

UC San Diego Health

# Degenerative Disc Disease: A Practical Guide to the Aging Spine




**Martin H. Pham, MD**  
Associate Professor  
Department of Neurosurgery  
UC San Diego Health



—  
GIM Grand Rounds  
May 2024





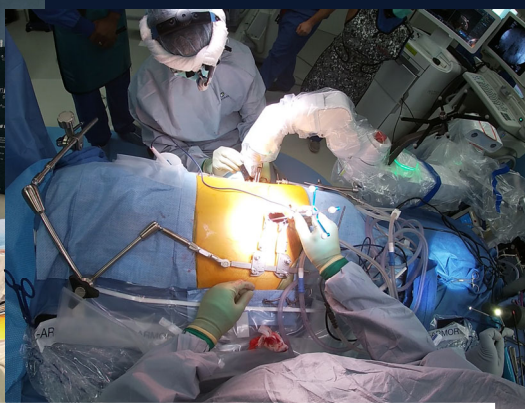
## Experience

- 
**Assistant Professor of Neurological Surgery**  
 UC San Diego Health  
 Sep 2018 - Present · 3 years 5 months
- 
**Spine Fellow**  
 Columbia University Irving Medical Center  
 2017 - 2018 · 1 year
- 
**Neurosurgery Resident Physician**  
 University of Southern California  
 2010 - 2017 · 7 years

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## Education

- 
**Northwestern University**  
 M.D. · Medicine  
 2006 - 2010
- 
**University of California, Los Angeles**  
 B.S. · Molecular, Cell, and Developmental Biology  
 2001 - 2005



### About Martin H. Pham, MD

Martin H. Pham, MD, is a board-certified neurosurgeon who focuses on the neurosurgical evaluation and treatment of [spinal disorders](#). This includes adult scoliosis and spinal deformity, complex spinal reconstruction, robotic and minimally invasive spine surgery, motion preservation of the spine, spine tumors, and spine trauma.



**Martin H. Pham, MD**  
@martinphammd

Associate Professor @UCSDNeuroSurg | Spinal Robotics and Minimally Invasive Surgery | once got an award for being an all-around nice guy

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GIM Grand Rounds  
May 2024

## Overview

- Patient Facing: What does it mean?
- Healthcare Facing: What do we do now?
- Surgery: When all else fails
- Conclusion

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## Overview

- **Patient Facing: What does it mean?**
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# Patient Facing: What does it mean?

Degenerative Disc Disease

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## (Surgical) Spinal Conditions

- Traumatic
- Neoplastic
- Infectious
- Deformity
- Degenerative

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## (Surgical) Spinal Conditions

- **Traumatic**
- Neoplastic
- Infectious
- Deformity
- Degenerative



Fractures



## (Surgical) Spinal Conditions

- Traumatic
- **Neoplastic**
- Infectious
- Deformity
- Degenerative

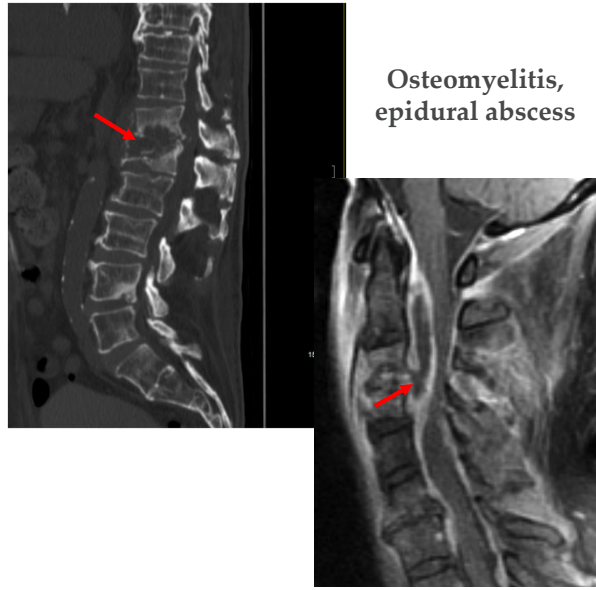


Cancer,  
tumors



## (Surgical) Spinal Conditions

- Traumatic
- Neoplastic
- **Infectious**
- Deformity
- Degenerative



## (Surgical) Spinal Conditions

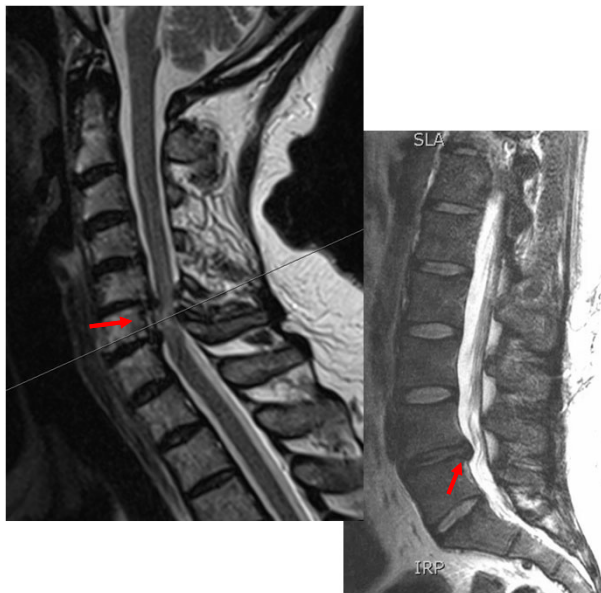
- Traumatic
- Neoplastic
- Infectious
- **Deformity**
- Degenerative





## (Surgical) Spinal Conditions

- Traumatic
- Neoplastic
- Infectious
- Deformity
- **Degenerative**



### Narrative & Impression

#### EXAM DESCRIPTION:

MRI LUMBAR SPINE W/O CONTRAST

#### CLINICAL HISTORY:

72-year-old female with neurologic deficit consistent with lumbar spine pathology

#### TECHNIQUE:

MR imaging of the lumbar spine was performed on a 1.5 Tesla scanner, with sagittal STIR, T1-, and T2-weighted imaging, axial T1- and T2-weighted imaging.

#### COMPARISON:

Left radiolucopathy radiographs of the lumbar spine

#### FINDINGS:

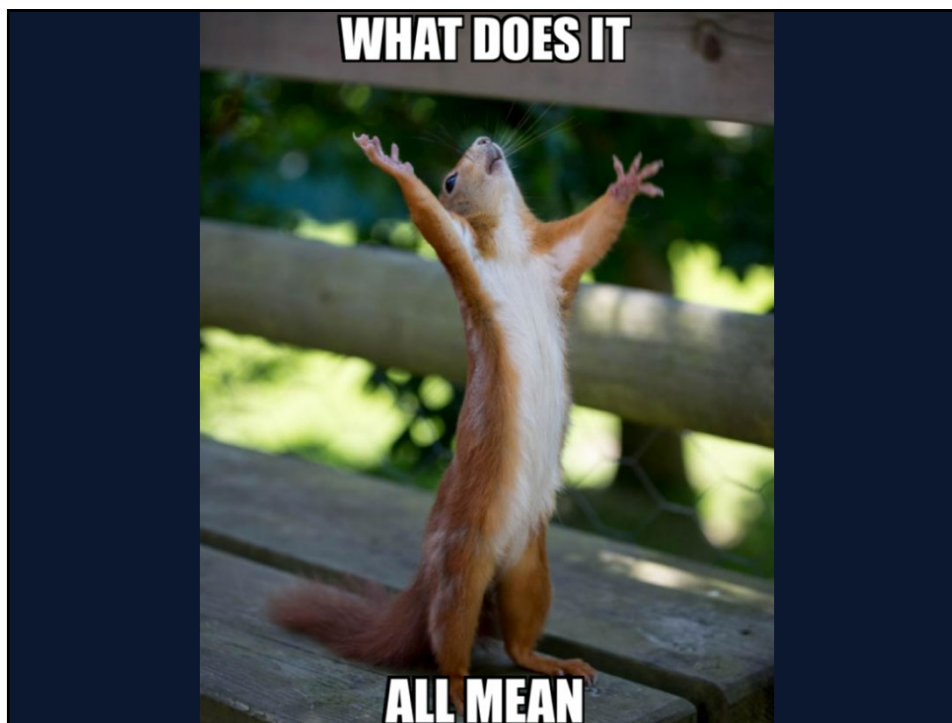
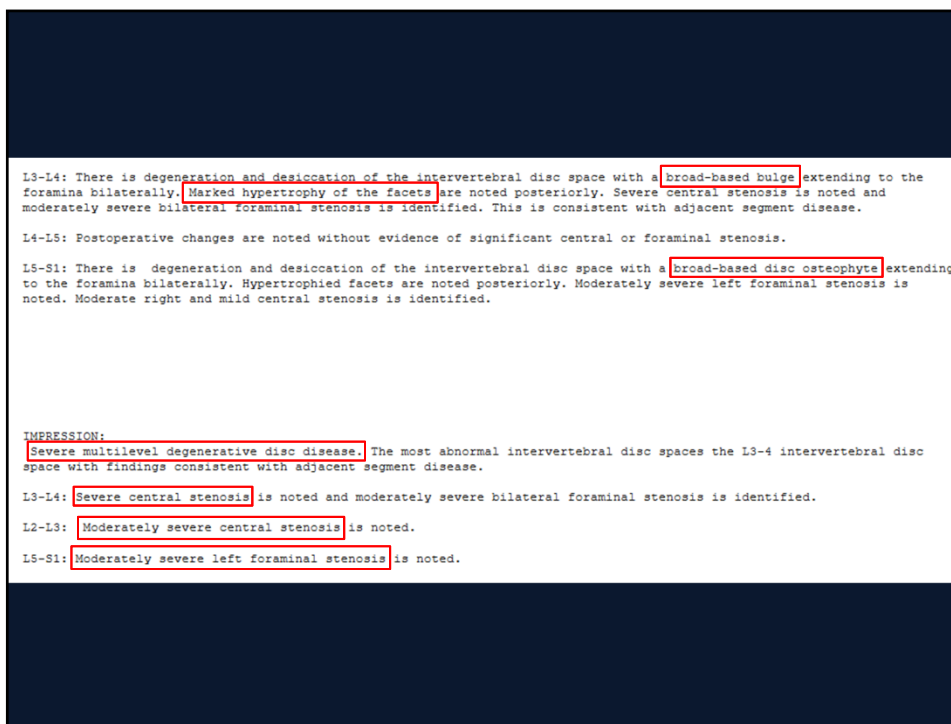
There is mild straightening of the normal lumbar lordosis. The patient is status post interbody fusion at L4-5 and L5-S1 with pedicle screws in place and postoperative changes are noted. There is no evidence of a stress fracture or insufficiency fracture.

Symmetrical kidneys are noted. The abdominal aorta and inferior vena cava appear normal. There is no evidence of para-aortic adenopathy. Mild atrophy of the psoas muscles is identified mild atrophy of the paraspinous muscles are noted.

T12-L1: There is **degeneration** of the intervertebral disc space without significant central or foraminal stenosis.

L1-L2: There is degeneration and desiccation of the intervertebral disc space with a **small focal disc protrusion** centrally not significantly deforming the thecal sac roots or foramina.

L2-L3: There is degeneration and desiccation of the intervertebral disc space with loss of height and marked hypertrophy of the facets posteriorly. A broad-based bulge extends to the foramina. **Moderately severe central stenosis** is noted. Mild bilateral foraminal stenosis is identified.

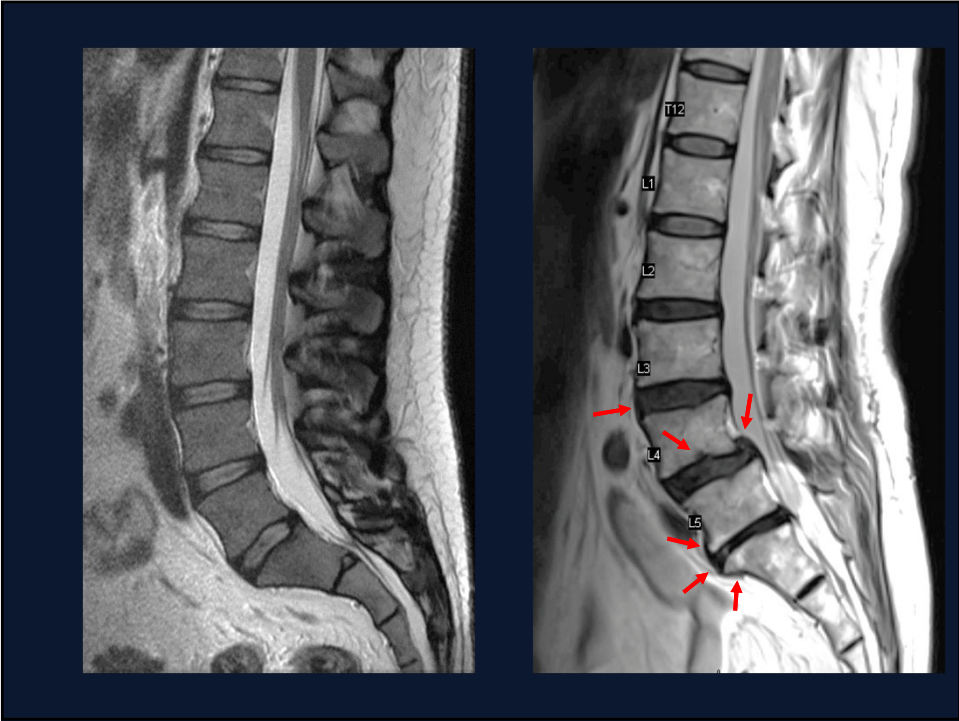


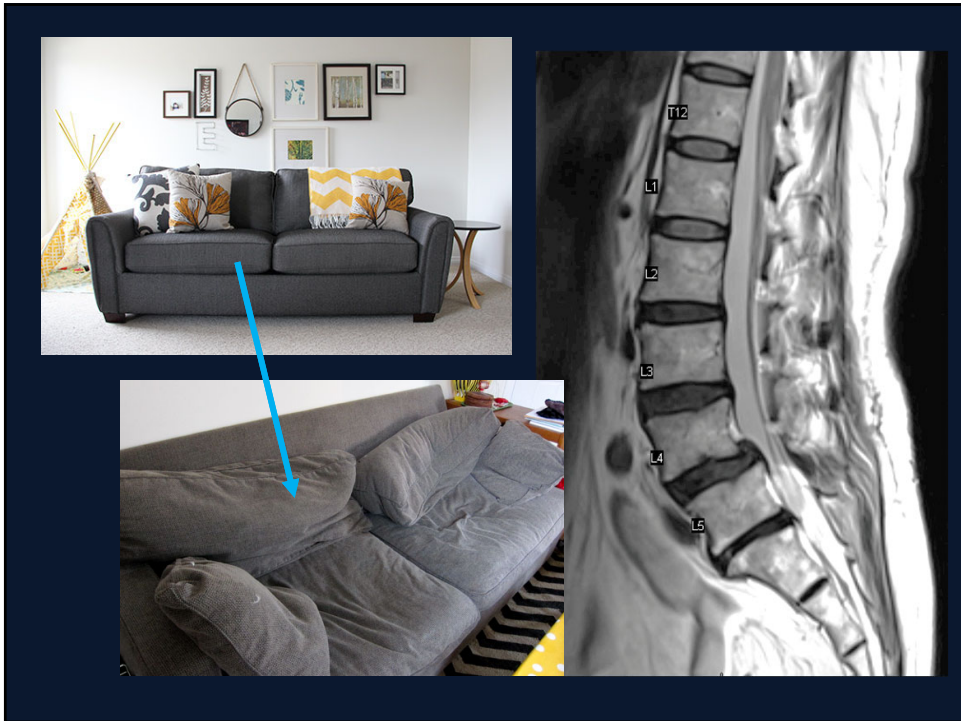
## Patient Facing

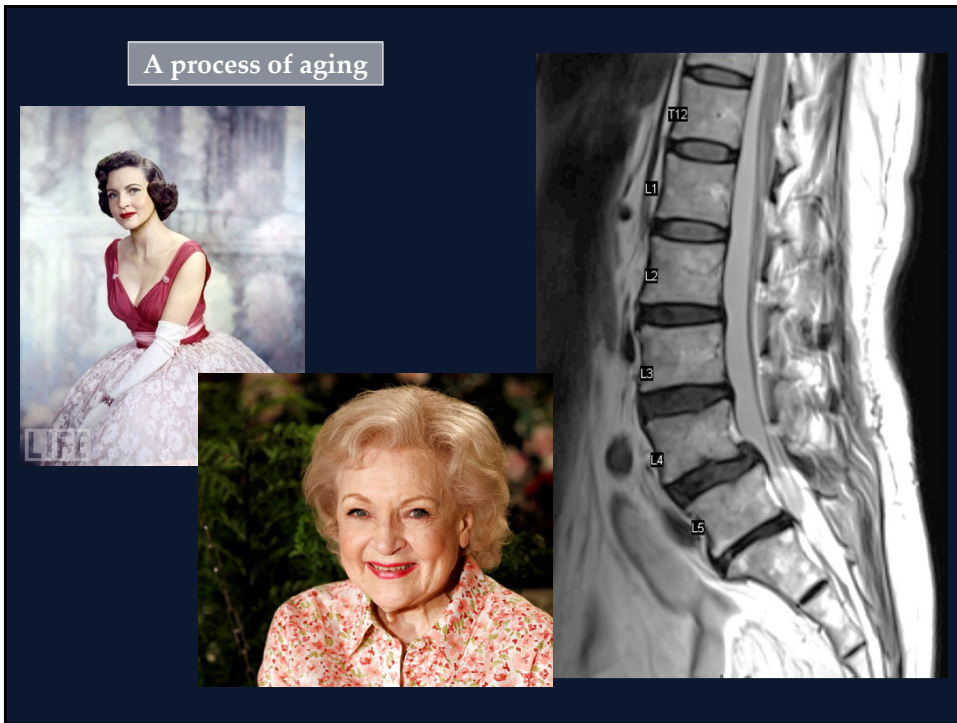
- Degenerative = Arthritic, aka “wear and tear”

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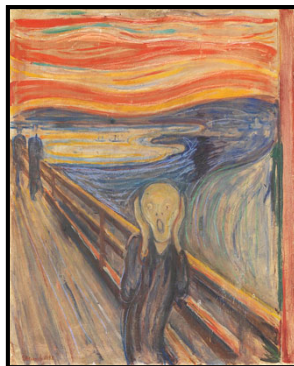






## (Surgical) Spinal Conditions

- Traumatic
- Neoplastic
- Infectious
- Deformity
- **Degenerative**



Painful  
but (usually) not  
Unstable or Dangerous

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## Overview

- **Patient Facing: What does it mean?**
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## Overview

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## Healthcare Facing: What do we do now?

The Practical Guide

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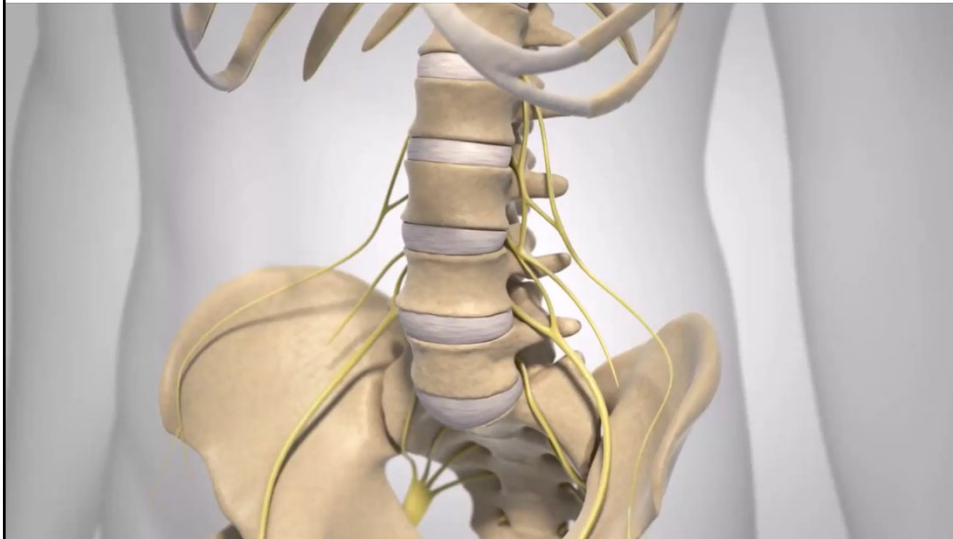


## Degenerative Disc Disease



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## Degenerative Disc Disease



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## Important Questions

- When is it concerning (red flags)?
- What treatments to help with pain? Numbness, weakness?
- When to call or refer to a spine surgeon? (Ortho/Neuro?)

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## Important Questions

- **When is it concerning (red flags)?**
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**In degenerative disc disease, clinical symptoms (or lack thereof) will always be more important than the radiographic findings.**

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## Important Questions

- **When is it concerning (red flags)?**
- What treatments to help with pain? Numbness, weakness?
- When to call or refer to a spine surgeon? (Ortho/Neuro?)

**Clinically**  
Asymptomatic



### **Radiographically**

“Severe stenosis, grade 5 annular tear, crowding of cauda equina, impingement of exiting and traversing extensive neuropathy, arthropathy, osteolysis with vertebral collapse and disc bulges...”



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## Important Questions

- **When is it concerning (red flags)?**
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### **Send to ER**

- Acute loss of bowel/bladder function
- Acute loss of upper/lower extremity function

### **Expedited Appointment**

- Gait unsteadiness, hyperreflexia
- Subacute bowel/bladder dysfunction
- Dense foot drop or hand weakness

### **All other**

- Pain (even severe) and mild weakness
- Longstanding symptoms

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## Important Questions

- When is it concerning (red flags)?
- **What treatments to help with pain? Numbness, weakness?**
- When to call or refer to a spine surgeon? (Ortho/Neuro?)

### Pain

#### Outside hospital

- Physical therapy, exercise, stretches
- Acupuncture, acupressure, chiropractic manipulation, massage
- Inversion tables, traction, aqua therapy, TENS units
- CBD lotions/creams

#### Inside hospital

- Trigger point injections
- Epidural steroid injections, facet injections, radiofrequency facet ablations

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## Important Questions

- When is it concerning (red flags)?
- **What treatments to help with pain? Numbness, weakness?**
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### Numbness, Weakness (>3 months)

#### Outside hospital

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- Inversion tables, traction, aqua therapy, TENS units
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#### Inside hospital

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- What treatments to help with pain? Numbness, weakness?
- **When to call or refer to a spine surgeon? (Ortho/Neuro?)**

**Personally?**

**Anytime**

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**Message**

→ Pham, Martin H, MD

Hi Dr. Pham,  
I hope you have a wonderful holiday season. I'm writing to ask you for a favor again. This patient of mine underwent surgery with [redacted] outside of UCSD and doing so poorly. I saw her recently and she is unable to sit or stand for more than 5-10 min due to severe pain. She has been suffering for the last 9 months. Worked really hard with PT. Had recent CT scan done and was told she needs more surgery. I know her for many years and I have not seen her like this. I told her that before she goes for surgery, I'm hoping that you will be able to see her for a 2nd opinion soon.  
I'm so grateful for your help.  
Regards

**Message**

→ Pham, Martin H, MD

Martin  
Need your input on this case please.

This patient has CLL and was found incidentally to have a posterior mediastinal schwannoma on T2 by routine CT f/u for CLL. MRI of chest confirmed findings. She has seen thoracic surgery [redacted] who recommended robotic surgical removal now scheduled in February.

Patient heard from a friend that this should be done by Neurosurgery instead and is anxious about it. Could you please provide (Curb-side) opinion whether this should be done by Neurosurgery or thoracic surgery? Happy to do official referral if you feel needed.

Thanks for your time.

Good morning marty. My patient M skilled nursing. He has an impingement on the right L4 five. He is making incredibly slow progress. I'm worried that he will reach a point where recovery from any potential surgery would be impossible because of forced mobility. Is it worthy of you seeing him if we can get him into a wheelchair and get him to your office before he becomes intractably immobile?

Sent with Siri

→ You

Martin, hope you're doing well. Got an abnormal L-spine MRI. There is cauda equina compression which is concerning to me. Patient does not have sphincter incontinence but has significant back and buttocks pain. I have a 2 p.m. telemedicine appointment with him to go over symptom in more details and probably offer him a neurosurgery referral. Wanted to hear your thoughts about the urgency of this.

As always, appreciate your time and input very much.

*Routing comment*

## Important Questions

- When is it concerning (red flags)?
- What treatments to help with pain? Numbness, weakness?
- **When to call or refer to a spine surgeon? (Ortho/Neuro?)**

### Practical Guide

1. Imaging (usually MRI)
2. Pain with failure of conservative management; or severe pain and unable to participate
3. Any weakness
4. Any clinical concerns about the spine

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## Important Questions

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- What treatments to help with pain? Numbness, weakness?
- **When to call or refer to a spine surgeon? (Ortho/Neuro?)**

### Ortho/Neuro? UC San Diego HEALTH SYSTEM

#### Orthopedics

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#### Orthopedic Spine Care

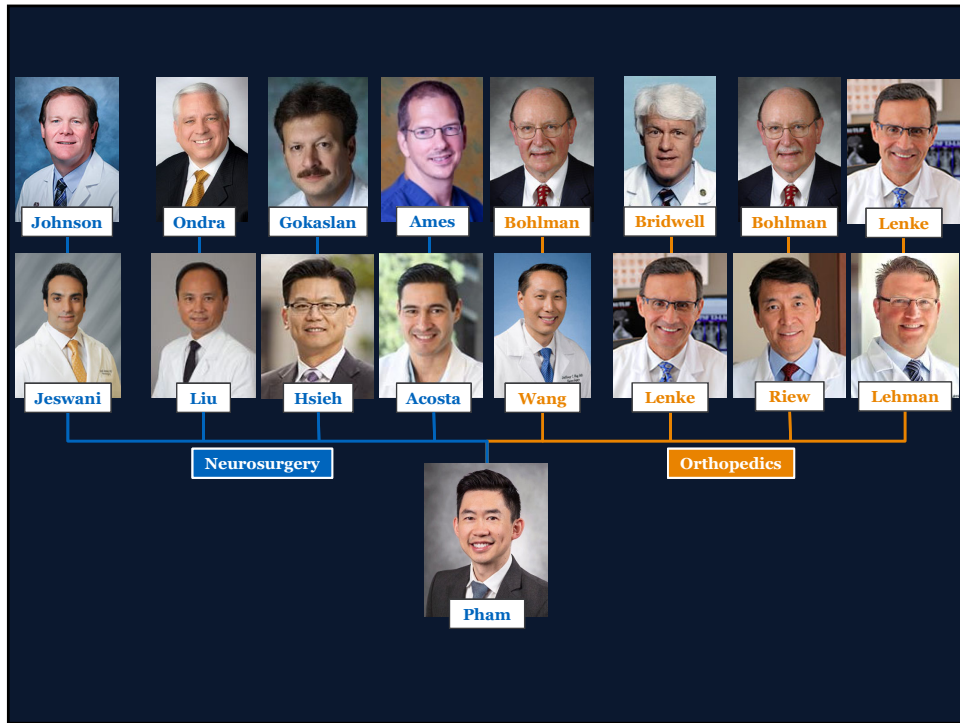
Back pain is one of the most common reasons UC San Diego Health has some of the nation's top spine surgeons, and is recognized as Center of Excellence for complex spine care.

#### Neurological Institute

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#### Neurological Spine Care

UC San Diego Health is a national leader in minimally invasive spine surgery as well as other surgical treatments for spinal disorders. We are a regional referral center for complex spine care.



## Important Questions

- When is it concerning (red flags)?
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# Surgery: When all else fails

## Case Examples

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## Treatment Options

### Outside hospital

- Physical therapy, exercise, stretches
- Acupuncture, acupressure, chiropractic manipulation, massage
- Inversion tables, traction, aqua therapy, TENS units
- CBD lotions/creams

### Inside hospital

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## Treatment Options

### Nonsurgical

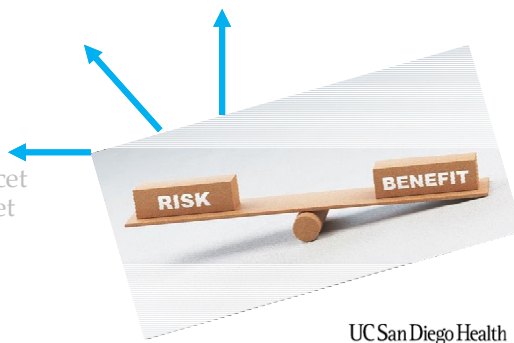
- Physical therapy, exercise, stretches
- Acupuncture, acupressure, chiropractic manipulation, massage
- Inversion tables, traction, aqua therapy, TENS units
- CBD lotions/creams

### Procedural

- Trigger point injections
- Epidural steroid injections, facet injections, radiofrequency facet ablations

### Surgery

- Decompression
- Arthroplasty (disc replacement)
- Fusion



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## Surgical vs Nonoperative Treatment for Lumbar Disk Herniation

The Spine Patient Outcomes Research Trial (SPORT): A Randomized Trial

James N. Weinstein, DO, MSc  
 Tor D. Tosteson, ScD  
 Jon D. Lurie, MD, MS  
 Anna N. A. Tosteson, ScD  
 Brett Hanscom, MS  
 Jonathan S. Skinner, PhD  
 William A. Abdu, MD, M  
 Alan S. Hilibrand, MD  
 Scott D. Boden, MD  
 Richard A. Deyo, MD, M

**Context** Lumbar discectomy is the most common surgical procedure performed for back and leg symptoms in US patients, but the efficacy of the procedure relative to nonoperative care remains controversial.  
**Objective** To assess the efficacy of surgery for lumbar intervertebral disk herniation.  
**Design, Setting, and Patients** The Spine Patient Outcomes Research Trial, a ran-

SPINE Volume 40, Number 2, pp 63-76  
 ©2015, Lippincott Williams & Wilkins

Spine

RANDOMIZED TRIAL

## Long-term Outcomes of Lumbar Spinal Stenosis

Eight-Year Results of the Spine Patient Outcomes Research Trial (SPORT)

Jon D. Lurie, MD, MS,†† Tor D. Tosteson, ScD,†† Anna Tosteson, ScD,†† William A. Abdu, MD, MS,†† Wenyuan Zhao, PhD,†† Tamara S. Morgan, MA,† and James N. Weinstein, DO, MSc††

1295

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## Surgical Compared with Nonoperative Treatment for Lumbar Degenerative Spondylolisthesis

Four-Year Results in the Spine Patient Outcomes Research Trial (SPORT) Randomized and Observational Cohorts

By James N. Weinstein, DO, MS, Jon D. Lurie, MD, MS, Tor D. Tosteson, ScD, Wenyuan Zhao, MS, Emily A. Blood, MS, Anna N.A. Tosteson, ScD, Nancy Birkmeyer, PhD, Harry Herkowitz, MD, Michael Longley, MD, Lawrence Lenke, MD, Sanford Emery, MD, and Serena S. Hu, MD



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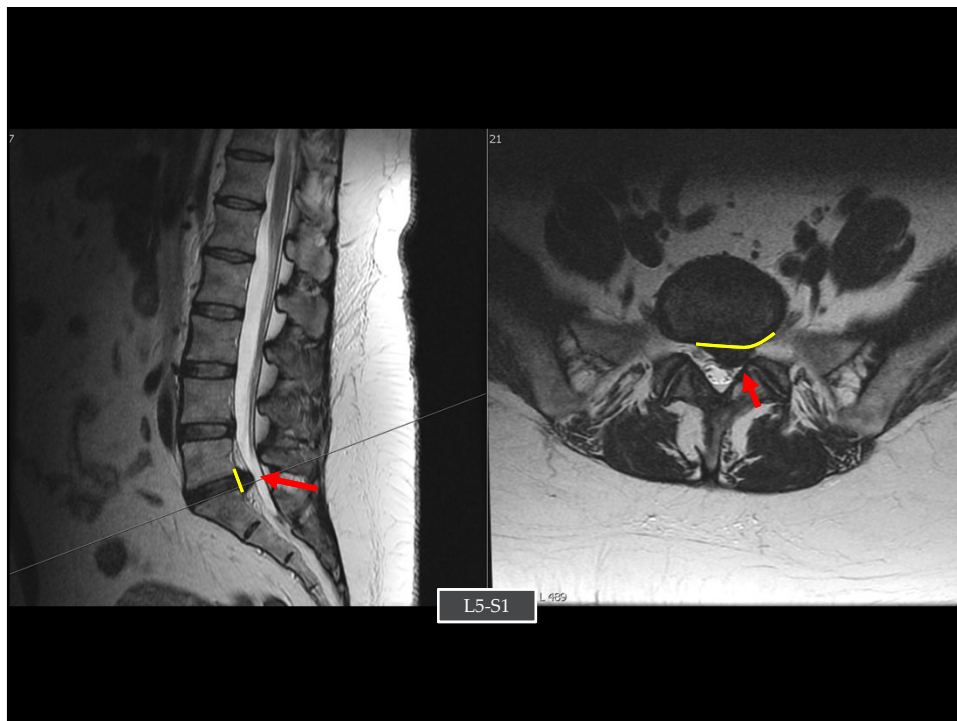
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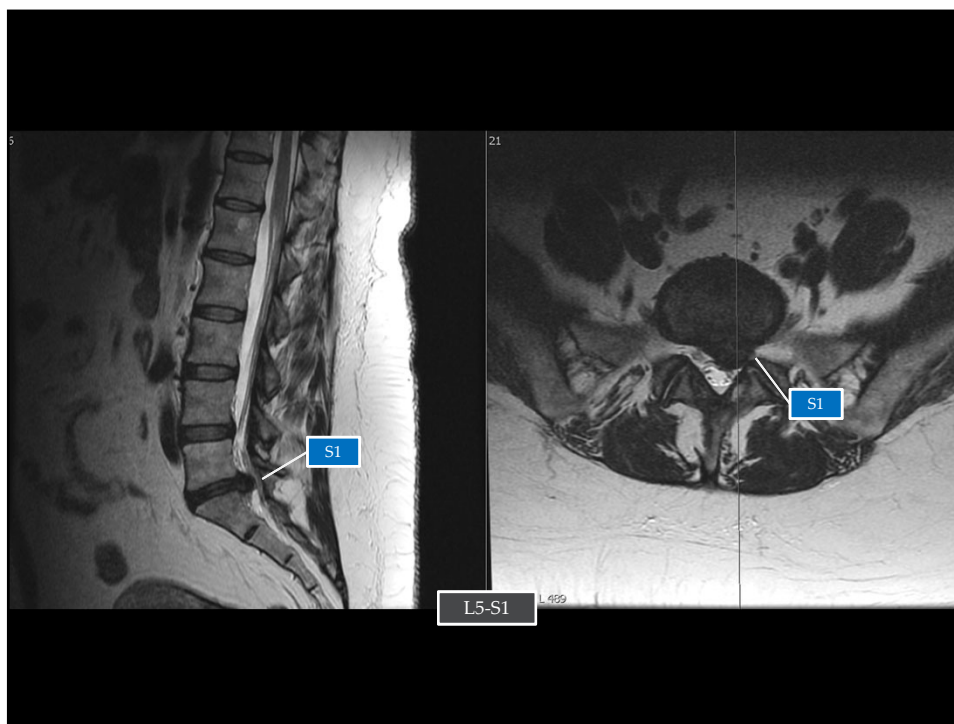
# Lumbar radiculopathy

## HPI

- 39F presenting with left lower extremity pain

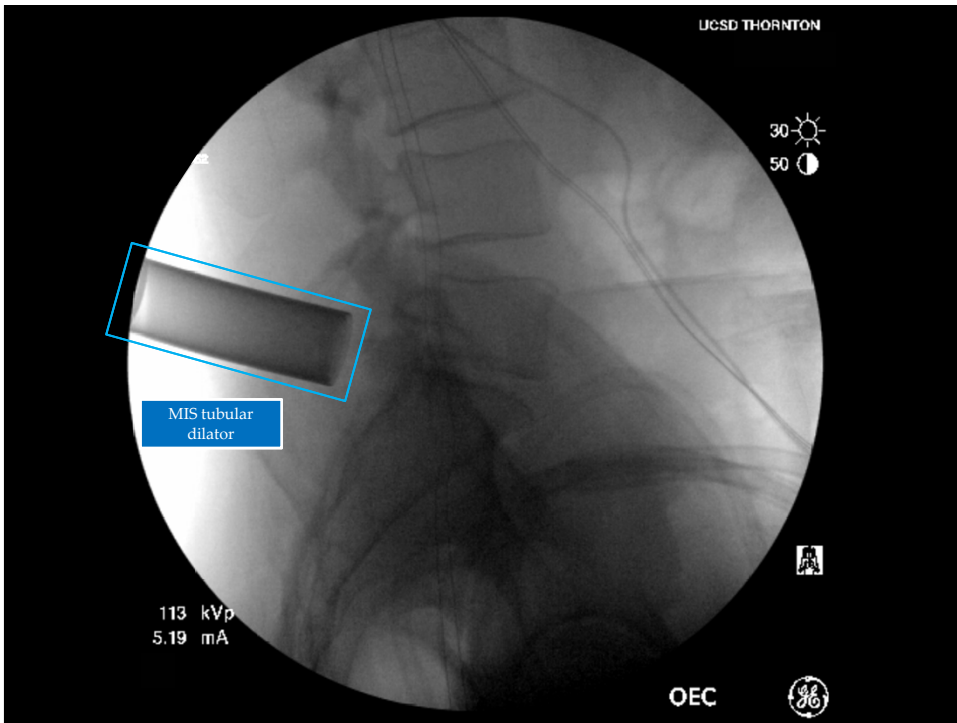
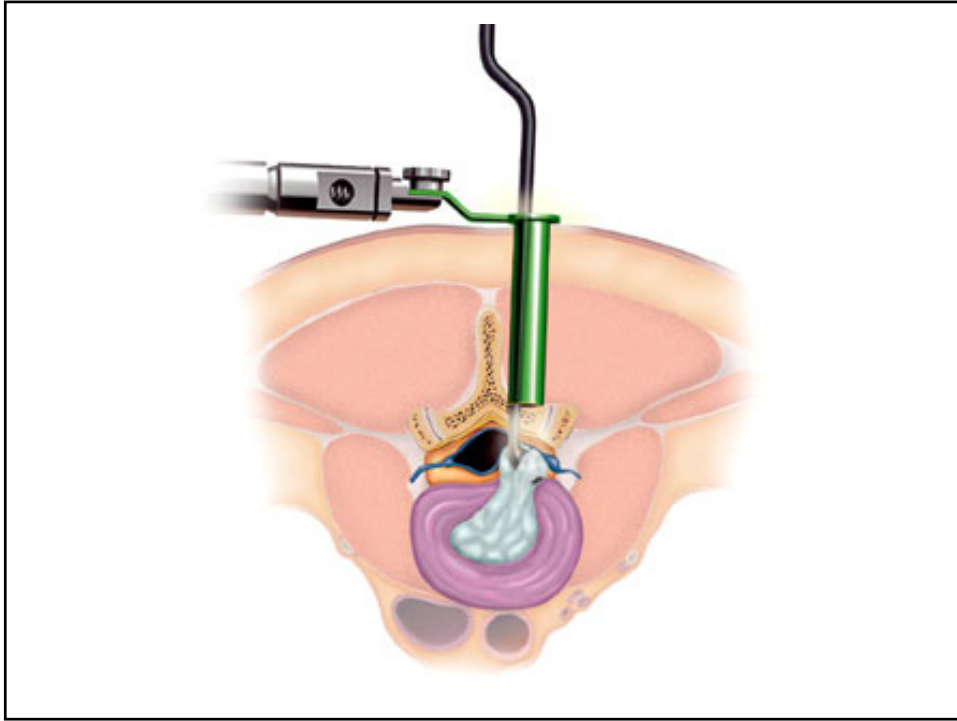
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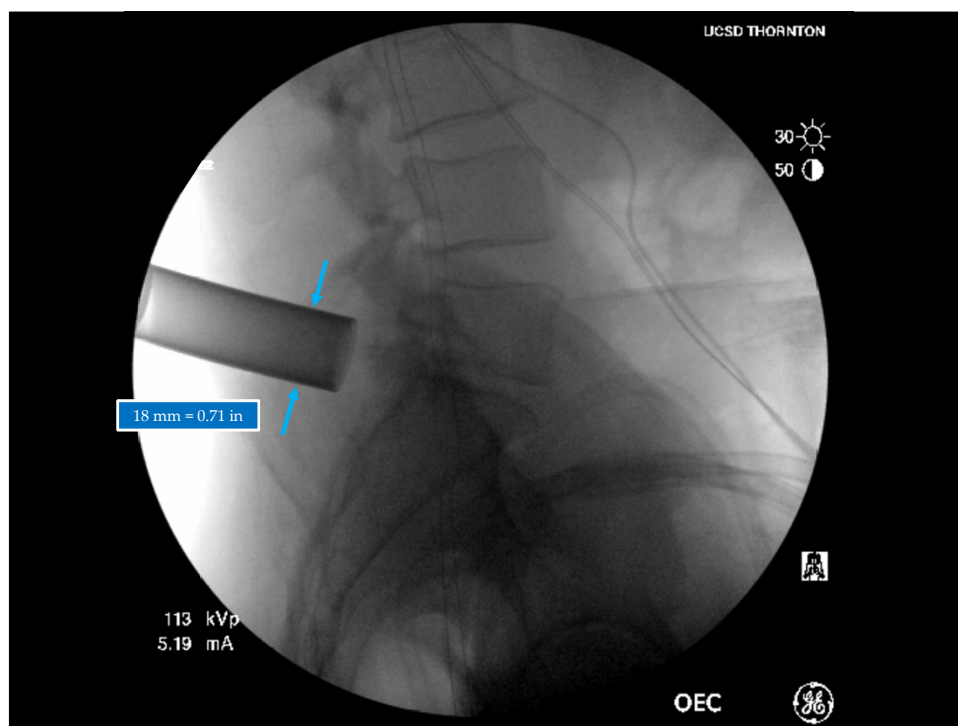




## Surgical Plan

- 39F presenting with left lower extremity pain
- **Plan:**
  - Left-sided L5-S1 minimally invasive microdiscectomy





## Outcome

- 39F presenting with left lower extremity pain
- **Outcome:**
  - Woke up in PACU with leg pain gone.
  - Remains pain free at 1 year follow-up.

# Lumbar stenosis

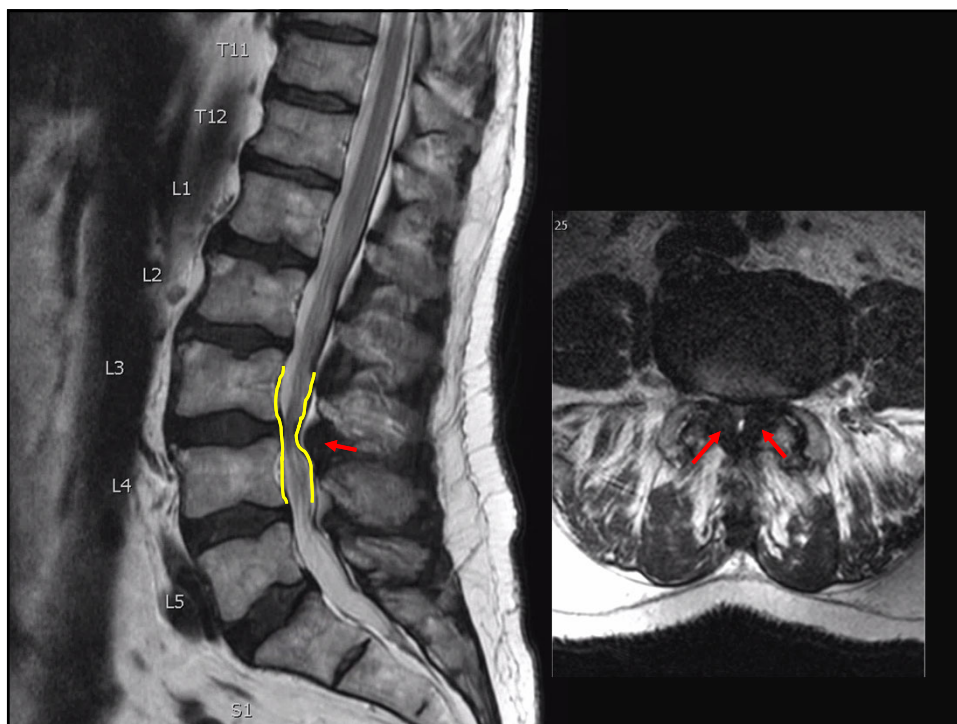
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## HPI

- 71F with bilateral buttock and leg pain

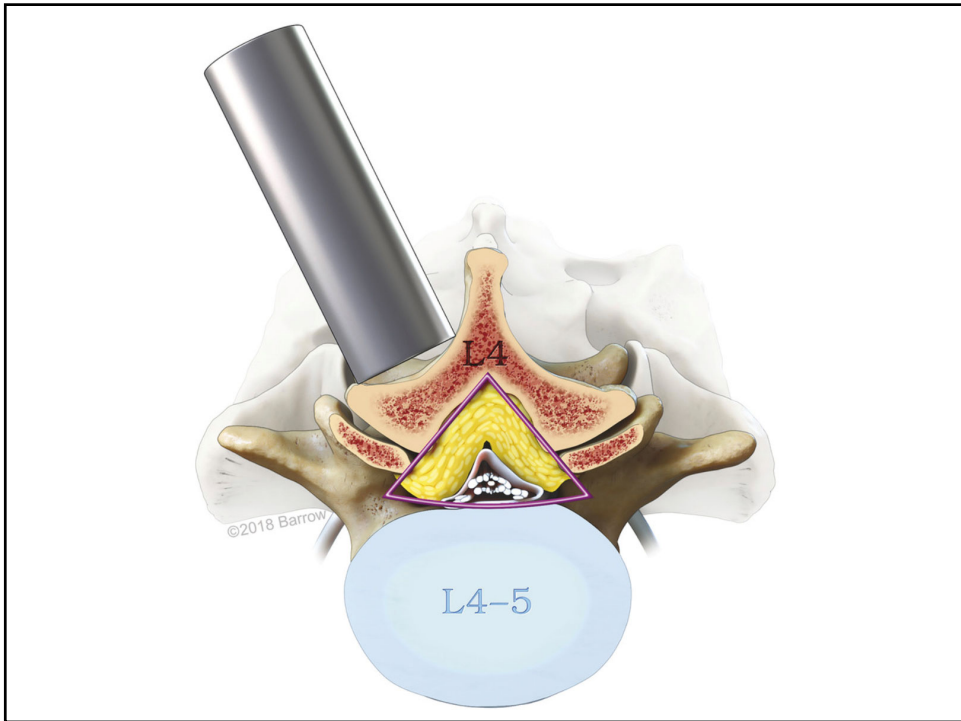
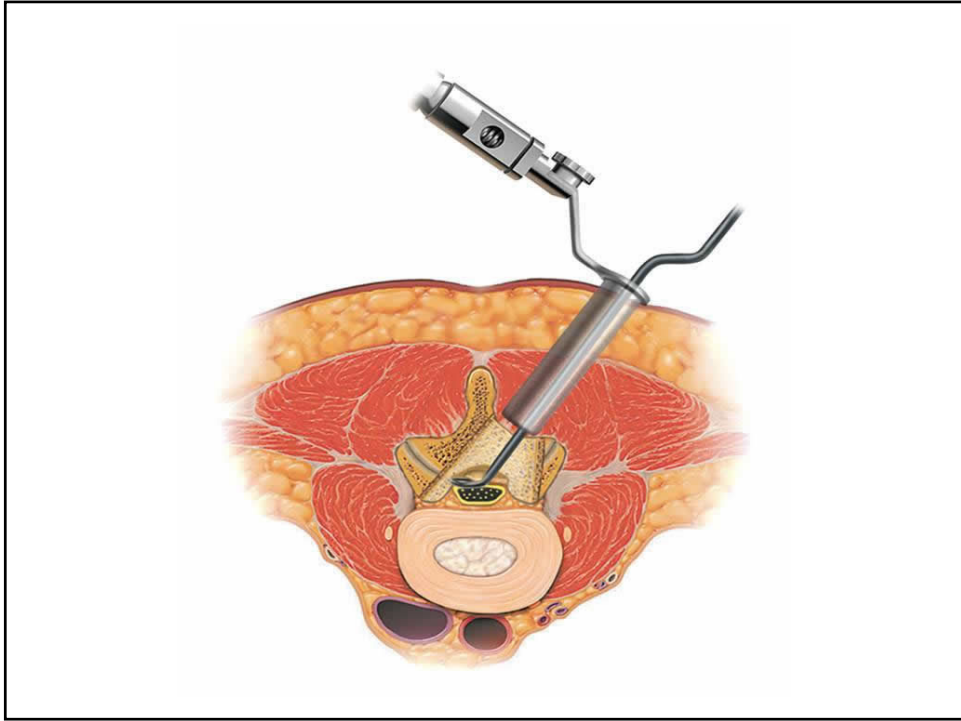
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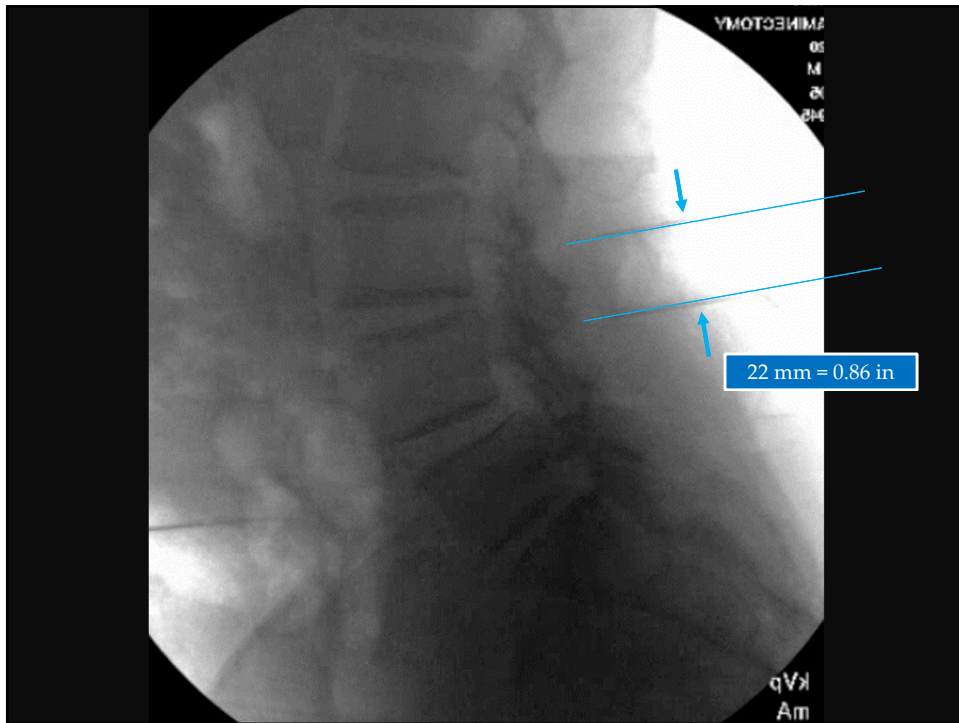
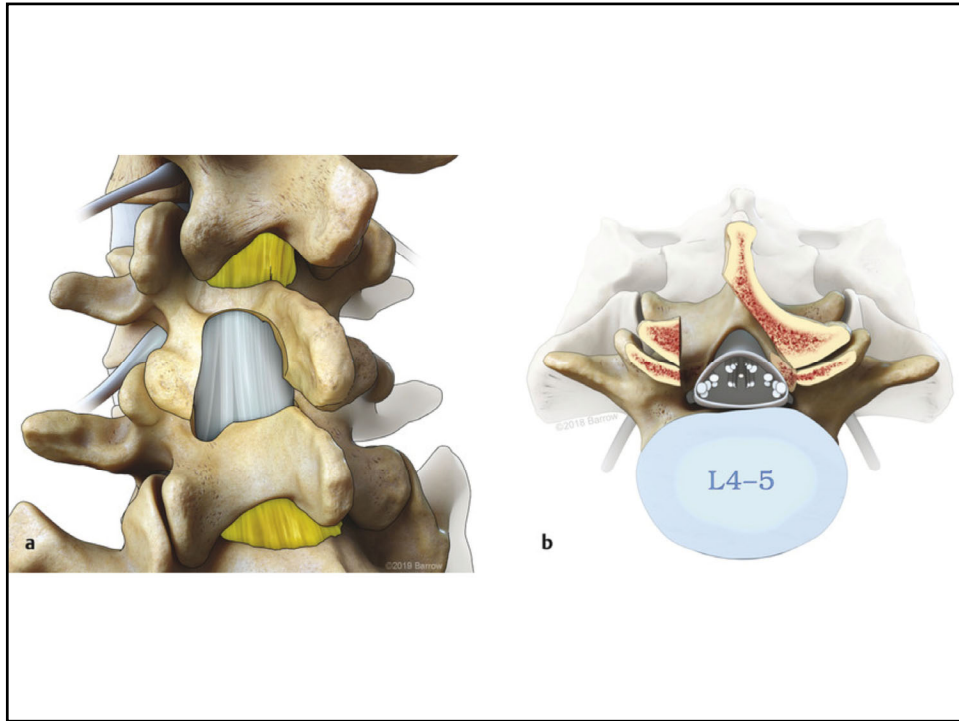


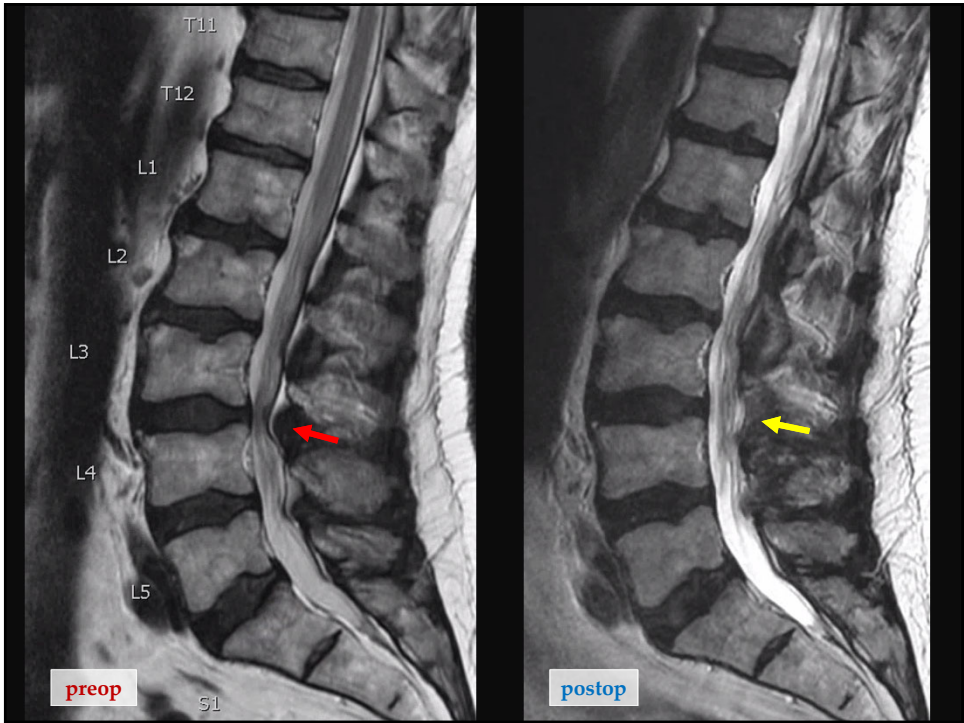
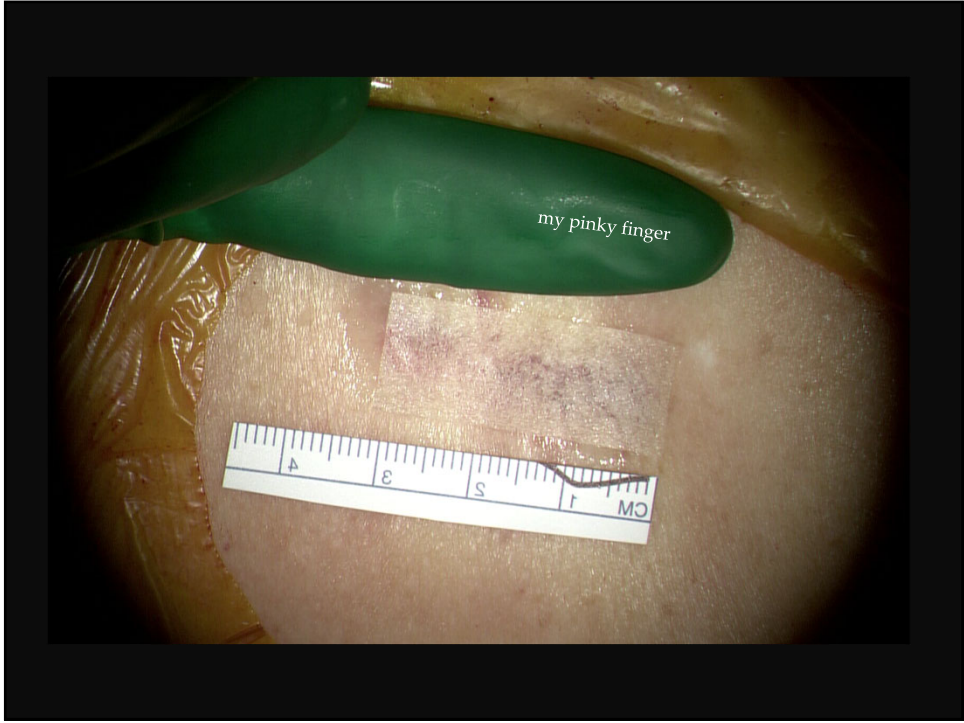


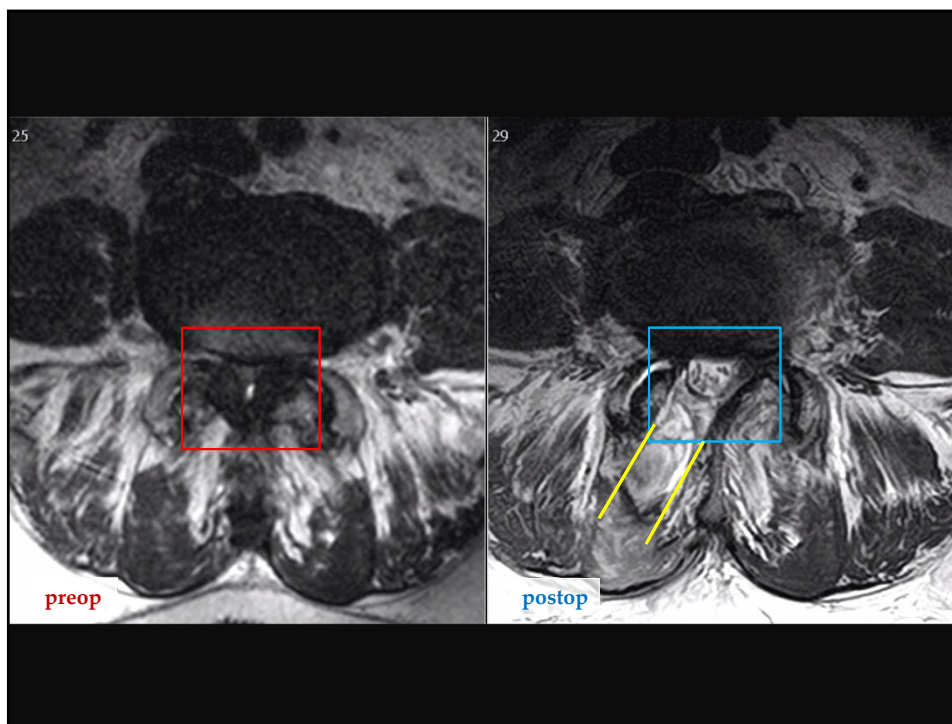
## Surgical Plan

- 71F with bilateral buttock and leg pain
- **Plan:**
  - Minimally invasive L3-4 laminectomy









## Outcome

- 71F with bilateral buttock and leg pain
- **Outcome:**
  - Buttock and leg pain resolved on same-day discharge.
  - Pain free at 6 months, back to golfing and walking miles.

## Lumbar spondylolisthesis

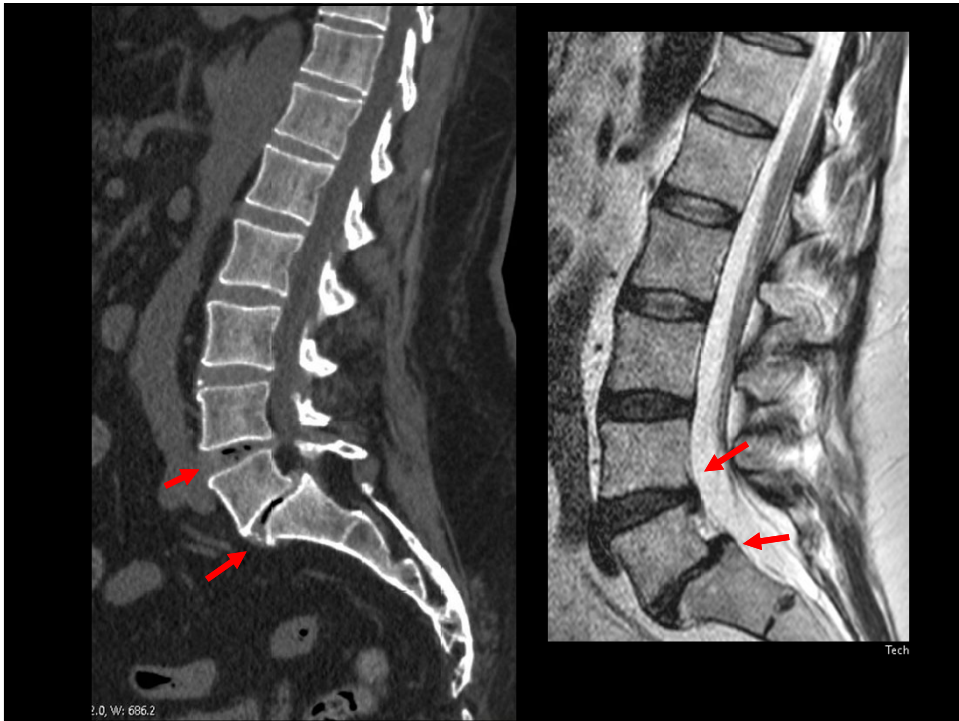
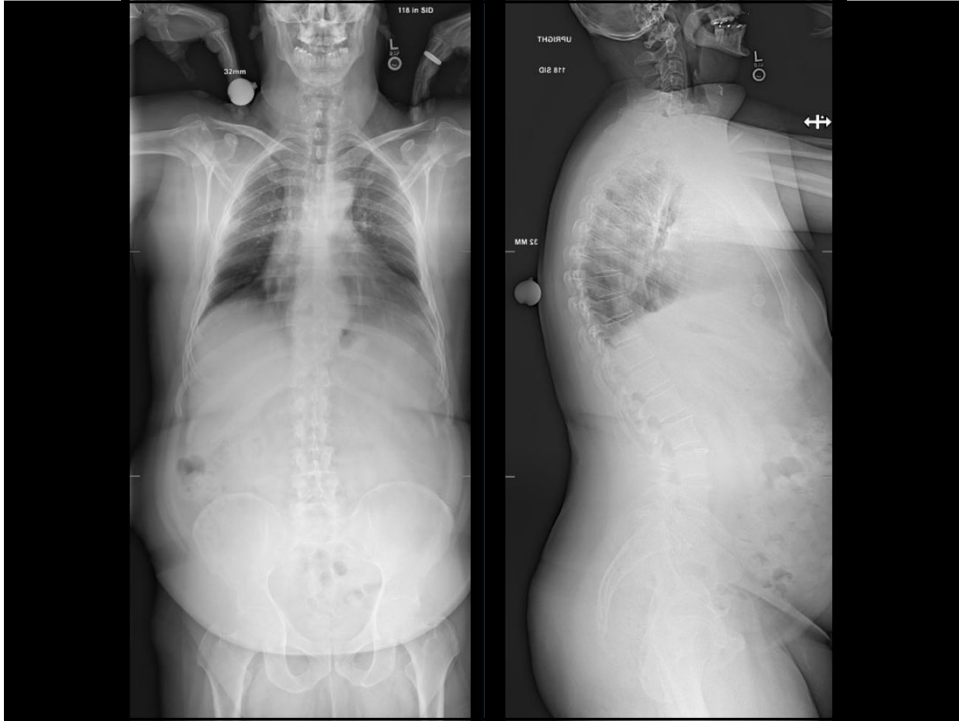
66M with L4-5 spondylolisthesis and back pain, right leg pain, and foot drop

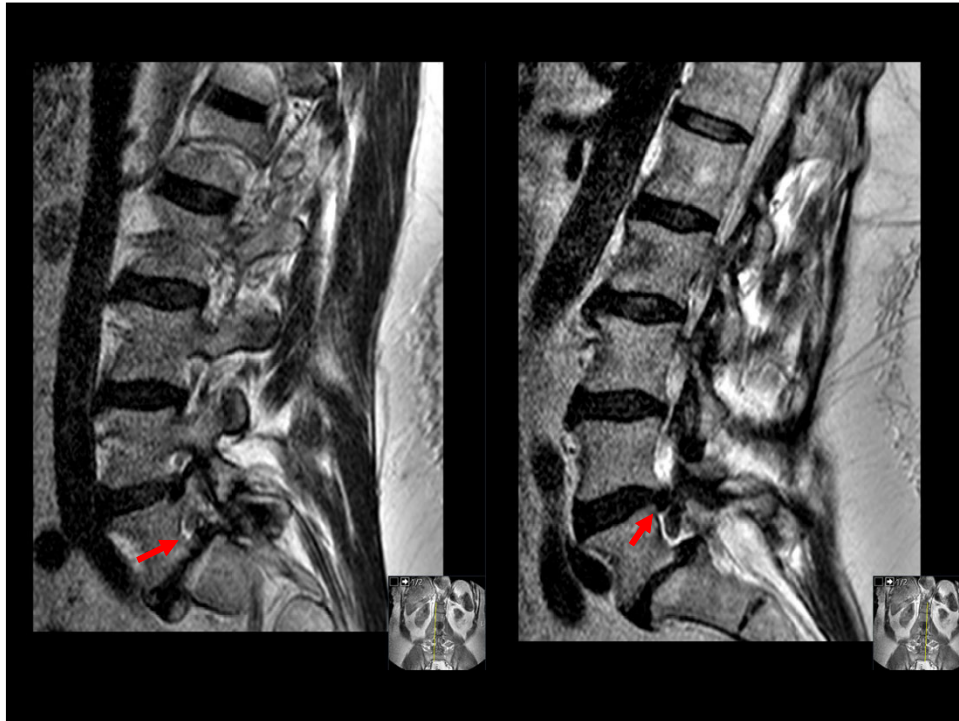
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### HPI

- 60M who presents with back pain with right worse than left leg pain

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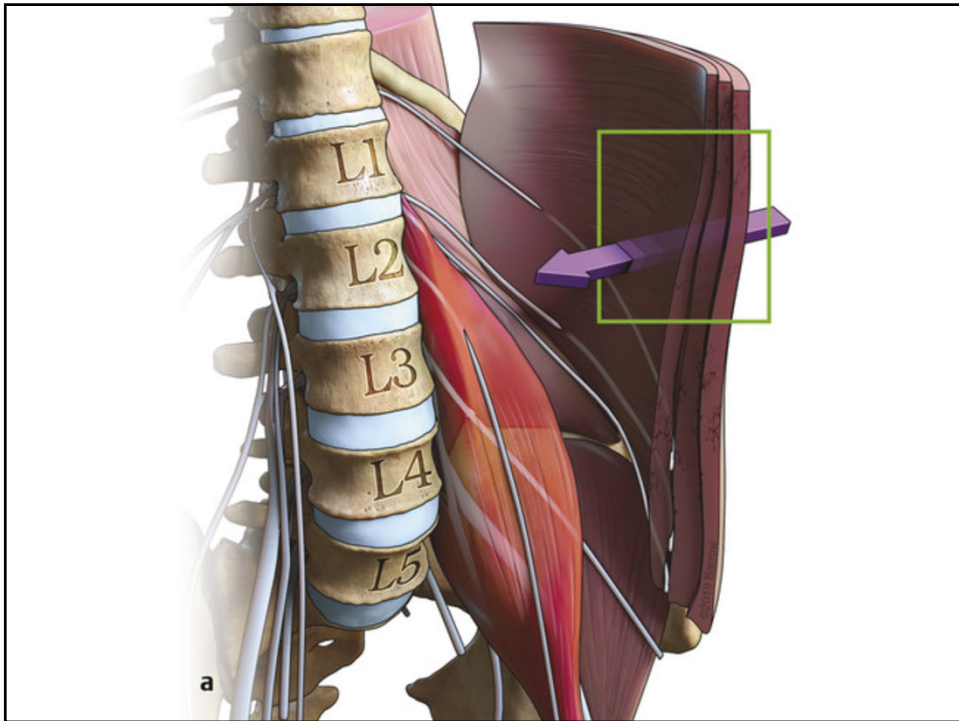
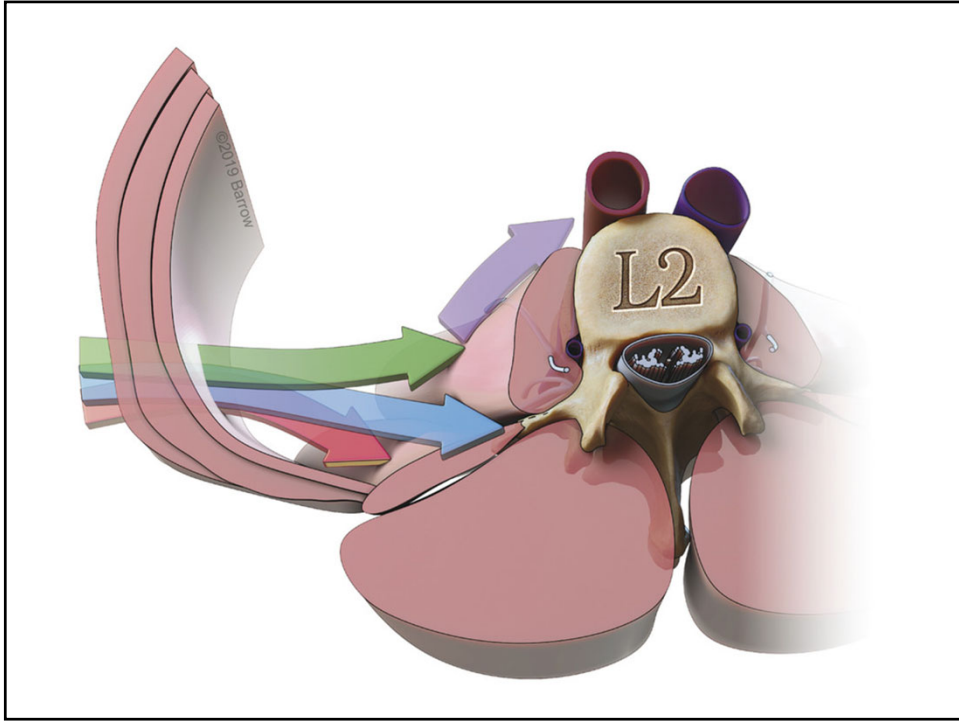


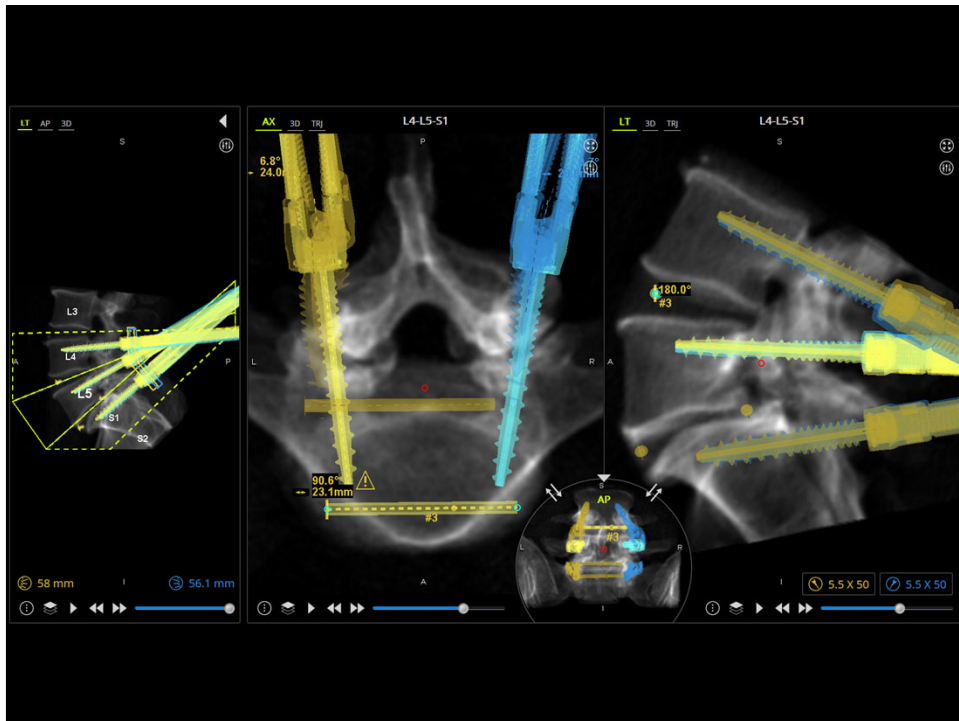
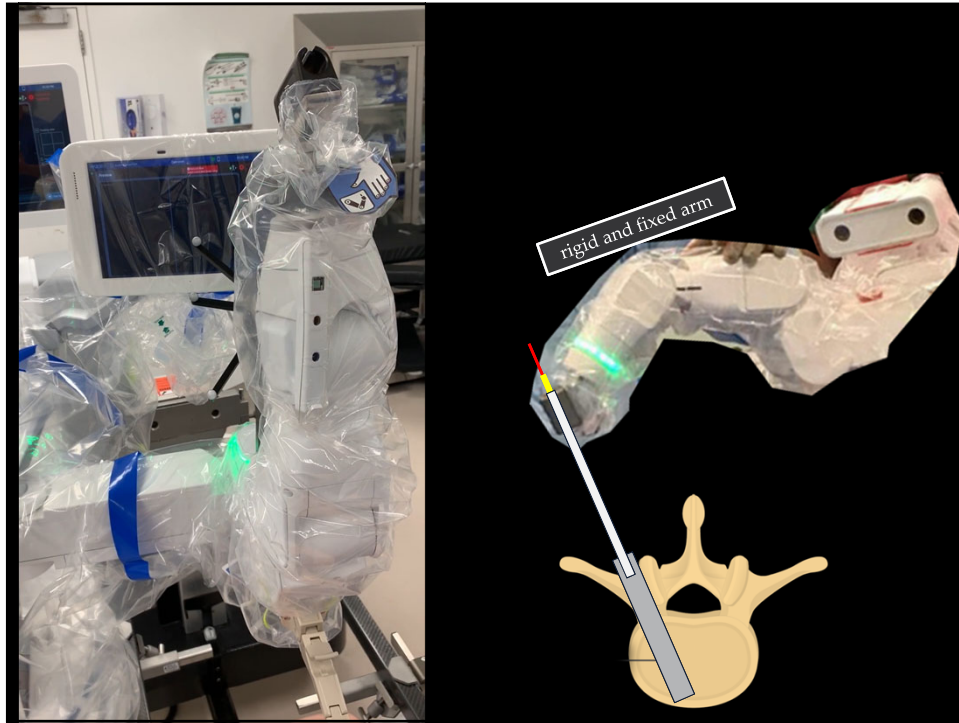


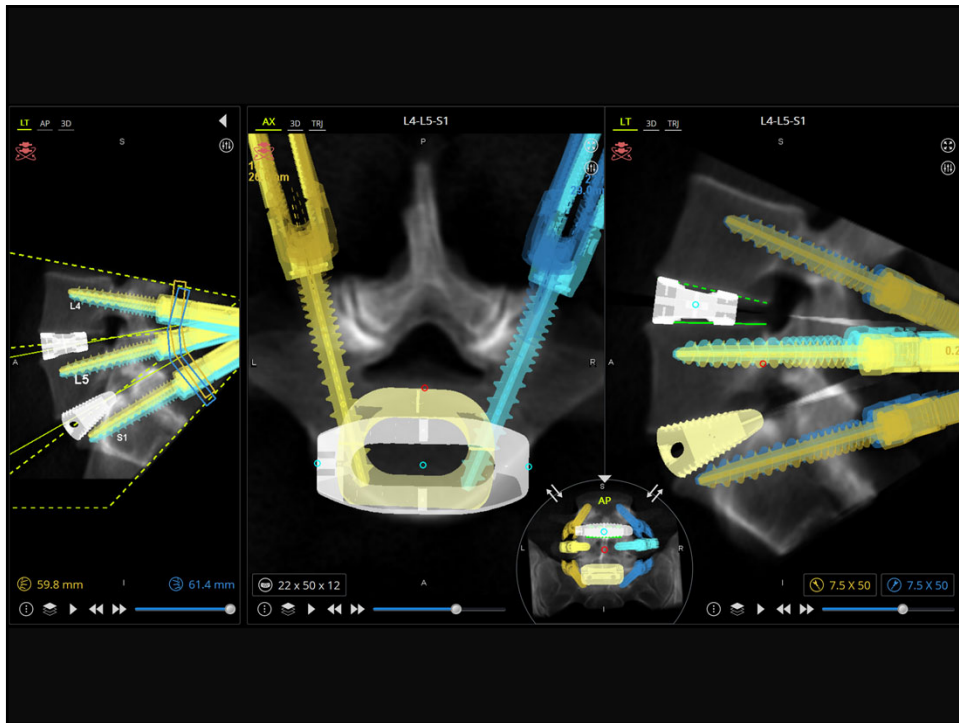
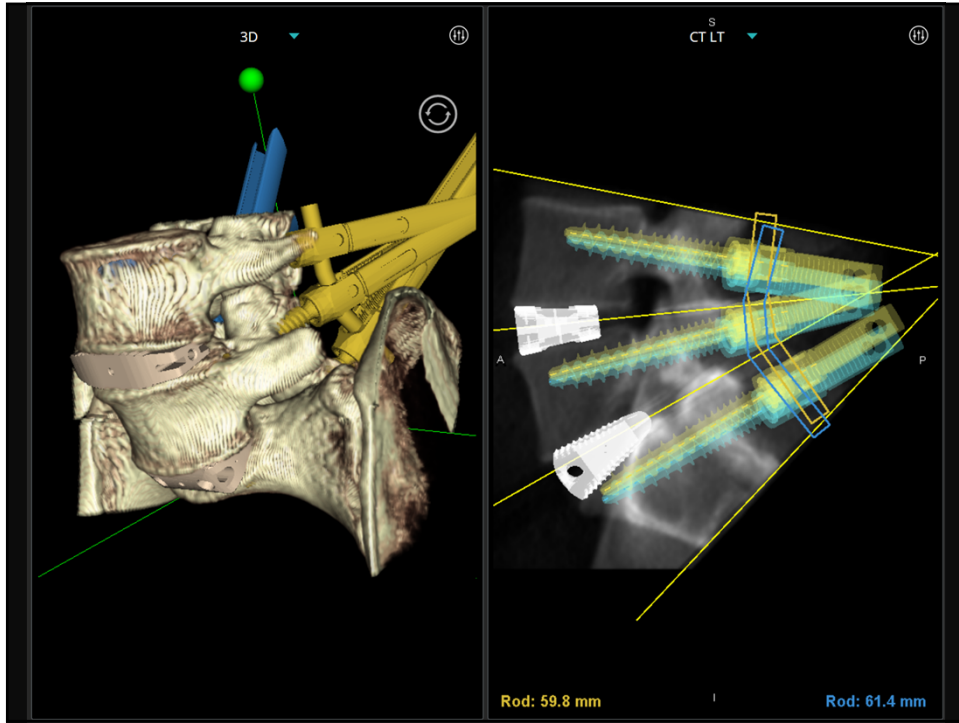
## Surgical Plan

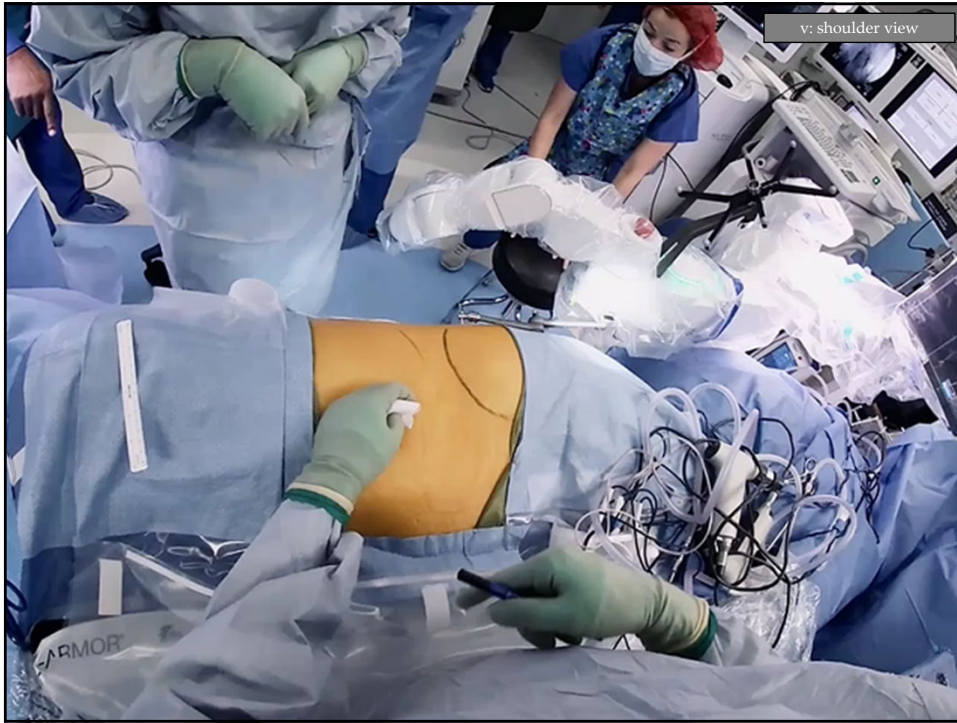
- 60M who presents with back pain with right worse than left leg pain
- **Plan:**
  - Single position minimally invasive robot-assisted L4-S1 oblique lumbar interbody fusion (OLIF) with posterior fixation













navigated robotics