obvious bony abnormality. Although the authors reported, in detail, the distribution of cam morphology as well as acetabular overcoverage (lateral center-edge angle [LCEA] $>40^\circ$), there was no mention of dysplasia as a possible diagnosis. Having said that, the authors stated that they excluded patients with a history of dysplasia; however, it is clear in the literature that very commonly, patients are first diagnosed with dysplasia in their adolescence with no history of childhood hip problems.⁶⁻⁸ If one looks at the range for the LCEA (LCEA $<25^\circ$ and Tönnis angle $>10^\circ$) on plain radiographs, there are certainly patients who would fit in the category of acetabular dysplasia. In addition, the authors stated that acetabular retroversion was not evaluated because of the lack of standardization of their anteroposterior pelvis radiographs affecting the sensitivity of the crossover sign. Although this is a valid point, the ischial spine has been shown to be a valid sign of acetabular retroversion independent of pelvic tilt.⁹ As such, conclusions on the cause of labral tears as well as their surgical management should be interpreted with caution because of these deficiencies, as well as lack of patient-reported outcome measurements. This is especially important where quality of medical care in regards to safety and effectiveness is under increasing scrutiny.¹⁰

These limitations are especially relevant because the incidence of patients undergoing femoroplasty as a function of the alpha angle being larger versus smaller than 55° was similar between the two groups: 66% versus 65%. Similarly, when Hooper et al.² compared

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the alpha angle in patients who underwent femoroplasty versus patients who had not, the mean values were similar: 46° versus 44°. These findings raise several important questions in defining causation versus association¹¹: What are the criteria necessary to establish the diagnosis of femoroacetabular impingement? At this point in time, there have been no definitive studies and we still rely heavily on expert opinions.

Is the cam morphology a cause of cartilage damage and/or degenerative arthritis or just an associated finding? Because of the associated biological gradient, the more severe the cam deformity, the greater the acetabular cartilage damage.^{4,12-14} Combined with the consistent location of the damage on the acetabular side, which has been validated in animal¹⁵ and biomechanical models of joint overload,¹⁶ we can state with some certainty that cam morphology is a cause of cartilage damage.

Is our imaging accurate enough to determine the presence or absence of cam morphology? The lack of agreement on what imaging modality is the gold standard, that is, plain radiographs, magnetic resonance imaging, or 3-dimensional computed tomography, to evaluate for cam morphology, as well as the associated measurement errors, leaves this partially unanswered. What we do know is that multi-planar imaging is more sensitive¹⁷ and the alpha angle measurement^{18,19} is the most consistent means of quantifying the head-neck concavity or lack thereof.

As the field of hip preservation surgery of the hip continues to mature, we must strive toward improving the accuracy of our clinical diagnosis so that the medical care provided is of the highest quality, that is, reliable, reproducible, effective, and safe. In the future, looking at the soft-tissue envelope—labrum, capsular thickness, and so on—will enhance our capacity to better delineate borderline pathologies. Finally, the importance of a comprehensive multidisciplinary approach encompassing physical therapists, radiologists, and orthopaedic surgeons offering the full spectrum of care is a critical component of providing the best care possible.

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