Surgical Approaches in Thoracolumbar Trauma

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Introduction

• Epidemiology

• TL fracture, 10-15% of spinal fractures

• T12-L2

• Elderly persons: low energy trauma, osteoporosis

• High energy trauma in young adults
T1-T8: Rigid
relatively rigid (ribcage), kyphosis.
flexion injury pattern predominates

T9-L2:
transition: immobile - mobile,
transition: kyphosis - lordosis
most injuries occur here

L3-sacrum:
mobile, lordosis
axial load injuries predominate

Prone to injury
A: compression injuries

B: distraction injuries (ant/post column)

C: rotational injuries

1

impaaction fractures

with post. lig. disruption

Type A injury with rotation

2

split fractures (pincer fracture)

with post. transoss. disruption (chance fracture)

Type B injury with rotation

3

burst fractures

with ant. disc disruption

rotation/shear injuries
Denis Three Column Theory

**Ant. column**
- Ant Longit Lig
- Ant annulus
- Ant 2/3 vert body

**Middle column**
- Post 1/3 of vert body
- Post annulus,
- Post Longit Lig

**Post. column**
- Posterior elements
  - pedicles, facets,
  - lamina
  - spinous proces
- Posterior ligaments
Indications for Surgery

- Deformity
- Instability
- Neurological deficit
General Principles

- Early Mobilization of the patient
- Diminished pain
- Facilitated nursing care
- Earlier return to work
- Avoidance of later neurological complications
General Principles

- Anterior
- Posterior
- Anterior plus Posterior
Anterior compression anterior approach

Osteoporotic collapse
Anterior and posterior
Anterior approach

- T2-T12
- Lateral Decubitus Position
- Left side approach
- Thoracotomy at one or two level above the level of lesion
Fig. 3. The dotted lines showing the dissection plane either in radioloque (a), or schematic (b) illustration (The zig-zag lines in the b frame represents vertebral fractures).
Fig. 7. The patient is placed in the lateral decubitus position with the left side up and is positioned in 10°-15° oblique chest position rotated to the posteriorly. The skin and subcutaneous tissue are opened from the lateral border of the paraspinal musculature to the costal cartilage junction over the rib to be resected (Department of Neurosurgery, Cumhuriyet University, with permission).
Fig. 8. The Periosteum is elevated first from the outer surface of the rib, then from the superior surface, followed by the inferior surface of the rib. The rib is cut as far anteriorly as between the costal cartilage junction and posteriorly at costotransverse joint (Department of Neurosurgery, Cumhuriyet University, with permission).
Fig. 9. Retroperitoneal area is accessed extrapleurally by the resection of 11th or 12th ribs depending on the location of the diaphragm. The intraoperative image of a patient following L1 corpectomy and stabilization by the aid of excellent exposure provided with the resection of 11th rib (Department of Neurosurgery, Cumhuriyet University, with permission).
Anterior Iliac Crest Graft
PLL Intact

Posterior Approach
Indirect Reduction