

Spinal cord compression in spine tumours and injuries

Chaloupka, R., Grosman, R., Repko, M., Tichý, V.

Spine involvement in tumours

Pain is caused predominantly by

- growing of tumour tissue
- nerve structures compression
- neural symptoms

Spine instability

- in extensive involvement of one or more vertebrae
- small force results in pathological fracture and neural deficit

Neural deficit

- growing of tumour and neural compression
- worsening of blood supply of spinal cord
- pathological fracture with neural compression
- combination of these mechanisms

Goals of surgeries

- prevention / improvement of neural deficit
- pain relief
- restoring spine stability
- improving quality of life

Indications

- present / imminent vertebral collapse
- present / imminent neural deficit
- to 24 hours after plegia onset (severe paresis)
- life expectancy – 3 months minimum

Diagnostics

- X-rays of C, Th, L spine – AP and lateral
- CT of affected part,
- MRI (optimum MRI of the whole spine, CT of brain, lung, abdomen)
- neurological,
- internal exam. (laboratory, lung X-ray, ultrasonography of abdomen)

Tomita scoring system (Spine, 2001)

Spine metastases:

Necessary: bone scan - Tc

MRI of the whole spine

CT of brain, thorax and abdomen

Grading of metastasis (according to origo):

1. low (mamma, prostata, thyroid gland) 1 point
2. middle (kidney, uterus) 2 points
3. high (pulmo, intestinum, stomach, liver, unknown) 4 points

Organ metastases:

- | | |
|----------------|---------|
| 1. none | 0 point |
| 2. Resectable | 2 body |
| 3. untreatable | 4 body |

Bone metastases:

- | | |
|-------------|----------|
| 1. Solitary | 1 point |
| 2. Multiple | 2 points |

According to the score value we indicate the extent of surgery:

- | | |
|------|-------------------------------------|
| 2-3 | wide – marginal resection (en bloc) |
| 4-5 | marginal – intralesional resection |
| 6-7 | palliative surgery |
| 8-10 | conservative – no surgery |

Treatment

Extent of surgery depends on

- tumour localisation and extent
- patient's age and condition

Quick progression of neural deficit

- quick decompression w / wo stabilization

Examination

- X-rays of the whole spine
- CT – MRI
- Internal, neurological examination

Unknown tumour aetiology

- Bone scan - Tc
- MRI of the whole spine
- CT of brain, thorax, abdomen

Surgery types

- Wide / marginal resection
- Marginal / intralesional resection
- Palliative surgery

Surgery

- Anterior – posterior
- Combined
(1 stage – 2 stages)

Occiput – C2

- decompression – anterior / posterior
- posterior fusion and instrumentation

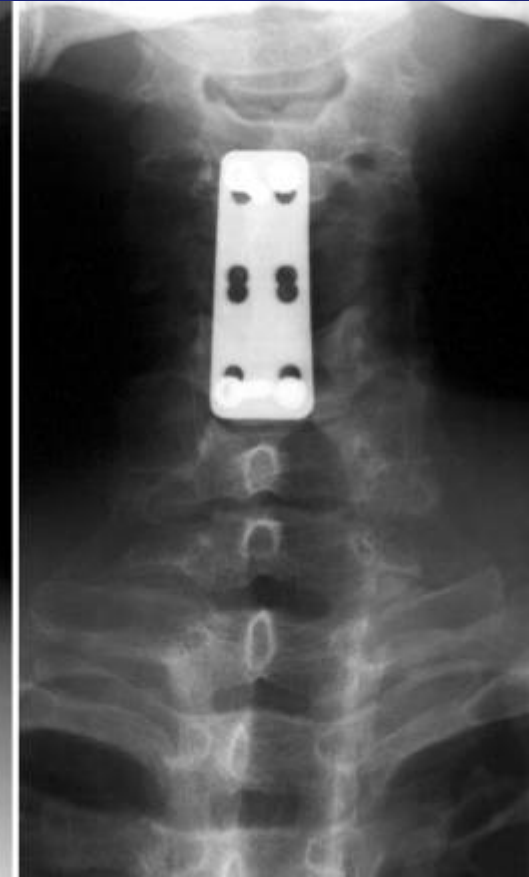


C 3-7

- Bone cement with K - wires
- autograft
- spacer



Pelvic autograft
and Caspar plate



K.A.

P



P





K.A.
80+10

K.A.
83+5
op 3+7



K.A.
83+5
op 3+7

Bone cement
with K-wires

T and L spine

Posterior surgery

- decompression +
- instrumentation +
- fusion

Th and L spine

Anterior surgery

- decompression
- vertebral body replacement
 - bone cement + K-wires
 - bone graft
 - spacer

Combined surgeries

Anterior – vertebral body replacement

Posterior - fusion and instrumentation

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KUCHAR STANISLAV, 73
694/94

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NS: 1A
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DR. NEUBAUER, DR. PECINKOVA
FNsP BRNO BOHUNICE

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205
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DR. NEUBAUER, DR. PECINKOVA
NsP BRNO BOHUNICE

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LEFT

5 CM

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KV 125
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GT 0
TP 111

NATIV
L3

M 350
C 40



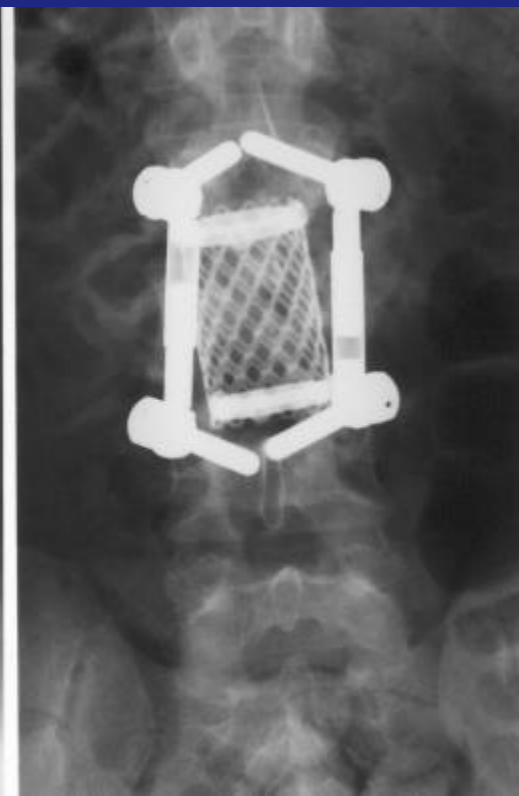
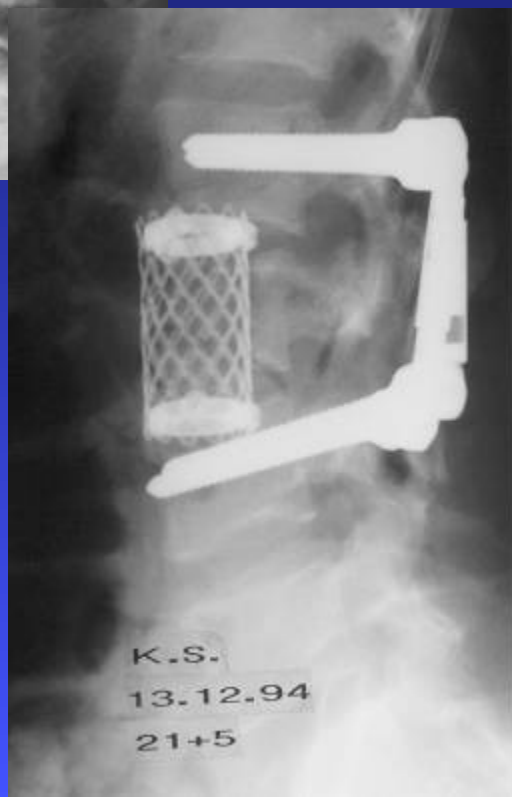
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Harms cage and transpedicular fixator



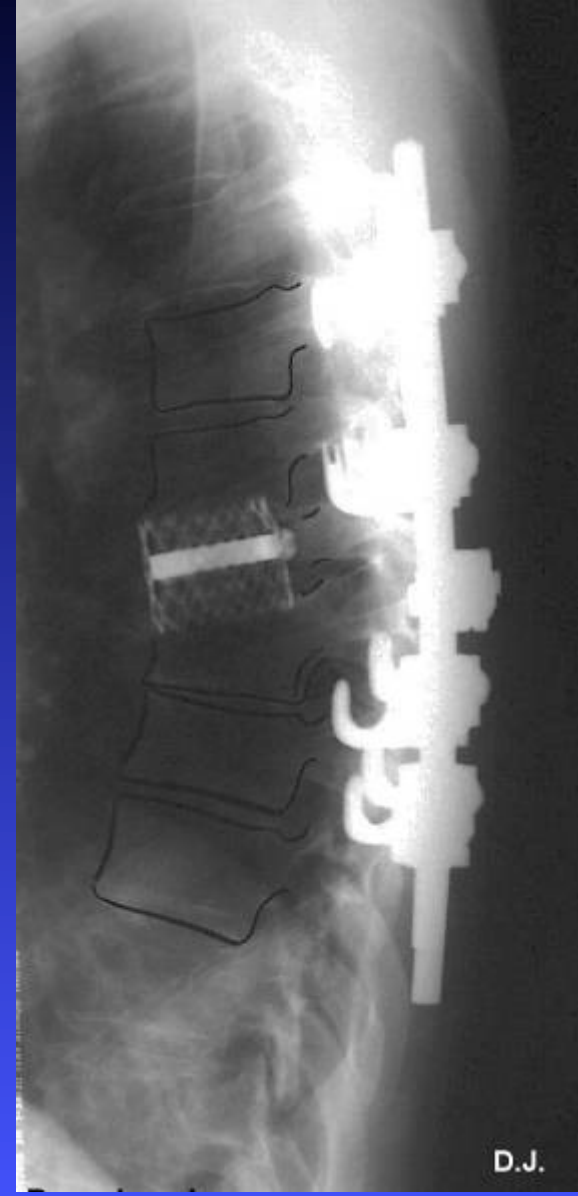
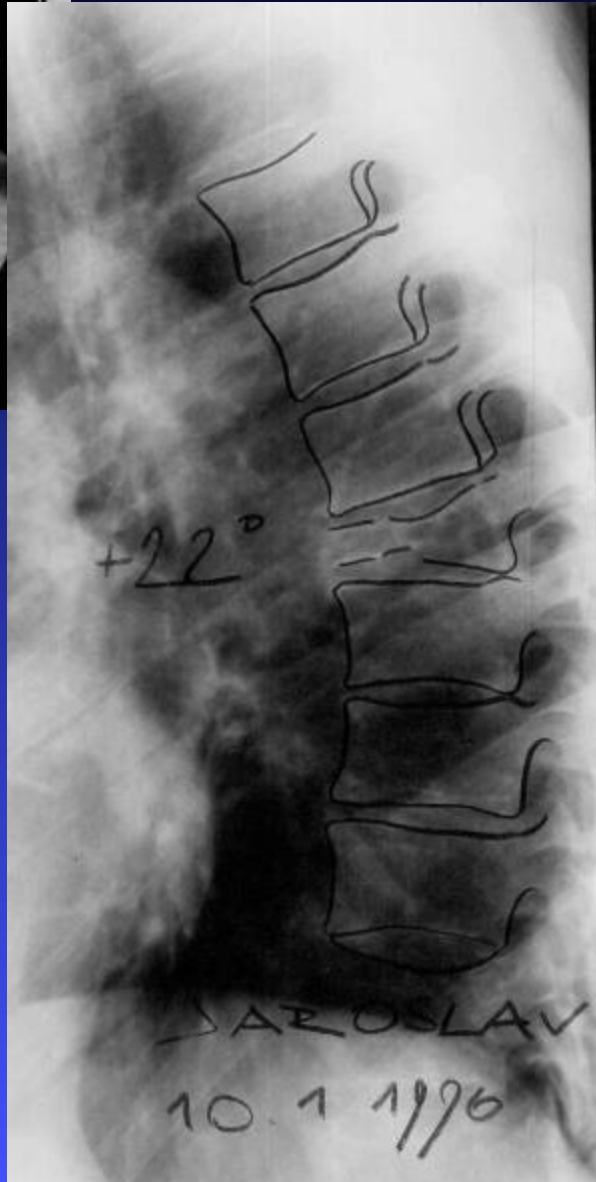
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C1 102
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ZOOM
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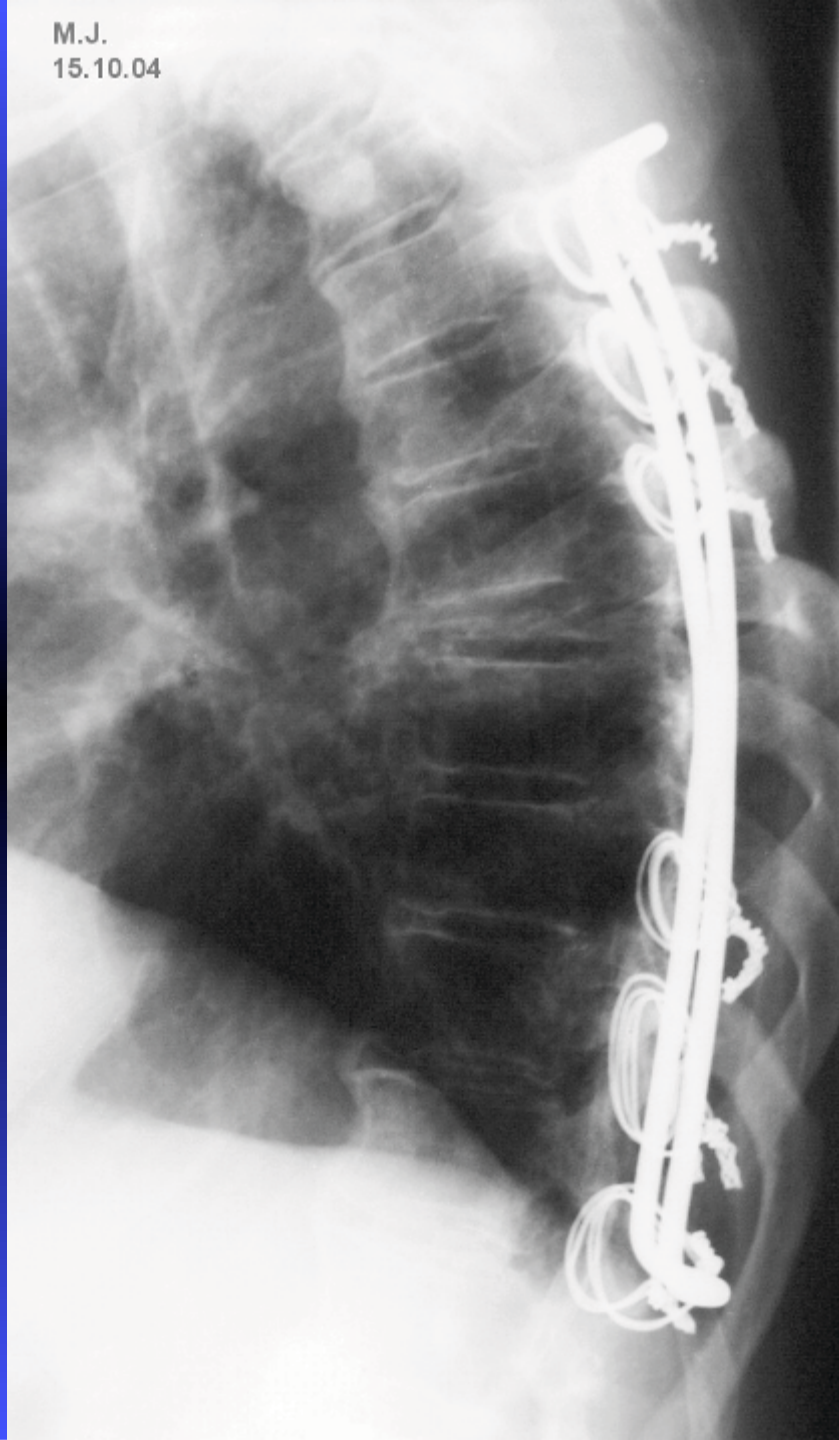
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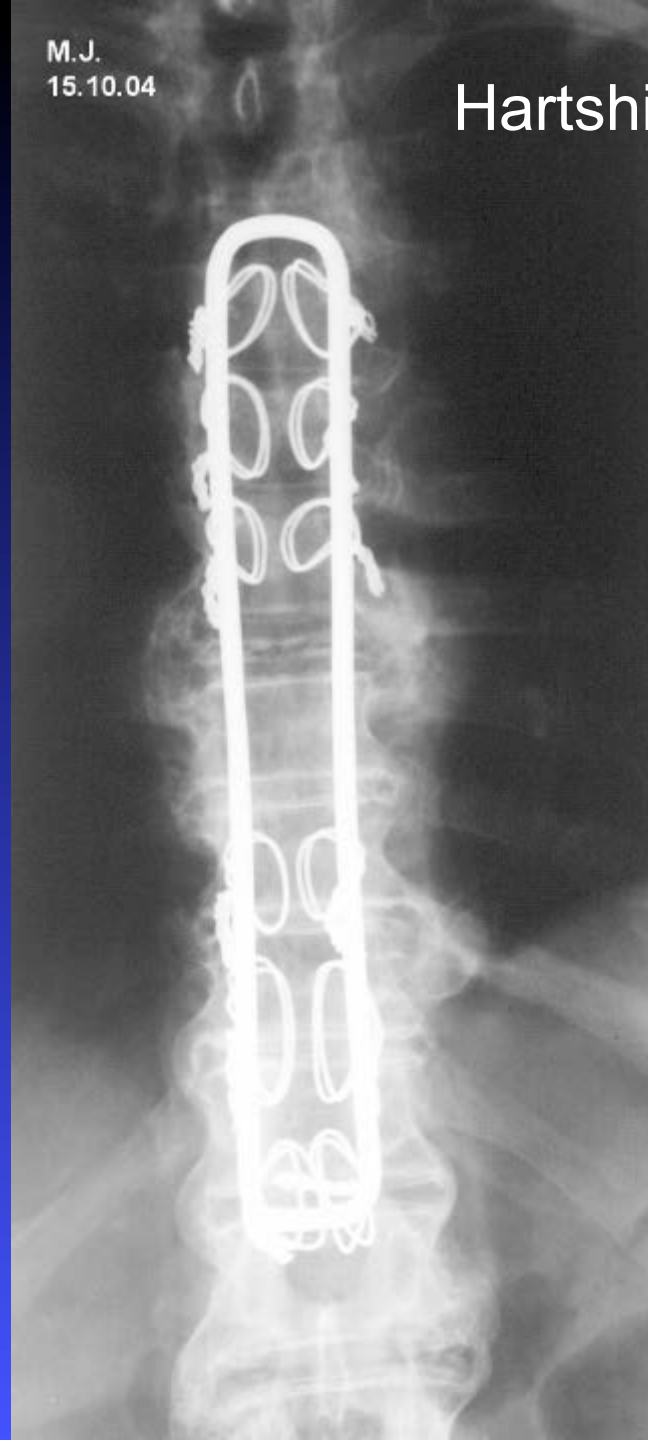
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Hartshill system

Unclear cases

Biopsy

- thoracoscopic
- lumboscopic
- transpedicular

Surgery in Czech Republic

- spine surgery departments
- specialized orthopaedic, neurosurgery,
traumatology departments
- Vertebro- and kyfoplasties – radiological departments

Orthotics

Orthoses – soft collars, Philadelphia collar, three-point body orthoses – Jewett orthosis, belts.



1984 – 2005

operated patients:	727
metastases	386
benign	98
malign	175
tumour-like affections	68

The most frequent metastases:

mammar cancer	75
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Grawitz. tumour	54
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Malignant tumours:

myeloma	72
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chordoma	17
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chondrosarcoma	12
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Surgeries

anterior	168
posterior	350
combined – 1 team	164
- 2 teams	45

Frankel scale:

A plegia, anesthesia

B plegia, some sensory function

C useful motor function

D useful motor (gait)

E normal

Complications

During surgery – heart failure,
extensive blood loss

Chylothorax

Infection

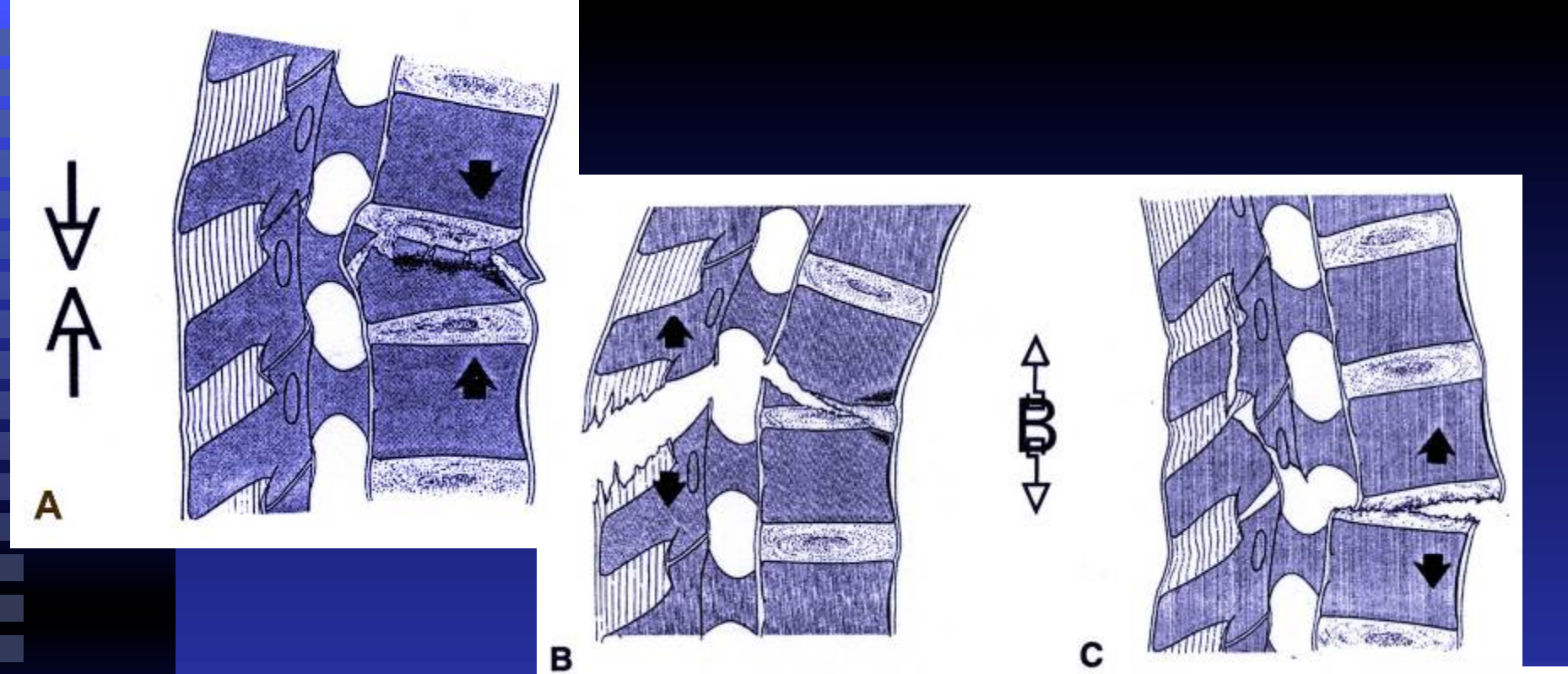
Exitus

Conclusion

Quick progression of paresis
Surgery to 24 hours after plegia onset

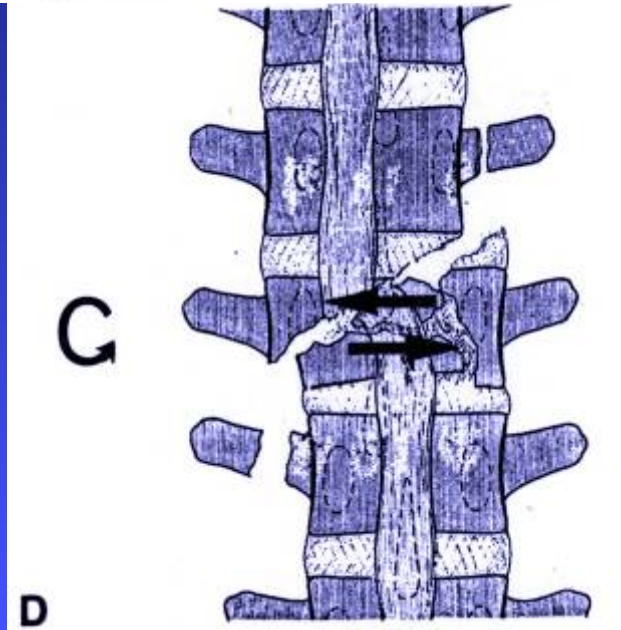


SPINE INJURIES



AO classification of T+L injuries

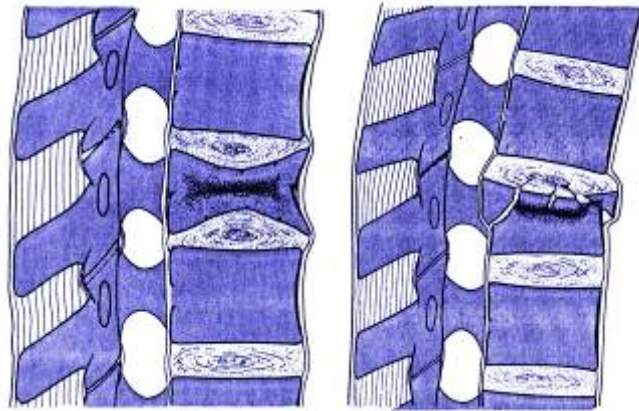
- A anterior column injury (wedge, split, burst)
- B both columns – flexion distraction
- C both columns with rotation



Neural deficit in Th + L spine

- A type – mainly burst fractures
- B type - seldom
- C type – majority of patients

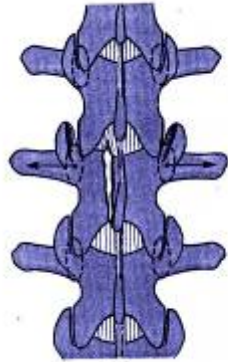
A1.3



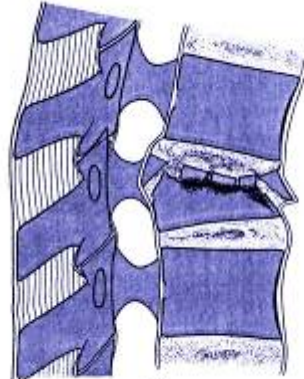
A3.1.1



A



B



C

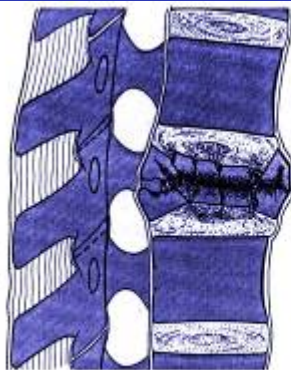


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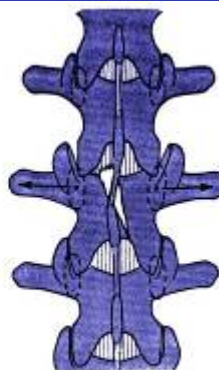


E

A3.2.1



A



B



C



D

A3.3.3

A3 burst

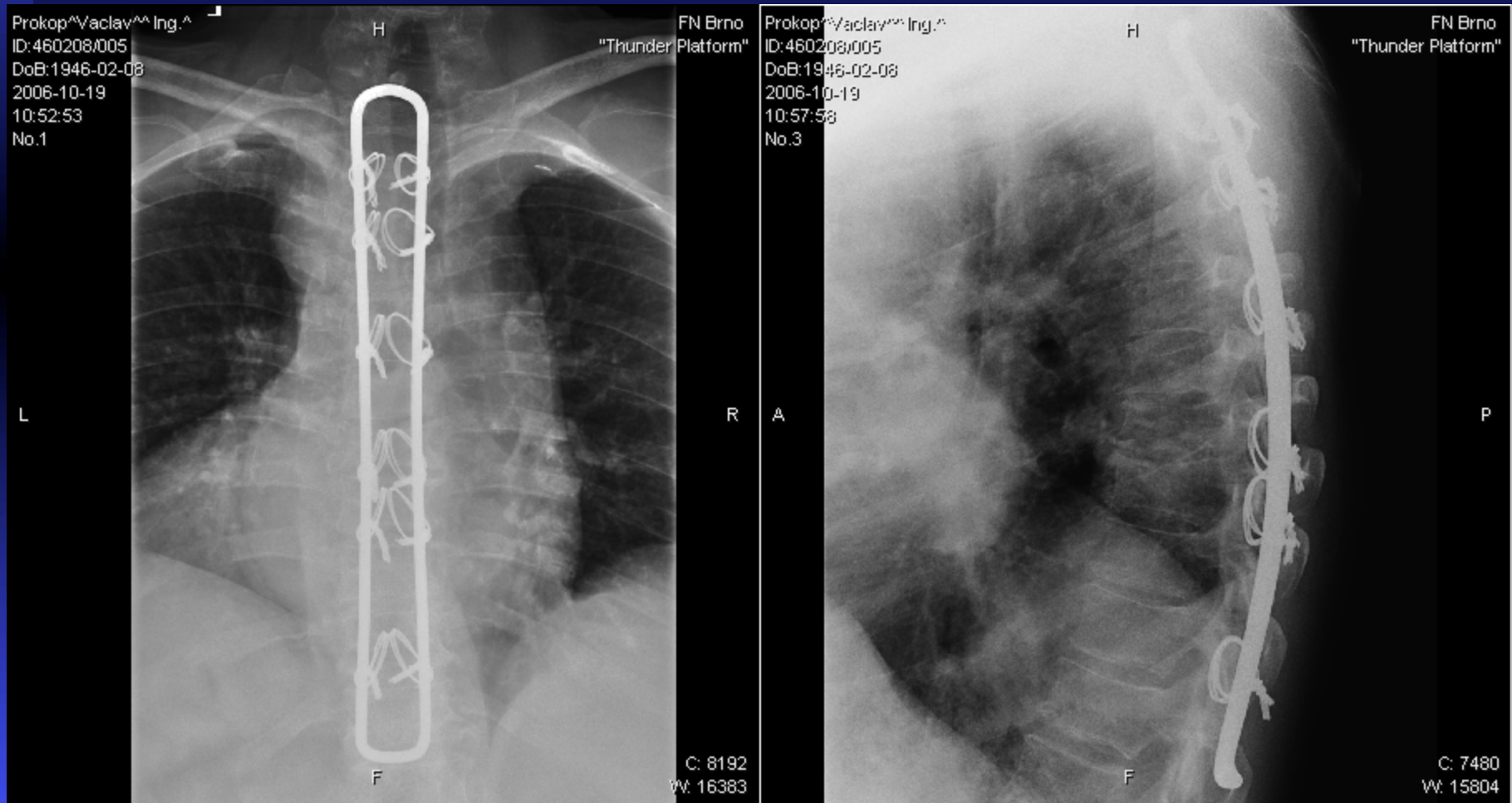
Injuries with neural deficit

- Transport to spine surgery department
- X-rays, CT, (MRI), int., neurol.
- Surgery to 6 hours after injury in case of severe neural deficit

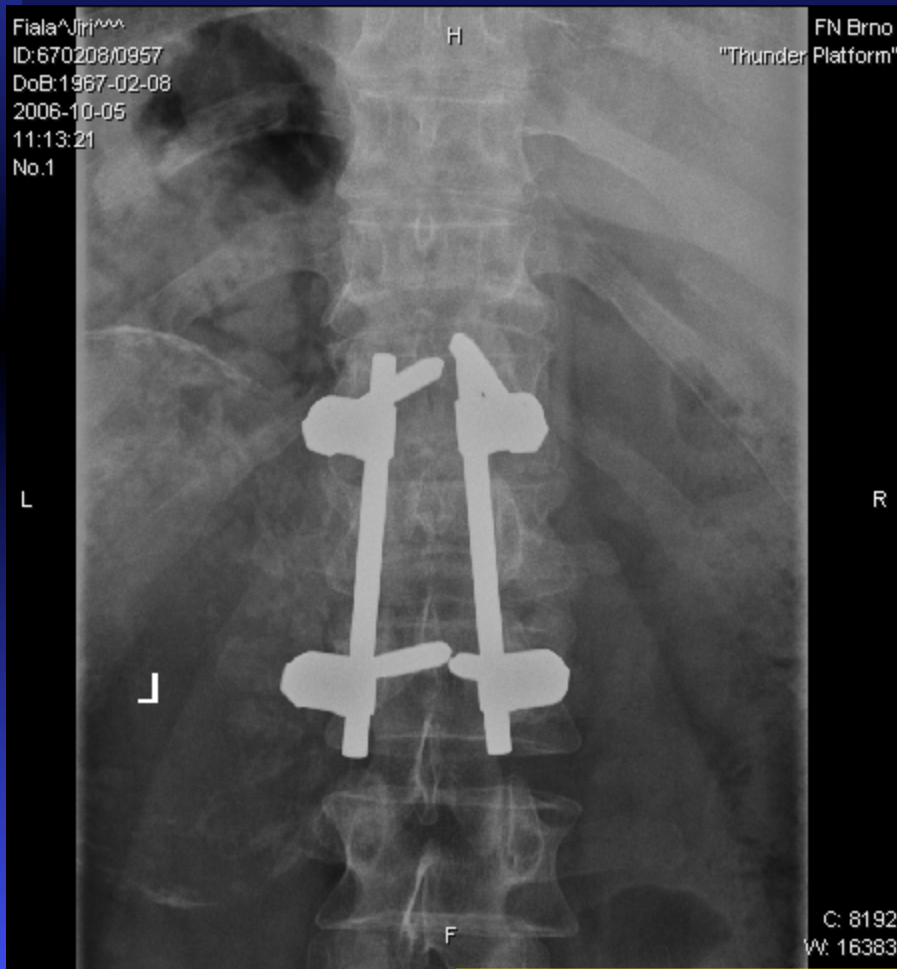
Surgery types

- Posterior – decompression, fusion, instrumentation
- Anterior – decompression, fusion, instrumentation – spacers, grafts
- Combined – posterior and anterior, anterior – vertebral body replacement in anterior column comminution - destruction

Multiple Th fractures – post surg, Hartshill – sublaminar – seldom



Posterior TL surgery – transpedicular fixation, fusion and decompression - majority



C 3-7 INJURIES

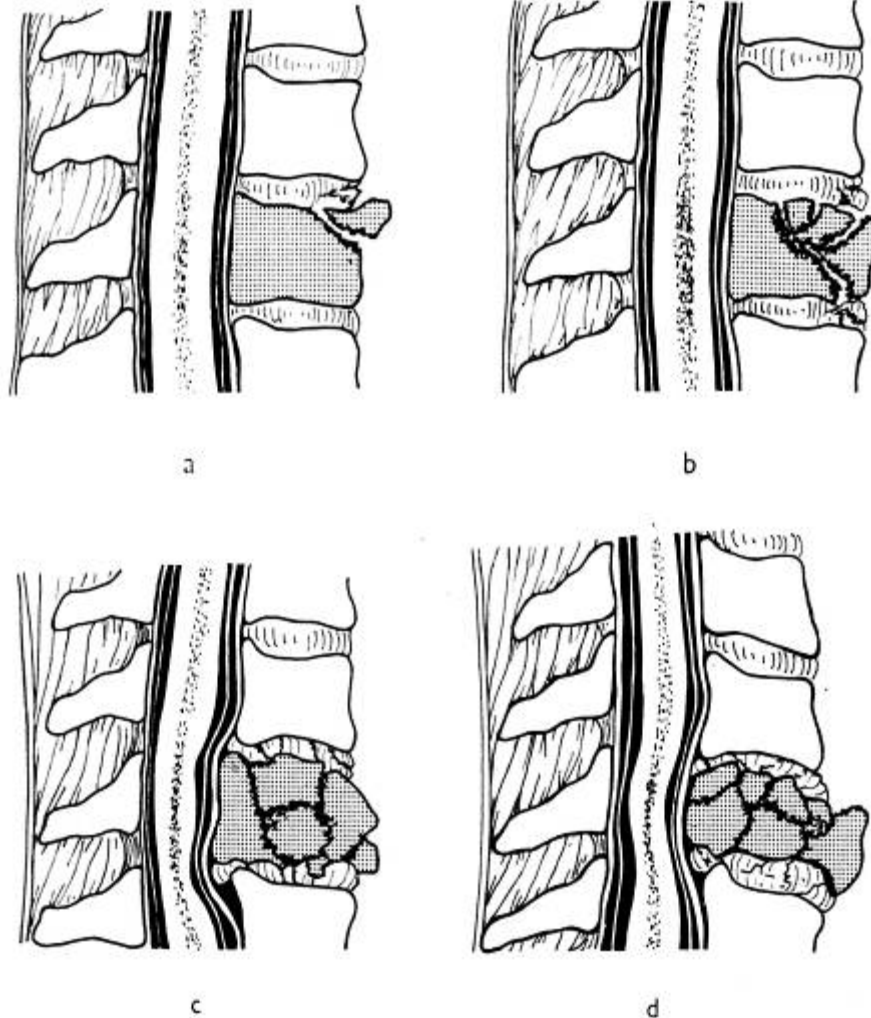
AO classification

- A. Injury of anterior column
- B. posterior
- C. both columns

1. Bone injury
2. Bone-ligamentous
3. Ligamentous

A1 type fracture - bone injury

wedge



Neural deficit:
burst fractures -
majority of cases

Combined C5-6 surgery

C type - dislocation



Neural deficit in C spine

A type – burst (C5-7) – majority of cases

B type – posterior column – seldom

C type – both columns – majority of cases

Surgery

Anterior – decompression, anterior fusion and plates –
majority of cases

Combined surgery – C type injuries