Posterior Instrumentation for Thoracolumbar Spine

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Bones and Spine
Morphometry

Transverse pedicle angles

- Angle reversal at T12
- Highest at Lower lumbar

Morphometry

Transverse Pedicle Isthmus width

- Below T10, avg > 7mm.
- L4, L5 all >8mm.
- T4-T9 = very narrow

*Zindric, Wiltse: Spine, Vol. 12, 2, 1987*
Morphometry
pedicle length and cord length

- L1 – L5 average cord length is 50mm at 15 degree angulation.

Pedicle screw entry point

Lumbar spine

- Straight ahead – Roy Camille
- Inward – Magerl
- Up & In – Levine and Edwards
Pedicle Screw Entry Point
Thoracic Spine

- **Roy-Camille**
  - Junction between mid inf. Facet and mid-TP
- **Vaccaro**
  - T4-T9: superior boarder of TP
  - Caudal to T9: transition to Mid TP

Roy-Camille, Ortho Clinics of North Am.: Vol. 17-1, Jan86
QuickTime™ and a decompressor are needed to see this picture.
Lower Thoracic (T10-T12) - down slope of bisected t.p. at junction of t.p. and lamina at same level as lateral pars
Mid-Thoracic (T4-T9) - junction of down slope of proximal t.p. and lamina at base of superior facet, medial to lateral pars
Proximal Thoracic (T1-T13) - junction of proximal t.p. and lamina medial to lateral pars
Complication

• Anterior penetration
Complication
Complication
Near Approach X-ray View

- **WhiteCloud**
  - Roentgenographic measurement of pedicle screw penetration

- **Whitecloud TS, Clin Ortho: 1989;245:57-68**
Placement of Pedicle Screws in the Thoracic Spine

- Vaccaro, Garfin, An, Balderston.
- Five Cadavers, ninety screws between T4-T12 without imaging studies.
- 37 (41%) penetrated cortex.
- 21 screws entered the canal, 16 penetrated the lateral cortex.

Conclusion: Be cautious and know your anatomy.

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Thank you