

Interesting image

Incidentally Detected Suspicion of Mild Acetabular Dysplasia During Bone Mineral Densitometry Examination

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Abstract

Acetabular dysplasia is characterized by insufficient acetabular coverage of the femoral head, resulting in abnormal load concentration across the hip joint and potentially leading to labral injury and degenerative osteoarthritis. Adult acetabular dysplasia often presents with mild or intermittent symptoms, which may delay diagnosis. This case aims to demonstrate the clinical value of visual assessment of bone mineral densitometry image using dual-energy X-ray absorptiometry through the incidental detection of suspected mild acetabular dysplasia during routine bone mineral density examination.

Keywords: Dual-energy X-ray Absorptiometry, Bone Mineral Densitometry, Acetabular dysplasia, Radiologic Technologist

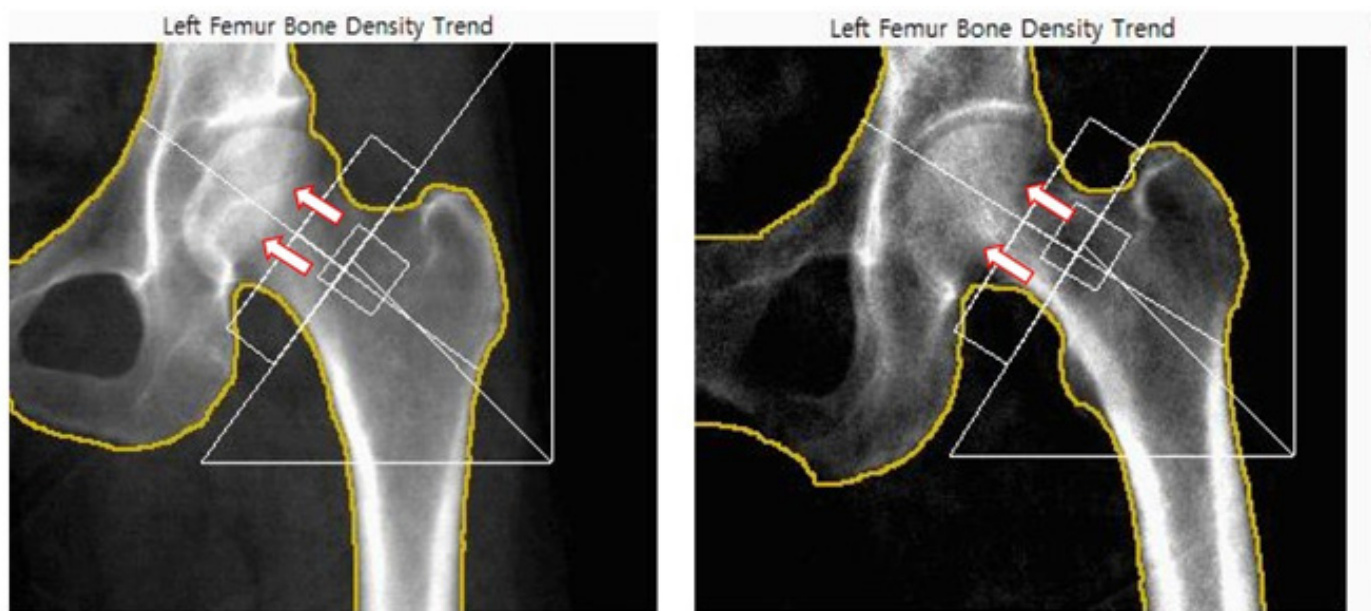


Fig. 1. Comparison of left proximal femur BMD images. The bone mineral densitometry (BMD) image using dual-energy X-ray absorptiometry (DXA) obtained from a 55-year-old female participant referred from a clinical trial center demonstrates decreased acetabular coverage (arrows), relative acetabular shallowness, increased superolateral exposure of the femoral head, and mild degenerative changes, raising suspicion of mild acetabular dysplasia (A). Additional review by a nuclear medicine physician supported these findings. In contrast, the BMD image of a normal subject demonstrates adequate acetabular coverage (arrows) and normal containment of the femoral head (B).

A 55-year-old woman was referred from a clinical trial center for bone mineral density assessment as part of an evaluation of a test food product. During review of the left proximal femur BMD image, increased superolateral exposure of the femoral head and decreased acetabular coverage were observed, raising suspicion of mild left acetabular dysplasia. Additional questioning revealed that the patient had experienced left hip pain for several days several weeks earlier, although the symptoms had resolved at the time of examination.

The patient was informed that insufficient acetabular coverage may increase focal loading of the hip joint and potentially contribute to degenerative changes over time. She was advised to seek consultation with a hip specialist if symptoms recurred or persisted.

Acetabular dysplasia is an important cause of abnormal load transmission across the hip joint and may lead to labral injury and early osteoarthritis of the hip [1,3]. Adult acetabular dysplasia frequently presents with mild or intermittent symptoms, which may delay diagnosis, making appropriate radiographic assessment essential [2]. Furthermore, mild acetabular dysplasia may remain asymptomatic or present with only transient symptoms, making early detection difficult [4].

In the present case, visual assessment of the BMD image revealed decreased acetabular coverage and increased superolateral exposure of the femoral head. Additional history taking identified a previous episode of hip pain. Furthermore, additional review by a nuclear medicine physician supported the suspicion of mild acetabular dysplasia accompanied by mild degenerative changes, providing additional support for the imaging findings.

Although recent studies report high agreement and reproducibility [intraclass correlation coefficient (ICC) 0.8–0.9] between DXA and plain radiography for major hip morphological indices, such as the lateral center-edge angle (LCEA) and acetabular index [5], this case is limited by the lack of quantitative measurements due to software restrictions and a localized single-hip view that prevents establishing a pelvic horizontal reference line [6]. Furthermore, unlike standard pelvic radiographs, DXA is performed in a non-weight-bearing position; thus, subtle geometric distortions or projection effects caused by pelvic tilt, rotation, or beam geometry cannot be entirely ruled out [7]. Therefore, direct comparison with standard weight-bearing AP pelvis radiography and quantitative angular analysis is required in future investigations to confirm its clinical utility.

Although confirmatory radiographic examination or orthopedic evaluation was not performed, the patient was informed of the possible hip abnormality and advised to seek specialist consultation if symptoms developed. This case demonstrates that BMD examinations, although primarily performed for bone mineral density assessment, may provide clinically meaningful information through careful visual analysis of the acquired images. Careful image review by radiologic technologists may contribute to the early recognition of potential hip disorders and expand the clinical value of BMD image.

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