

Patient Name:

Date of Birth:

Procedure:

MRI LUMBAR SPINE W/O

Date of Study:

20-Oct-2025 1:51 PM

EXAM: MRI LUMBAR SPINE W/O

HISTORY: 22-year-old female with pain after a motor vehicle accident 04/10/25.

TECHNIQUE: Axial and sagittal multi-weighted images of the lumbar spine were obtained.

COMPARISON: None.

FINDINGS:

CONUS: Terminates in normal position and demonstrates normal signal characteristics.

OSSEOUS STRUCTURES: Small Schmorl's nodes are incidentally noted. No fractures.

ALIGNMENT: No vertebral body listhesis is present.

BONE MARROW: Normal bone marrow signal. No focal osseous lesion is seen.

PARASPINAL SOFT TISSUES: Paraspinal soft tissues are unremarkable.

T12-L1: No disc herniation, central canal, or foraminal stenosis.

L1-L2: No disc herniation, central canal, or foraminal stenosis.

L2-L3: No disc herniation, central canal, or foraminal stenosis.

L3-L4: No disc herniation, central canal, or foraminal stenosis.

L4-L5: There are left greater than right facet joint effusions without underlying arthritis. This can be seen in the setting of a prior capsular sprain or instability. No disc herniation. No central canal or foraminal stenosis.

L5-S1: There is mild disc desiccation without disc height loss. No degenerative osteophyte formation. No facet arthritis. There is a left facet joint effusion which can be seen in the setting of a capsular sprain or instability. However, there is a 4.7 mm central protrusion type disc herniation with an annular tear (fissure), series 10 image 8, series 9 image 2, series 7 image 8. This impinges the thecal sac abutting the traversing bilateral S1 nerve roots in the lateral recess, series 8 image 24, series 7 image 7 resulting in mild central canal stenosis. There is mild bilateral foraminal stenosis contacting but not compressing the exiting right L5 nerve root, series 10 image 4, 11.

There are no significant underlying degenerative changes. No significant disc desiccation or disc height loss. No facet arthropathy. No osteophyte formation.

IMPRESSION:

1. L5-S1 demonstrates a 4.7 mm central protrusion type disc herniation with annular tear which impinges the thecal sac and abuts the traversing bilateral S1 nerve roots in the lateral recesses resulting in mild central canal stenosis and mild bilateral foraminal stenosis contacting but not compressing the exiting right L5 nerve root.

2. Left greater than right facet joint effusions at L4-L5 and L5-S1 which can be seen in the setting of a prior capsular sprain or instability.

3. Based on the imaging findings and within a reasonable degree of medical probability, the observed disc herniations may be temporally and causally related to a recent traumatic event rather than solely attributable

Patient Name:  
Referring Physician:  
Procedure: MRI LUMBAR SPINE W/O

Patient ID:  
Date of Birth: [REDACTED]  
Date of Study: 20-Oct-2025 1:51 PM

to a chronic, degenerative process. Features that support a traumatic etiology may include the absence of significant endplate changes or large posterior osteophyte formation, presence of focal annular disruption, and morphology or location of the herniation that is atypical for age-related degeneration. Additionally, the lack of multilevel degenerative change or disc space narrowing at the affected level may further suggest that the pathology is more likely to be post-traumatic in nature. This interpretation should be considered in conjunction with the clinical history, mechanism of injury, and absence of prior comparable imaging for direct comparison.

The descriptions/nomenclature of any reported disc pathology, specifically with respect to the definitions of a disc bulge or disc herniation (protrusion type disc herniation and/or extruded disc herniation), is based on the recommendations from the following peer reviewed journal article: Lumbar Disc Nomenclature: version 2.0: Recommendations of the combined task forces of the North American Spine Society, the American Society of Spine Radiology, and the American Society of Neuroradiology. Spine J. 2014 Nov 1;14(11):2525-45. Any references to causation and permanency follow the guidelines established by the American Medical Association Guides to the Evaluation of Permanent Impairment, Sixth Edition, 2023. It should be noted that a normal MRI does not exclude certain pathologies that may be difficult to diagnose radiographically including certain pathologies involving small localized nerves and facet joints. A normal MRI does not exclude the possibility of certain abnormalities that may only be detected with a thorough physical examination and clinical history.

#### Facet Joint Effusion:

##### 1. Definition and Imaging Characteristics

Facet joint effusion is an abnormal accumulation of fluid within the synovial cavity of the facet joint. It appears on MRI as a hyperintense signal on T2-weighted or STIR sequences. This indicates synovial irritation, inflammation, or mechanical disruption, often due to trauma when no chronic degenerative or inflammatory conditions are present.

##### 2. Traumatic Etiology: Capsular Sprain and Instability

Facet joints are synovial joints enclosed by a fibrous capsule, vulnerable to injury from high-impact or shear forces. Capsular sprain results from stretching or tearing of the capsule, leading to fluid accumulation (effusion). Trauma (e.g., car accidents, falls) causes acceleration-deceleration or rotational forces that can cause sprains, microfractures, or subluxations. Studies have shown facet effusions are frequently associated with whiplash and other acute spinal trauma in the absence of degenerative changes.

##### 3. Clinical Correlation

Patients with traumatic facet joint effusions often report localized spinal pain, stiffness, or pain worsened by spinal extension or rotation. The recent onset of these symptoms following trauma supports a causal relationship. Effusions generally resolve within weeks to months unless instability persists.

##### 4. Absence of Arthritis or Alternative Diagnoses

Patient Name:  
Referring Physician:  
Procedure: MRI LUMBAR SPINE W/O

Patient ID:  
Date of Birth: [REDACTED]  
Date of Study: 20-Oct-2025 1:51 PM

- Osteoarthritis: Not supported due to absence of cartilage loss, osteophytes, or subchondral changes.
- Rheumatoid Arthritis: No bilateral/multilevel involvement or systemic inflammatory signs.
- Seronegative Spondyloarthropathies: No sacroiliitis, syndesmophytes, or enthesitis.
- Infection: No fever, elevated CRP/ESR, or bone marrow edema.
- Synovial Cyst: No cystic mass or degenerative joint changes.
- Crystal Arthropathy: No tophi, erosions, or urate elevation.
- Hemarthrosis: No hemorrhagic signs (e.g., T1-hyperintensity, hemosiderin).

The absence of these findings and the presence of isolated effusion suggest trauma as the most likely cause.

#### 5. Mechanistic Support for Trauma

The facet capsule is easily injured by sudden hyperextension, rotation, or lateral bending. Capsular injury leads to fluid production and effusion. Microtears and ligament laxity contribute to instability and persistent inflammation. Facet effusions, especially when isolated, are indicative of trauma when no degenerative or inflammatory findings are present.

#### 6. Permanency and Clinical Implications

Effusions due to capsular sprain typically resolve with conservative treatment. However, if instability persists, the effusion and symptoms may become chronic. Persistent spinal pain or limited motion lasting more than 6?12 months may indicate permanency. Clinical follow-up and potential interventions, including physical therapy or diagnostic injections, may be needed to assess instability and manage ongoing pain.

#### Conclusion

In a patient with a recent trauma and an isolated facet joint effusion on MRI, the most likely cause is a traumatic capsular sprain or facet joint instability. The absence of degenerative or inflammatory findings supports a traumatic origin. These findings correlate with mechanical injury from shear or rotational forces and may become permanent if symptoms persist, necessitating ongoing clinical evaluation and management.

A traumatic disc herniation can initiate disc desiccation (dehydration and degeneration of the intervertebral disc) relatively quickly. The timeline varies depending on the severity of the injury, the disc's baseline condition, and individual factors such as age and overall health.

#### Immediate Effects (Hours to Days)

A traumatic disc herniation disrupts the annulus fibrosus, allowing the nucleus pulposus to protrude. This reduces the disc's ability to retain water. The nucleus pulposus, which is 70-90 percent water in a healthy disc, begins to lose hydration within hours to days due to loss of pressure and inflammatory changes.

#### Early Desiccation (Days to Weeks)

Within days to a few weeks, MRI may reveal early desiccation as water content decreases. Inflammatory



Patient Name: \_\_\_\_\_ Patient ID: \_\_\_\_\_  
Referring Physician: \_\_\_\_\_  
Procedure: MRI LUMBAR SPINE W/O Date of Study: 20-Oct-2025 1:51 PM

---

responses and altered biomechanics accelerate this loss. Significant reduction in hydration can occur within 1 to 4 weeks after the injury, especially in severe herniations or with continued stress on the disc.

#### Progressive Degeneration (Weeks to Months)

Over several weeks to months, further degeneration develops as proteoglycans that help retain water are lost and disc height decreases. By 3 to 6 months, MRI often shows clear evidence of degeneration and desiccation with reduced T2 signal intensity.

#### Factors Influencing Speed of Desiccation

Severity of the herniation can accelerate water loss. Younger individuals with healthier discs may experience slower desiccation compared to older adults with pre-existing degeneration. Higher physical stress and mechanical loading hasten the process. Inflammatory response and poor vascular supply also promote quicker dehydration and degeneration.

#### Clinical Observations

Studies show that MRI can detect decreased water content within 1 to 2 weeks post-herniation, with progressive desiccation over 3 to 12 months. Symptoms such as pain do not always match the degree of desiccation, as nerve compression and inflammation often contribute more to early symptoms.

#### Summary

Disc desiccation may begin within hours to days following a traumatic disc herniation. Imaging can reveal changes within 1 to 4 weeks, with significant degeneration progressing over months.

Electronically signed by:  
Darren Buono, MD  
10/23/2025 2:07 PM EDT

Electronically Signed: \_\_\_\_\_ Date: 23-Oct-2025 2:07 PM

A handwritten signature in black ink that reads "Darren Buono MD". The signature is stylized and cursive.

Darren Buono M.D.  
Board Certified: American Board of Radiology  
NPI: 1912004698

© 2025 Star Teleradiology. All rights reserved.  
© 2025 Star Radiology. All rights reserved.  
© 2025 Darren Buono, M.D. All rights reserved.



Patient Name:  
Referring Physician:  
Procedure:

MRI LUMBAR SPINE W/O

Patient ID:  
Date of Birth: ██████████  
Date of Study: 20-Oct-2025 1:51 PM

---

This material is protected under U.S. and international copyright laws. Unauthorized reproduction, distribution, or use of any portion of this document without express written consent from the copyright holder is strictly prohibited.

**Objects**

- ~ Disc
- ~ Sacrum
- ~ Vert
- ~ Herniation

**Measurements**

- T12-L1:  
| Sp. canal AP diam.: 22.1mm
- L1-L2:  
| Sp. canal AP diam.: 22.1mm
- L2-L3:  
| Sp. canal AP diam.: 22.3mm
- L3-L4:  
| Sp. canal AP diam.: 21.9mm
- L4-L5:  
| Sp. canal AP diam.: 21.5mm
- L5-S1:  
| Sp. canal AP diam.: 17.3mm  
| Protrusion AP diam.: 4.7mm





