Diagnostic efficacy of dual-energy CT virtual non-calcium technique in the diagnosis of bone marrow edema of sacroiliac joints in ankylosing spondylitis

Lu et al. (2025), in *Journal of Orthopaedic Surgery and Research*

Products
Dual-energy CT (DECT) Virtual Non-Calcium (VNCa) imaging for sacroiliac joint bone marrow edema (BME) in ankylosing spondylitis (AS).

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Clinical Background
Ankylosing spondylitis (AS) affects the sacroiliac joints, leading to inflammation and structural changes. Bone marrow edema (BME) is a key indicator of active disease. While MRI is the gold standard for detecting BME, DECT VNCa provides a faster, cost-effective alternative for assessing BME in AS.

Aim of Study
To evaluate the diagnostic efficacy of DECT VNCa in detecting BME in sacroiliac joints and its performance compared to MRI.

Cohort Study
42 AS patients underwent same-day DECT and MRI. BME was assessed on iliac and sacral surfaces, with MRI as the reference. Qualitative and quantitative analyses were performed to evaluate DECT's diagnostic accuracy.

Link to paper

Results

- **Sensitivity: 92.5% (iliac), 88.4% (sacral)**
- **Specificity: 90.7% (iliac), 87.8% (sacral)**
- **CT values:** Edematous areas: **−41.4 HU (iliac), −38.8 HU (sacral)** vs. Normal areas: **−79.6 HU (iliac), −72.8 HU (sacral)**
- **AUC values: 0.90 (iliac), 0.89 (sacral)**
- **Optimal CT cutoff: −57.4 HU (iliac), −56.8 HU (sacral)**

Summary

- **DECT VNCa effectively detects BME** in **ankylosing spondylitis**, offering a **reliable alternative** to MRI.
- **High sensitivity and specificity** in both **visual and quantitative assessments** confirm **strong diagnostic accuracy**.
- **CT values correlate with BME severity**, supporting **early detection and monitoring**.
- **Faster, cost-effective imaging** makes **DECT VNCa a valuable tool** for **AS diagnosis and management**.

Source: Lu, H., Li, Z., Liang, Z., Liu, Y. (2025). DOI: 10.1186/s13018-024-05341-3, in *Journal of Orthopaedic Surgery and Research*.