Femoroacetabular Impingement (FAI): Counterpoint—Do Not Equate FAI Morphology With FAI Syndrome

William E. Palmer, MD

The author declares that there are no disclosures relevant to the subject matter of this article.

Please see the corresponding Point by Bensler and Fritz in this issue:

Femoroacetabular Impingement (FAI): Point—Early Diagnosis and Treatment of FAI Is Important to Provide a Chance for Hip Joint Preservation. doi.org/10.2214/AJR.21.26198

The hip is susceptible to abnormal morphologies of the proximal femur and acetabular rim. Cam, pincer, and mixed morphologies are associated with chronic repetitive abutment that may cause painful limitation in motion and lead to the diagnosis of femoroacetabular impingement (FAI) syndrome [1]. Early diagnosis and surgery are emphasized, with the goal of hip preservation. However, FAI morphology also occurs in individuals without symptoms. Because FAI morphology has been equated with FAI syndrome, rates of FAI diagnosis and therefore FAI surgery have skyrocketed, along with claims of overdiagnosis and overtreatment.

Despite an overwhelming body of literature on FAI, research studies lack the strong scientific evidence needed to understand patient outcomes and establish practice guidelines. They diverge on outcome measures, diagnostic algorithms, management strategies, operative techniques, and rehabilitation protocols. Practice variations have led to uncertainty and confusion about the significance of FAI morphology.

In the absence of practice guidelines, hip specialists have produced three interdisciplinary consensus statements to identify areas of agreement and disagreement in FAI syndrome [2–4]. Even if not contributing new scientific knowledge, consensus statements may improve quality and uniformity of patient care. They promote the opinions of experts who reach conclusions, whether through open debate or more rigorous techniques such as the Delphi methodology.Clinicians must then interpret and judge these opinions.

The 2016 Warwick agreement [2] convened an international panel of 22 experts (one radiologist) representing five specialties to answer six questions. The first question “What is FAI syndrome?” introduced and formalized FAI as a clinical syndrome [2]. It was decided that the diagnosis of FAI requires a combination of positive symptoms, clinical signs, and imaging findings. Panelists dismissed the concepts of “asymptomatic FAI” and “radiological FAI,” and rejected the role of prophylactic arthroscopy for hip preservation in patients with FAI morphology who do not have symptoms [2].

The second question “How should FAI syndrome be diagnosed?” generated specific details about the symptoms, clinical signs, and imaging findings that characterize FAI syndrome [2]. Panelists agreed that initial imaging evaluation should include an anteroposterior radiograph of the entire pelvis and a lateral femoral neck view of the symptomatic hip. This combination screens for FAI morphology and excludes other causes of hip pain, such as osteoarthritis or acetabular dysplasia. The panel reaffirmed that FAI morphology is essential in diagnosis of FAI syndrome but warned that “a substantial proportion of people in the general population are thought to have cam or pincer morphology” [2].

The 2019 International Society of Hip Preservation (ISHA) physiotherapy agreement [3] convened 11 physiotherapists and eight orthopedic surgeons to address hip examination and nonsurgical treatment in FAI syndrome. The panel used Delphi methodology to answer eight questions. The first question was “How should physiotherapists evaluate a patient presenting with hip pain?” [3]. The answer does not involve imaging but is important for radiologists to understand because it underscores important overlap in symptoms and signs. Physical examination should differentiate hip pain from lumbosacral or abdominal referred pain. It should test for intraarticular versus extraarticular sources of pain. Intraarticular disorders have several classifications including FAI syndrome, hypermobility, and hypomobility. The Warwick panel also viewed hip examinations as challenging [2], FAI pain varies in location, character, severity, and precipitating factors. It can localize not only to the hip or groins but also the back, buttock, or thigh. Groin pain is especially problematic. The 2014 Doha agreement [5] combined a premeeting Delphi procedure with a 1-day consensus meeting to address groin injuries in athletes. Besides hip-related groin pain, it listed numerous overlapping conditions in four additional categories: adductor-, iliopectoas-, inguinal-, and pubic-related groin pain.

The 2019 Lisbon agreement [4] on FAI imaging convened 30 panelists (21 radiologists, nine orthopedists) who used Delphi methodology to generate statements on FAI morphology, image interpretation, and reporting. It considered all major modalities. Imaging goals included identification of chondro labral defects and detection of early or focal osteoarthritis. Similar to the Warwick and ISHA agreements, expert-based opinion was needed given the paucity of high-level scientific evidence and lack of uniformity in day-to-day practice [2, 3]. The panel concluded that “radiographic evaluation is the cornerstone of hip evaluation” [4] but restated the Warwick agreement’s requirement for symptoms and clinical signs in the diagnosis of FAI syndrome [2].

Panelists stressed the importance of dedicated FAI protocols and standardized techniques for achieving reproducibility in image acquisition, qualitative assessment, and quantitative measurement. In cam morphology, they agreed that screening radiographs should combine anteroposterior pelvis and 45° Dunn views. The defining cam feature was increased alpha angle. Compared with radiographs, radial MRI or CT were believed to be more accurate and precise in determining the maximum alpha angle. In pincer morphology, panelists recommended the anteroposterior pelvis view for initial evaluation of acetabular version and coverage. Defining pincer features were crossover, posterior wall, or ischial spine signs for acetabular retroversion and abnormal center-edge angle of Wiberg or acetabular index for acetabular overcoverage. However, the panel acknowledged

1Department of Radiology, Massachusetts General Hospital, 55 Fruit St, YAW 6030, Boston, MA 02114. Address correspondence to W. E. Palmer (wpalmer@mgh.harvard.edu).

doi.org/10.2214/AJR.21.26181

AJR:217, December 2021
practice variations and highlighted the following key point [6]: “diagnostic imaging for FAI is not standardised due to scarce evidence-based guidance on which imaging modalities and diagnostic criteria/parameters should be used.”

In summary, caution is warranted in making imaging-based assumptions about FAI morphology. International expert panels have advised against diagnosing FAI syndrome in patients who do not have symptoms. Moreover, they have warned against the false-positive diagnosis of FAI syndrome in patients who do have symptoms. Not all hip pain is FAI pain. Numerous intraarticular, extraarticular, abdominal, and spinal disorders cause FAI-like symptoms in young patients. For radiologists, a limiting factor is access to high-quality clinical information at the time of image interpretation. The electronic medical record often documents a history of present illness but lacks adequate information about symptoms and signs. Another limiting factor is satisfaction of search. In the presence of FAI morphology, radiologists should describe other potential sources of pain and recognize possible overlapping conditions. Finally, image-based measurements cannot discriminate FAI morphology from FAI syndrome. Such measurements are critical, however, in surgical planning. Radiologists who report measurements in the medical record should recognize potential discrepancies with measurements documented by orthopedists who use different tools and techniques.

**References**