MIS Surgery Is (NOT) the Way To Go For Treatment of Degenerative Scoliosis

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Trends In Spine Surgery

• Less Invasive
• Biologics and Biomaterials
• Pushing the Limit
• VALUE, COST EFFECTIVE, EVIDENCE BASED

Surgical Goals

• Surgical Goals
  – Decompress
    • Direct
    • Indirect
  – Stabilize
  – Correct Deformity
  • Improve Balance
  • Improve Overall

  – Improve Outcome
Options to Accomplish Goals: Approach

- Anterior/Posterior Open
- Posterior only
  - With Interbody fusion
- Posterior only with Osteotomies
  - With or without interbody fusion
- Minimally or Lesser Invasive options
  - Transpsoas: XLIF/DLIF etc.
  - MIS-TLIF
  - L5/S1 ALF
  - Perc internal fixation
- Combination Open and MIS

What we want to avoid

MISS: Lateral Approach
Percutaneous Fixation

OPEN SURGERY: 64yo female progressive LBP and difficulty walking
2 years post op

MISS: 73 yo female progressive back pain deformity and difficulty walking
Post op

MISS

Spine Osteotomies
Smith Petersen Osteotomy
Pedicle Subtraction Osteotomy
How To Improve Sagittal and Coronal Balance - Lateral Approach

- Avoid Subsidence
  - End plate preservation
  - Slides
- Larger Cage
- Release Anterior Longitudinal Ligament
  - Partial
  - Complete release
- Cutting/rupturing
- Modify Cage Design

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Spinal Deformity Perioperative Data
MIS vs OPEN-20pts (10 Open, 10 MISS)

<table>
<thead>
<tr>
<th></th>
<th>NUMBER OF LEVELS</th>
<th>OR TIME (min)</th>
<th>ANESTHESIA TIME (min)</th>
<th>ESTIMATED BLOOD LOSS (cc)</th>
<th>LENGTH OF STAY (days)</th>
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<tbody>
<tr>
<td>MIS 2 stage</td>
<td>8</td>
<td>646.6</td>
<td>834.7</td>
<td>512.5</td>
<td>12.2</td>
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<tr>
<td>OPEN 2 Surgeon</td>
<td>8.9</td>
<td>351.1</td>
<td>437.6</td>
<td>1285</td>
<td>8</td>
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Spinal Deformity
MIS vs OPEN
Acute Complications

**MIS**
- Purulent drainage chest tube site
- Return to OR (L2 pedicle screw removal)
- Sinus Tachycardia; RLE weakness (CT benign; AFO brace)
- Respiratory arrest (PE)
- Pulmonary emphysema (right pleural effusion)
- Atelectasis (ventilated); mental obtundation/mop difficulties due to PEP
- Hx sinus; dehiscence; decompression/ventilator (vent bronchial; L thoracotomy; L rib removed)

**OPEN**
- Acute urinary incontinence; slight confusion (CT benign)
- Staph hemitropic bone infection; acute delirium (CT/MRI showed reversible ischemic changes; posterior ephalopathy, resident ordered blood pressure, intubation, etc.)
- Post-op delirium
- Respiratory failure (on ventilator resolved day 3)
- Possible DIC psychosis
CONCLUSION:
- "Minimally invasive surgery demonstrated reduced costs, blood loss, and hospital stays whereas open surgery exhibited greater improvement in VAS scores, deformity correction, and sagittal balance."