

RV-008 · SP-MIX(CS+TS+LS+SI+HW)

XR / MRI Correlation Summary

RheumaView-aligned multimodal correlation document

Case ID	RV-008	Demographics	Caucasian male, 86 years old
XR study date	October 2025	MRI study date	October 2025
XR coverage	C-spine, T-spine, L-spine, SI joints, bilateral hands/wrists	MRI coverage	Lumbar spine without contrast
Document purpose	XR / MRI correlation only	Source basis	

Scope. This document isolates multimodal XR/MRI correlation for the submitted 10/16/2025 radiographs and external lumbar MRI report dated 10/07/2025. It preserves the latest report-level conclusions and research-layer metrics already established in this chat, without rewriting the full clinical report.

1. Modality Input Summary

Modality	Date	Regions / sequences	Primary strengths	Limits
Plain radiographs	10/16/2025	Cervical, thoracic, lumbar spine; SI joints; bilateral hands/wrists	Global structural pattern recognition; ossification morphology; SI structural assessment; hand pattern classification	No direct canal/foraminal grading; incomplete hips; no marrow/STIR signal
MRI lumbar spine (external report)	10/07/2025	Lumbar spine without contrast	Level-by-level stenosis map; Modic/reactive endplate change; soft-tissue edema; temporal comparison to 5/6/2021	Lumbar only; external narrative report rather than full image review here; does not replace XR morphology classification

2. Region-Level Structural Burden and Modality Contribution

Region	Degenerative burden (0–4)	Flowing ossification (0–4)	Inflammatory-appearing burden (0–4)	XR contribution	MRI contribution	Net interpretation
Cervical spine	4	3	0–1	Loss/reversal of lordosis; multilevel disc loss; bulky anterior non-marginal ossification; marked uncovertebral/facet OA; multilevel foraminal narrowing substrate	Not assessed on current MRI	Advanced degeneration with secondary bulky ossification; not thin marginal syndesmophyte pattern
Thoracic spine	2	2	0	Mild spondylosis; lower thoracic / thoracolumbar bulky	Not assessed on current MRI	Mild thoracic degeneration with lower thoracic enthesopathic

Region	Degenerative burden (0–4)	Flowing ossification (0–4)	Inflammatory-appearing burden (0–4)	XR contribution	MRI contribution	Net interpretation
				anterior-lateral ossification		ossification
Thoracolumbar / upper lumbar	4	4	0	Very severe disc collapse, sclerosis, vacuum change; bridging/near-bridging non-marginal ossification	Progressive left T12-L1 disc-height loss; new Modic I at left T12-L1; severe T12-L1 stenosis	Peak multimodal burden; severe degenerative disease with DISH-pattern ossification
Mid / lower lumbar	4	3–4	0	Advanced multilevel degeneration; marked facet arthropathy; flowing anterolateral ossification	Multilevel foraminal/canal stenosis from L2-L3 through L5-S1	High mechanical/degenerative burden with DISH-pattern support
Sacroiliac joints	1	0	0	Patent SI joints; mild bilateral degenerative sclerosis/irregularity; no erosions or ankylosis	Visualized sacrum/SI joints reported intact	Low-burden degenerative SI change; inflammatory sacroiliitis not supported
Hands / wrists	4	0	0–1	Severe bilateral 1st CMC OA; multifocal DIP/PIP erosive OA; no MCP/carpal inflammatory erosions	Not assessed on current MRI	Peripheral phenotype favors severe OA / erosive OA, not RA-pattern inflammatory arthropathy

3. MRI Level-by-Level Lumbar Stenosis and Structural Substrate

Level	Foraminal stenosis	Central canal stenosis	MRI structural drivers	XR substrate correlation	Correlation class
T12-L1	Severe left; moderate-severe right	Moderate-severe	Left paracentral protrusion on bulge; asymmetric osteophytes; facet arthropathy; mild paraspinal/facet-adjacent edema	XR shows maximal disc collapse, sclerosis, vacuum, and bulky ossification at thoracolumbar junction	Very high
L1-L2	No significant	No significant	No major stenotic burden reported	XR shows adjacent degenerative change but not peak stenotic level	Low
L2-L3	Moderate right; mild left	Mild	Diffuse bulge; right-asymmetric osteophytes; facet arthropathy	XR confirms multilevel degenerative substrate	High
L3-L4	Moderate-severe right; mild-moderate left	Mild	Diffuse bulge; endplate osteophytes; facet arthropathy	XR confirms multilevel degenerative substrate	High
L4-L5	Moderate-severe bilateral	Mild	Diffuse bulge; osteophytes; facet arthropathy	XR confirms marked lower-lumbar degeneration/facet OA	High

Level	Foraminal stenosis	Central canal stenosis	MRI structural drivers	XR substrate correlation	Correlation class
L5-S1	Moderate bilateral	Mild	Diffuse bulge; osteophytes; facet arthropathy	XR confirms lower-lumbar disc degeneration	High

4. Direct XR ↔ MRI Correlation Matrix

Domain	What XR shows best	What MRI shows best	Combined reading	Net weight
Global lumbar phenotype	Pattern of severe multilevel degeneration plus DISH-pattern bulky non-marginal flowing ossification	Disc, bulge/protrusion, stenosis, Modic/endplate reactivity, edema	XR defines morphology class; MRI confirms severity and active degenerative stress at T12-L1	Very high
Thoracolumbar junction	Severe collapse, sclerosis, vacuum, bridging/near-bridging ossification	Progressive left T12-L1 disc loss; new Modic I; severe foraminal/canal stenosis; edema	This is the strongest multimodal concordance zone and likely a major pain/stiffness generator	Very high
Lower lumbar mechanical burden	Marked lower-lumbar degenerative disc disease and facet arthropathy	Multilevel foraminal stenosis L2-L3 through L5-S1, especially L3-L4 and L4-L5	Consistent mechanical / stenotic substrate	High
Sacroiliac region	Patent SI joints with mild degenerative change only; no ankylosis; no erosions	Visualized sacrum/SI joints intact	Multimodal data argue against structural inflammatory sacroiliitis	High
Inflammatory axial SpA support	No convincing thin marginal syndesmophytes; no SI ankylosis; no erosive sacroiliitis	No MRI statement supporting inflammatory sacroiliitis or marrow inflammatory pattern; lumbar findings are degenerative	Current multimodal dataset does not structurally support ankylosing spondylitis	High

5. Pattern Differentiation: Degenerative / DISH / Inflammatory

Pattern candidate	Supporting multimodal features	Opposing / absent features	Net support
Degenerative axial disease	Severe disc collapse, endplate sclerosis, vacuum phenomenon, multilevel facet arthropathy, multilevel bulge/osteophyte-driven stenosis, Modic I at T12-L1, Schmorl's nodes	None significant	Very high
DISH-pattern ossification	Bulky flowing non-marginal anterolateral bridging/near-bridging ossification across multiple contiguous thoracolumbar/lumbar levels; additional bulky anterior cervical ossification	Not all extraspinal DISH sites assessed in current dataset	High
Ankylosing spondylitis / axial inflammatory SpA	Clinical history of prolonged stiffness only	No definite thin marginal syndesmophytes; no SI erosive sacroiliitis; no SI ankylosis; morphology too bulky / non-marginal; Humira nonresponse noted clinically	Low

Pattern candidate	Supporting multimodal features	Opposing / absent features	Net support
RA-pattern peripheral inflammatory disease	None compelling on imaging	Hands show DIP/PIP central erosive OA pattern and severe 1st CMC OA; no convincing MCP/carpal marginal erosions	Very low
Generalized OA / erosive OA	Severe bilateral 1st CMC OA; multifocal bilateral DIP/PIP central erosive remodeling; partial bilateral hip OA; diffuse axial degeneration	Does not alone explain full flowing axial ossification burden	Very high as coexisting phenotype

6. Key Quantitative Signals Extracted from the Latest READY+ / READY++\$\$ Layers

Metric family	Value / class	Interpretive use
Global axial structural burden	Very high	Explains major mechanical disease load
DISH-pattern ossification burden	High	Supports enthesopathic flowing ossification rather than thin inflammatory syndesmophytes
SI inflammatory structural support	Very low / not supported	Weakens axial inflammatory SpA hypothesis on available structural imaging
Cross-modal concordance (XR ↔ MRI)	High in lumbar degeneration; peak at T12-L1	XR and MRI reinforce rather than contradict each other
Temporal progression	MRI-only focal progression at T12-L1 vs 5/6/2021	Provides limited longitudinal evidence despite absent serial matched XR
Hand structural burden	Very high bilateral OA / erosive OA	Supports generalized OA phenotype beyond the spine

7. Integrated Multimodal Synthesis

- The current XR/MRI dataset is strongly concordant for severe chronic mechanical-degenerative lumbar disease.
- The thoracolumbar junction, especially T12-L1, is the strongest multimodal hotspot: XR shows maximal collapse/sclerosis/vacuum and MRI adds progressive disc-height loss, new Modic type I change, severe foraminal stenosis, moderate-severe canal stenosis, and soft-tissue edema.
- XR is the dominant modality for recognizing the axial morphology class: bulky non-marginal flowing ossification across multiple contiguous levels supports a DISH-pattern process superimposed on advanced degeneration.
- MRI is the dominant modality for grading neural compromise and reactive degenerative activity, especially in the lumbar spine.
- SI joint data from both modalities argue against structural inflammatory sacroiliitis on the currently available studies.
- Taken together, the imaging burden is best explained by a mixed but strongly degeneration-dominant phenotype with high DISH-pattern support, not by convincingly demonstrated ankylosing-spondylitis-type structural disease.

8. Limits / Non-computable Correlation Elements

Field	Status / reason
Formal serial XR deltas	Not computable: no matched prior radiographs available in this chat
DEXA-linked correlation metrics	Not computable: no DEXA dataset attached

Field	Status / reason
Numeric morphometric angles (Cobb, lordosis, PI/SS/PT)	Not assigned: current source set supports qualitative alignment only
External AI provenance weights / human override metrics	Not applicable in this document
Dedicated hip XR–MRI correlation	Not available: hips incompletely visualized on current radiographs and no hip MRI provided

Prepared from the most recent XR-based READY+ / READY++\$\$ conclusions in this chat and the uploaded external lumbar MRI report.

9. Added Value of Multimodal RheumaView Correlation

This correlation layer does more than place an X-ray report next to an MRI report. Radiographs define morphology class and structural phenotype; MRI defines level-specific stenosis, reactive endplate activity, and soft-tissue-adjacent stress. The combined interpretation helps prevent mislabeling bulky degenerative/DISH-pattern bridging as inflammatory 'bamboo spine', identifies the strongest multimodal pain generators, and shows why the available data support a degeneration-dominant process rather than convincingly demonstrated axial inflammatory spondyloarthritis.

Task	XR advantage	MRI advantage	Combined advantage
Morphology classification	Very high	Moderate	Very high
Stenosis grading	Low	Very high	Very high
SI inflammatory exclusion	High	Moderate	High
DISH-pattern recognition	Very high	Low-moderate	Very high
Pain-generator localization	Moderate	High	Very high

10. Misclassification Prevention

Potential misread	Why it is misleading	What combined XR/MRI review shows	RheumaView value
'Bamboo spine' label from bridging alone	Bulky bridging can be inflammatory or non-inflammatory if morphology is not analyzed carefully	XR shows broad non-marginal flowing ossification across multiple contiguous levels, favoring DISH-pattern disease rather than thin marginal syndesmophytes	Reduces false inflammatory classification
Chronic stiffness interpreted as structural axial SpA	Symptoms alone can overcall inflammation in an elderly patient with severe degeneration	XR shows preserved SI patency without erosive sacroiliitis; MRI reports intact visualized sacrum/SI joints	Separates symptom history from structural proof
Lumbar pain attributed mainly to inflammatory axial disease	This risks underrecognizing major mechanical stenotic disease	MRI shows multilevel foraminal/canal stenosis, with T12-L1 as the peak hotspot; XR shows maximal collapse/sclerosis/vacuum and severe lumbar degeneration	Reprioritizes likely structural pain drivers
Hand pain treated as RA-pattern inflammatory	OA with erosive remodeling can mimic inflammatory	XR shows severe bilateral 1st CMC OA and central	Supports erosive OA rather than classic RA-pattern

arthropathy	disease if distribution is ignored	erosive DIP/PIP OA without convincing MCP/carpal marginal erosions	damage
-------------	------------------------------------	--	--------

11. Imaging-Based Pain-Generator Prioritization

Candidate pain driver	XR support	MRI support	Net likelihood
T12-L1 thoracolumbar junction disease	Very high - maximal collapse, sclerosis, vacuum, bulky ossification	Very high - progressive disc-height loss, Modic I change, severe foraminal stenosis, moderate-severe canal stenosis, edema	Very high
Multilevel lower lumbar degenerative/stenotic disease	High - advanced multilevel disc disease and marked facet arthropathy	Very high - multilevel foraminal/canal stenosis from L2-L3 through L5-S1	High
Cervical mechanical pain source	High - marked cervical spondylosis, foraminal narrowing, bulky ossification	Not assessed on current MRI	High for neck symptoms
SI inflammatory pain source	Low - mild degenerative SI change only	Low - visualized sacrum/SI joints intact	Low
Primary axial inflammatory structural pain source	Low - no convincing thin syndesmophytes or SI erosive sacroiliitis	Low - no MRI finding forcing inflammatory reinterpretation	Low

12. Why Neither Modality Alone Is Sufficient

Reading strategy	Main blind spots	Why fused interpretation is stronger
XR alone	Cannot directly grade canal/foraminal stenosis, Modic activity, or facet-adjacent edema	Good for morphology class and broad structural phenotype, but incomplete for current symptom-driving activity
MRI alone	Can over-focus on stenosis/soft tissues and underclassify the bridging/ossification phenotype	Good for neural compromise and reactive degeneration, but weaker than XR for DISH-pattern vs inflammatory morphology separation

13. Timeline and Fusion Logic

Date	Source	Key contribution
05/06/2021	Prior MRI comparator	Reference point for later MRI-stated progression at T12-L1
10/07/2025	External lumbar MRI report	Level-by-level stenosis map; Modic I change at left T12-L1; soft-tissue edema; intact visualized sacrum/SI joints
10/16/2025	Submitted radiographs	Global structural phenotype: severe degeneration + DISH-pattern axial ossification + bilateral erosive OA hands

14. RheumaView-Specific Added Conclusions

- The strongest multimodal hotspot is T12-L1, where radiographic maximal structural collapse aligns with MRI-proven progression, reactive endplate change, severe foraminal stenosis, canal stenosis, and soft-tissue-adjacent stress.
- The broad non-marginal bridging pattern is better classified as DISH-pattern enthesopathic ossification superimposed on advanced degeneration than as ankylosing-spondylitis-type bamboo spine.
- The currently available multimodal data lower structural support for inflammatory sacroiliitis because both XR and MRI preserve SI integrity rather than showing erosive/ankylosing inflammatory change.
- The hand phenotype materially influences whole-case interpretation: severe bilateral 1st CMC OA plus erosive DIP/PIP OA supports generalized OA/erosive OA burden rather than a uniform RA-pattern inflammatory framework.
- The combined dataset is more clinically useful than either modality alone because it separates morphology class from symptom-driving activity.

15. Decision-Impact Summary

Imaging implication	Why it matters
Supports a degeneration-dominant / DISH-pattern structural explanation	Helps avoid overcalling inflammatory axial disease from bridging alone
Supports focused attention to thoracolumbar junction and multilevel lumbar stenosis	These are the strongest multimodal structural pain generators on available studies
Lowers structural support for axial inflammatory spondyloarthritis on current imaging	SI joints remain non-erosive/non-ankylosed and thin marginal syndesmophyte pattern is not convincingly present
Provides clearer modality-specific task allocation	XR best defines phenotype class; MRI best defines stenosis and active degenerative stress