L Spine

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Additional slides provided by Weber Faculty
Normal Spine – 5 Groups
Normal Spine

- Fetal
- 8 months
- 2 years
- 6 years
Vertebral Curvature

• Primary curves are present at birth
• Secondary or Compensatory curves develop after birth

CERVICAL
Lordotic Convex Anteriorly Secondary

THORACIC
Kyphotic Concave Anteriorly Primary

PELVIS
Kyphotic Concave Anteriorly Primary

LUMBAR
Lordotic Convex Anteriorly Secondary
Abnormal Curvatures of the Spine

Kyphosis     Lordosis     Scoliosis
Lordosis is excessive curvature in the lumbar portion of the spine which gives a swayback appearance.
Kyphosis is a curvature of the upper spine. Kyphosis is a spinal deformity that can result from trauma, developmental problems, or degenerative disease. Kyphosis can occur at any age, although it is rare at birth.
Scoliosis:
Lateral or sideways curving of the spine.

1. **Congenital scoliosis**: problem with the formation of vertebrae or fused ribs during prenatal development.

2. **Neuromuscular scoliosis**: caused by muscular weakness or paralysis due to diseases (i.e. cerebral palsy, muscular dystrophy, spina bifida, polio)

1. **Idiopathic scoliosis**: unknown cause & appears in a previously straight spine.
Scoliosis
Spinal Cord

- Cord begins at the level of C2 and extends to L1 or L2

- **Nerves:**
  - Cervical = 8 pair
  - Thoracic = 12 pair
  - Lumbar = 5 pair
  - Sacral = 5 pair
  - Coccygeal = 1 pair
  - TOTAL = 31 PAIRS

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Spinal Cord
Meninges

1. Dura Mater - strong fibrous membrane sheath
2. Arachnoid - thin transparent sheath
3. Pia mater - highly vascular & adheres to cord itself
Lumbar Vertebrae

- Characterized by massive bodies and strong spinous and transverse processes.
- Articular facets are oriented parasagittally, which contributes to the large range of anteroposterior bending between lumbar vertebrae.
- Also contain small mamillary and accessory processes - sites of attachment of deep back muscles.
Lumbar Vertebrae

- Superior Articular Process
- Intervertebral Foramen
- Transverse Process
- Body
- Intervertebral Disc
- Spinous Process
- Interior Articular Facet
- Lamina
- Pars Interarticularis
- Spinal Cord
- Posterior
- Anterior

Transverse Process
Intervertebral Disc

Axial (Overhead) View of Intervertebral Disc

- Annulus Fibrosus
- Nucleus Pulposus
Herniated Nucleus Pulposus “Slipped Disc”

Slipped disc pressing upon the spinal cord

Nerve Root
L5
Disc
S1
Annular Tear
Lumbosacral Junction
Sacrum/Coccyx
Bend knees slightly to decrease lordosis-center at crest (14X17) to include sacrum or 1.5 inches above crest (11X14) for demonstration of L-spine only.
LATERAL LUMBAR SPINE

CR perpendicular when spine perfectly horizontal. If not, CR 5-8 degree caudad matching angulation of L spine.
L5-S1 SPOT PROJECTION

Center on coronal plane 2 in posterior to ASIS and 1.5 in inferior to the iliac crest.
OBLIQUE LUMBAR RPO and LPO positions

- Turn patient 45 degrees toward affected side.

- Zygapophyseal joints closest cassette demonstrated.

CR 2 inches medial to elevated ASIS

CR 1.5 inches above the iliac crest
Oblique demonstrates the zygapophyseal joints and pars interarticularis.
Flexion/Extension

- Determine whether motion is present in the area of a spinal fusion or to localize a herniated disk as shown by limitation of motion at the site of the lesion.
AP AXIAL PROJECTION
Lumbosacral Junction & SI Joints

CR 1.5 in superior to pubic symphysis

CR 30-35 cephalic angle
OBLIQUES OF SI JOINTS
RPO and LPO positions

Center 1” medial to elevated ASIS
Elevate side 25-30 degrees

Demonstrates SI joint **farthest** from the cassette.
PA PROJECTION (Chamberlain View)

- Demonstrates abnormal sacroiliac motion (sacroiliac slippage or relaxation) by showing the relationship of the pubic bones.

- 2 PA projections with patient upright and altering weight bearing limbs (Pt standing on something at least 6” high. Pt should hold onto upright bucky)

- Use 8X10 and center to pubic symphysis
SACRUM

CR 2” superior to pubic symphysis
COCCYX

CR 2” superior to pubic symphysis
SACRUM: CR perpendicular and 3.5 inches posterior to the ASIS

COCCYX: 2 inches inferior from sacrum centering
Myelogram

Contrast media is injected into the subarachnoid space between L2-L3.
Myelogram History

1940-1970’s: Oil based contrast (3-6 cc). Oil was heavier than CSF and had to be removed. Very painful. Patient remained recumbant and non-elevated for 12-24 hours post procedure.

Late 1970’s: Water soluble non-ionic contrast (6-15 cc). Spinal needle removed early in exam. Patient can raise head slightly and move after 8 hours.

Contraindications: headache, nausea, vomiting, and rarely seizures.
Spinal Column Injury

- 3 Peak Categories:
  - C1-C2
  - C5-C7
  - T12-L2

- **Paraplegia:** lesions involving the thoracic vertebrae or below.

- **Quadriplegia:** Cervical lesions below C4. Lesions above C4 will additionally lead to respiratory compromise from paralysis of the diaphragm.
Cord Injury Classifications

1. Complete
   - Total loss of sensation and function below the level of injury

2. Incomplete
   - Partial loss of sensation below the level of injury.
Flexion/Extension Fractures

**FLEXION:** anterior wedging of vertebral body

**EXTENSION:** results in small avulsion fractures of the anteroinferior or anterosuperior margin of the vertebral body
Compression/Distraction Fractures

Burst-like fractures of the vertebral body with displacement of the fragments.

Pulling-apart forces result in horizontal fractures through the neural arch and posterior aspect of vertebral body.
Dislocation of the Spine

Segmental malalignment caused by subluxation, dislocation, or fracture dislocation.
Moving a patient

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