Thoracolumbar fractures.
Treatment options. A long trip.

MIS SURGERY.¿ WHY NOT?
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CLASSIFICATIONS.
Classification.

- Many attempts of classification.
- Ancient system (Watson-Jones; Nicoll; Holdsworth).
- New system (Denis, Mc Affe; Magerl AO, TLICS)
Denis . Classification.

- In 1983.
- Three column concept.
- Four types of fractures.

- Denis F. The three-column spine and its significance in the classification of acute thoracolumbar spinal injuries. Spine 1983; 8: 817-31
Mc Affe Classification.

- Evolution of Denis system.
- Focus on medial column.
- This can fail on axial compression, traction or translation.
Mc Affe Classification.
Magerl (AO) Classification.

- Divided in three groups.
- Type A (compression)
- Type B (traction)
- Type C (rotation)

- Is a global classification but reliability inter and intraobserver is a problem.

TLICSS Classification.

- Spine Trauma Study Group in 2005.
- Attempt to integrate mechanical and morphological aspects with prognosis and treatment.
TLICSS Classification.

• TLICSS uses three concepts to define stability:
  1. Fracture morphology.
  2. Neurologic lesion.
  3. Integrity of PLC.
TLICSS Classification.

- Fracture morphology is divided in compression, translation, and traction by CT and Xray.
- Neurologic lesion with MRI. Option to surgical treatment.
- Integrity of PLC with MRI (T2 and STIR).
TLICSS Classification.

- Surgery is recommended with $5 >$ points.
- Conservative treatment with $3 <$ points.
- $3 - 4$ points is debate.
TREATMENT.
Treatment.

- CONSERVATIVE.
- SURGICAL.
Conservative treatment.

- Stable fractures.
- Compresion fractures.
- Burst stable.
- TLICSS < or 3.
- Bed rest few days, analgesics
- Orthosis (TLSO, others).
Conservative treatment.

- Adequate clinical and radiographic outcome.
- No differences > 6 months in clinical outcome.
Surgical treatment.

- Absolute indication in:
- Failed conservative treatment.
- Complete spinal cord lesion with kyphosis and canal compromise.
- Fracture-dislocation.
Surgical treatment.

- Relative indication in:
- Compresion or burst fractures with PLC lesion.
Surgical treatment.

- Anterior approach.
- Posterior approach.
- Combined.
- The choice depends on fracture pattern, neurologic status, and surgeon preference.
Surgical treatment. Anterior approach.

• Absolute indication: incomplete neurologic lesion.
• Corpectomy with decompression and stabilization.
• Fracture pattern treated by anterior surgery only is burst fracture without PLC lesion.
Surgical treatment. Anterior approach.

- 150 patients.
- Corpectomy, decompression, bone graft and stabilization.
- 93% fusion.
- 90% improvement in Frankel scale.
Surgical treatment. Posterior approach.

- The most preferred approach.
- Used to stabilize the majority of fractures.
- Pedicular screws have better control for reduction.
- Short construct and fusion.
Surgical treatment . Posterior approach.


• Progression kyphosis and or screw breakage in 50% patients.


• Short construct have 55% failed rate and collapse of vertebral body compared with long construct.
Surgical treatment. Posterior approach.

- Posterior fixation in short segments is better with reconstruction of anterior support.
- Also in flexion-distraction pattern.
- Weak anterior column, long instrumentation (2 levels above and below).
- Indirect decompression or ligamentotaxis: if PLL are intact.
Surgical treatment: Posterior approach.

- Patients to be treated by ligamentotaxis are:
  - Compresión fr
  - Burst fr
  - PLL intact.
- Direct decompression: several authors propose this strategy to avoid anterior surgery.
- Problem arise from high seudo rate (17.8%).
Surgical treatment. Combined approach.

- The indications are in debate.
- Disadvantage: morbidity related with two surgeries.
- Advantage: adress the pathology.
- Absolute indication: TL fracture with incomplete neurologic lesion and LPC lesion.

- Indications: can be used in
- unstable fracture with PLC injury (flexion-distraction or burst).
- < 40 years
- Absence of neurologic lesion
- Absence of facet or disc lesion

- Require surgical intervention to remove instrumentation
- No indication:
  - >20° kyphosis with severe disc injury, require posterior fusion.
  - >30° kyphosis or >55% loss of anterior vertebral height, anterior fusion is needed.
MIS TECHNIQUES.
MIS techniques. Rationale.

- In open surgeries:
- Greater blood loss (1000 ml)
- Infection rate (0.7-10%)
- Approach related morbidity.
MIS techniques. Rationale.

- Standard midline posterior approach can produce:
  - Iatrogenic muscle denervation
  - Ischemia
  - Revascularization injury
  - Irreversible changes on paraspinal muscles.
  - Clinical effect with pain and functional impairment.
MIS techniques. Requirements.

• Knowledge of anatomy.
• For anterior surgery: training on endoscopic techniques.
• For posterior surgery: use of percutaneous pedicle screws.
• Intraoperative imaging (biplanar fluoroscopy).
• Neurophysiologic monitoring.
MIS techniques.

• Currently:
  1. Anterior techniques (endoscopic decompression and stabilization).
  2. Posterior techniques (percutaneous screw fixation).
  3. Percutaneous vertebral body balloon-assisted endplate reduction and augmentation.
  4. Temporary percutaneous posterior fixation.
  5. Combination of previous techniques.
MIS techniques. Anterior endoscopic decompression and stabilization.

- Used in “stand alone” or with supplemental posterior tension band fixation for TL burst fractures.
- Compared with conventional techniques: diminished blood loss, postop pain and hospital stays.
- No differences in long term functional outcomes.
MIS techniques.
Posterior percutaneous tension band fixation.

• Indication: stand alone fixation in burst and flexion-distraction injuries.
• With or without fusion.
• Combination with endoscopic anterior techniques.
• No differences on long term outcomes.
MIS techniques.
Percutaneous vertebral body balloon-assisted.

- Balloon assisted Techniques can be used alone or with posterior fixation.
- Good indication in unstable osteoporotic fractures.
MIS techniques.
Temporary percutaneous posterior fixation.

- Controversial indication.
- In polytrauma patients, to stabilize spine fractures.