Symptomatic femoroacetabular impingement is a known prearthritic condition, but impingement morphology is poorly defined in the adolescent population. A double-cohort study was undertaken to determine the prevalence of radiographic abnormal femoroacetabular impingement morphology in adolescents with no hip joint symptoms and to determine whether a meaningful difference existed in the prevalence of these parameters between cohorts.

Anteroposterior pelvic radiographs made with the EOS imaging technique (a collaboration among LBM, Paris; LIO, Montreal, Quebec, Canada; Saint Vincent de Paul Hospital, Paris; and Biospace Instruments, Paris, France) were used to stratify patients into 2 groups: those with scoliosis (defined as a coronal curve greater than 10°) and those with spinal asymmetry but no radiographic evidence of scoliosis.

The cohort of patients with scoliosis was selected by alternating between men and women until 45 pelvic images (90 hips) of consecutive patients with scoliosis were obtained. Patients were included if both femora were visualized to the level of the lesser trochanter, the pelvis was within acceptable limits of rotation and inclination, and no preexisting congenital hip problem or history of hip surgery was observed. The second cohort of 45 pelvic images (90 hips) was an age-matched cohort with the same inclusion criteria. No patient had any symptoms related to the hip. Mean age for the 180 patients was 15.9 years (range, 10.2 to 24.6 years).

Radiographs were analyzed for impingement-related parameters, including coxa profunda, protrusio acetabuli, Tönnis angle, anteroposterior alpha angle, center-edge angle, acetabular crossover sign, ischial spine sign, and femoral neck-shaft angle.

Of the 180 hips, 92.8% demonstrated at least 1 parameter suggesting impingement morphology, and 52.2% demonstrated at least 2 signs. Mean Tönnis angle was 2.9° ± 5.5° (range, 1° to 14° to 21°). Mean neck-shaft angle was 132.6° ± 5.5° (range, 120° to 160°). Mean alpha angle for all hips was 49.4° ± 12.4° (range, 31° to 105°), and mean center-edge angle was 31.8° ± 5.9° (range, 18° to 52°).

When the cohorts of male vs female patients and patients with vs without scoliosis were analyzed, no significant differences in Tönnis angle, neck-shaft angle, or protrusion were detected. Abnormal alpha angles (P = .029), crossover signs (P = .029), and ischial spine signs (P = .026) were more common in the cohort without scoliosis, and coxa profunda was more common in women (P = .034).

A high prevalence of radiographic impingement morphology was found beyond the spectrum of normal in this study. Significant differences were also found in the rates of certain radiographic parameters between patients with and without scoliosis. This study suggests that potential similar radiographic findings exist in the age groups just outside adolescence, which should be studied further with larger numbers. Based on these findings, the authors suggest readjusting the spectrum of radiographic measurement values that should be recognized as normal.
As the field of orthopedic surgery advances by developing new procedures and refining its understanding of pathology, a foundation of thorough research is essential. The availability of Level I evidence to help practitioners make sound diagnostic and treatment decisions is critical. As newer fields emerge and new conditions are identified with sometimes complex parameters for diagnosis, it is important to emphasize the care that must be taken in correlating radiographic findings with the clinical presentation.

The article by Schmitz et al radiographically examined hips in asymptomatic adolescents in 2 cohorts: 1 with and 1 without scoliosis. They found a high prevalence of radiographic parameters suggestive of femoroacetabular impingement (FAI), with more than 90% of the hips that were examined demonstrating at least 1 parameter suggestive of impingement morphology and more than 50% demonstrating 2 such signs. Based on their findings, they question whether our definitions of abnormal hip morphology should be redefined. In addition, they caution against the exclusive use of radiographic parameters when evaluating FAI.

This study makes several important points. First, the dangers of relying on radiographic measurements alone, in FAI as well as in many other disorders, cannot be overstated. Basing diagnostic and treatment decisions on imaging findings that may not correlate with the patient’s symptoms and clinical examination findings may delay the correct diagnosis, leading to frustration for both the patient and the orthopedist; at its worst, it may lead to the wrong surgical procedure. This is a particular point to emphasize with those in training. As students and residents take great delight in developing their diagnostic skills, the ability to recognize subtle radiographic findings becomes a point of pride and is often something tested, both in written examinations and in person during rounds; the importance of a detailed clinical examination must be stressed as well. Despite continuing advances in technology, imaging cannot be the sole basis for diagnosis.

Furthermore, because the authors found a high prevalence of radiographic parameters suggestive of impingement in their study cohorts, despite the participants all being asymptomatic, they suggest that this should lead to a reconsidering of the definitions of normal hip morphology. In particular, they question whether coxa profunda should be considered normal rather than pathologic, and they note that they also found a high prevalence among these asymptomatic hips for the other parameters they examined. Given the high prevalence in their study, it seems reasonable to consider coxa profunda insufficient in isolation for the diagnosis of FAI. In addition, this study suggests the need for further anatomic, radiographic, and natural history studies to refine our understanding of FAI. Larger numbers across multiple studies and cohorts will help to provide better evidence for improved decision making in treating FAI.

This is a clear and well-conducted diagnostic study. Its significance to the practicing orthopedist should be to use caution when treating adolescents with suspected FAI. Careful attention should be paid to correlating symptoms and physical examination findings to radiographic findings and not making treatment decisions based on imaging alone.

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