Interpreting X-Ray in Axial Spondyloarthritis (Axial SpA)

Axial SpA is a type of spondyloarthritis in which the predominant symptom is inflammatory back pain and where radiographic sacroiliitis may or may not be present. The term axial SpA includes ankylosing spondylitis (AS) and non-radiographic axial SpA (nr-axSpA).

X-ray can usually be performed to assess if the patient has radiographic sacroiliitis. If a patient’s radiograph reveals bilateral grade 2-4 or unilateral grade 3-4 they may fulfil the modified New York criteria (mNYc) for AS (see below). Grade 1 (unilateral/bilateral) or grade 2 (unilateral) sacroiliitis may also be a sign of axial SpA (even though they do not meet the mNYc) therefore you should consider performing magnetic resonance imaging (MRI) to investigate further.

**Modified New York Criteria (mNYc) for Ankylosing Spondylitis**

A diagnosis of AS may be made if radiographic sacroiliitis (bilateral grade 2-4 or unilateral grade 3-4) and one of the clinical criteria are present.\(^1\)

Clinical criteria:
- Low back pain and stiffness for >3 months which improves with exercise but is not relieved by rest.
- Limitation of motion of the lumbar spine in both the sagittal and frontal planes.
- Limitation of chest expansion relative to normal values corrected for age and sex.

**Grading of radiographic sacroiliitis:**\(^1\)

<table>
<thead>
<tr>
<th>Grade 0:</th>
<th>Grade 1:</th>
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<tbody>
<tr>
<td>Normal</td>
<td>Suspicious</td>
</tr>
<tr>
<td>(no specific abnormality)</td>
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<table>
<thead>
<tr>
<th>Grade 2:</th>
<th>Grade 3:</th>
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<tr>
<td>Minimum abnormality</td>
<td>Moderate abnormality</td>
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<td>(loss of definition at the edge of the sacroiliac joints, there is some sclerosis and perhaps minimal erosion, there may be some joint space narrowing)</td>
<td>(definite sclerosis on both sides, blurring and indistinct margins and erosive changes with loss of joint space)</td>
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If the sacroiliac joints (on the radiograph of anteroposterior (AP) pelvis) are normal, grade 1 (unilateral/bilateral) or grade 2 (unilateral) then an MRI should be considered to further evaluate for early sacroiliitis.

Grade 4:
- Complete ankylosis (without residual sclerosis)
X-rays for suspected axial SpA:

- **Recommended:** An anteroposterior (AP) radiograph of the pelvis, which includes the hips and sacroiliac joints, is recommended to assess for axial SpA. There is little evidence to support the use of oblique or angled views over an AP view; however, a study has shown that oblique views may be advantageous in assessing sacroiliitis in early axial SpA. The AP view is associated with reduced radiation exposure than oblique and angled views and also allows the assessment of the hip joints, which are commonly involved in axial SpA.

- **Other X-rays that may be useful:**
  - Cervical spine
  - Lumbar spine

Spondyloarthritic changes in the thoracic spine are more difficult to detect due to overlying structures and should, therefore, be considered on a case by case basis.

**Typical X-ray changes seen in the spine**

Typical changes in the spine of a patient with axial SpA include shiny corners, squaring of the vertebral bodies and syndesmophytes.