



Common Spinal Disorders

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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

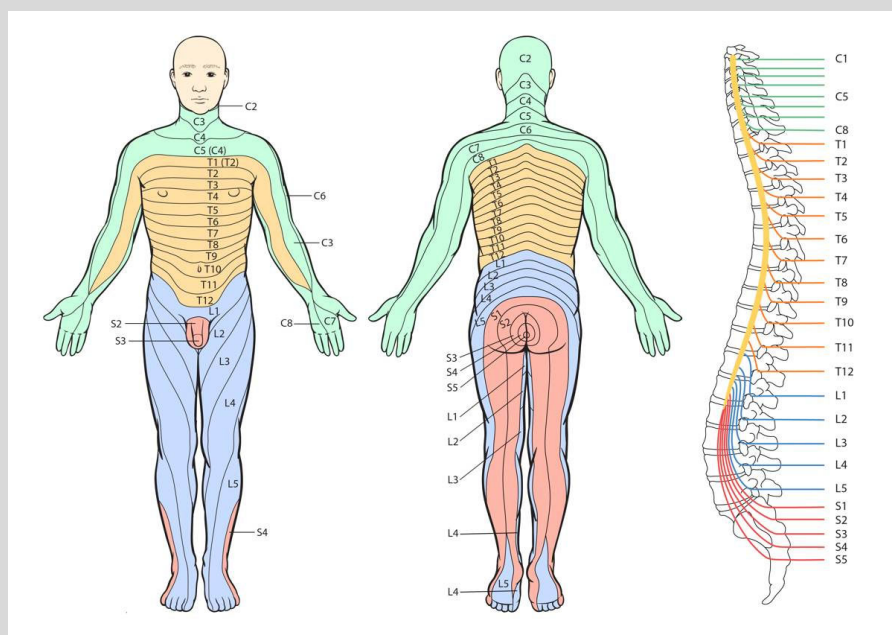
Evaluation of back pain

- 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 OF SPINAL CORD INJURY** **ISCS**

MOTOR KEY MUSCLES (score by reverse side)
 C5 R L Elbow flexors
 C6 R L Wrist extensors
 C7 R L Elbow extensors
 C8 R L Finger flexors (distal phalanx of middle finger)
 T1 R L Finger abductors (little finger)
 UPPER LIMB TOTAL + =
 (MAXIMUM) (25) (25) (50)
 Comments: _____

L2 Hip flexors
 L3 Knee extensors
 L4 Ankle dorsiflexors
 L5 Long toe extensors
 S1 Ankle plantar flexors
 Voluntary anal contraction (Neur)
 LOWER LIMB TOTAL + =
 (MAXIMUM) (25) (25) (50)
 T0 ALS
 (MAXIMUM) (50) (50) (50) (50)

SENSORY KEY SENSORY POINTS
 0 = absent
 1 = impaired
 2 = normal
 NT = not testable

Light Touch Score (max: 112)
 Pin Prick Score (max: 112)

NEUROLOGICAL LEVEL
 The most caudal segment with normal function

COMPLETE OR INCOMPLETE?
 Incomplete = deep sensory or motor function in S1-S5

ASIA IMPAIRMENT SCALE

ZONE OF PARTIAL PRESERVATION
 Specify nature of sensory/motor involvement

SENSORY MOTOR

• Key Sensory Points

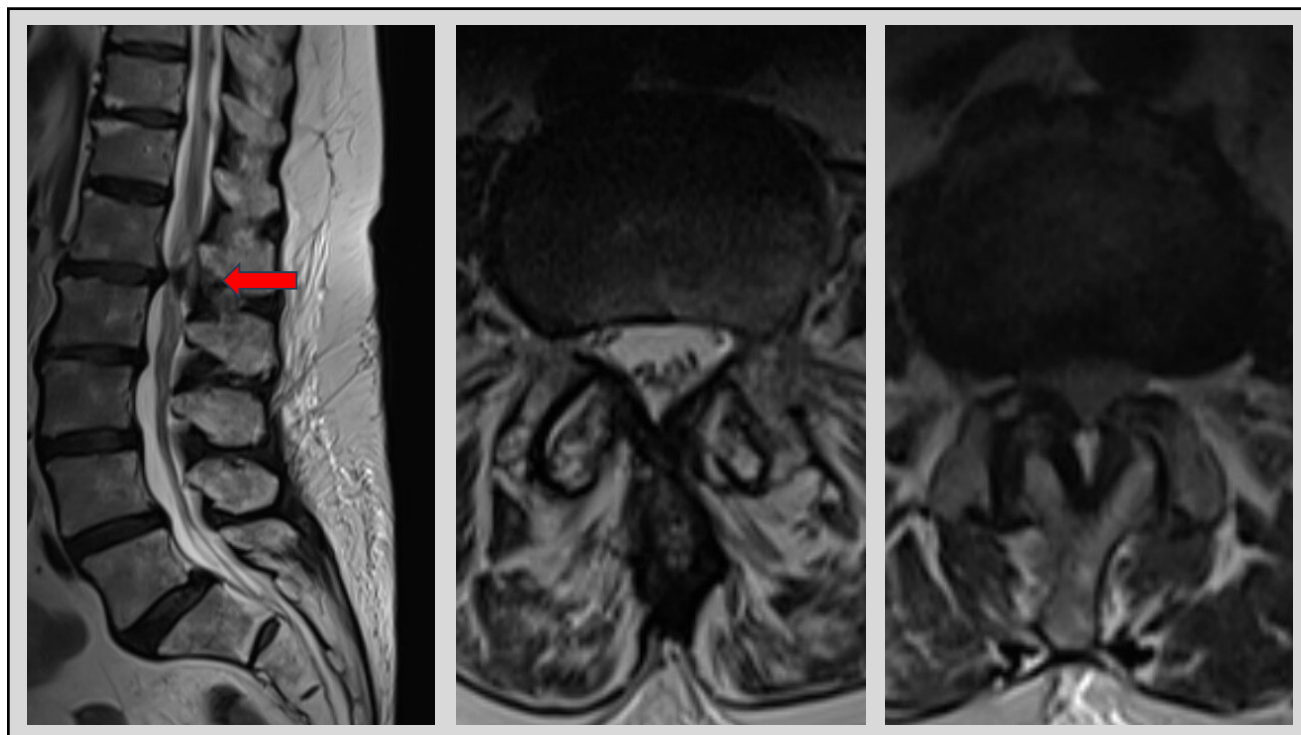
Red Flags

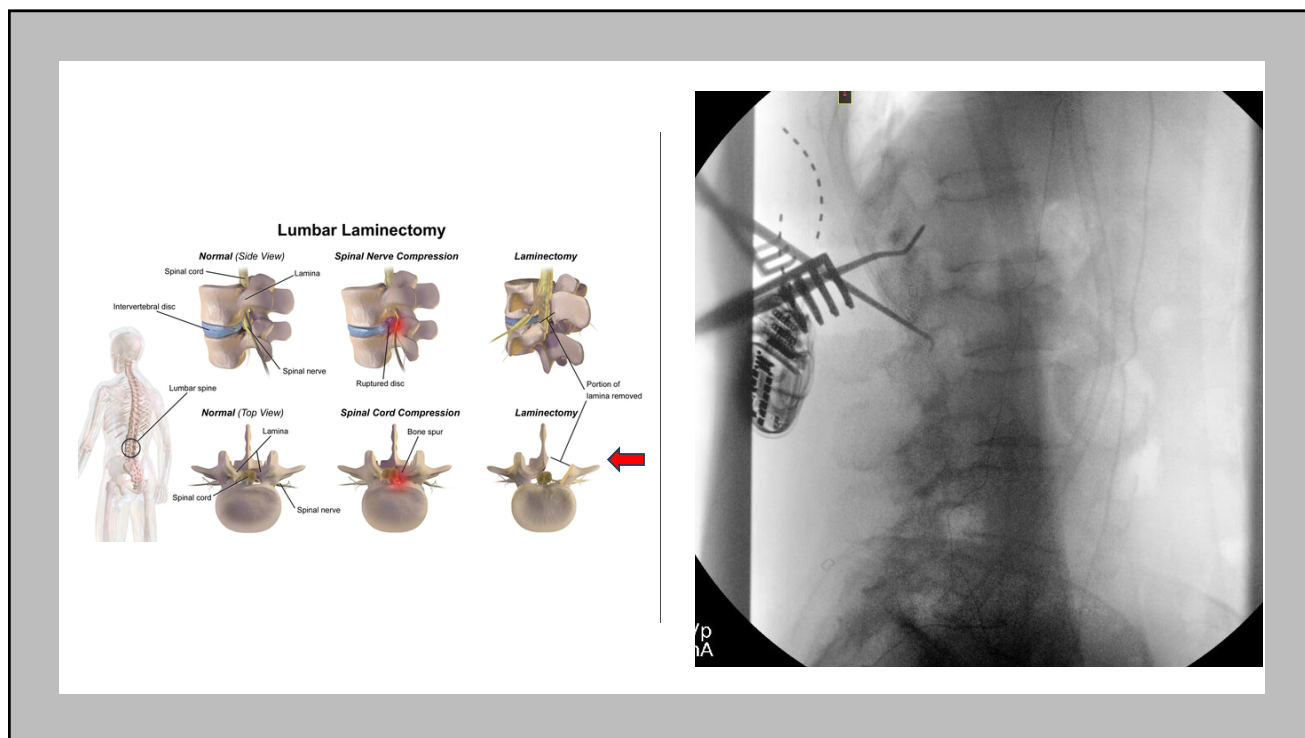
- Progressive neurologic deficits
 - Weakness
 - Bowel/bladder dysfunction
- Fever
- Sudden onset pain with spine tenderness
- History of trauma
- Serious underlying condition
 - Infection
 - Malignancy
- Osteoporosis or chronic steroid use
 - May be at increased risk of fractures

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

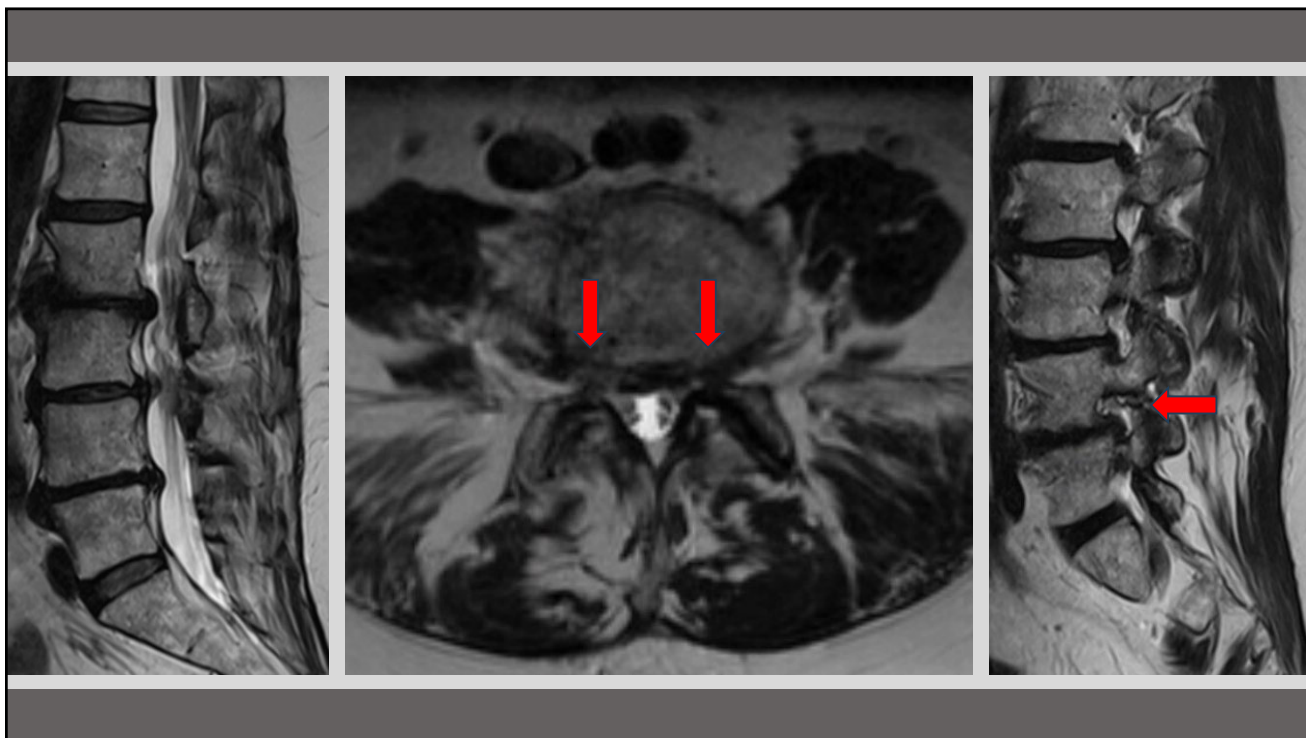




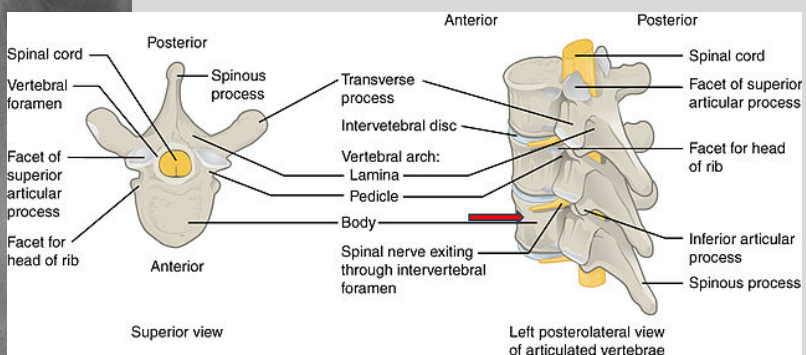
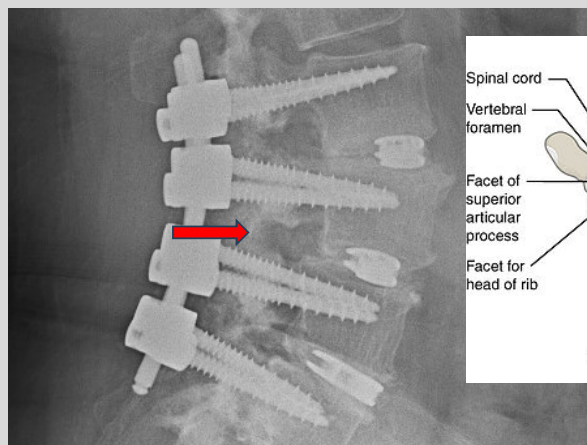
Foraminal Stenosis

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



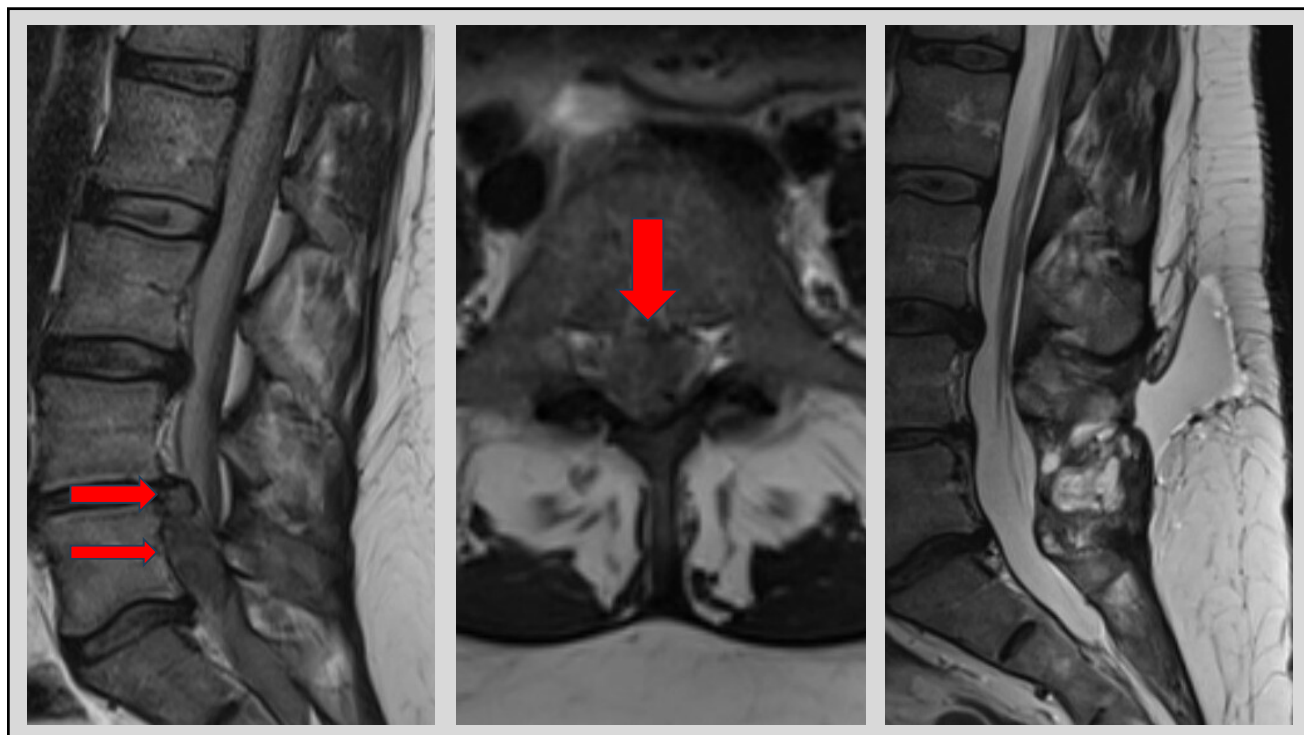
Lumbar Transforaminal Interbody Fusion (TLIF)



Lumbar Disc Herniation

Lumbar Disc Herniation can cause impingement of a lumbar nerve

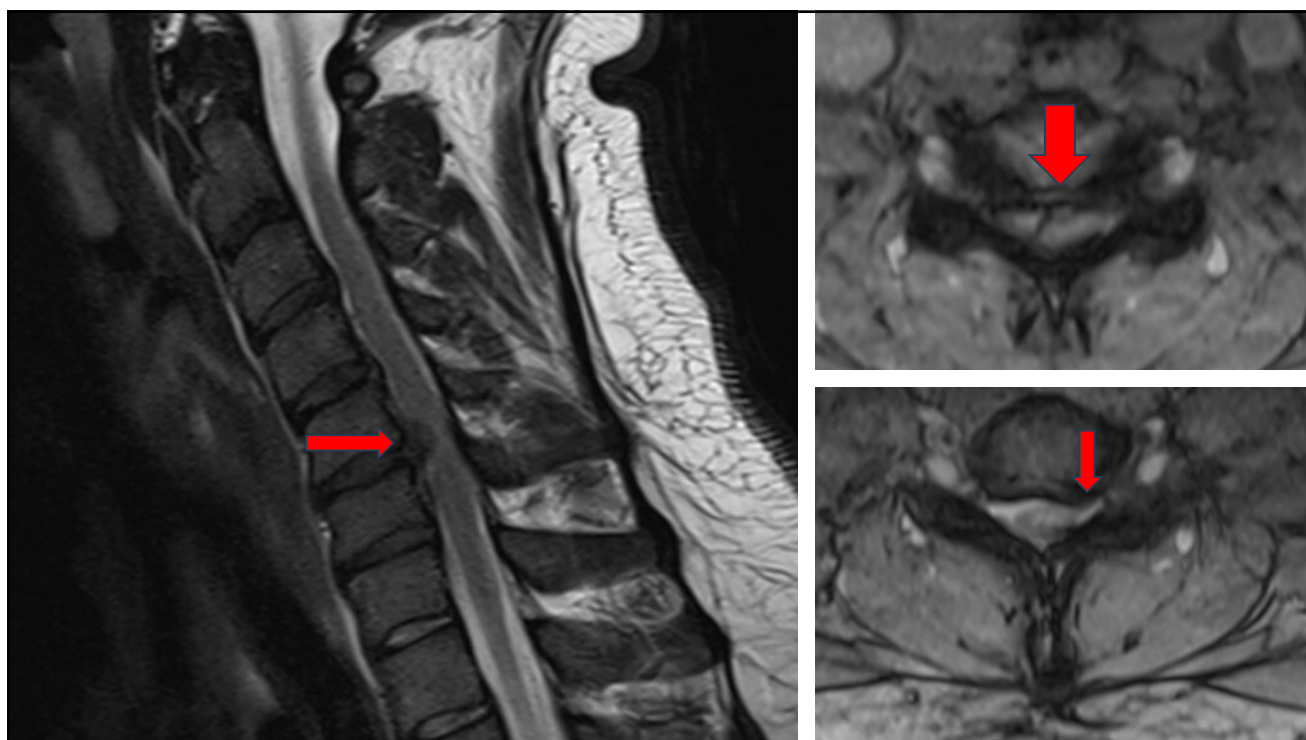
- Symptoms can include radicular leg pain, numbness, weakness
- Severe disc herniations can cause cauda equina syndrome



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

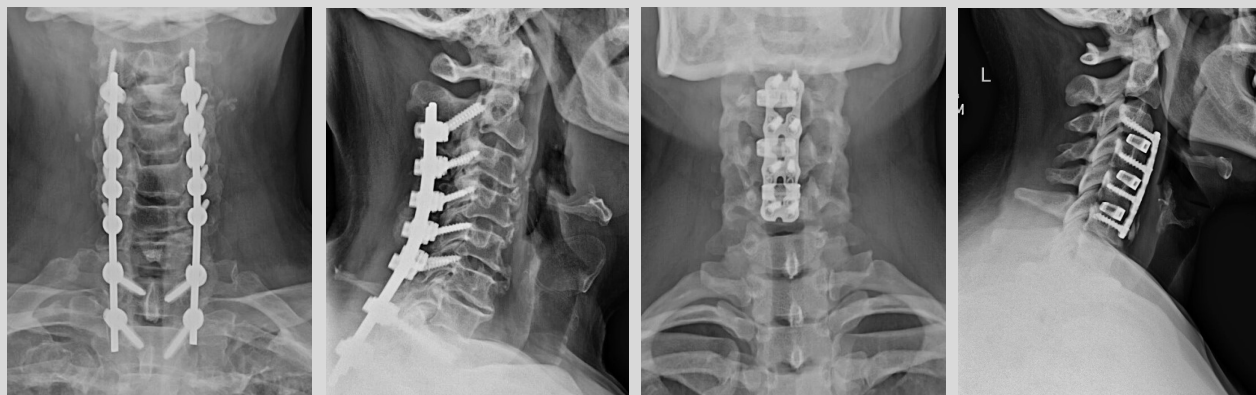
Treatment options include

- 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

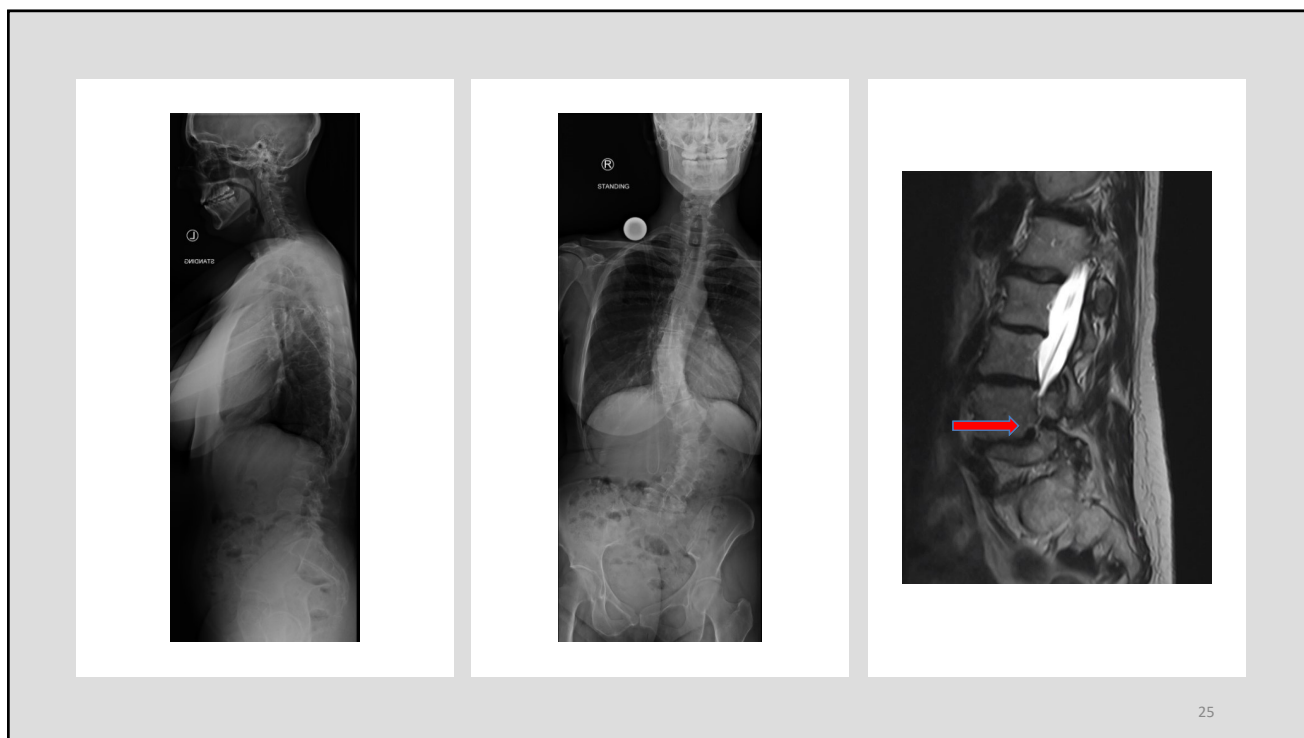
- Can cause pain from difficulty standing upright
- Often times combined with stenosis, foraminal stenosis, disc herniations, etc...

Case 1

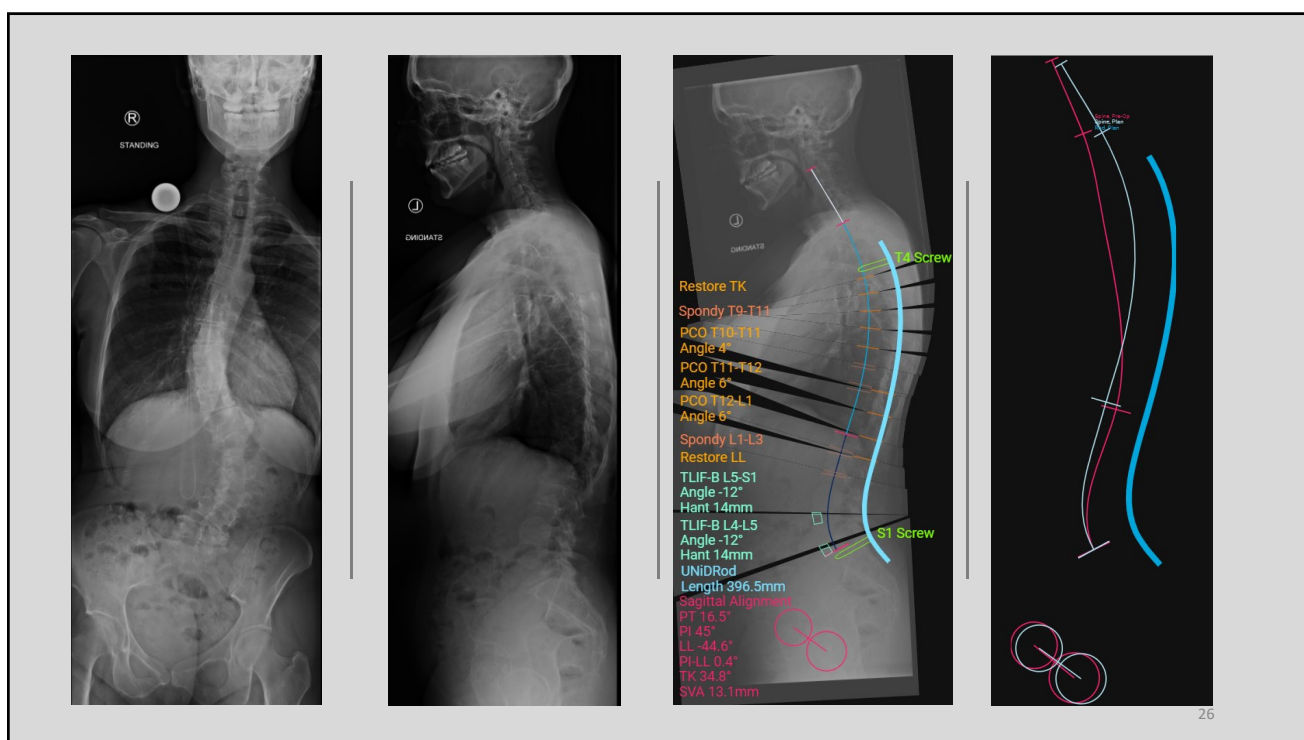
- 52 yo Female who presents with a several year of progressive axial low back pain along with maintaining a standing posture.
- Conservative management: Physical therapy, multiple epidural steroid injections, radiofrequency ablation

Case 1

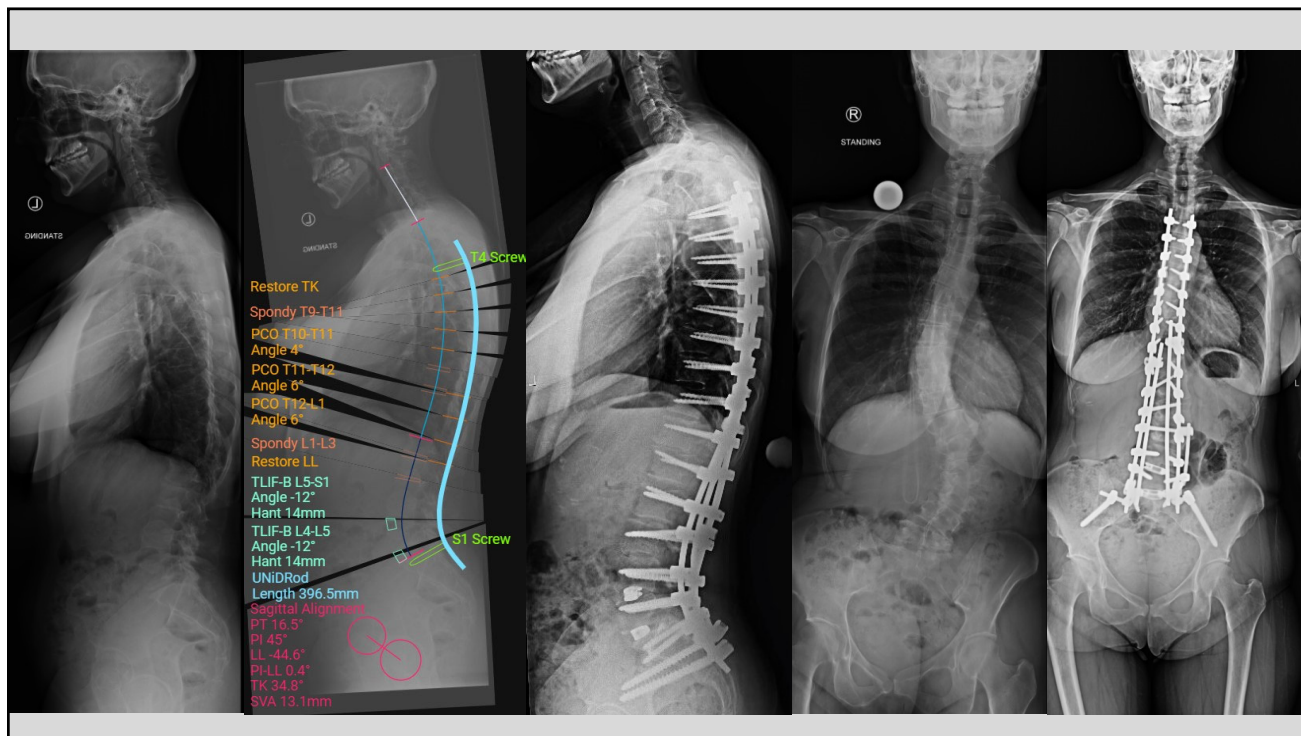
- Physical Exam:
 - Alert and oriented x 3
 - Cranial nerves 2-12 intact
 - 5/5 strength in bilateral upper and lower extremities
 - Sensation intact
 - Posture: left leaning posture



25



26



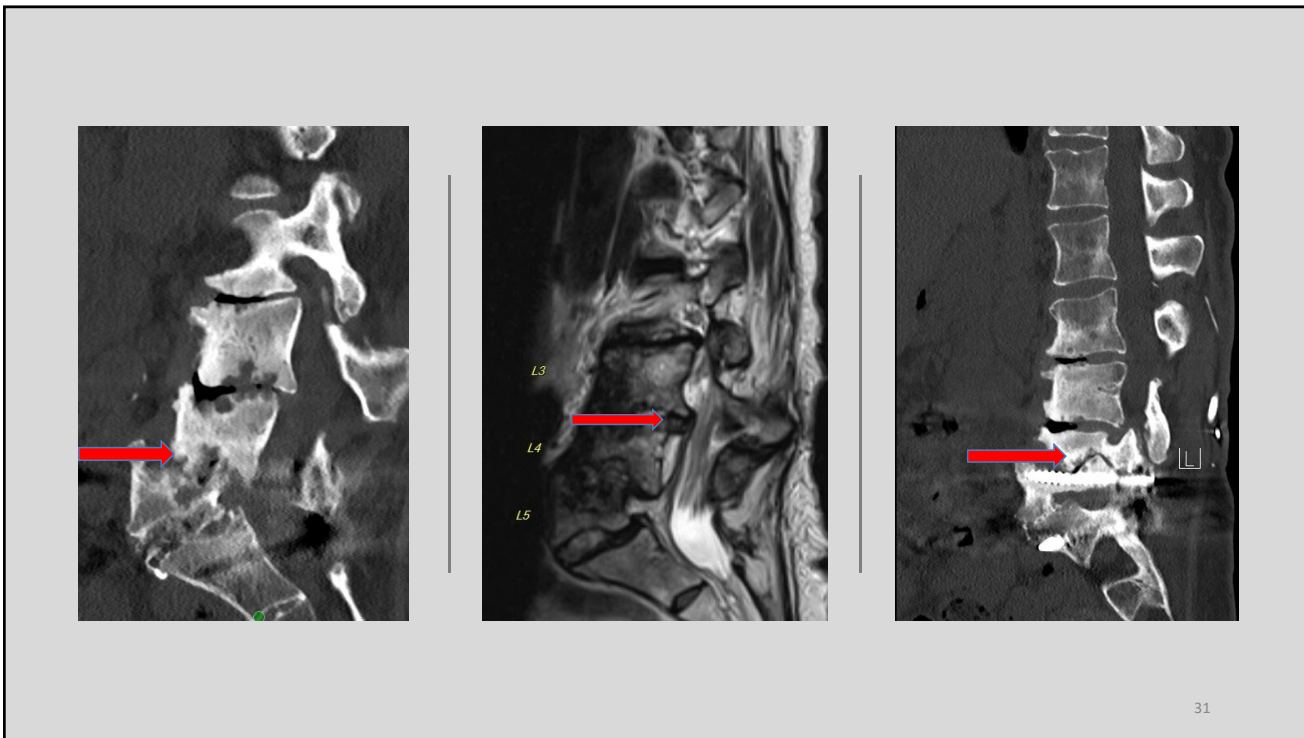
Case 2

- 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

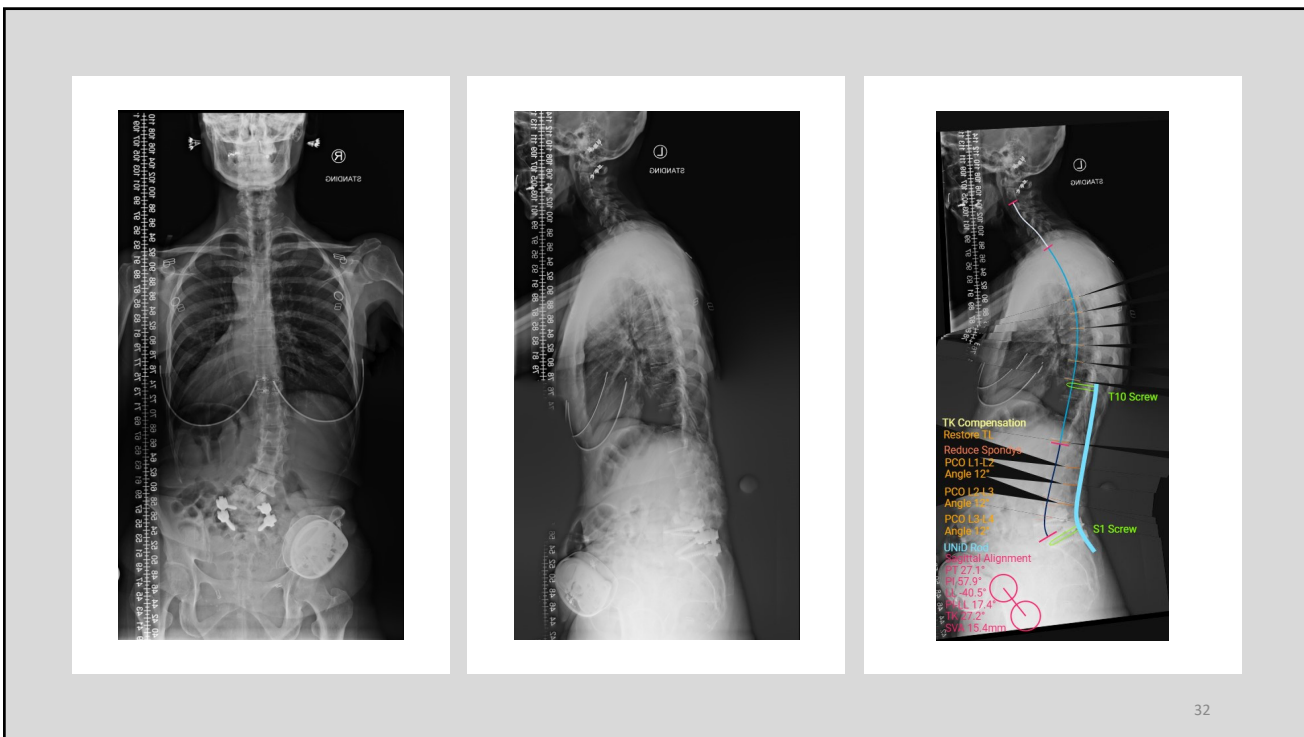
Case 2

- 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

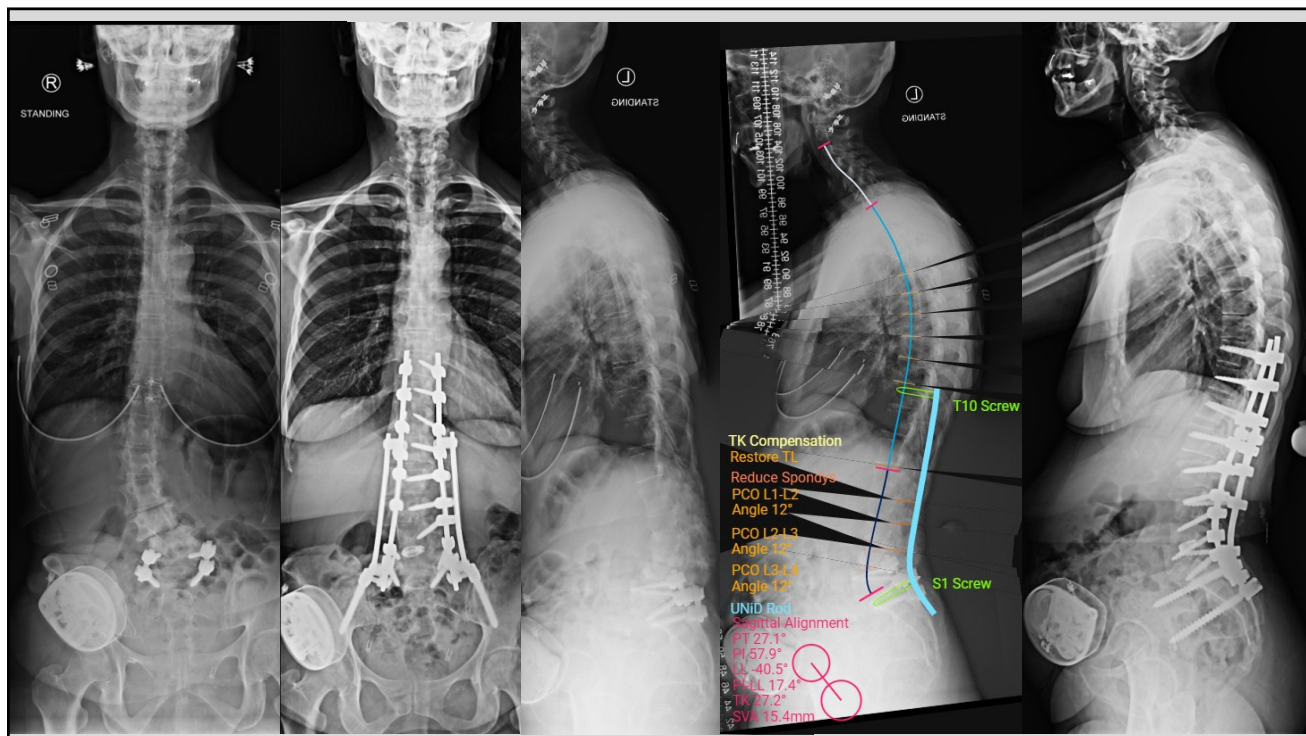




31



32



	↓	↓	↓	↓
	PRE-OP VISIT 2/10/2022	CASE U4/18/2022	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

