



AS/r-axSpA 3D Explorer

A visual exploration of common skeletal changes and imaging findings in AS/r-axSpA through three patient scenarios

LET'S EXPLORE >>



Early Stage

Inflammatory lower back pain for 2-3 years, morning stiffness that improves with movement, fatigue

Mid Stage

Middle back pain for 6-10 years, morning stiffness lasting 2-3 hours, profound fatigue

Late Stage

Neck and middle back pain in addition to lower back pain for 20 years or longer, mild shortness of breath, fatigue



AS/r-axSpA 3D Explorer

A visual exploration of common skeletal changes and imaging findings in AS/r-axSpA through three patient scenarios

LET'S EXPLORE >>

Early Stage

Inflammatory lower back pain for 3-6 years, morning stiffness that improves with movement, fatigue

Late Stage

Back and middle back pain in addition to lower back pain for 20 years or longer, mild shortness of breath, fatigue

Mid Stage

Middle back pain for 8-10 years, morning stiffness lasting 2-3 hours, profound fatigue





AS/r-axSpA 3D Explorer

A visual exploration of common skeletal changes and imaging findings in AS/r-axSpA through three patient scenarios

LET'S EXPLORE >>

Early Stage
Inflammatory lower back pain for 3-12 years, morning stiffness that improves with movement, fatigue

Mid Stage
Middle back pain for 6-10 years, morning stiffness lasting 3-12 hours, profound fatigue

Late Stage
Neck and middle back pain in addition to lower back pain for 20 years or longer, mild shortness of breath, fatigue





Early Stage

Mid Stage

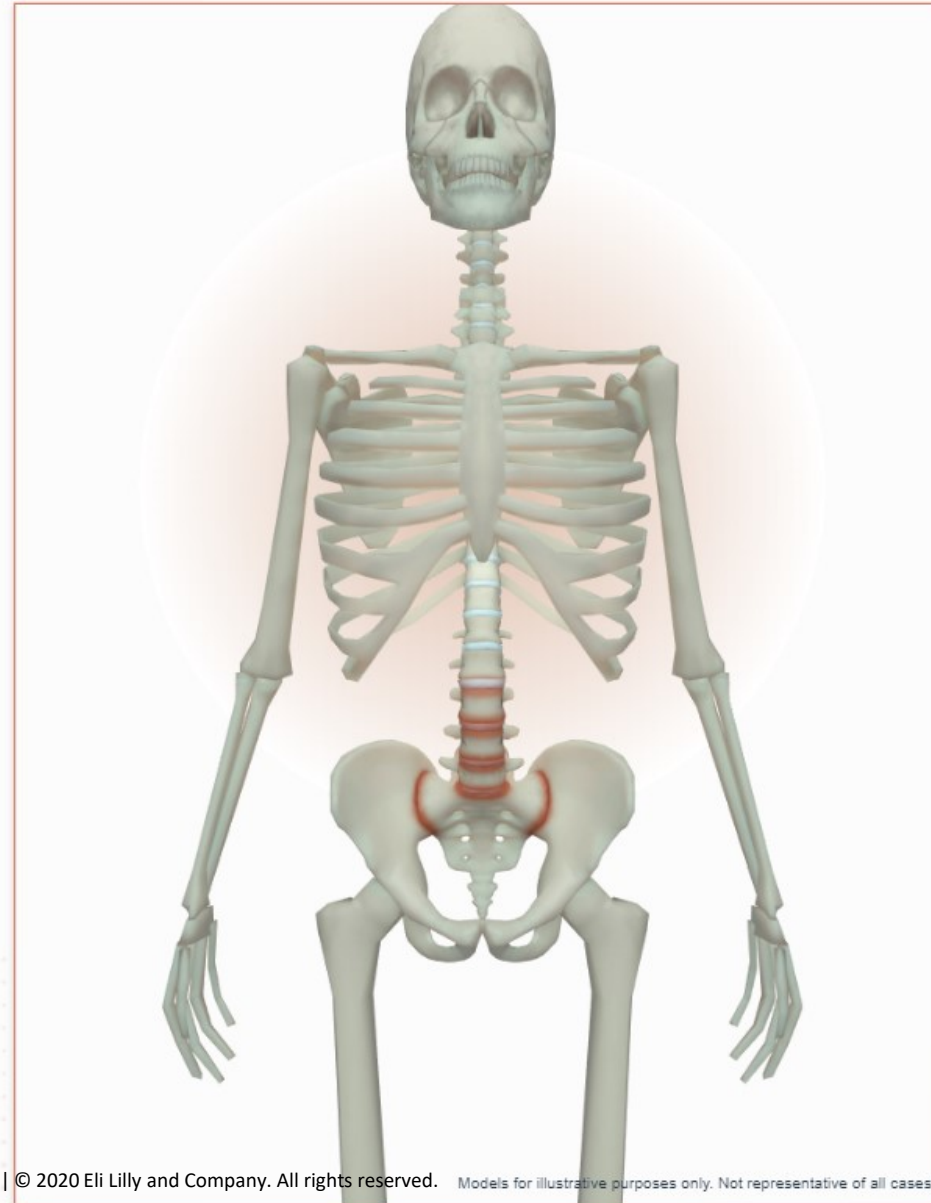
Late Stage

Patient Symptoms

In the early stage of the disease, patients with AS/r-axSpA may present with:

- Inflammatory lower back pain for quite some time, usually 2 to 3 years
- Morning stiffness that improves with movement
- Fatigue

Disease progression is variable among patients with AS/r-axSpA¹



EXPLORE
SIJ Skeletal
Changes >>



EXPLORE
Spine Skeletal
Changes >>

EXPLORE
Pathophysiological
Changes >>



Early Stage

Mid Stage

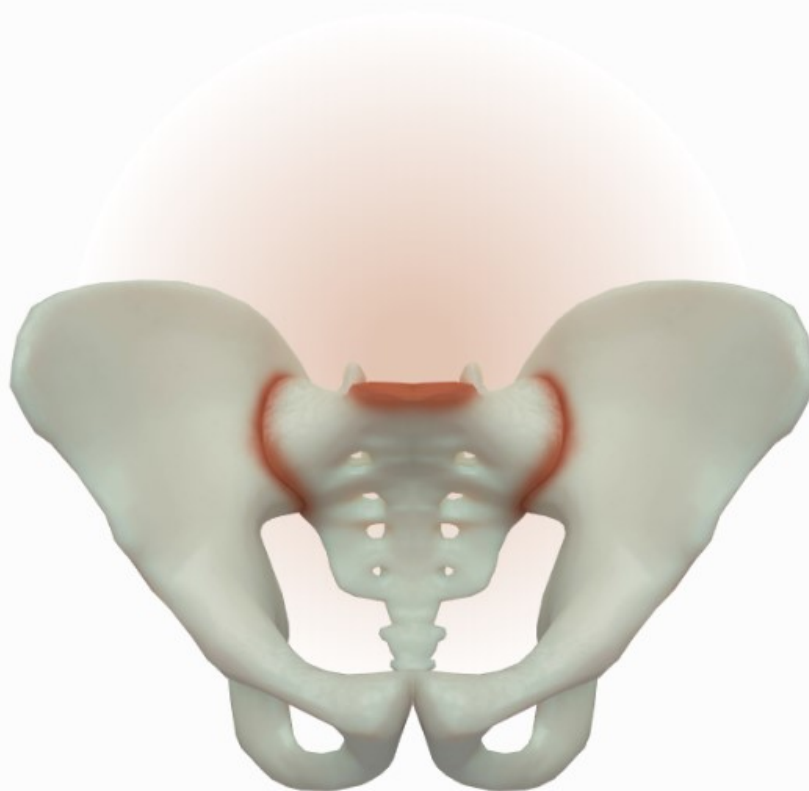
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Disease progression is variable among patients with AS/r-axSpA¹



SIJ Skeletal Changes

Early abnormalities in AS/r-axSpA usually include inflammation and small localized areas of erosion in the SIJs¹⁻⁴

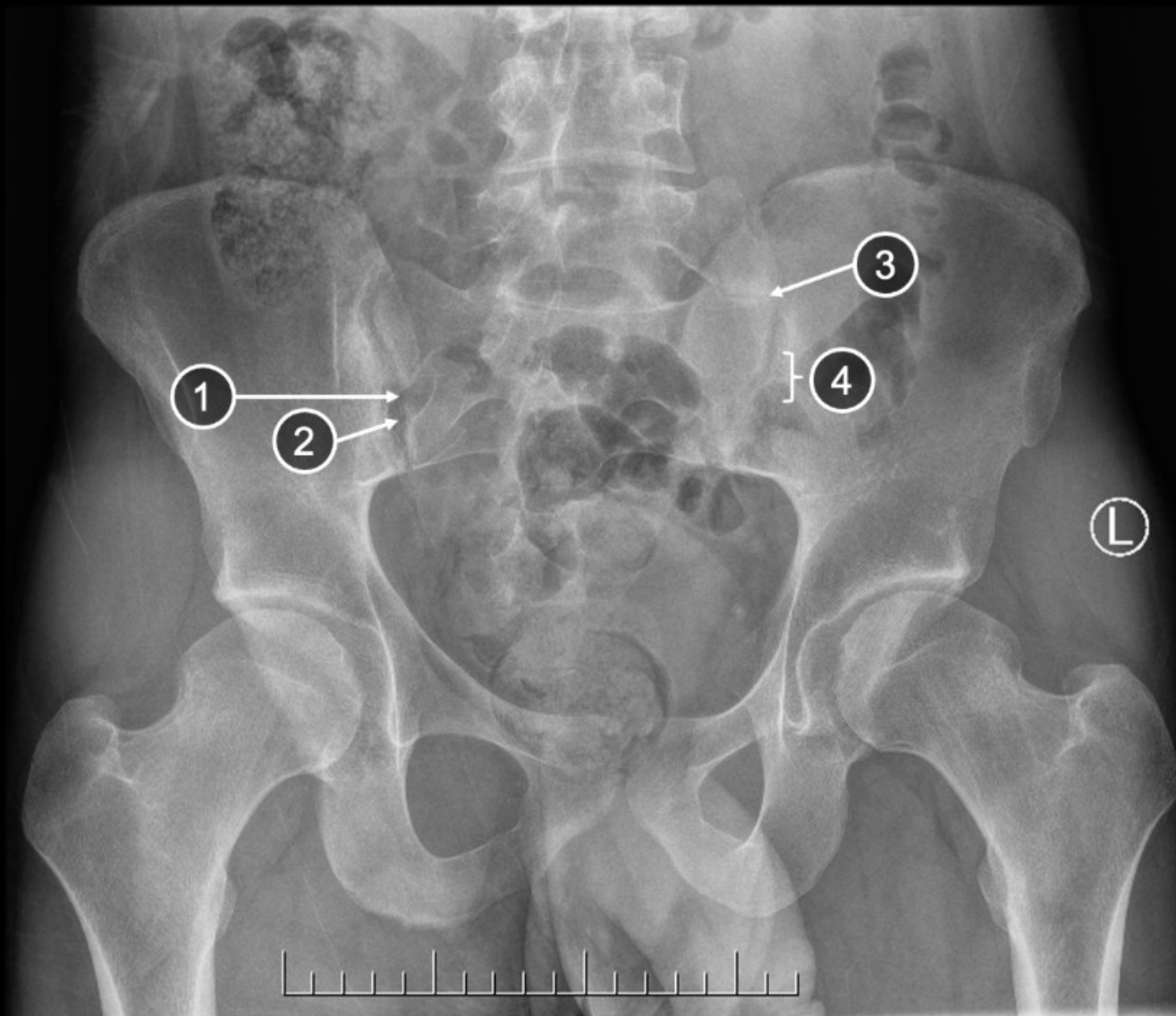
[VIEW X-RAY >>](#)

[VIEW MRI >>](#)



Early | SIJ X-ray

- The SIJs show widening and narrowing of the joint space, and an erosion in the right SIJ, all of which are consistent with Grade 2 sacroiliitis³



1. Erosion
2. Joint space widening
3. Joint space narrowing
4. Irregular joint space

Image courtesy of Dr. R. Inman (2019) with permission to use in the AS/r-axSpA 3D Explorer Tool for educating HCPs globally.



Early | SIJ MRI

- Bone marrow edema, indicative of inflammation, in both SIJs is detected using STIR sequence^{1,3,5}

1. Bone marrow edema

Image courtesy of Dr. R. Inman (2019) with permission to use in the AS/r-axSpA 3D Explorer Tool for educating HCPs globally.



Early Stage

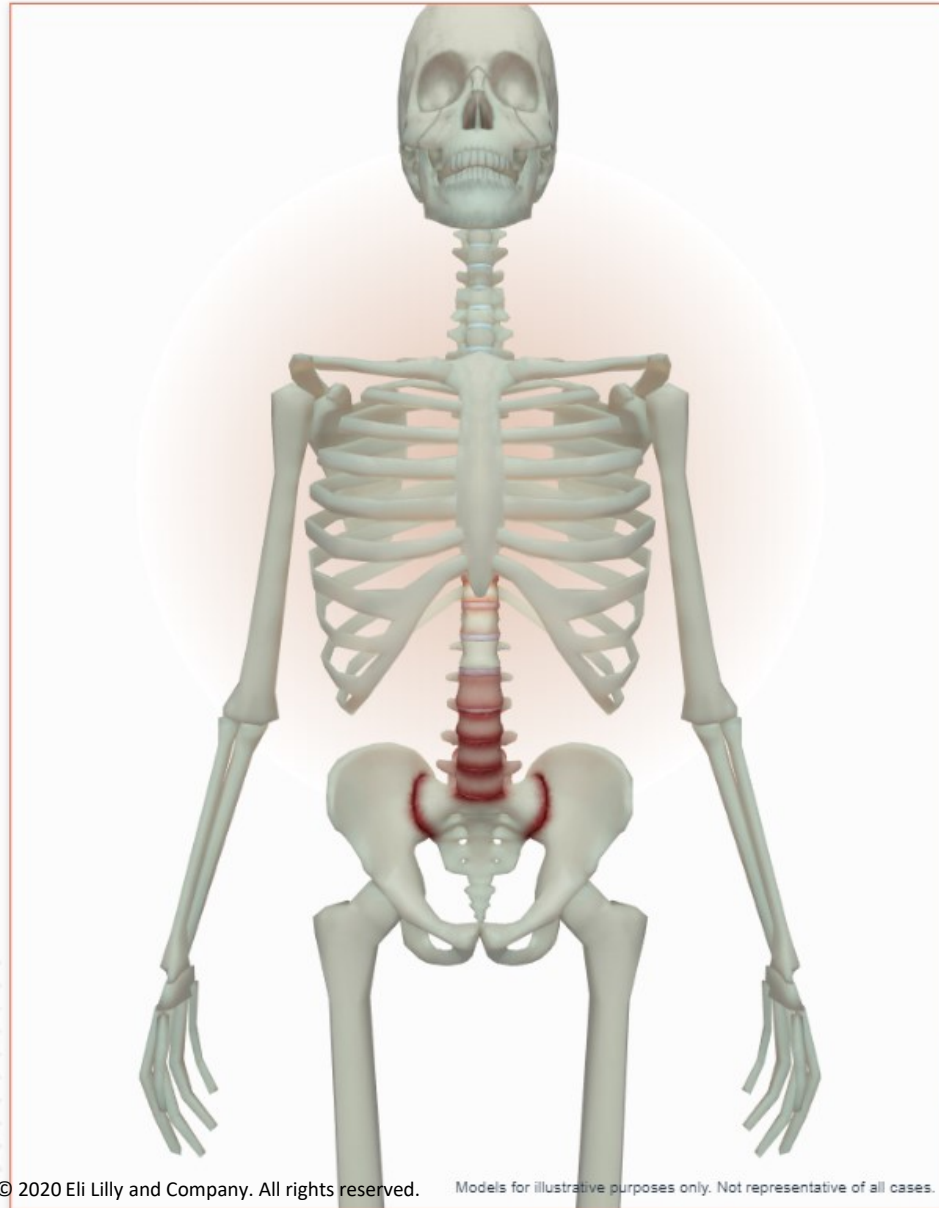
Mid Stage

Late Stage

Patient Symptoms

As the disease persists, patients with AS/r-axSpA may present with:

- Middle back pain of much longer duration, usually 8 to 10 years
- Difficulty bending over
- Morning stiffness lasting 2 to 3 hours
- Profound fatigue



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Early Stage

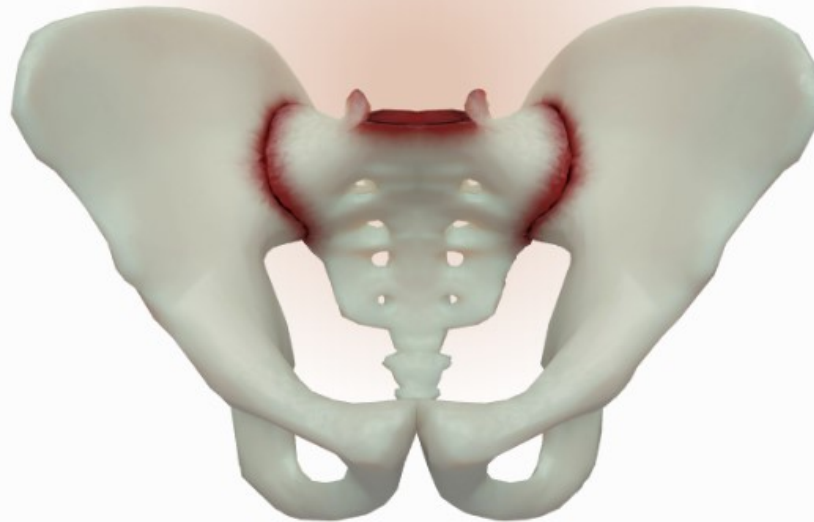
Mid Stage

Late Stage

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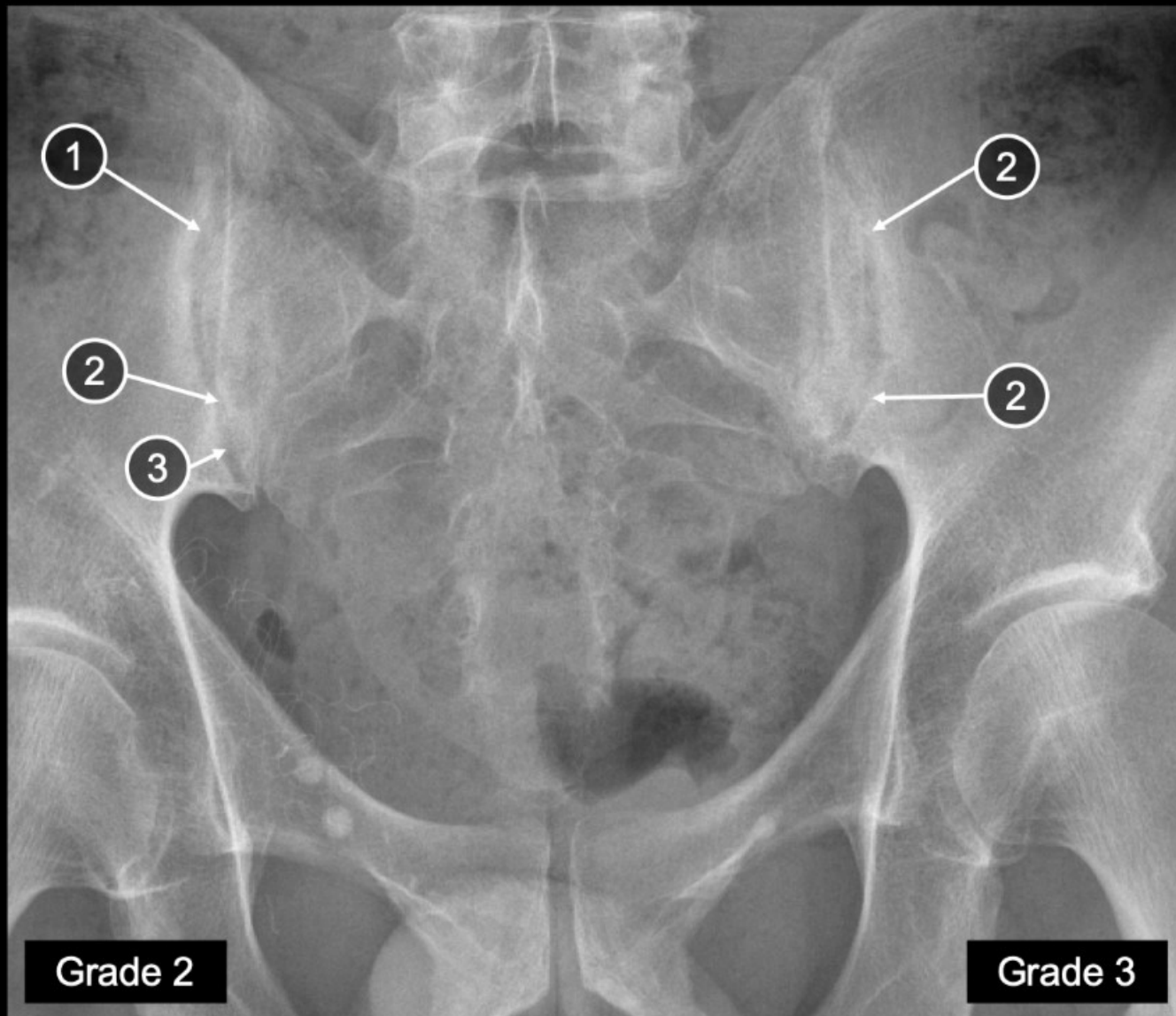


SIJ Skeletal Changes

Inflammation, evidence of progressive erosions, and joint space alteration with areas of widening and/or narrowing are characteristic findings in mid-stage AS/r-axSpA^{1,5}

[VIEW X-RAY >>](#)

[VIEW MRI >>](#)



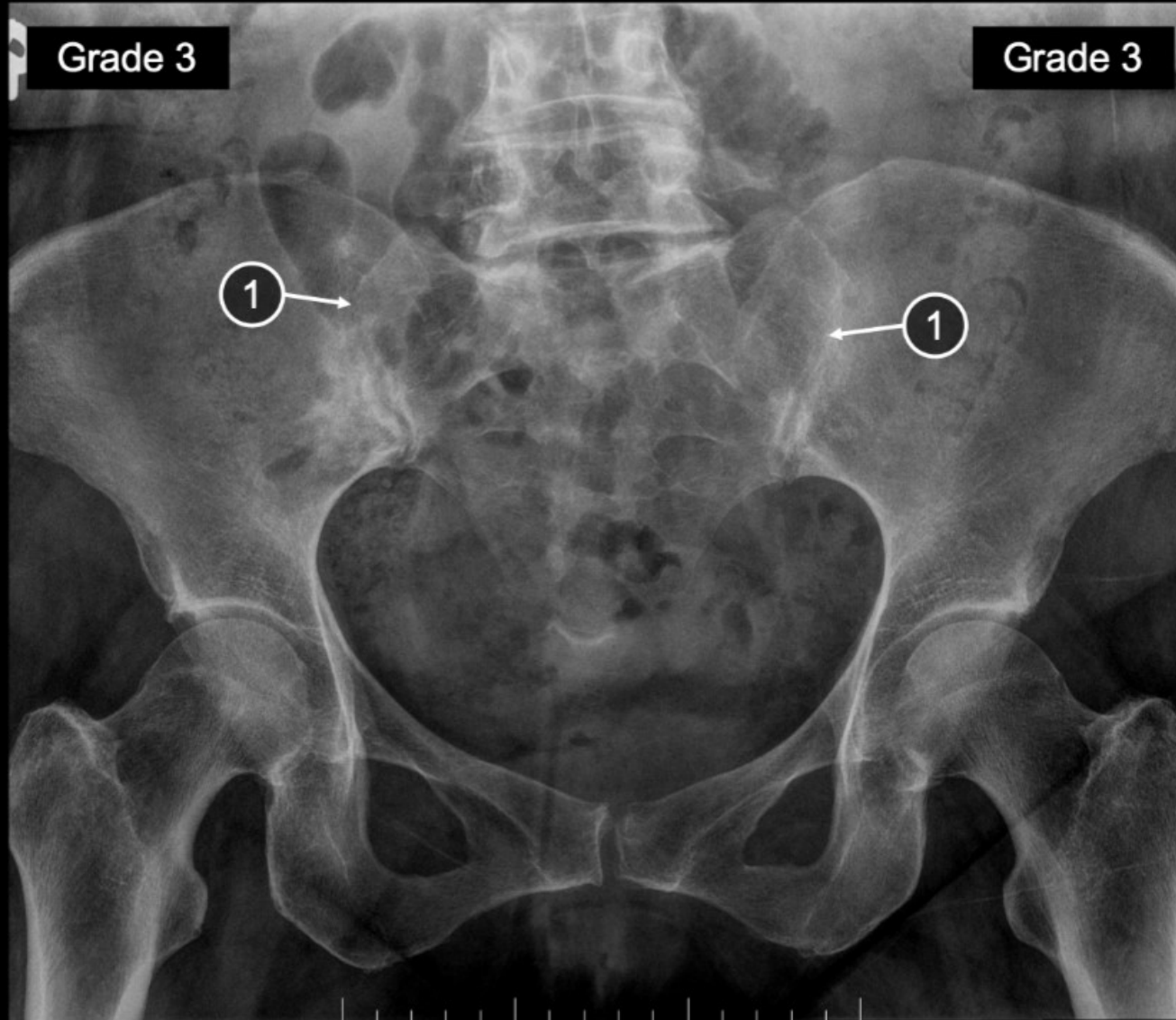
Mid | SIJ X-ray

- Grade 2 sacroiliitis defined by inflammation and localized areas of erosion is seen on one side, and Grade 3 sacroiliitis that involves progressive erosion, and widening and narrowing of joint space is seen on the other side³



1. Irregular joint space with areas of widening
2. Joint space with severe narrowing
3. Erosion

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Mid | SIJ X-ray

- Bilateral Grade 3 sacroiliitis with areas of ankylosis seen on X-ray³

1. Areas of ankylosis

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Mid | SIJ MRI

- Bone marrow edema in both SIJs is observed on MRI STIR sequence^{3,10}

1. Bone marrow edema

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Early Stage

Mid Stage

Late Stage

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Spine Skeletal Changes

In addition to inflammation, abnormalities in mid-stage AS/r-axSpA can involve syndesmophytes and some fusion of facet joints^{5,11}

[VIEW X-RAY >>](#)

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Mid | Spine X-ray

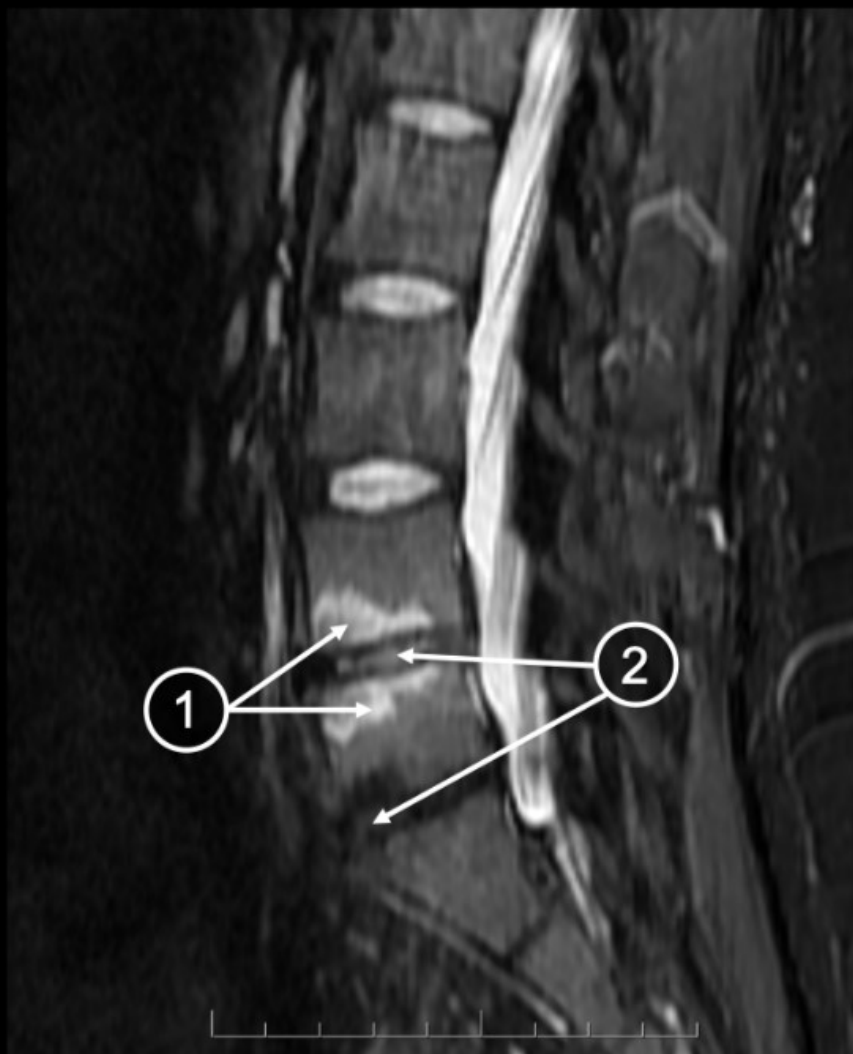
- Erosion combined with syndesmophytes in patients with AS/r-axSpA are indicative of a more advanced stage of disease^{5,11}

1. Erosion
2. Syndesmophyte

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Lumbar spine



Mid | Spine MRI

- Bone marrow edema in vertebral bodies and spondylodiscitis, both indicative of active inflammation, can be detected by STIR sequence^{3,5}

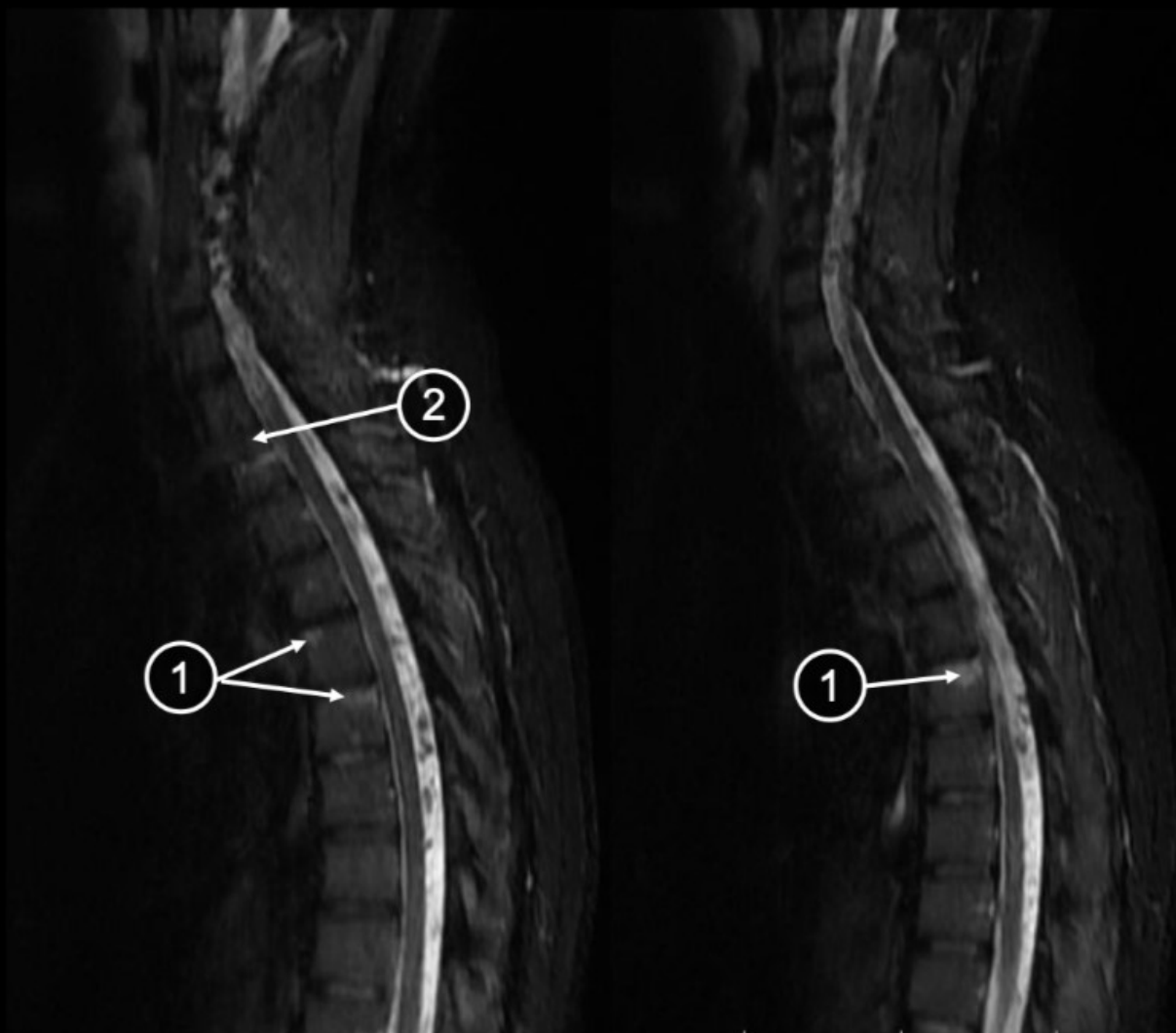


1. Bone marrow edema
2. Discitis

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Cervical-thoracic spine



Mid | Spine MRI

- Bone marrow edema in vertebral bodies and spondylodiscitis, both indicative of active inflammation, can be detected by STIR sequence^{3,5}

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2. Discitis

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Early Stage

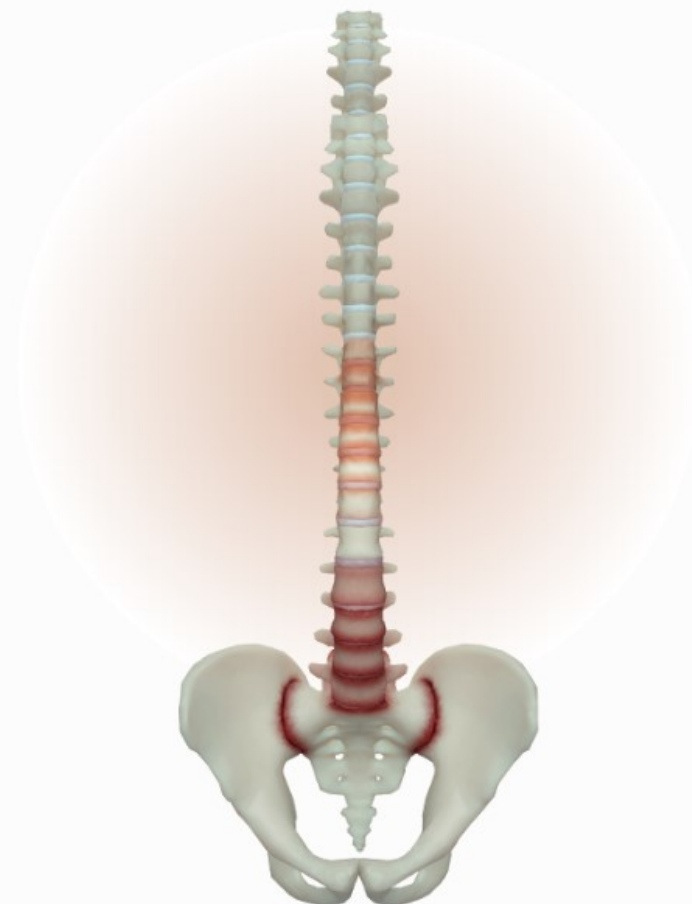
Mid Stage

Late Stage

Patient Symptoms

As the disease persists, patients with AS/r-axSpA may present with:

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Pathophysiological Changes

- Ongoing inflammation in AS/r-axSpA contributes to increasingly pronounced bone erosions⁸
- Inflammation is followed by a repair process that triggers pathogenic bone formation^{12,13}



Early Stage

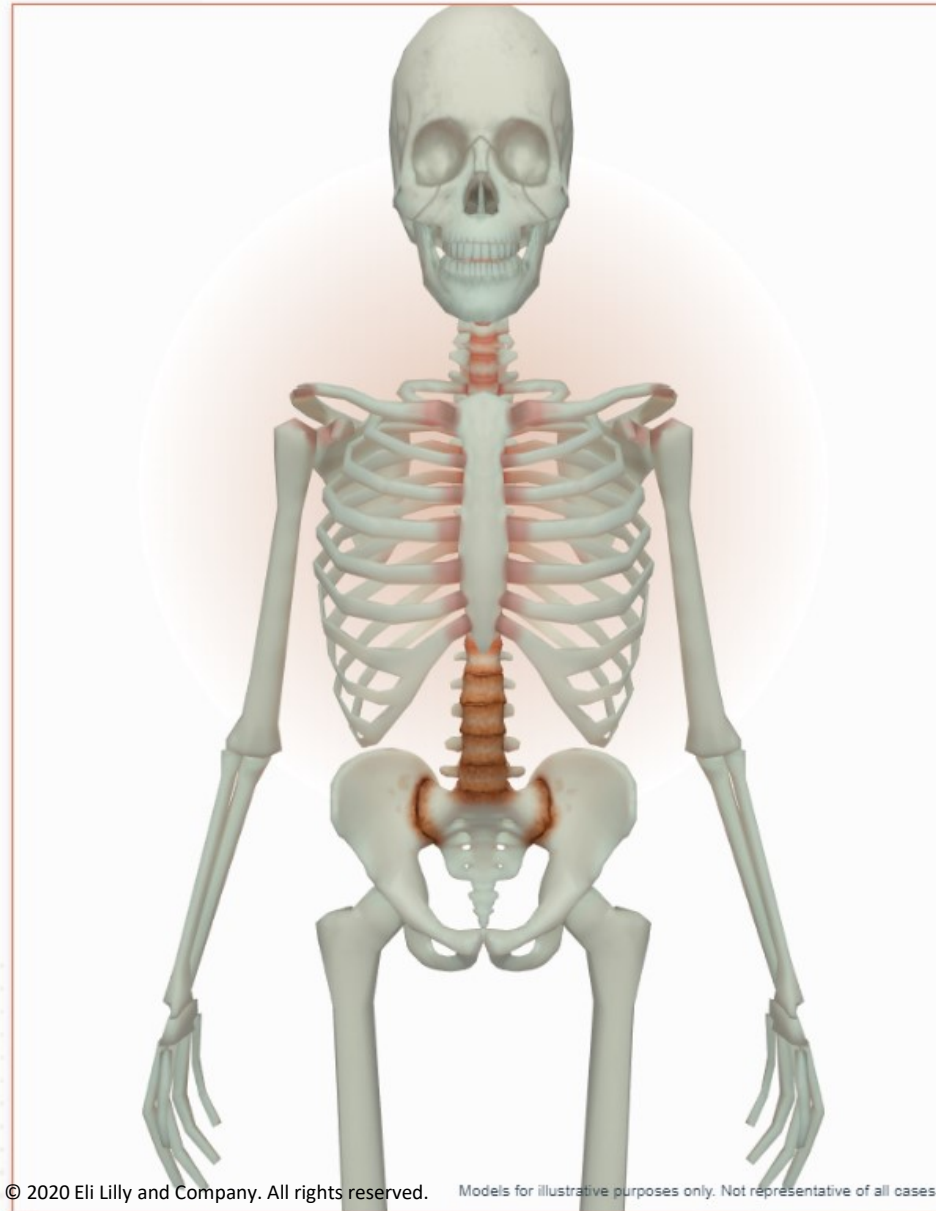
Mid Stage

Late Stage

Patient Symptoms

In the late stage of the disease, patients with AS/r-axSpA may present with:

- Neck and middle back pain in addition to lower back pain that has been ongoing for a long time, usually 20 years or more
- Difficulty performing everyday activities such as tying shoelaces and checking blind spots
- Mild shortness of breath with exertion
- Fatigue



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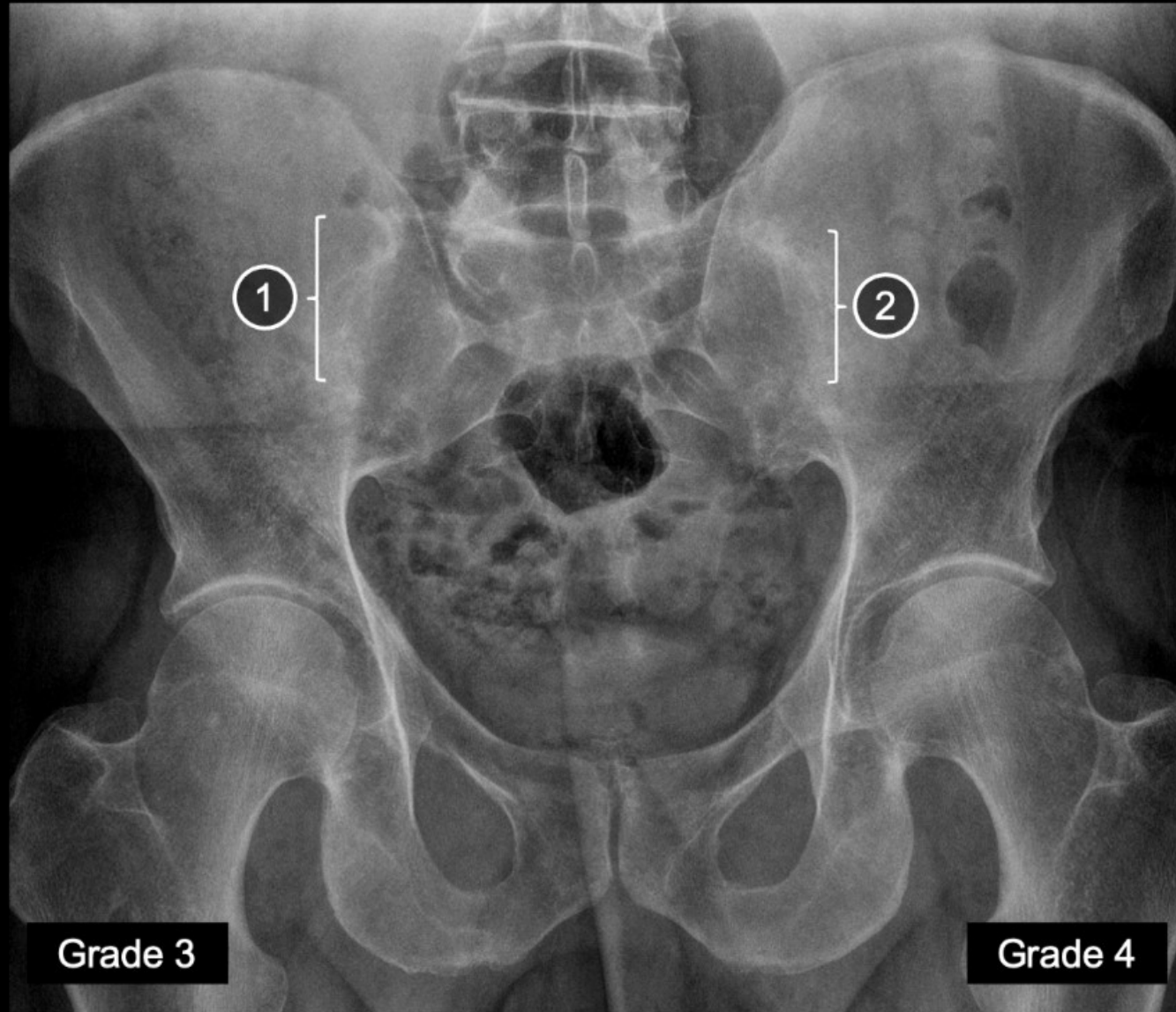


SIJ Skeletal Changes

Typical SIJ changes at this stage of AS/r-axSpA include partial or complete bone fusion (ankylosis)^{5,10}

[VIEW X-RAY >>](#)

[VIEW MRI >>](#)



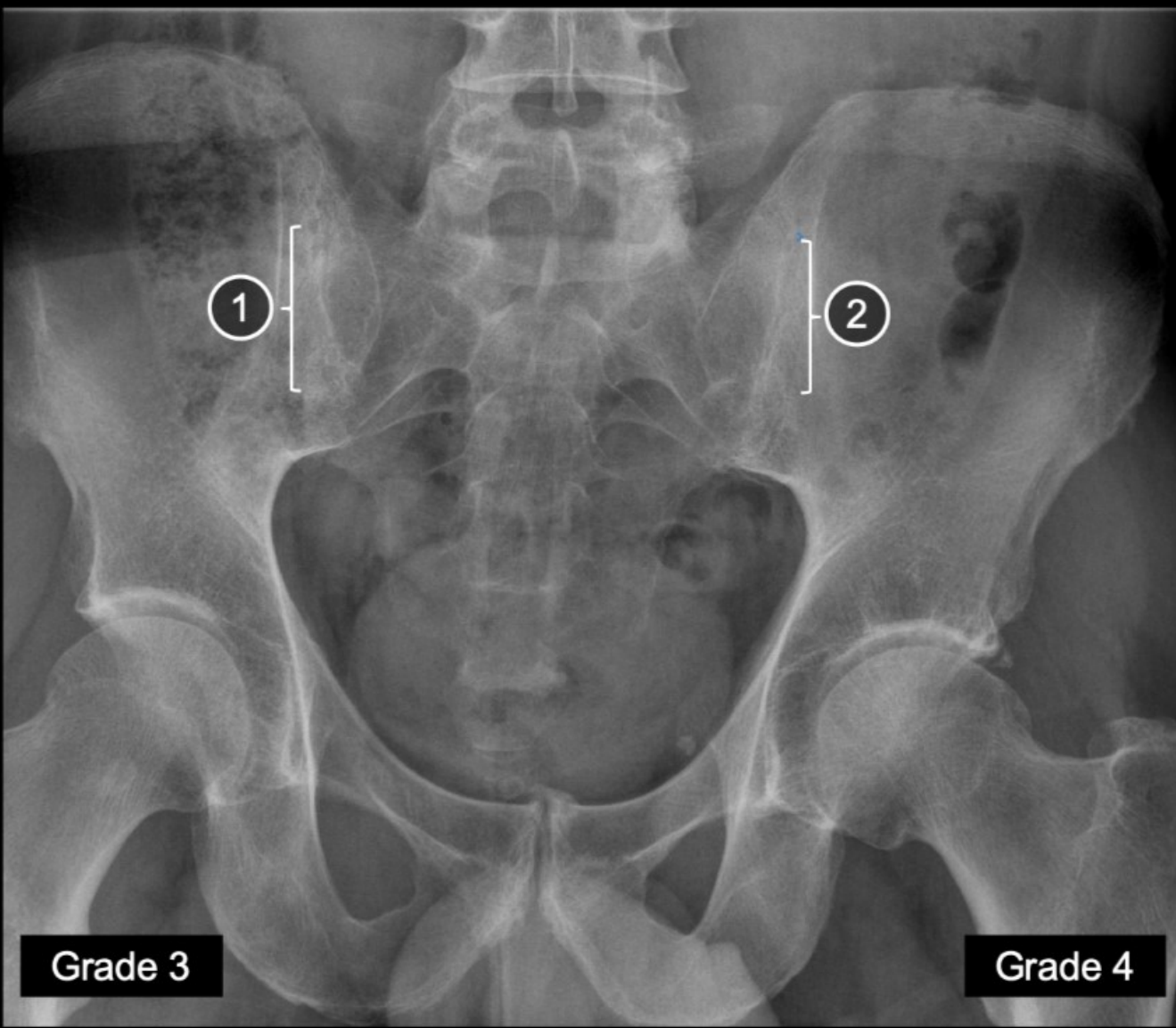
Late | SIJ X-ray

- X-rays indicate partial or complete fusion of the SIJs (ankylosis)³

1. Almost complete fusion
2. Complete fusion



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Late | SIJ X-ray

- X-rays indicate partial or complete fusion of the SIJs (ankylosis)³

1. Almost complete fusion
2. Complete fusion



Grade 3

Grade 4

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Late | SIJ MRI

- MRIs reveal areas of sclerosis³

1. Areas of sclerosis

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Late Stage

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- Difficulty performing everyday activities such as tying shoelaces and checking blind spots
- Mild shortness of breath with exertion
- Fatigue



Pathophysiological Changes

- At this stage, pathogenic bone formation leads to progressive spinal fusion¹³
- This can contribute to the rigidity of the spine, causing an increase in physical limitations for patients¹³



References

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AS: ankylosing spondylitis; HCP: health care practitioner; MRI: magnetic resonance imaging; r-axSpA: radiographic axial spondyloarthritis; SIJ: sacroiliac joint; STIR: short tau inversion recovery.