



Common Spinal Disorders

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MedNet21
Center for Continuing Medical Education

 **THE OHIO STATE UNIVERSITY**
WEXNER MEDICAL CENTER

Objectives

- Understand basic spine pathology
- Understand presenting symptoms
- Understand common treatment options

Back Pain

- The fifth most common reason to seek medical care in the outpatient setting
- Eighty-four percent of adults have back pain at some point in their lives
 - 23% one month prevalence
- Risk factors for back pain
 - Smoking, obesity, sedentary lifestyle, age, physically strenuous or sedentary work, low education, Workers' compensation, job dissatisfaction, anxiety, depression
- >85% of back pain is non-specific
 - Absence of reliably identifiable cause

<https://www.aafp.org>
Uptodate.com

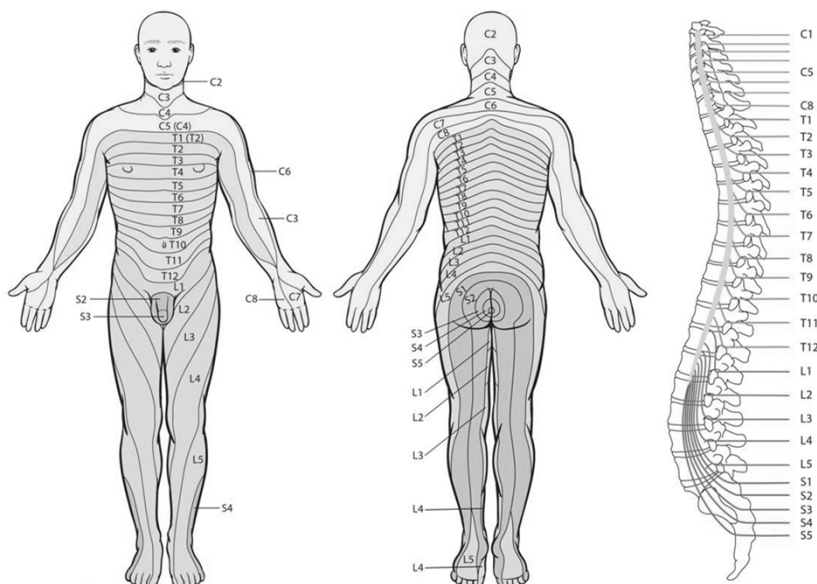
Evaluation of back pain

- Associated factors
 - What makes it better or worse
 - Mechanical vs biological pain
 - Location of pain
 - Radiating pain
 - Lumbar radiculopathy
 - Numbness
 - Weakness
 - Bowel/bladder symptoms

Physical Exam

- Inspection of back and posture
 - Kyphosis, scoliosis
- Palpation/percussion
- Neurological exam
 - Test major muscle groups, sensory exam, gait, reflexes
- Straight leg raise
- Nonorganic signs
 - Overreaction to exam, exam improves when distracted, breakaway weakness, non-dermatomal sx

Dermatomes



Myotomes

Patient Name _____
 Examiner Name _____ Date/Time of Exam _____

ASIA **STANDARD NEUROLOGICAL CLASSIFICATION** **ISC** **OF SPINAL CORD INJURY**

MOTOR
KEY MUSCLES (scoring on reverse side)

C5	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Elbow flexors
C6	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Wrist extensors
C7	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Elbow extensors
C8	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Finger flexors (distal phalanx of middle finger)
T1	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Finger abductors (little finger)

UPPER LIMB TOTAL (MAXIMUM) + = (25) (25) (50)

Comments: _____

L2	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Hip flexors
L3	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Knee extensors
L4	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Ankle dorsiflexors
L5	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Long toe extensors
S1	<input type="checkbox"/>	R	<input type="checkbox"/>	L	Ankle plantar flexors

Voluntary anal contraction (N/A)

LOWER LIMB TOTAL (MAXIMUM) + = (25) (25) (50)

SENSORY
KEY SENSORY POINTS

0 = absent
1 = impaired
2 = normal
NT = not testable

	LIGHT TOUCH		PIN PRICK	
	R	L	R	L
C2				
C3				
C4				
C5				
C6				
C7				
C8				
T1				
T2				
T3				
T4				
T5				
T6				
T7				
T8				
T9				
T10				
T11				
T12				
L1				
L2				
L3				
L4				
L5				
S1				
S2				
S3				
S4				
S5				

Any anal sensation (N/A)

PIN PRICK SCORE (max: 112)

LIGHT TOUCH SCORE (max: 112)

TOTALS: (MAXIMUM) (50) (50) (50) (50)

• Key Sensory Points

NEUROLOGICAL LEVEL: R L

COMPLETE OR INCOMPLETE? (Incomplete = key sensory or motor function in S4-S5)

ZONE OF PARTIAL PRESERVATION: (Specify level of sensory/motor involvement)

ASIA IMPAIRMENT SCALE:

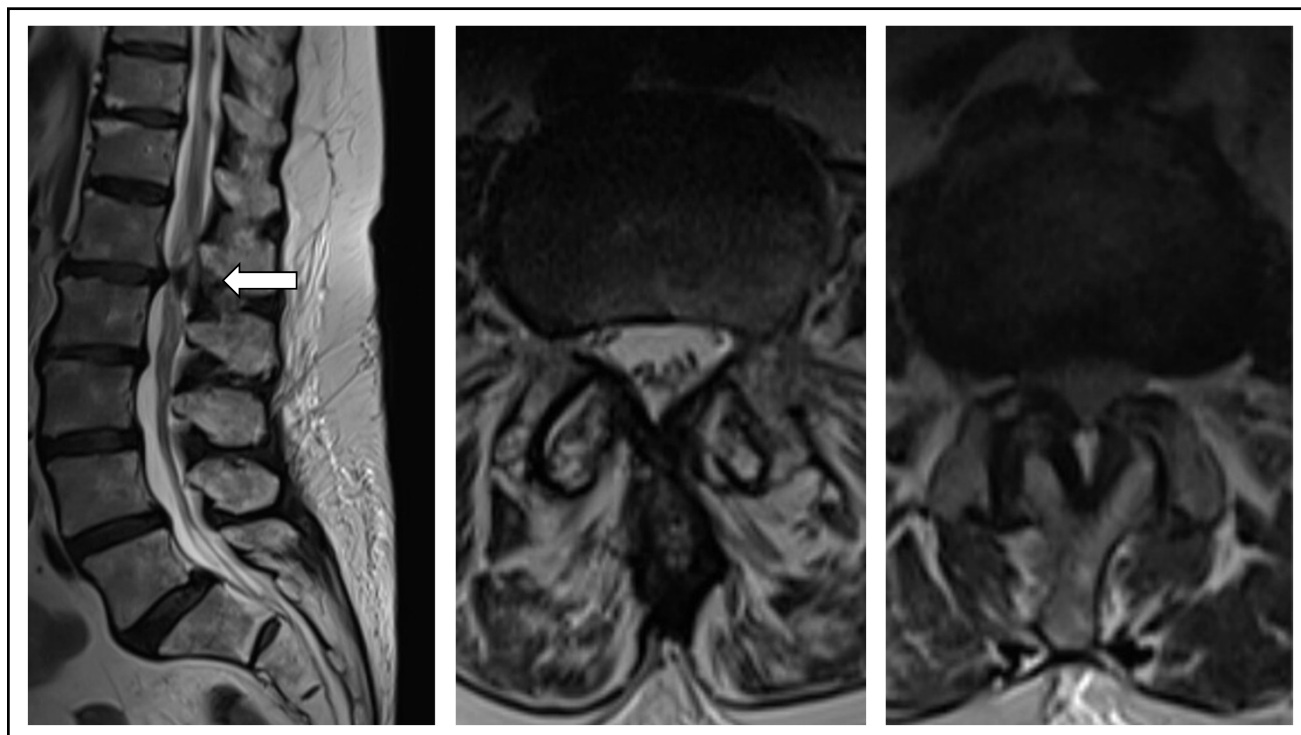
Red Flags

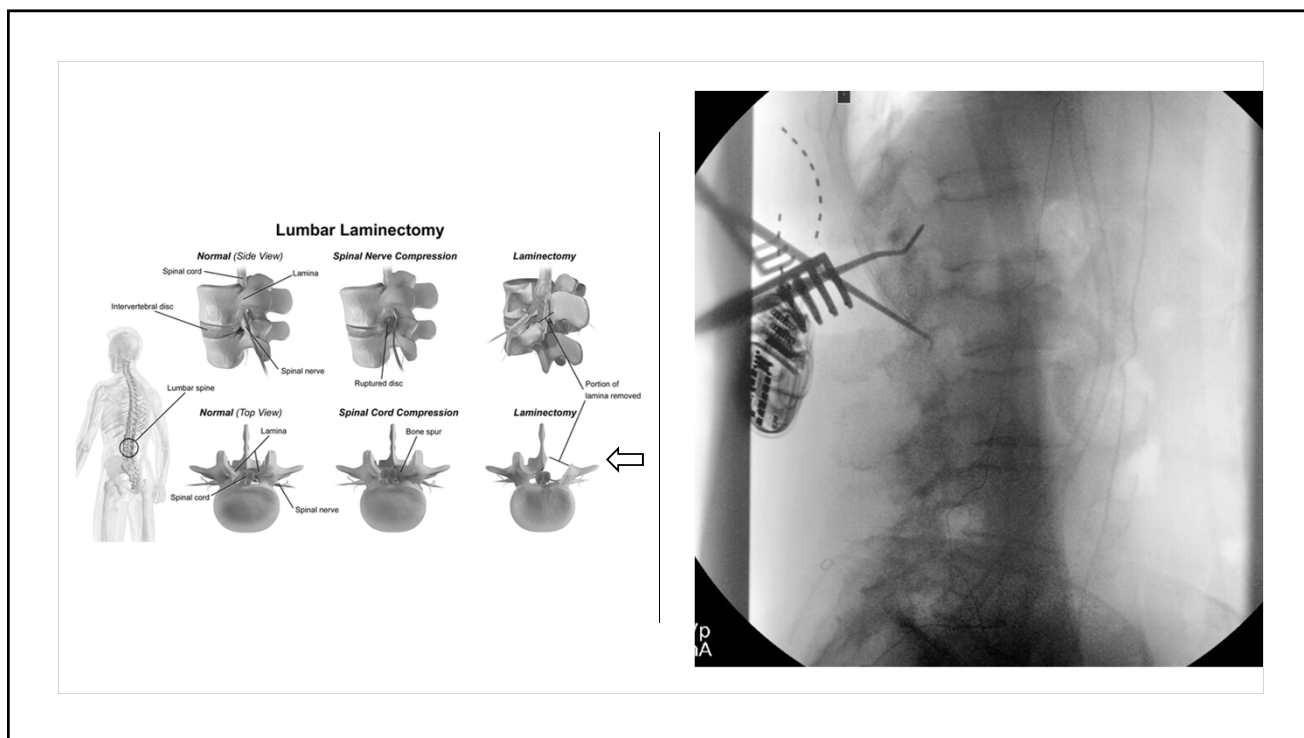
- Progressive neurologic deficits
 - Weakness
 - Bowel/bladder dysfunction
- Fever
- Sudden onset pain with spine tenderness
- History of trauma
- Serious underlying condition
 - Infection
 - Malignancy
- Osteoporosis or chronic steroid use
 - May be at increased risk of fractures

Lumbar Stenosis

Lumbar stenosis is a condition that involves narrowing of the central canal

- symptoms can include radicular leg pain, numbness, bowel/bladder incontinence
- Neurogenic Claudication is a classic sign of lumbar stenosis

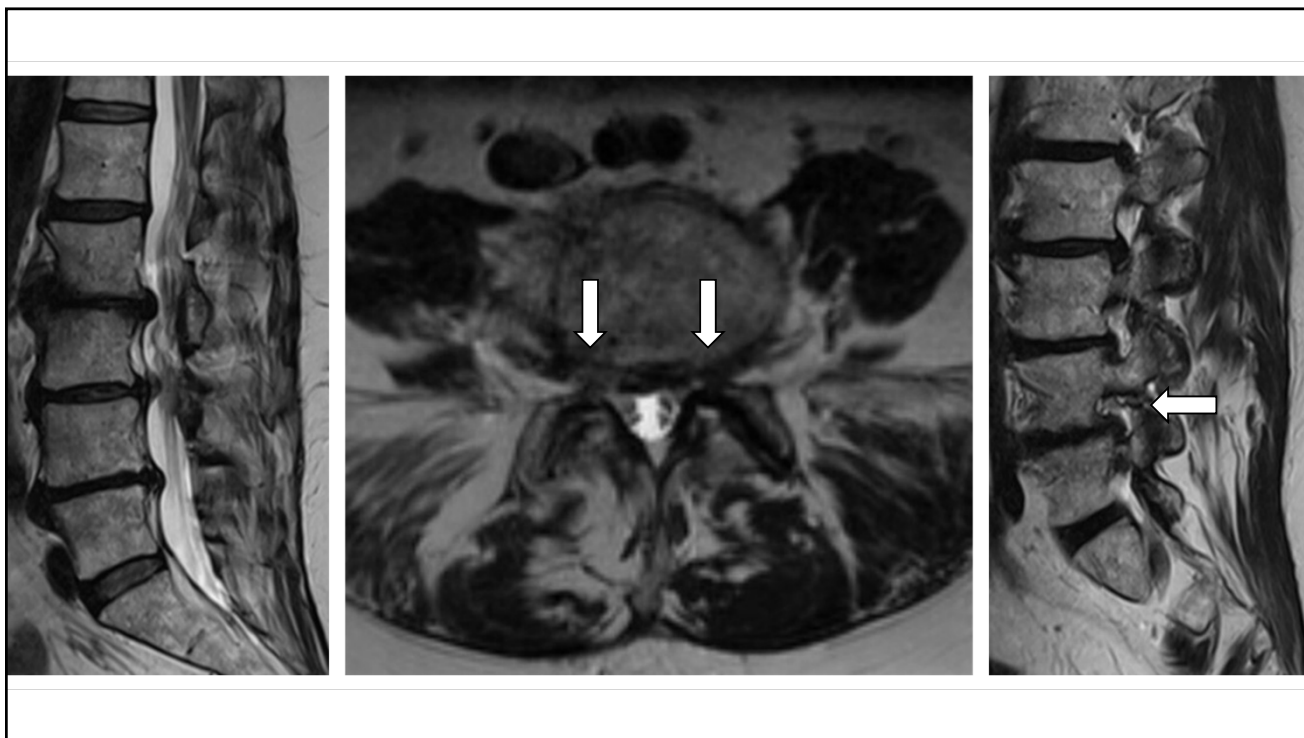




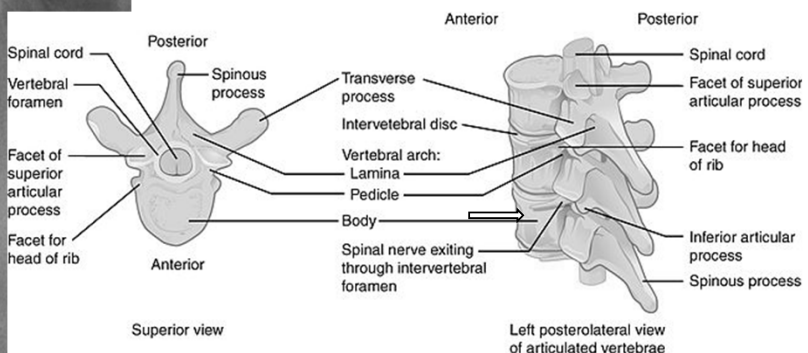
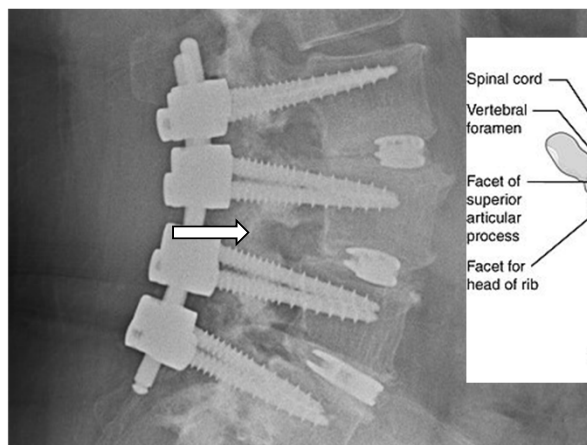
Foraminal Stenosis

Foraminal stenosis is a condition that involves narrowing of the neuroforamen (i.e. where the nerve exits)

- Symptoms can include radicular leg pain, numbness,
- Neurogenic Claudication is NOT a classic sign of lumbar stenosis
- Does Not cause bowel/bladder issues



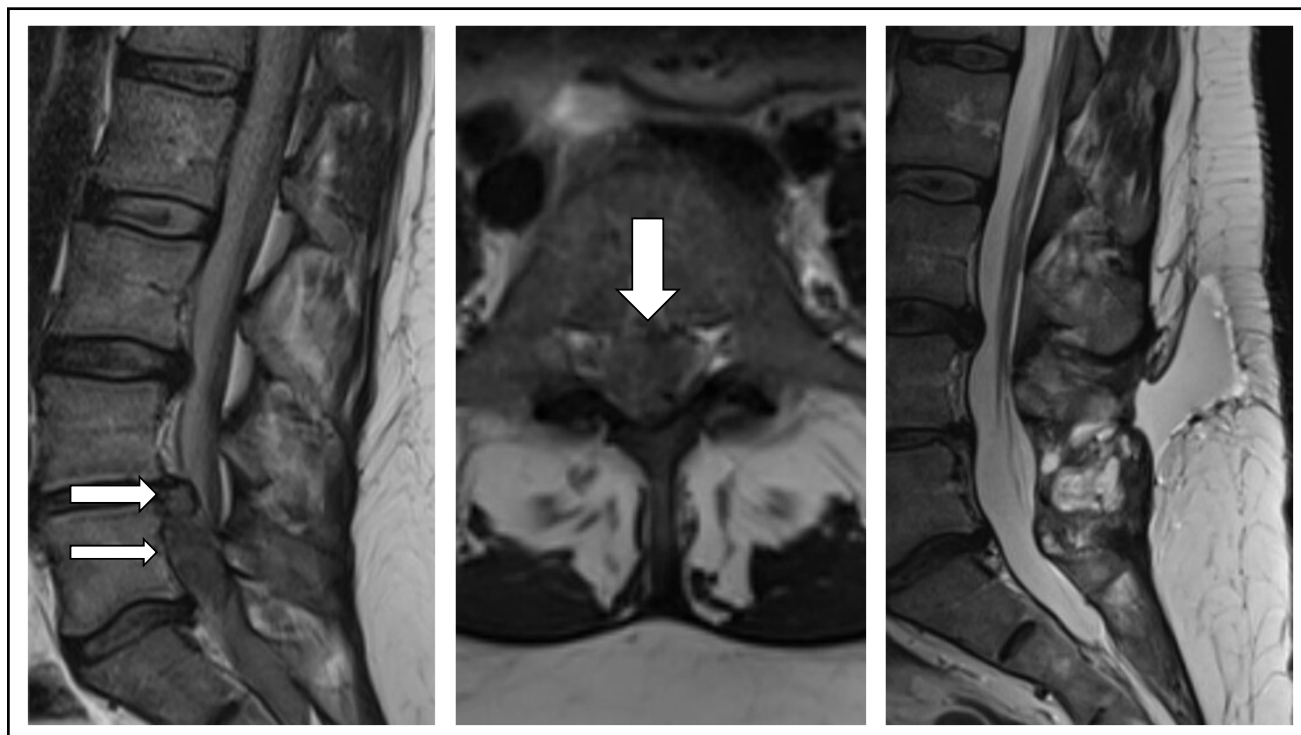
Lumbar Transforaminal Interbody Fusion (TLIF)



Lumbar Disc Herniation

Lumbar Disc Herniation can cause impingement of a lumbar nerve

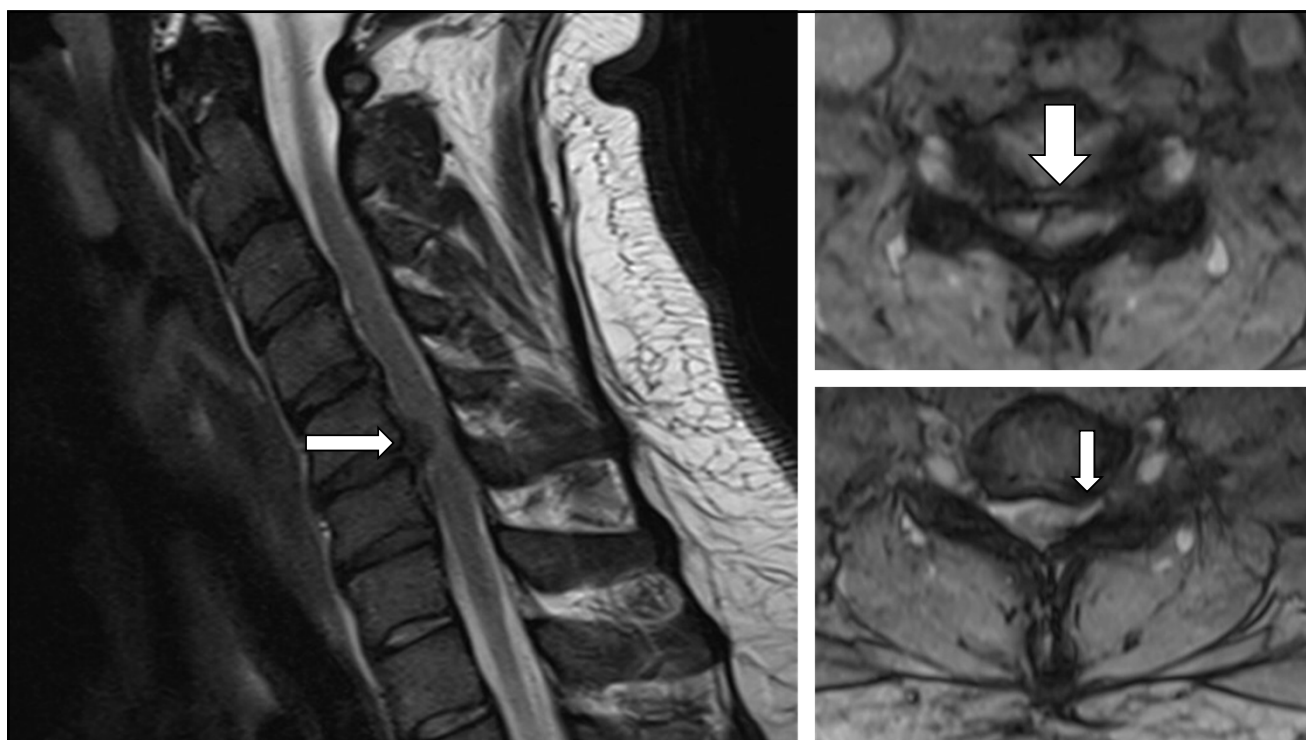
- Symptoms can include radicular leg pain, numbness, weakness
- Severe disc herniations can cause cauda equina syndrome



Cervical Stenosis

Cervical Stenosis can cause impingement on exiting nerves (radiculopathy) or spinal cord (myelopathy)

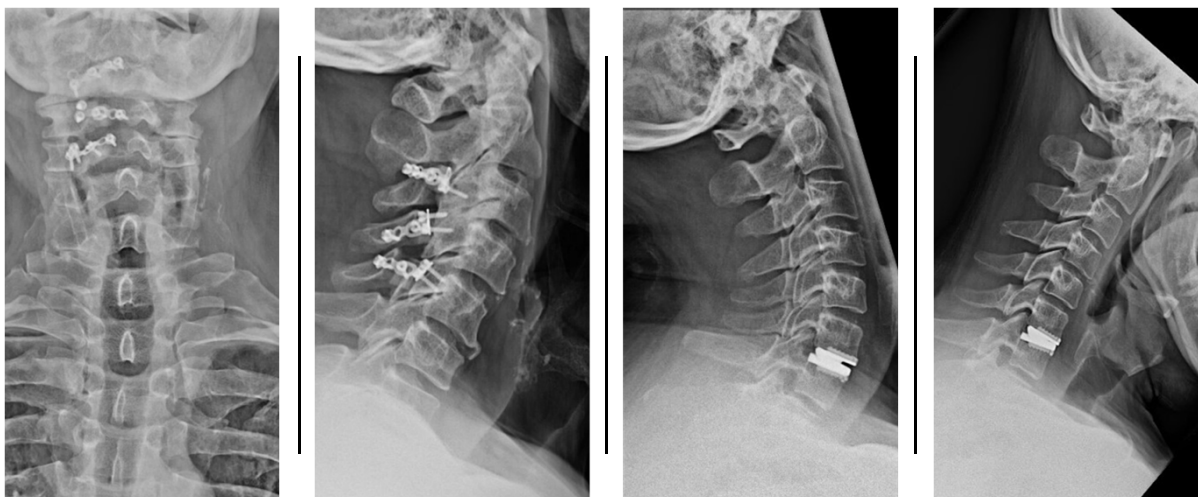
- Symptoms of cervical radiculopathy can be radiating pain, numbness, or weakness.
 - Loss of reflexes
- Cervical myelopathy can cause coordination problems, balance problems, numbness, weakness, bowel/bladder issues
 - Hyperreflexia, Hoffman's Sign



Cervical Stenosis

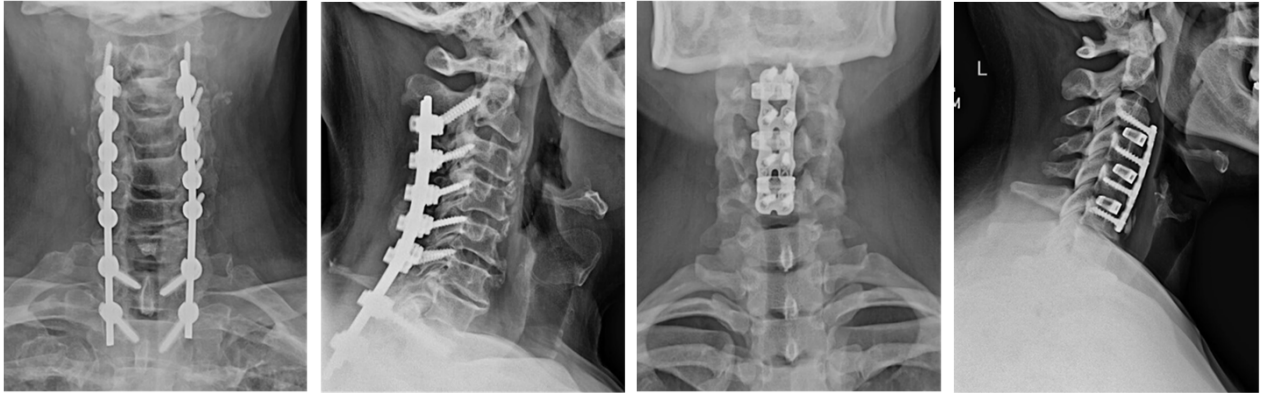
Treatment options include

- Decompression and Fusion
 - Anterior (ACDF) or Posterior
- Laminoplasty (posterior)
- Cervical Disc Arthroplasty (artificial disc)



•Cervical Decompression and Fusion

- Anterior vs. Posterior



Spinal Deformity

Problem with spinal alignment

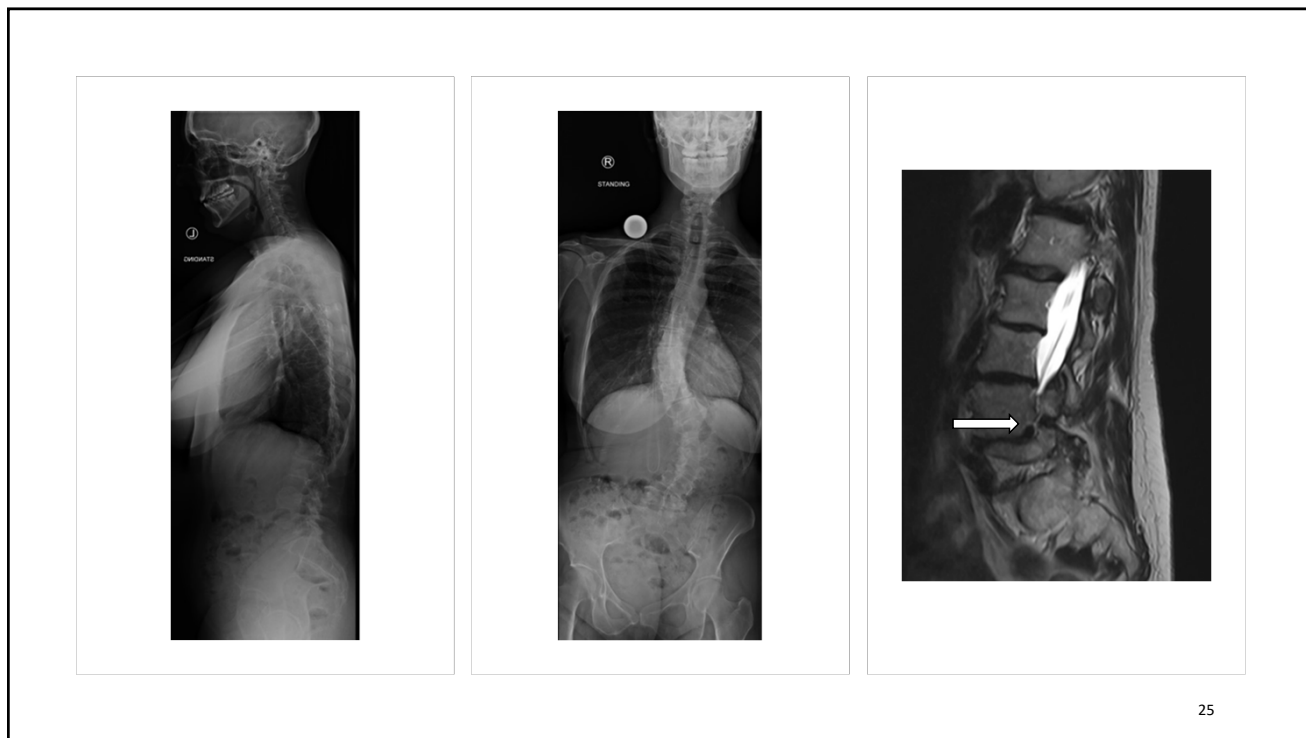
- Can cause pain from difficulty standing upright
- Often times combined with stenosis, foraminal stenosis, disc herniations, etc...

Case 1

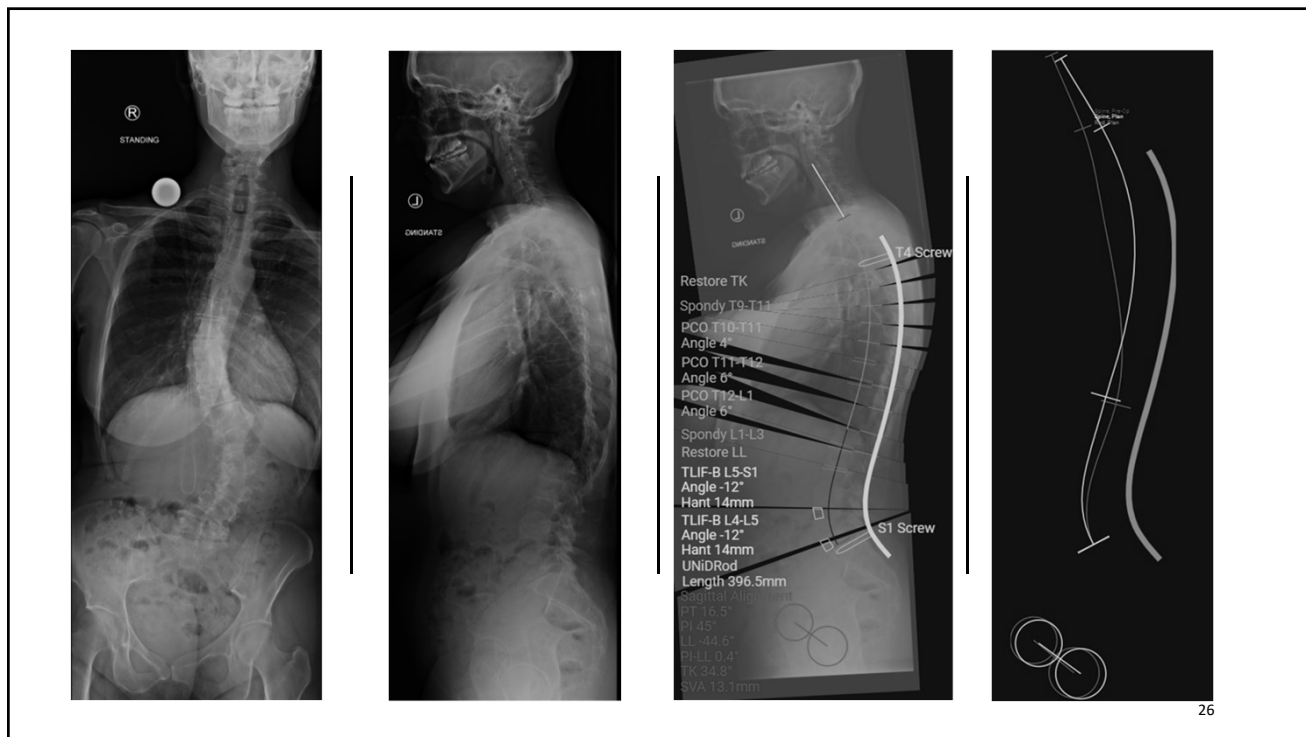
- 52 yo Female who presents with a several year of progressive axial low back pain along with maintaining a standing posture.
- Conservative management: Physical therapy, multiple epidural steroid injections, radiofrequency ablation

Case 1

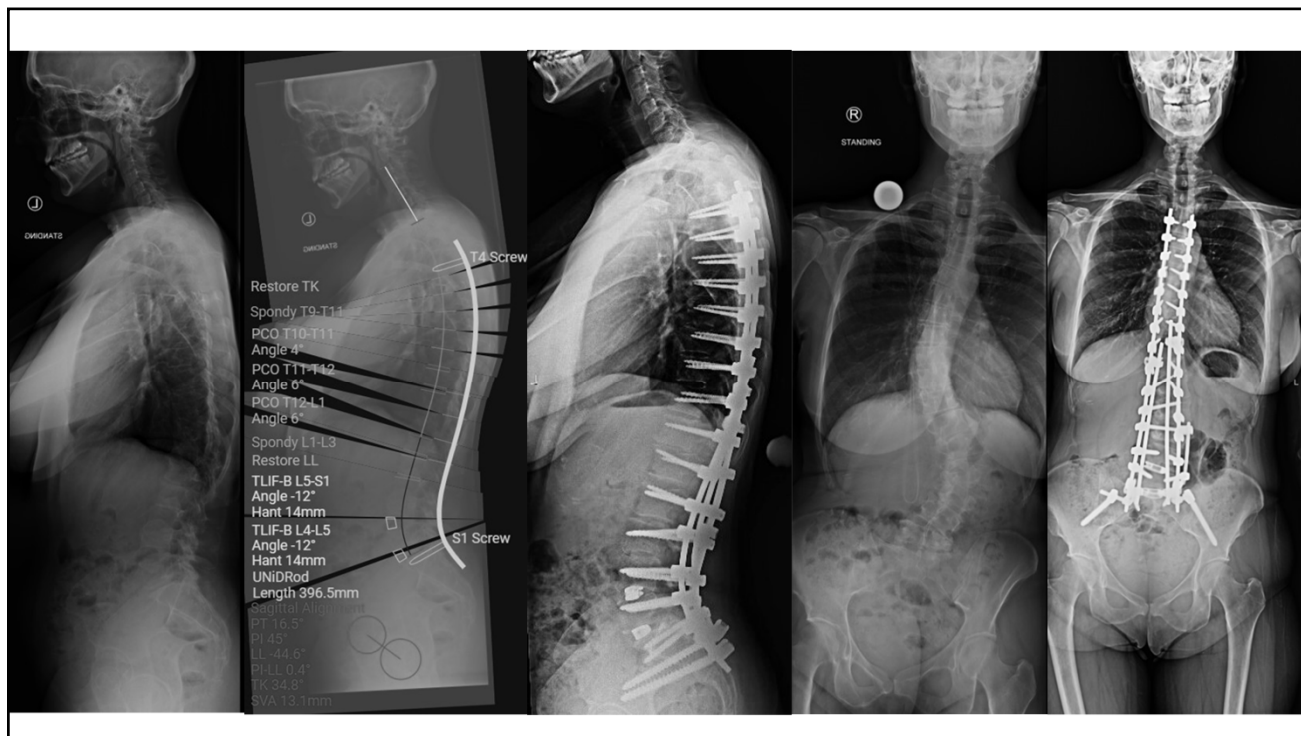
- Physical Exam:
 - Alert and oriented x 3
 - Cranial nerves 2-12 intact
 - 5/5 strength in bilateral upper and lower extremities
 - Sensation intact
 - Posture: left leaning posture



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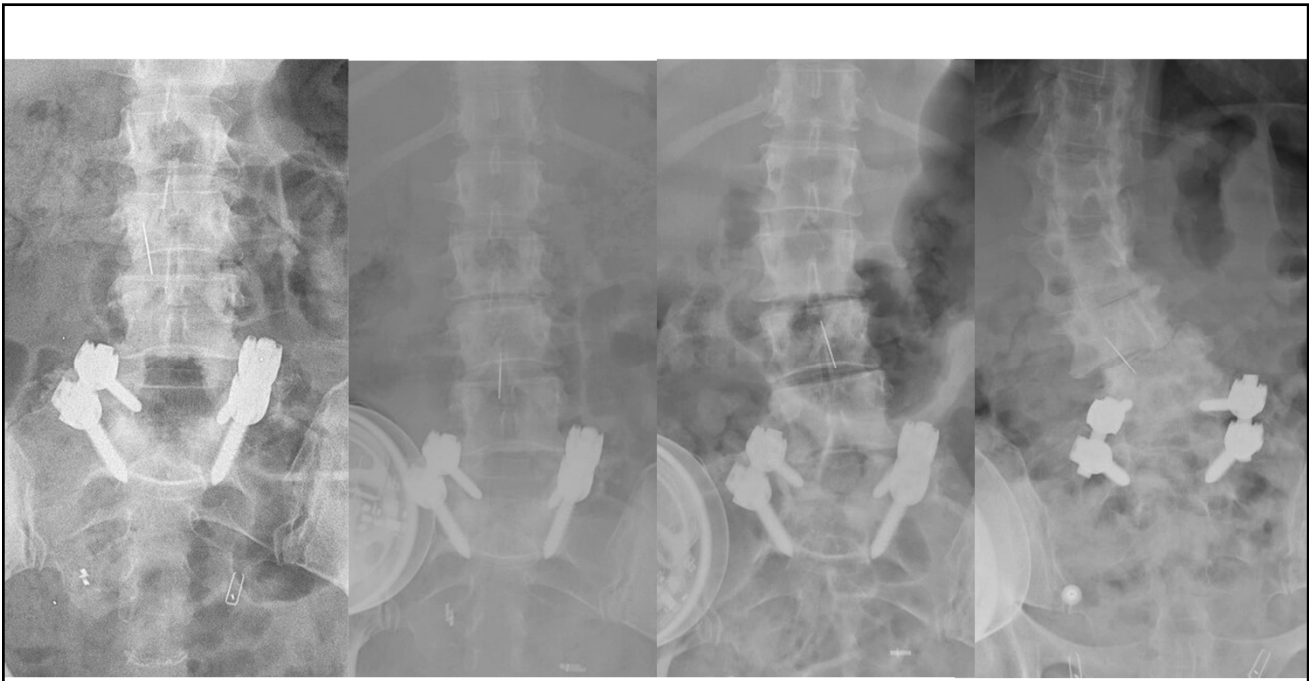


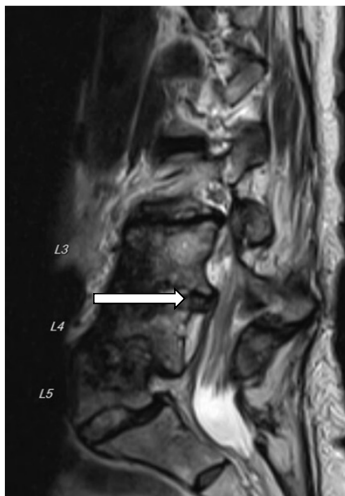
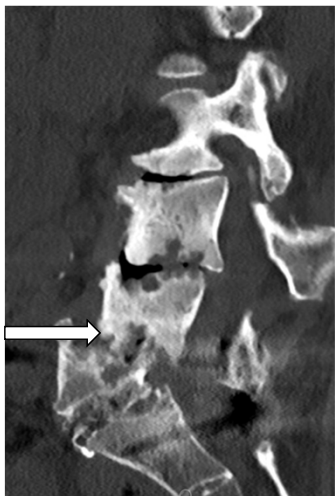
Case 2

- 62 year old female presents with progressive back and leg pain, lower extremity numbness and weakness.
- Several recent falls, uses a wheelchair for long distances
- Conservative management: Physical therapy
- Past medical/surgical history: L5/S1 TLIF in 2012, baclofen pump placement

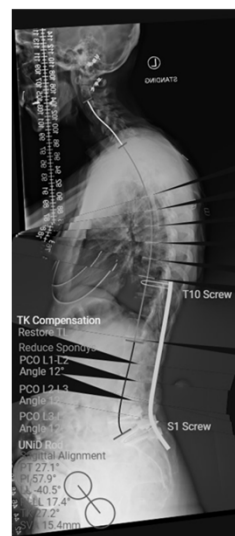
Case 2

- Physical Exam:
 - Alert and oriented x 3
 - Cranial nerves 2-12 intact
 - 5/5 strength in bilateral upper extremities
 - 4/5 in bilateral lowers, 3/5 in right dorsiflexion/extensor hallucis longus
 - Sensation diminished in bilateral legs

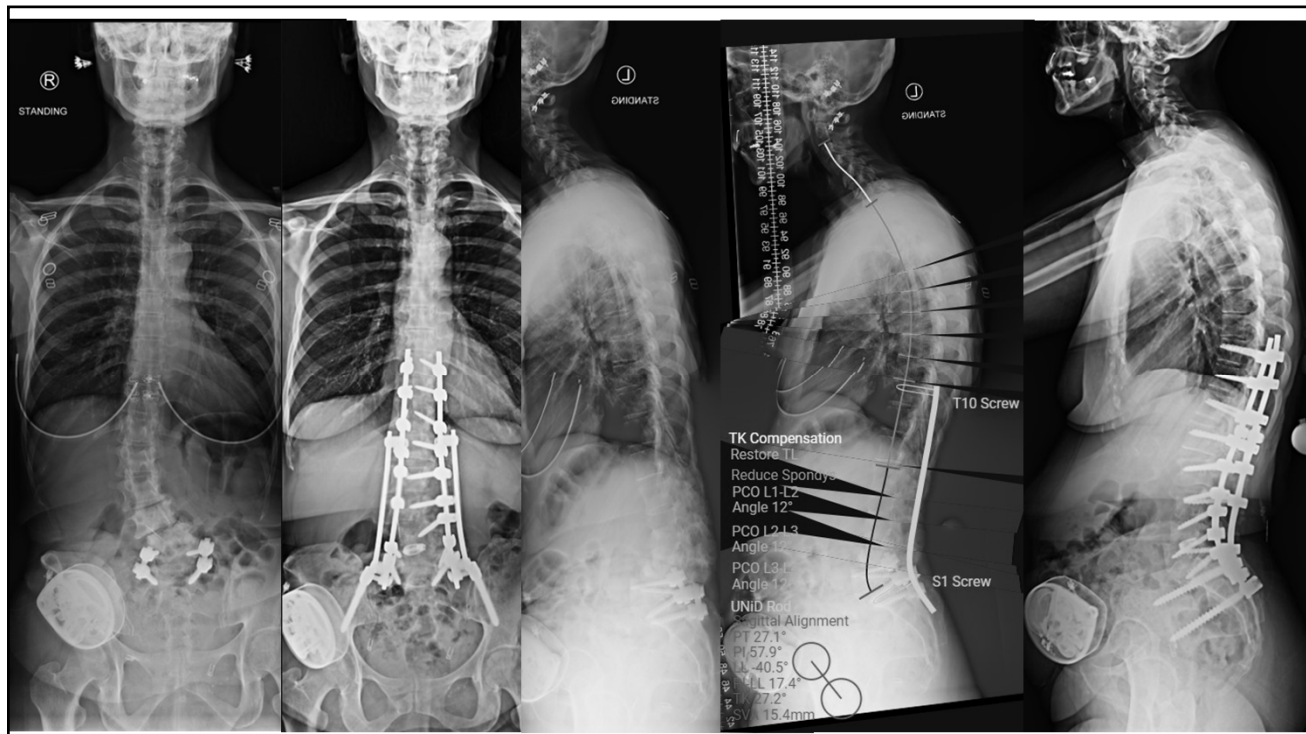




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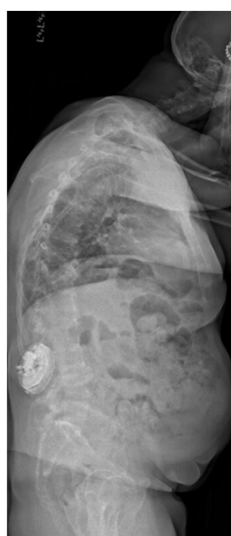
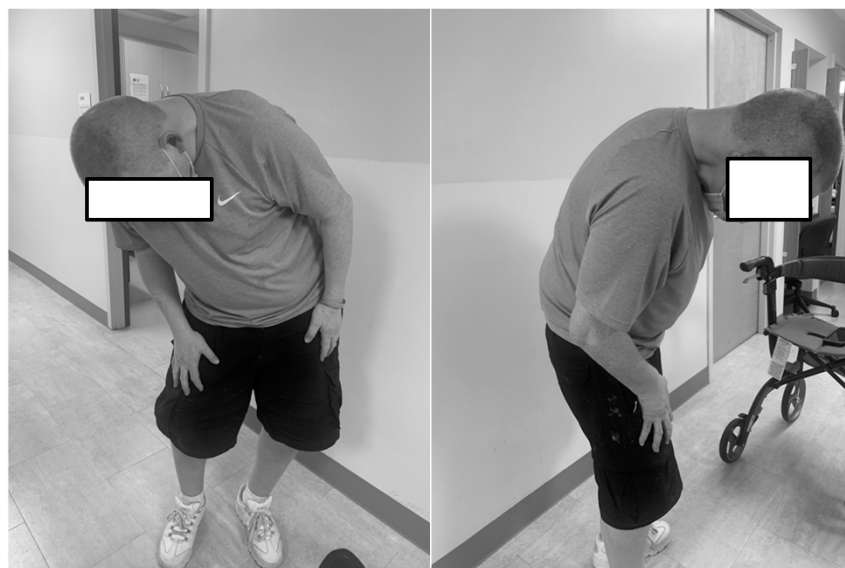
	↓	↓	↓	↓
	PRE-OP VISIT 2/10/2022	CASE U	VISIT 8/11/2022	VISIT 12/13/2022
Pelvic Tilt, PT (°)	34	27	23	25
Pelvic Incidence, PI (°)	58	58	58	58
Sacral Slope, SS (°)	24	31	35	33
Lumbar Lordosis, LL (°)	-4	-40	-47	-49
PI-LL (°)	53	17	11	9
T1 Pelvic Angle, TPA (°)	36	22	18	20
Sagittal Vertical Axis, SVA (mm)	82	15	18	19
T4-T12 Thoracic Kyphosis, TK (°)	-1	27	29	34

Case 3

- 54 yo M presents to clinic with progressive back pain and difficulty standing upright over two years
- PMH: MS
- PSH: baclofen pump

Case 3

- Exam:
- A+Ox3
- CN 2-12 intact
- Strength 4+/5 in RUE/RLE, 5/5 in LUE/LLE
- Sensation mildly diminished on R
- No Hoffman Sign
- 1+ reflexes in BLE
- Gait slow and antalgic
- Severely kyphotic posture, leaning to R



	PRE-OP
Pelvic Tilt, PT (°)	31
Pelvic Incidence, PI (°)	58
Sacral Slope, SS (°)	27
Lumbar Lordosis, LL (°)	-31
PI-LL (°)	27
T1 Pelvic Angle, TPA (°)	36
Sagittal Vertical Axis, SVA (mm)	116
T4-T12 Thoracic Kyphosis, TK (°)	44
▼ CORONAL PARAMETERS	
	PRE-OP
Coronal Balance (mm)	219

