

## Diagnostic value of SPECT/CT in axial spondyloarthritis

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**Background/Aims:** Spondyloarthropathies (SpA) including ankylosing spondylitis are characterized by inflammatory arthritis involving the spine and peripheral joints. Bone SPECT/CT is in the spotlight as it can reflect the current level of inflammation. We aimed to investigate the diagnostic performance of bone SPECT/CT for axial SpA (axSpA) at the level of sacroiliac joints.

**Methods:** Patients with low back pain who had undergone SPECT/CT of the SI joints were selected for inclusion in this study through a retrospective review of medical records from August 2016 and July 2018. We used semi-quantitative scoring methods for SPECT/CT. For visual scoring, a score of 0 was assigned when tracer uptake in the sacroiliac joint was less than that in the sacrum; a score of 1, when equal to that in the sacrum; and a score of 2, when greater than that in the sacrum. A score of 2 was considered positive for the diagnosis of sacroiliitis on SPECT/CT (Figure 1). The diagnosis of axSpA was retained when patients fulfilled the Assessment of SpA International Society criteria.

**Results:** A total of 164 patients were enrolled (34 patients with axSpA). The remaining 130 patients had non-axSpA rheumatic inflammatory disease (n=24), vertebral disk herniation (n=13), avascular necrosis (n=11), and others such as bursitis, and fracture (n=85). The mean age of aSpA ( $37.8 \pm 15.6$  years) was lower than controls ( $49.8 \pm 16.4$  years) ( $p < 0.001$ ), and axSpA (64.5 %) had more male than others (42.1 %) ( $p = 0.024$ ). The sensitivity, specificity, positive and negative predictive values of bone SPECT/CT for axSpA were 83.9%, 63.2%, 34.7%, and 94.4%, respectively. The bone SPECT/CT maximal score and BASDAI score has positive correlation ( $r = 0.481$ ,  $p = 0.007$ ). The bone SPECT/CT compared with MRI is marginal correlation ( $k = 0.369$ ,  $p < 0.001$ ).

**Conclusions:** In patients with low back pain, the bone SPECT/CT has a high negative predictive value that can exclude AS. In addition, when contraindication in MRI the bone SPECT/CT can be an alternative test.

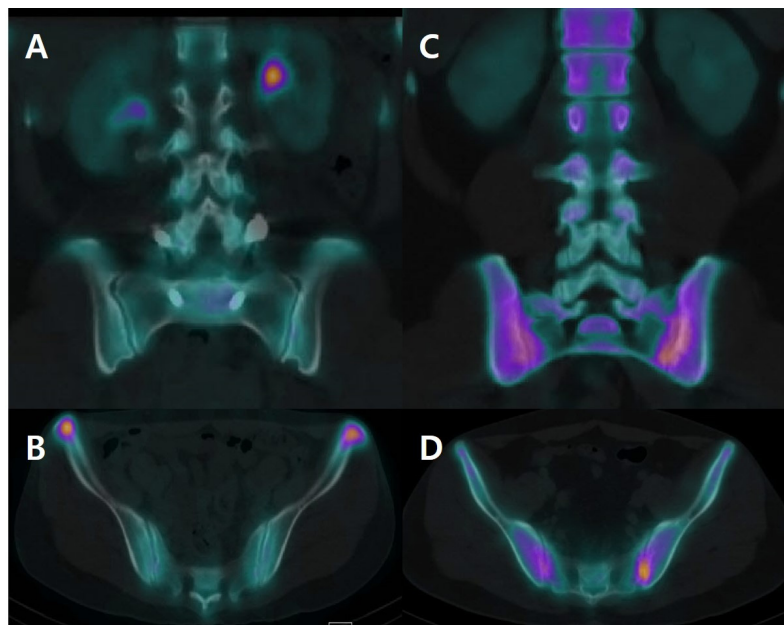


Figure 1. There is two bone SPECT/CT imaging. (A,B) 44 years old female diagnosed with ankylosing spondylitis (AS) and her Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) score is 2.2. For visual scoring is 1 because sacroiliac joint was equal to sacrum. (C,D) 26 years old male, he diagnosed AS and BASDAI score is 4. sacroiliac joint uptake is greater than the sacrum, so semi-quantitative scoring is 2.