

Translational Injury

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RADS 4001

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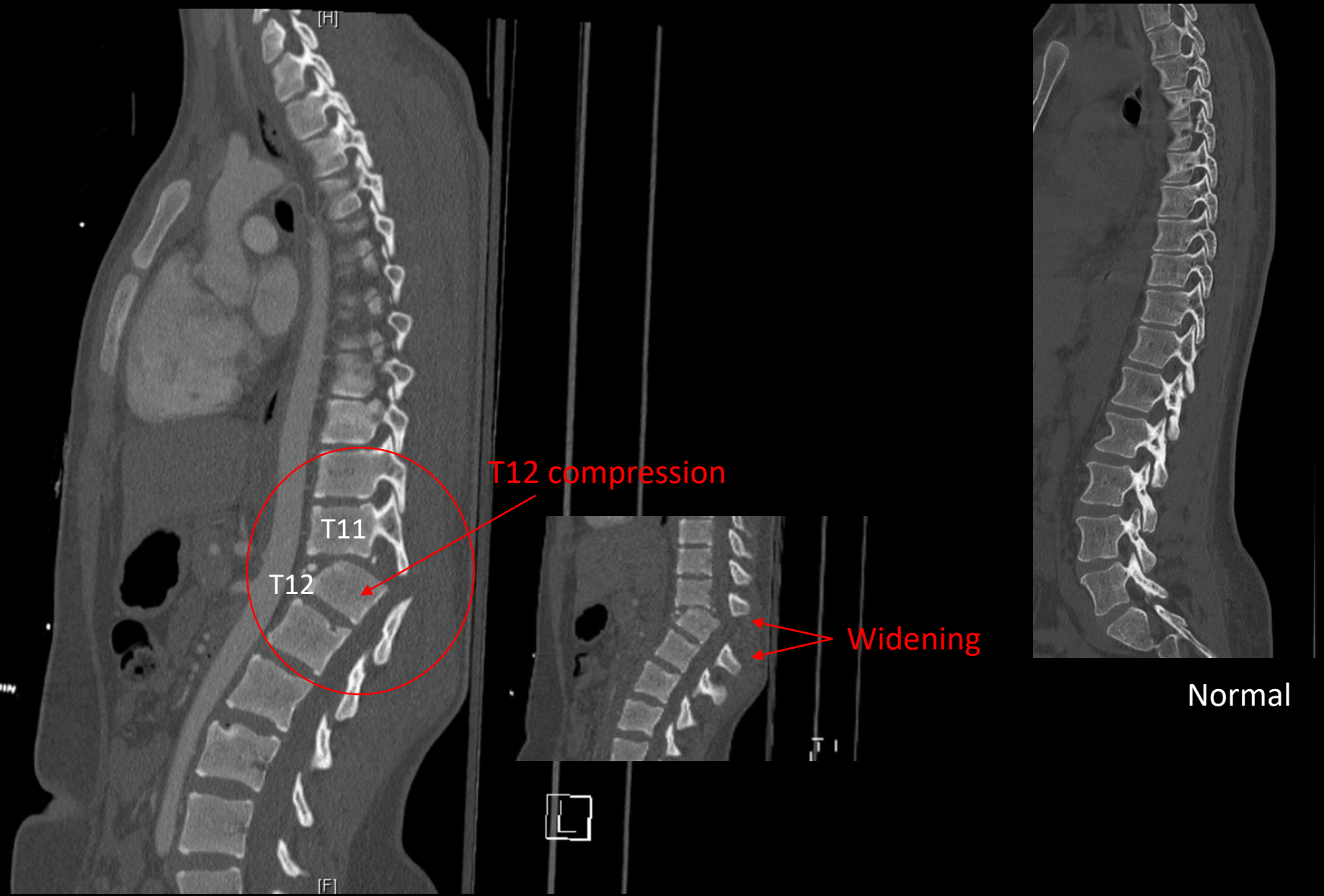


Clinical History

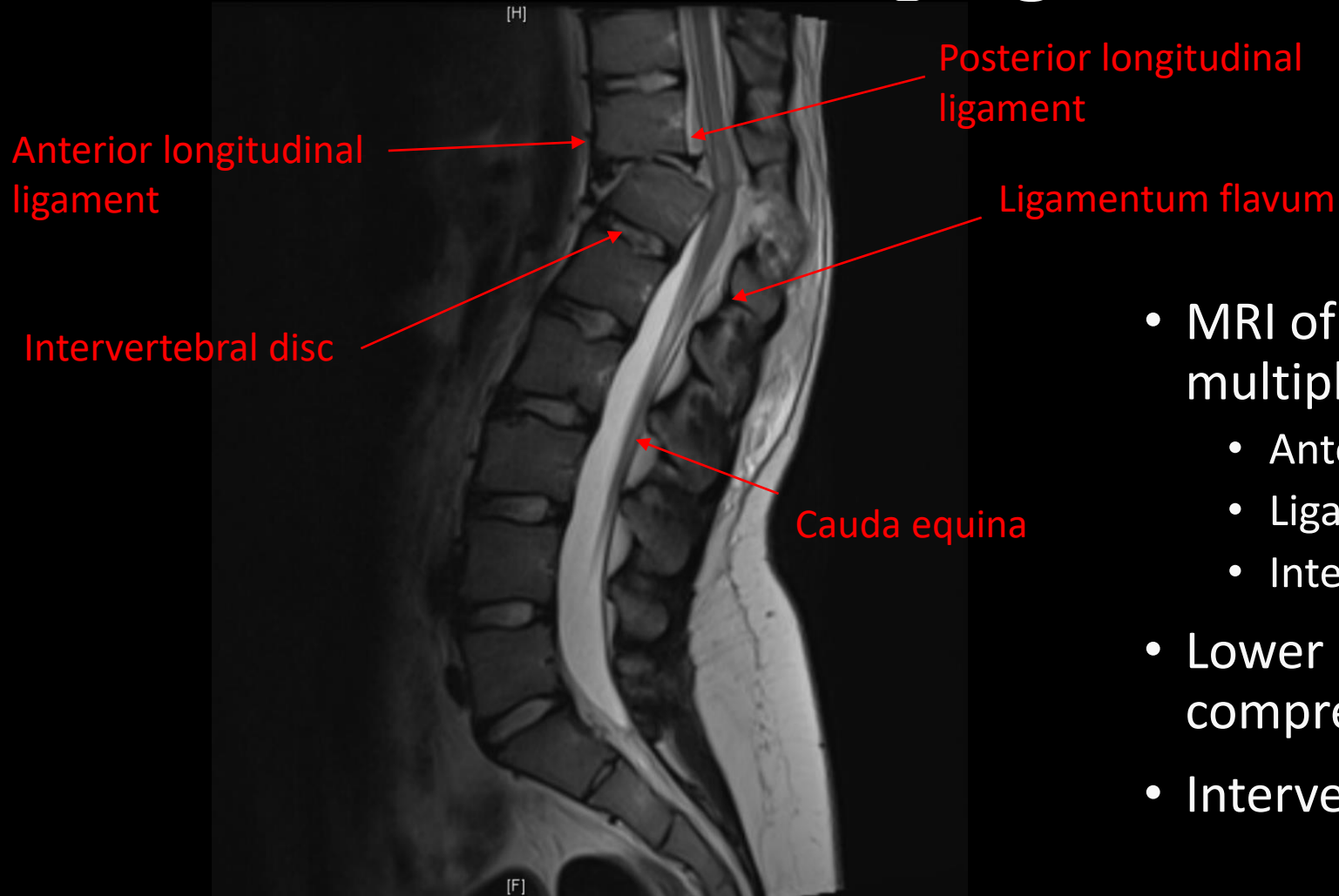
- Patient is a 14 year-old female with no PMH who presented via Life Flight after being an unrestrained passenger in a MVC.
- She complained of lower back pain and loss of sensation and movement below the knee.
- In the ER, she was hemodynamically stable (BP 112/62), tachycardic (110).
- Secondary survey: step off noted around T10-T12, decreased rectal tone, moderate sensory loss at L1-L4, and complete sensation loss below L5
- Workup: FAST exam, CT cervical spine, CT brain, CT spine, Pelvis XR, Chest XR, MRI spine, CT c/a/p

Relevant Imaging

- Anterolisthesis
- Interspinous widening
- Compression T12, 20% height loss



More relevant imaging

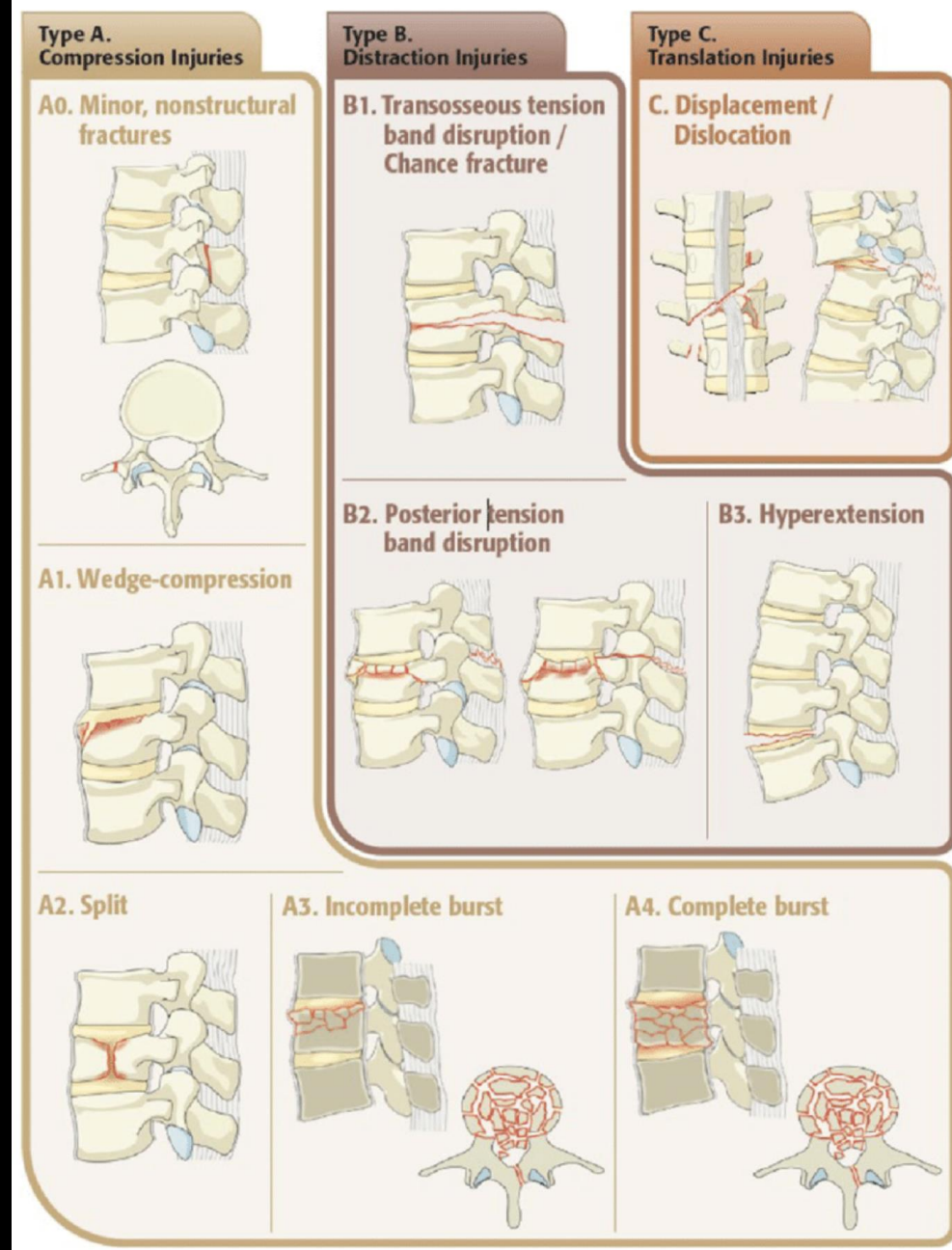


- MRI of spine showing injury to multiple ligaments
 - Anterior posterior longitudinal ligaments
 - Ligamentum flavum
 - Interspinous and supraspinous ligaments
- Lower cord is compressed however no compression of cauda equina
- Intervertebral disc injury

Key imaging findings

- Step-off noted on physical exam in T10-T12 area, with loss of sensation below knees and loss of motor function of lower extremities
- On imaging, translational injury at T11-12 with anterior rotation of distal spine and posterior displacement of T12 vertebral body into spinal canal. Compression of T12 vertebral body.
- AO classification system
- Spinal cord injury (ASIA scale)

AOSpine Thoracolumbar Classification System



ASIA Impairment Scale

<i>ASIA Impairment Scale</i>	<i>Description</i>
A	Complete. No sensory or motor function is preserved in the sacral segments S4–S5.
B	Incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4–S5.
C	Incomplete. Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3 (grades 0–2).
D	Incomplete. Motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade greater than or equal to 3.
E	Normal. Sensory and motor function are normal.

Differential Diagnosis

based on imaging

- AO Type B3, hyperextension
 - Injured anterior tension band, through the intervertebral disk or vertebral body
- AO Type C, translation
 - Bone or disco-ligamentous injuries with circumferential disruption of spinal column

Final Diagnosis

- T11-T12 fracture dislocation with ligamentous injury with spinal stenosis, malalignment and T12 fracture
 - T11-12 AO C: translational injury
 - AO T12 A1: compression injury
- ASIA-B incomplete spinal cord injury

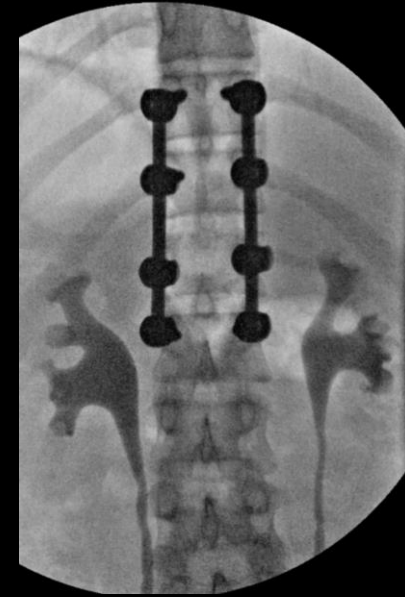
Discussion

- Blunt trauma to spine secondary to MVC caused the dislocation of T12 vertebral body
- Prognostic factors: level of neurologic impairment, level of spinal injury
- Intervention: **TLICS** score 4+ → surgery
- Various studies report a range of recovery of neurological deficit of about 50-85% of early operated patients
- Further management done: post-op imaging, inpatient rehab

TLICS 3 independent predictors			
1	Morphology immediate stability	- Compression - Burst - Translation/rotation - Distraction	1 ★ 2 3 ★ 4 - Radiographs - CT
2	Integrity of PLC longterm stability	- Intact - Suspected - Injured	0 2 3 ★ - MRI
3	Neurological status	- Intact - Nerve root - Complete cord - Incomplete cord - Cauda equina	0 2 2 3 ★ 3 - Physical examination
Predicts		- Need for surgery	0 – 3 4 > 4 - nonsurgical - surgeon's choice - surgical

Treatment

- Pediatric neurosurgery took patient to OR for T10-L1 posterior spinal fusion and reduction of fracture
- Patient had return of sensation in bilateral lower extremities. Patient still unable to move BLE.
- One study reported 72.4% of patients with thoracolumbar SCIs improved by one or more ASIA levels after surgery compared with status at admission
- Prognosis of AO Type C fractures is the worst



ACR appropriateness Criteria

- ACR Appropriateness
- MRI Lumbar w/o \$5933
- CT cervical spine w/o \$4057
- CT head/brain w/o \$3157
- CT C/A/P w/c \$11934
- Pelvis XR \$994
- Chest XR \$683 = \$26,758
- <https://www.memorialhermann.org/patients-caregivers/memorial-hermann-charge-master/>

Variant 4: Child, younger than 16 years of age, suspected thoracolumbar spine trauma. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
Radiography thoracic and lumbar spine	Usually Appropriate	☼☼☼
CT thoracic and lumbar spine without IV contrast	May Be Appropriate (Disagreement)	☼☼☼☼
MRI thoracic and lumbar spine without IV contrast	★ May Be Appropriate (Disagreement)	○
Arteriography thoracic and lumbar spine	Usually Not Appropriate	☼☼☼☼
CT myelography thoracic and lumbar spine	Usually Not Appropriate	☼☼☼☼
CT thoracic and lumbar spine with IV contrast	Usually Not Appropriate	☼☼☼☼
CT thoracic and lumbar spine without and with IV contrast	Usually Not Appropriate	☼☼☼☼
CTA thoracic and lumbar spine with IV contrast	Usually Not Appropriate	☼☼☼☼☼
MRA thoracic and lumbar spine without and with IV contrast	Usually Not Appropriate	○
MRA thoracic and lumbar spine without IV contrast	Usually Not Appropriate	○
MRI thoracic and lumbar spine without and with IV contrast	Usually Not Appropriate	○

Take Home Points / Teaching points

- AOSpine treatment options
 - Type A: conservative
 - Type B & C: early intervention
- ASIA impairment scale
 - Functional goals
- TLICS
 - 0-3 – no surgery
 - 4 – surgeons call
 - 4+ surgery
- Wear your seatbelt!!

References

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Questions?