



## Roles of Osteotomies

- Loosen stiff curves
- Address fixed deformity
- Reduce strain on instrumentation/bone interface during deformity correction
- Permit shortening or lengthening of portions of the spinal column

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| Type | Description                                                                                                                                                             | Diagram | Reference               |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------|
| 1    | Resection of posterior elements from mid pars above to pedicle below with realignment of the spine through hinging through a mobile disc anteriorly                     |         | Ponte                   |
| 2    | Resection of posterior elements from mid pars above to pedicle below with realignment of the spine through hinging through a mobile disc anteriorly                     |         | Smith-Peterson          |
| 3    | Posterior-based transpedicular decancellation of the vertebral body with realignment through controlled fracture of the anterior column                                 |         | Heinig                  |
| 4    | Posterior-based intraosseous wedge resection of the vertebral body with realignment through osteoclasia of the proximal third of the anterior vertebral body            |         | Thomassen (PSO)         |
| 5    | Posterior-based wedge resection with extension of the osteotomy into the supra-adjacent disc and realignment hinging on the anterior column at the intervertebral space |         | Mod Thomassen (Ext PSO) |
| 6    | Posterior-based vertebral column resection including one or more vertebra with adjacent discs                                                                           |         | Suk (VCR)               |

## Posterior Osteotomy Techniques

- Post Shortening - Ponte
- Post Shortening Ant Elongation - Smith P  
– Also asymmetric
- Post and Middle Shortening - PSO  
– Also asymmetric and extended
- 360 - VCR
- (Anterior release and Anterior Osteotomy)

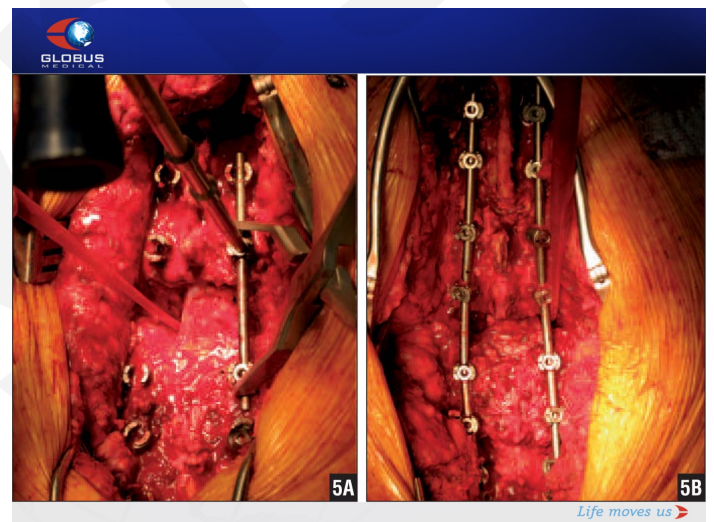
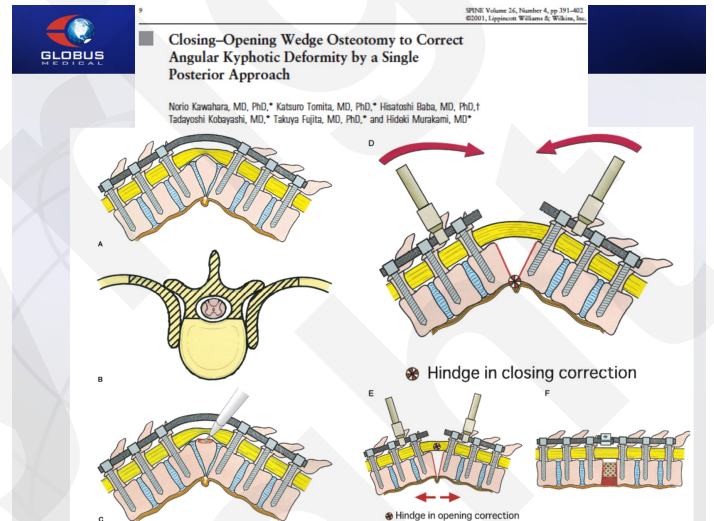
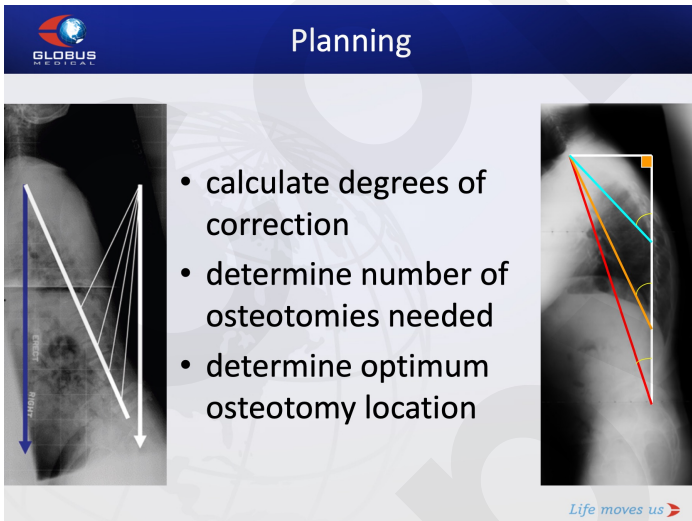
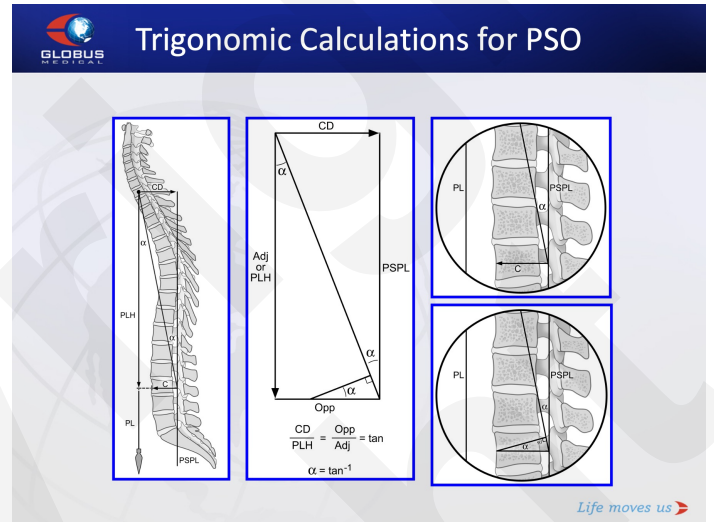
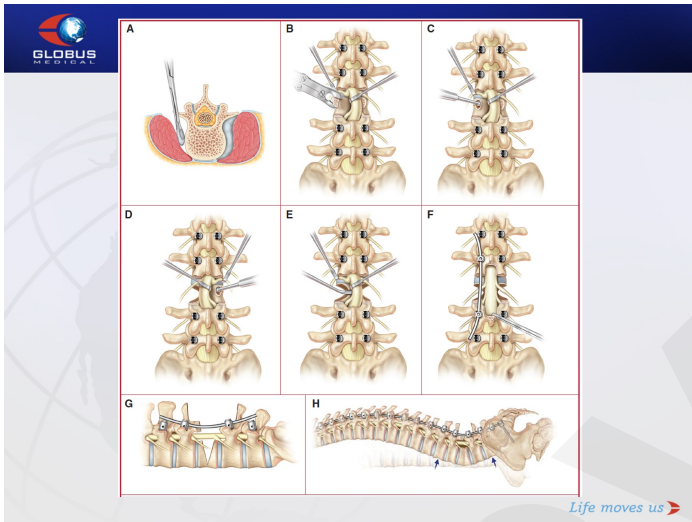
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## Smith Peterson

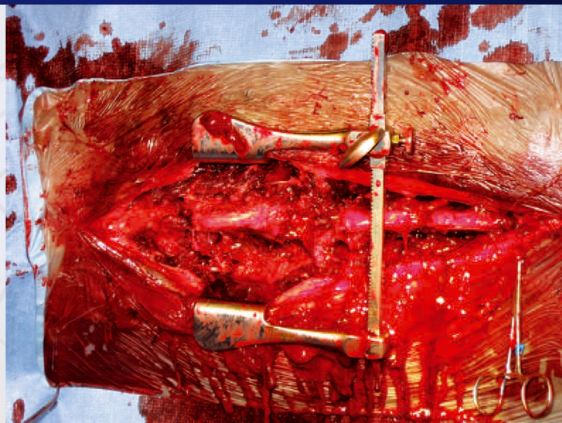
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## PSO

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## What it often looks like...



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## Osteotomy vs ALL Release

- Osteotomy - PSO
  - Direct canal decompression
  - Direct foraminal decompression (but no height restoration)
  - Shortening procedure
  - “Bone on bone” fusion if performed correctly
  - Correction = per level
    - Typically up to 30 degrees
- ALL release + Cage
  - Indirect canal decompression
  - Indirect foraminal decompression
  - “Lengthening” procedure
  - Fusion through a cage
  - Requires additional posterior procedure
  - Correction = per level
    - Depends on cage lordosis and facets at back

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## Problems with Osteotomy (PSO)

- Can't see the XRs
- Can't see because its bleeding
- Inadequate / too much correction
- Translation at osteotomy
- Collapse not wedge
- Dural tear – often revision case
- Nerve compression
- Non union - disc levels posterior elements
- PJK / DJK / Screw loosening
- Osteoporosis

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## Problems with ALL Release

- Not enough cases done...
- “Neither be the first nor the last to embrace a new technology”
- ¼ XLIFs penetrate endplate and subside
  - VB fracture
  - Implant extrusion
  - Vessel, Renal, Bowel even Cauda Injury

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