

Lower Lumbar Fractures

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Bones and Spine

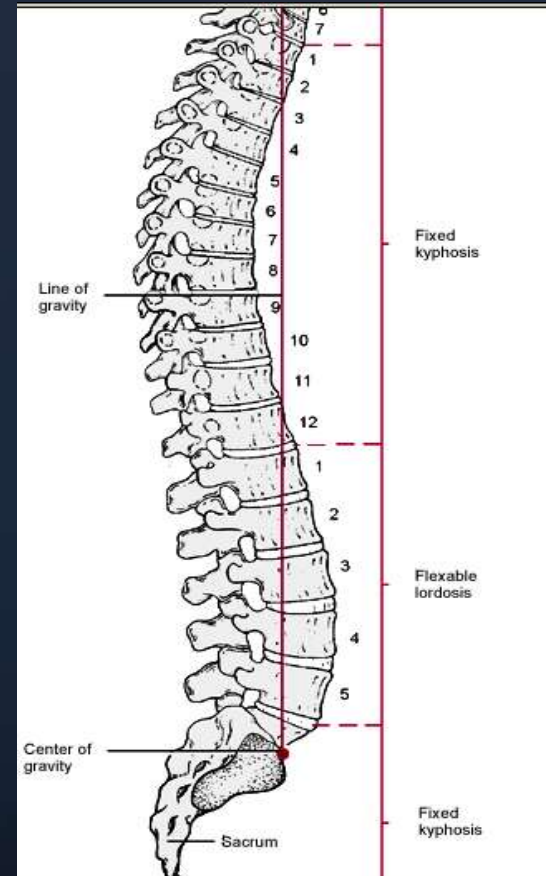
Lower Lumbar Fractures

- Definition
 - L3-L5
- Incidence
 - 4%



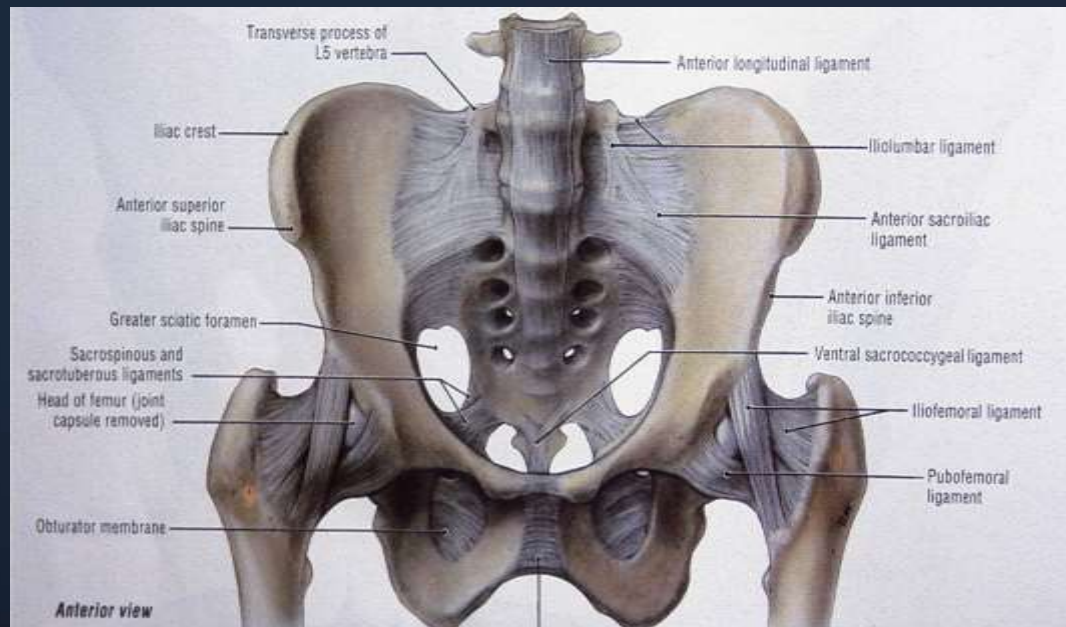
Anatomic Features

- Weight-Bearing Axis
 - T10 – L1
 - L2 is the transition
 - L3 – L5
- Size of Canal
- Cauda equina Vs. conus
- Lumbar Lordosis



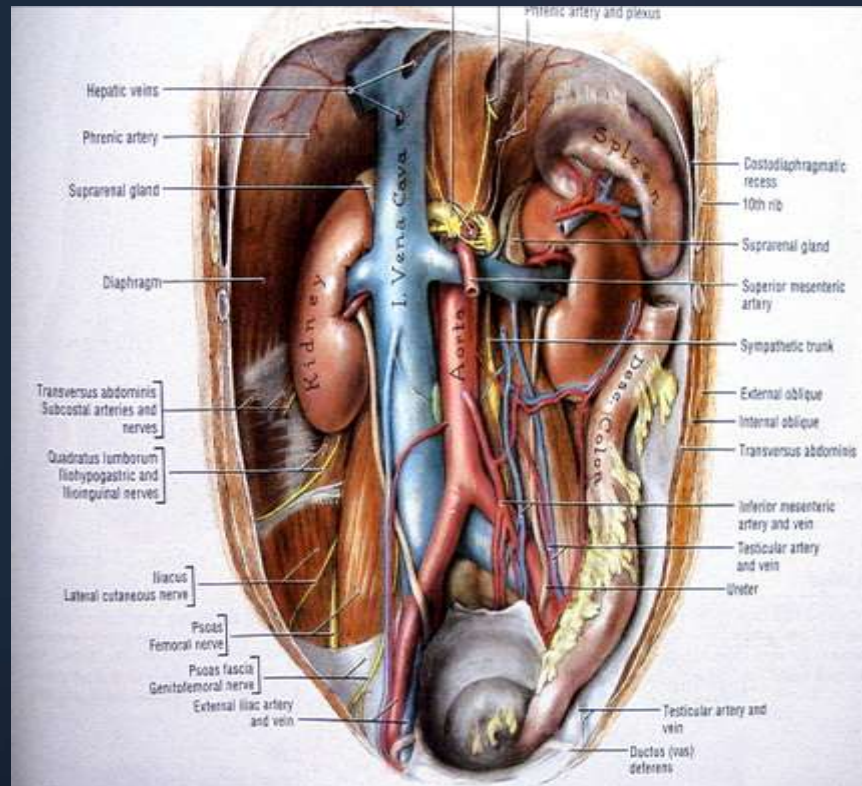
Anatomic Features

- Iliolumbar Ligaments



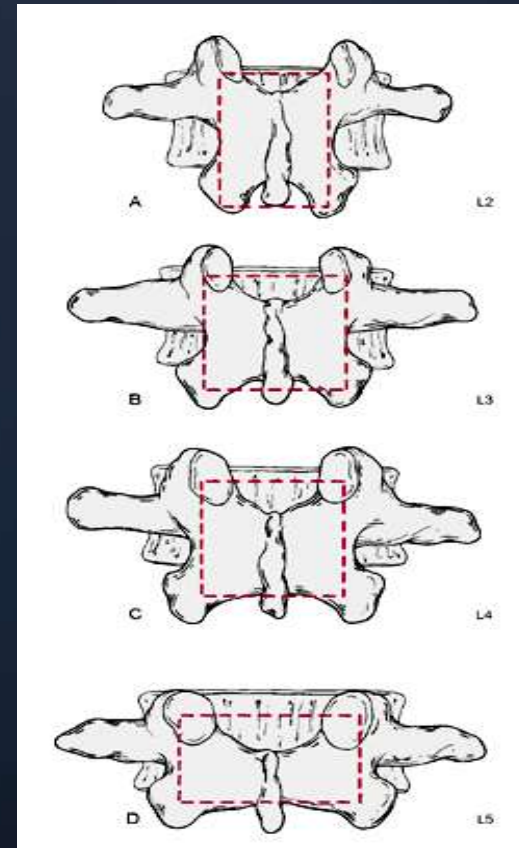
Anatomic Features

- Blood vessels



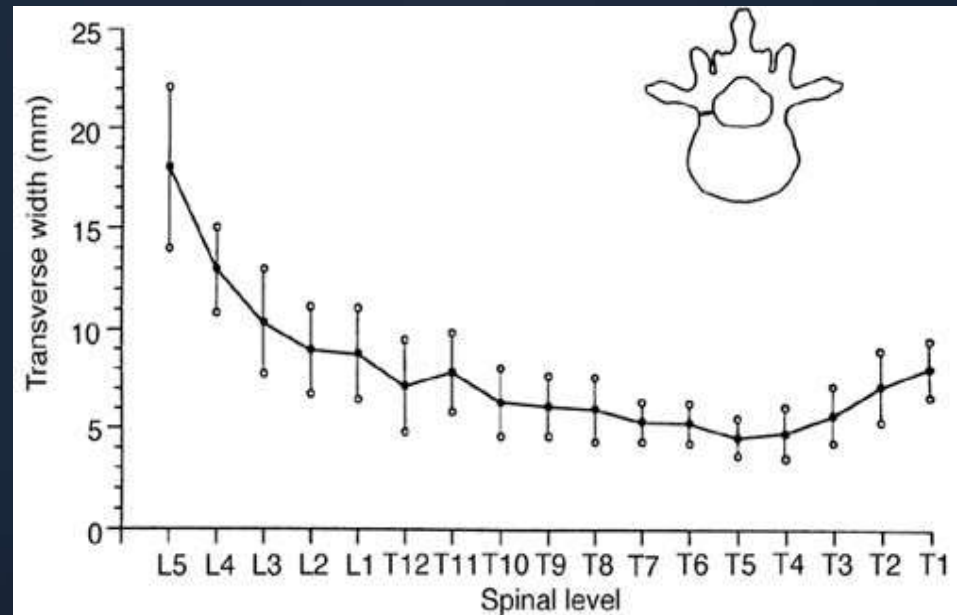
Anatomic Features

- Shape of lumbar laminae
 - Hook placement



Anatomic Features: Transverse Pedicle Isthmus width

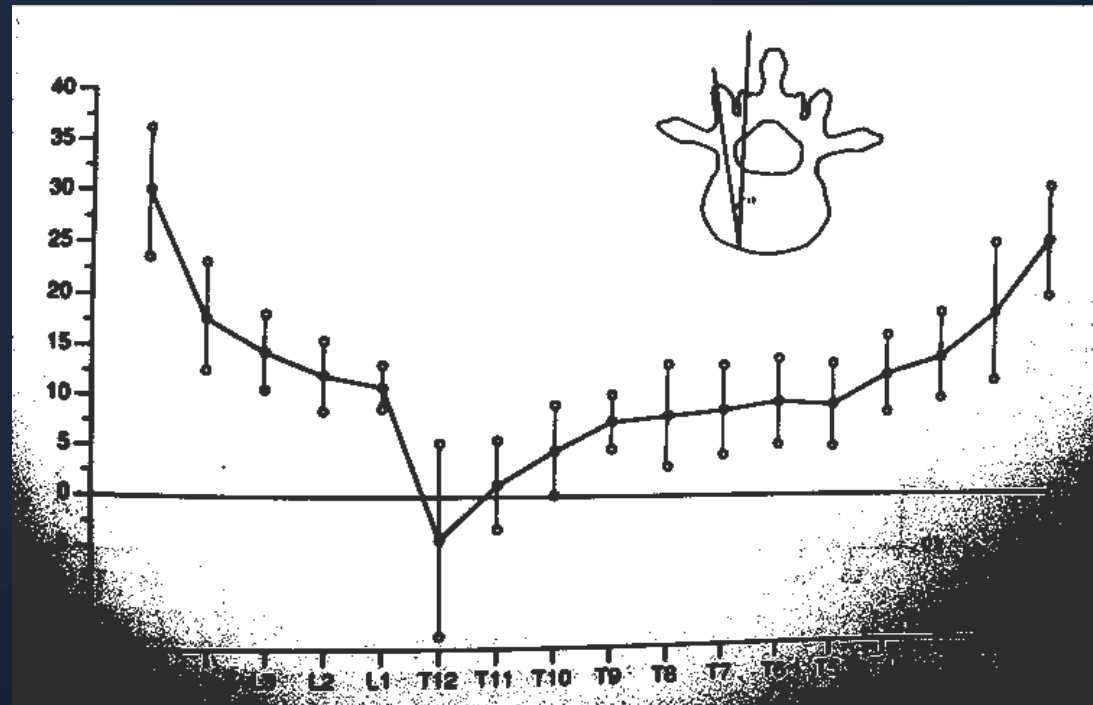
- Increasing width
- L3,L4, L5 all >8mm.



•Zindric, Wiltse: Spine, Vol. 12, 1987

Anatomic Features: Transverse pedicle angles

- Increasing pedicle angles.



Injury Patterns

- I. Wedge Compression Fractures.
- II. Burst Fractures.
- III. Flexion-Distracton Injuries
- IV. Shear Injuries
- V. Limbus Fractures.

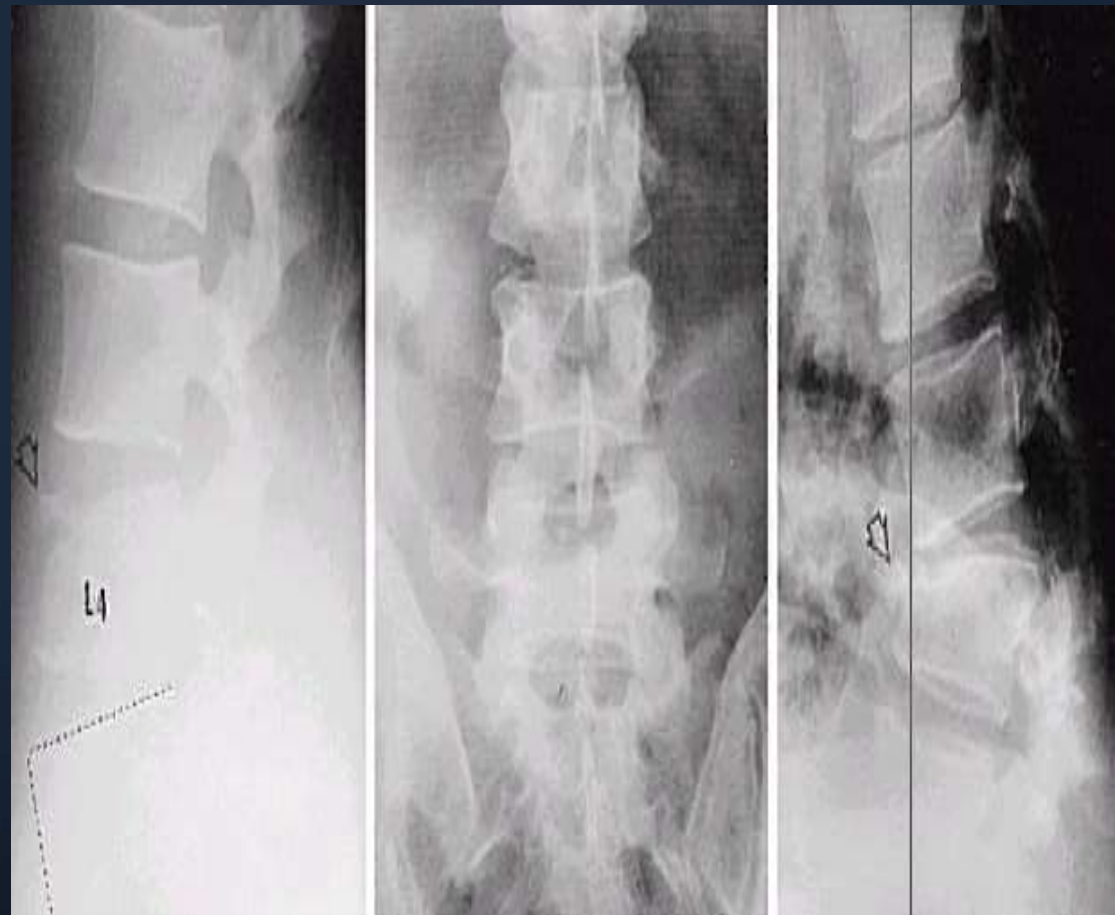
Wedge Compression Fx.

- Sparing of middle column
 - Posterior wall of the body must remain intact



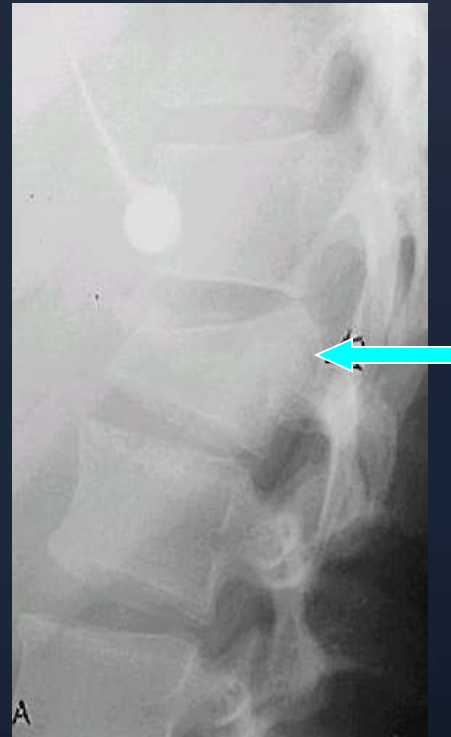
Level of suspicion

- Suspicion for ligamentous disruption with high impact injury.



Burst Fractures

- Mechanism:
 - Flexion+Axial loading.
- Age:
 - 50% younger than 20 years old.
- Denis type B
 - Watch for postsup.
Body retropulsion.



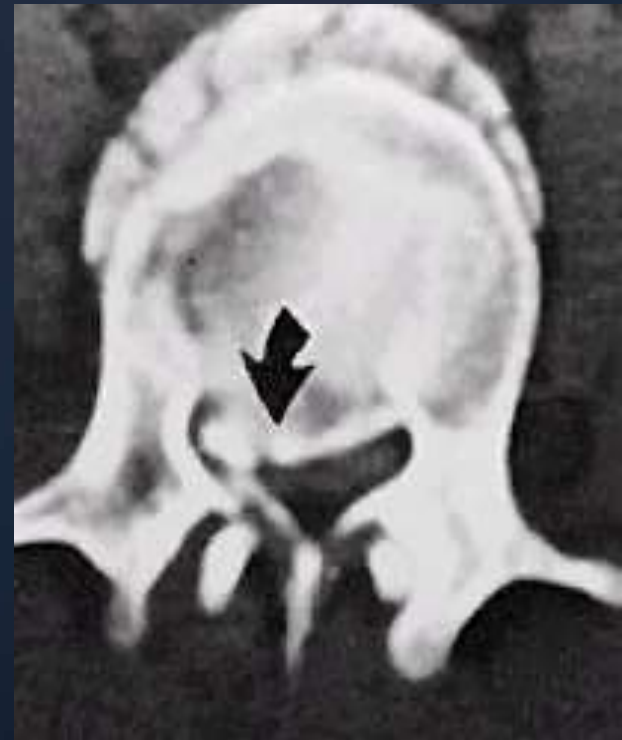
Burst Fractures

- Denis Type A
 - Classic burst Fx.
 - Less frequent



Dural tears

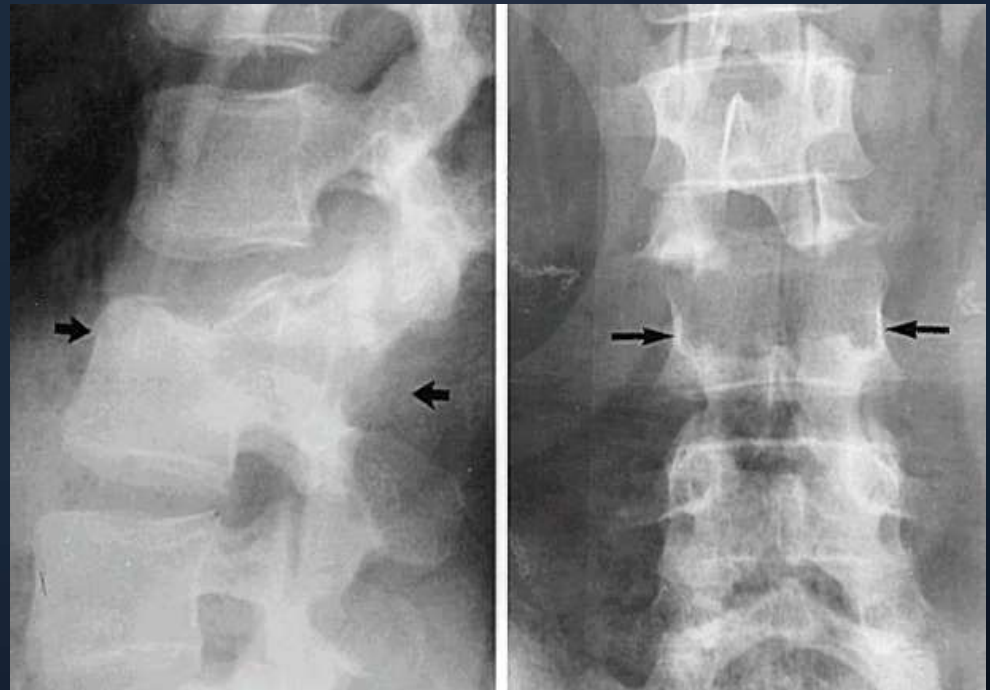
- Burst Fx + Laminar Fx + Neuro. Deficit =
posterior
exploration for
dural Laceration
(sensitivity 100%
specificity 74%)
- Watch for entrapped neural
elements.



Flexion-Distrraction Injuries

- Associated Injury
 - 50% intra-abdominal
 - 39% other spinal injuries
- Three types
 - Bony(Chance Fx)
 - Ligamentous(facet dislocation)
 - mixed

Bony Chance Fx.



Flexion-Distrraction Injuries

- Bilateral Facet Dislocation
- CT shows “empty facet sign”



Flexion-distraction Injury

- Unilateral facet dislocation
- CT- Inf. Facet of L5 anterior to Sup. Facet of S1



Shear Injuries

- Extremely unstable injury of all 3 columns with disruption of ALL.



Shear Injuries

- Watch out for patients with “stiff spine”.
 - DISH
 - AS



Limbus Lumbar Vertebral Fractures

- Location
 - Fx between ring apophyses and central cartilage where fusion is incomplete
- Age
 - Usually between 18-40
- Dx.
 - CT or Myelo-CT
- Tx.
 - Surgical excision



Treatment Options

- **Non-operative:**

- Bed rest
- Postural reduction
- External immobilization by cast or orthosis

- **Operative:**

1. Posterior reduction, stabilization, fusion.
2. Post. or transpedicular decomp, stablz., fusion.
3. Anterior decomp., stabilization and fusion.

Nonoperative Treatment

- *Duration of recumbency*
 - Fracture personality (immediate mobilization VS. 3 months bed rest)
- *Type of external immobilization*
 - Poor selection leads to increase in movement at lumbosacral level.
 - Baycast spica most effective in Fx. Below L3.

Indications for Surgery

- **Instability**
 - Severe post. Ligamentous complex disruption
 - Flexion-distraction (ligamentous type)
 - Shear Injuries.
 - Burst with (severe canal/body compromise, laminar Fx)
- **Neurologic Deficit**
 - >50% canal compromise? + neuro. Compromise?
- **Disruption of axial or sagittal spinal alignment**
 - Kyphosis and scoliosis

Operative Vs. Nonoperative

| <u>Year</u> | <u>Author</u> | <u>#pts</u> | <u>Conclusion</u> |
|-------------|---------------|-------------|--|
| 1999 | Seybold | 42 | -Functional outcome no diff. |
| 1993 | Knight | 22 | -Functional outcome no diff. |
| 1992 | An | 20 | -Avoid long instrument/fusion -more loss of height/lordosis in non-surg. Group. But no correlation to back pain |

Current Trend

- Neurologically intact with minimal to moderate deformity

 –Nonoperative Treatment

- Neurological deficit or significant deformity

 –Operative Treatment