

ZLOMENINY V OBLASTI L-S PÁTEŘE. FAKTA A KONTROVERZE.

BILIK A.

Klinika úrazové chirurgie FN Brno Bohunice

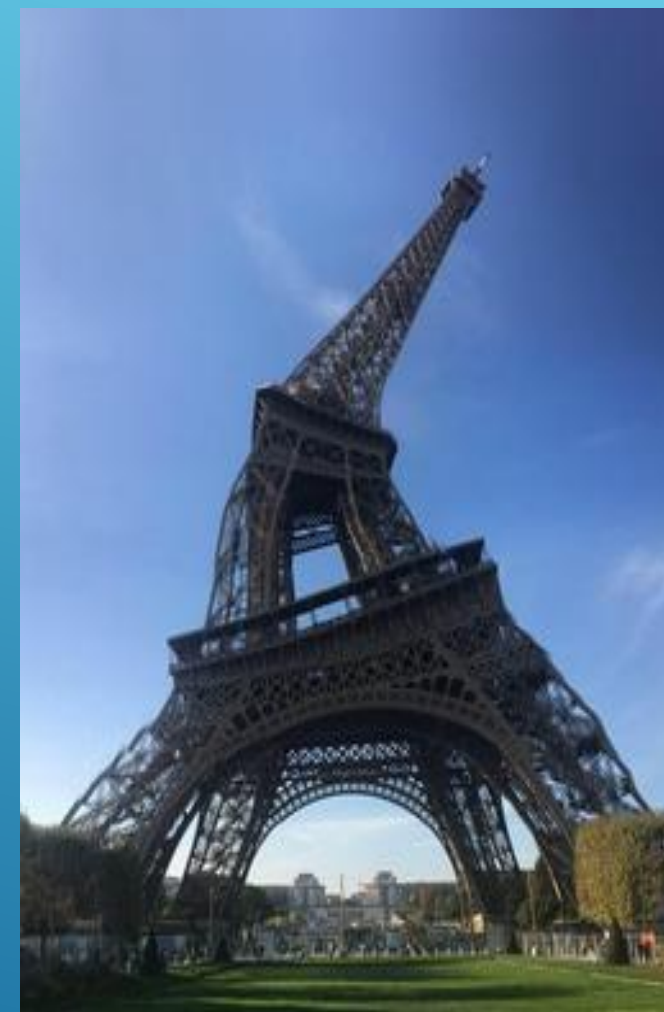
Traumacentrum

přednosta: Doc. MUDr. Mašek M., CSc.

 **FAKULTNÍ
NEMOCNICE
BRNO**



Introduction



Incidence

High energy trauma - **traffic accident**
 falling from a height
 falling of a heavy object

Sacral fractures – 45% of all the pelvic fractures, isolated less than 5%

Associated : **50% pelvic ring or acetabulum**

30% spinal or lower limb

20% thoracic trauma

16% abdominal trauma







11% cranial trauma

Neurologic injuries – 25%

Type of spinopelvic lesion and classification

Lumbosacral (L5-S1) dislocation

Vialle

Pure dislocation	 Unilateral Type IA	 Lateral Type 1B	 Anterior Type IC
L5 anterior slipping	NO	NO	YES
Fracture dislocation	Unilateral fracture	 Rotatory Type II	
	L5 anterior slipping	YES	
	Bilateral fracture	 Anterior Type IIIA	 Rotatory Type IIIB
	L5 anterior slipping	YES	YES

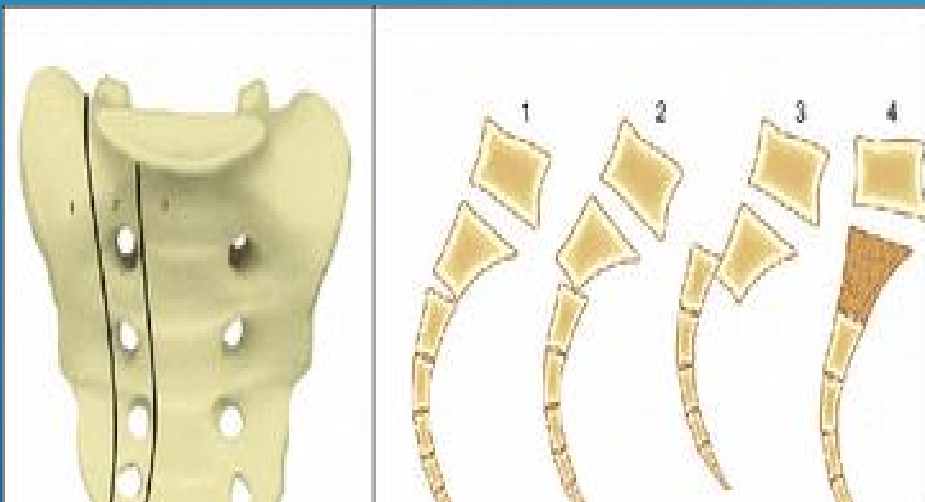
compression, rotation, flexion or extension on fixed pelvis

ignores posterior forms !

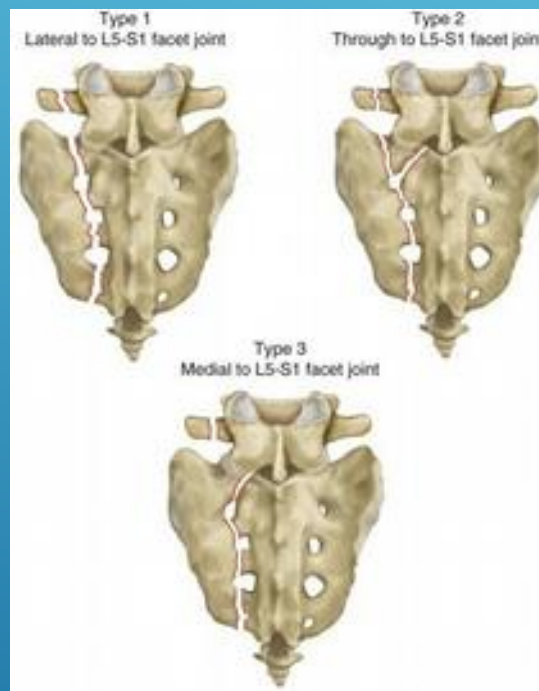
Isolated sacral fractures

Denis

Roy-Camille



Isler



AOSpine Sacral Classification System

Type A: Lower Sacroccocygeal Injuries
No impact on posterior pelvic ring stability

Type B: Posterior Pelvic Injuries
Stability depends on posterior pelvic ring stability

Type C: Spino-Pelvic Injuries
Posterior pelvic instability

A1: Unilateral or symmetrical sacral fracture, superior to S1-S2 level

A2: Non-angled sacrospinous fracture, anterior to S1-S2 level

A3: Angled sacrospinous fracture, anterior to S1-S2 level

B1: Central fracture, anterior to S1-S2 level

B2: Transverse fracture, anterior to S1-S2 level

B3: Transforaminal fracture, anterior to S1-S2 level

C0: Horizontal sacral fracture, anterior to S1-S2 level

C1: Vertical fracture, anterior to S1-S2 level

C2: Vertical fracture, anterior to S1-S2 level

C3: Horizontal fracture, anterior to S1-S2 level

Sacral Fracture Overview
Hierarchical system progressing from least to most unstable

- Type A: Lower Sacroccocygeal Injuries
No impact on posterior pelvic ring stability
- Type B: Posterior Pelvic Injuries
Stability depends on posterior pelvic ring stability
- Type C: Spino-Pelvic Injuries
Posterior pelvic instability

Neurology

Neurology	Stability	Classification
Stable	Stable	A1, A2, A3
Unstable	Stable	B1, B2, B3
Unstable	Unstable	C0, C1, C2, C3

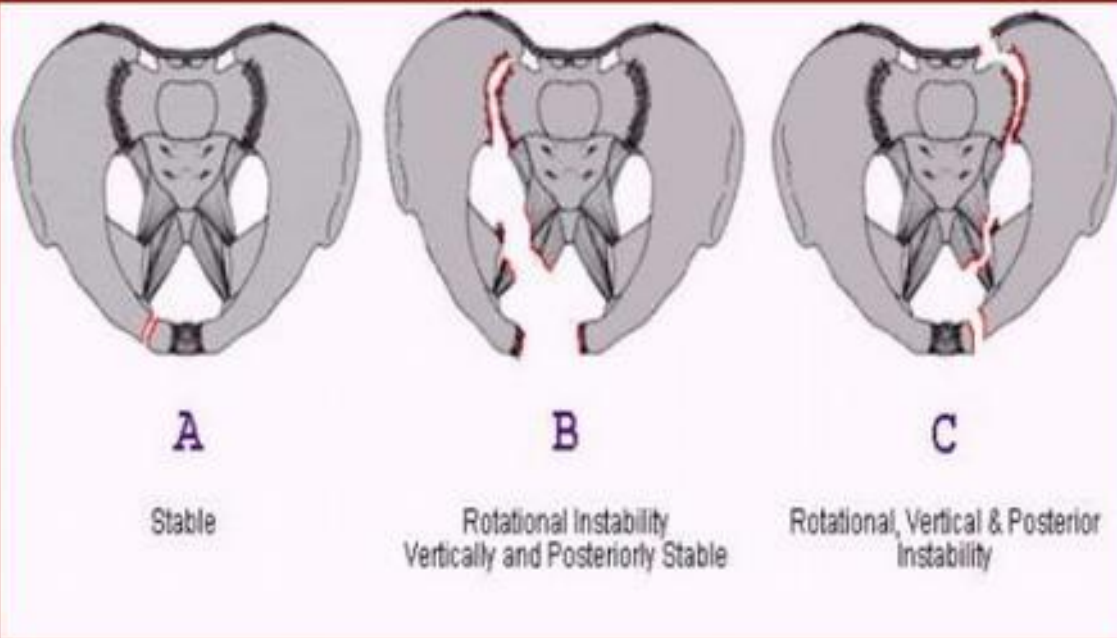
Classification nomenclature
Transforaminal fracture (B3) high energy trauma associated with anterior column injury (A3) and soft tissue injury (C3)

B3; M1, M3

Further information: www.aospine.org/classification

Pelvic ring fractures

Tile/AO Classification

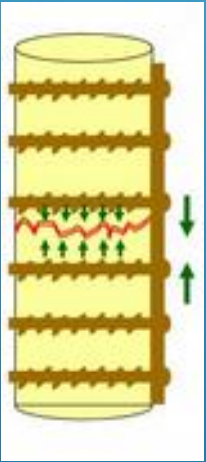


Type A	Stable (posterior arch intact)
A1	Avulsion of the innominate bone
A2	Iliac wing or anterior arch fracture caused by a direct blow
A3	Transverse fractures of the sacrum and coccyx
Type B	Partially stable (incomplete disruption of posterior arch)
B1	Open book injury (external rotation)
B2	Lateral compression injury (internal rotation)
B3	Bilateral B injuries
Type C	Complete unstable (complete disruption of posterior arch)
C1	Unilateral
C2	Bilateral, with one side type B, one side type C
C3	Bilateral

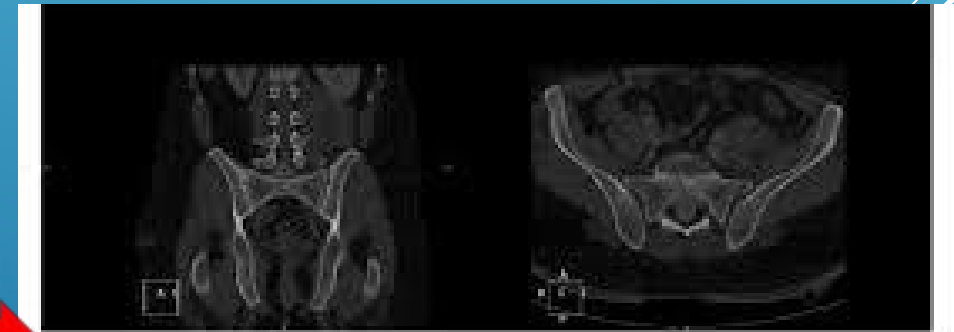
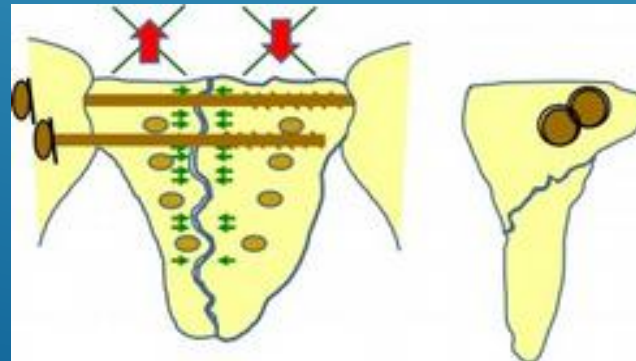
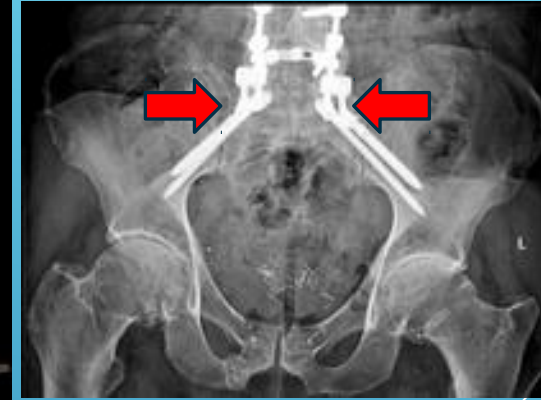
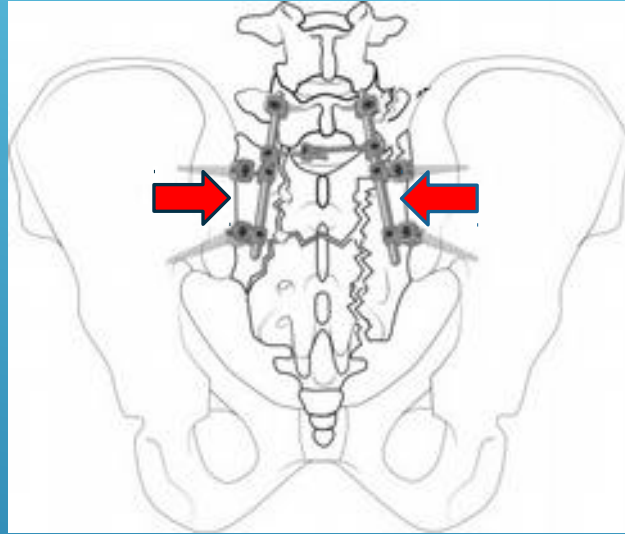
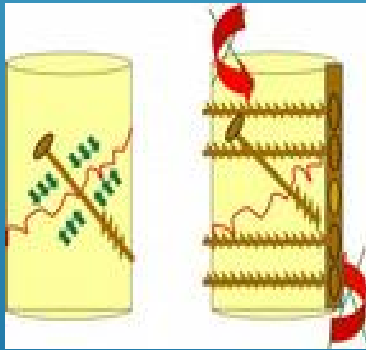
Principles of osteosynthesis for spinopelvic injuries

1. compression

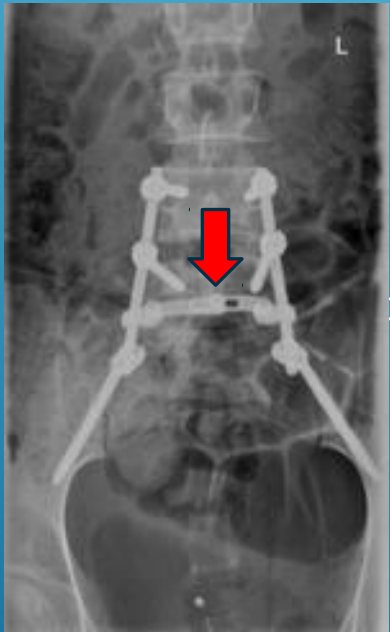
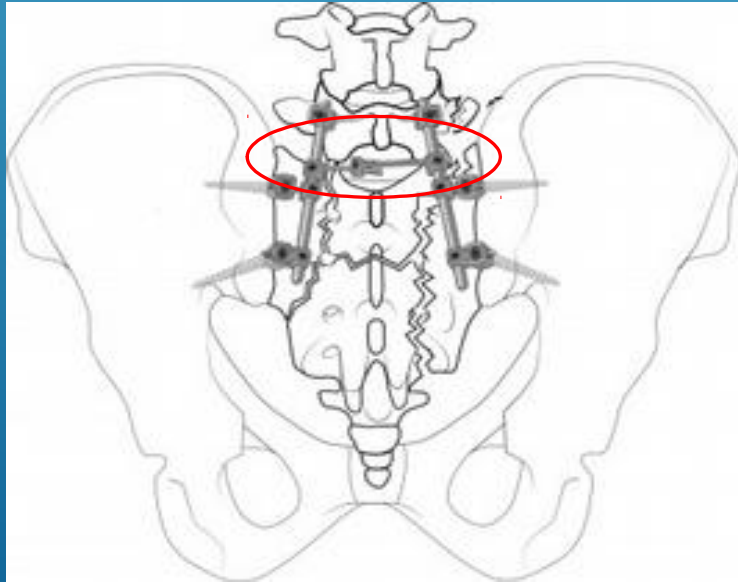
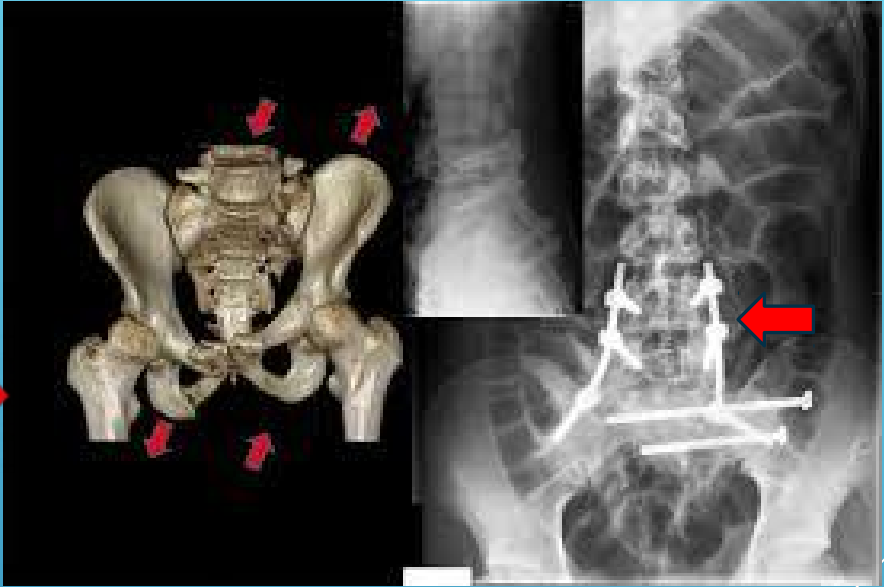
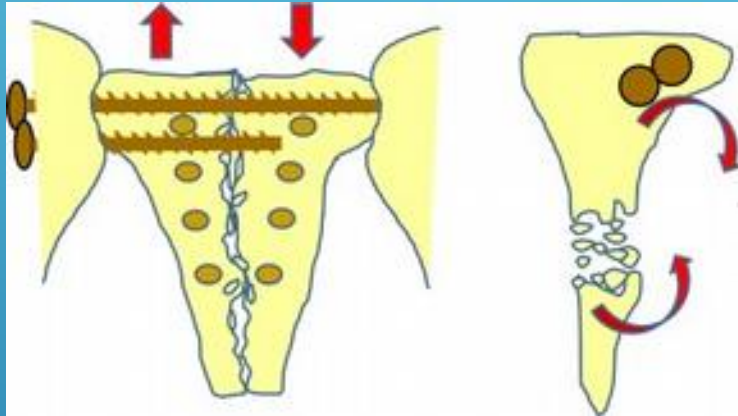
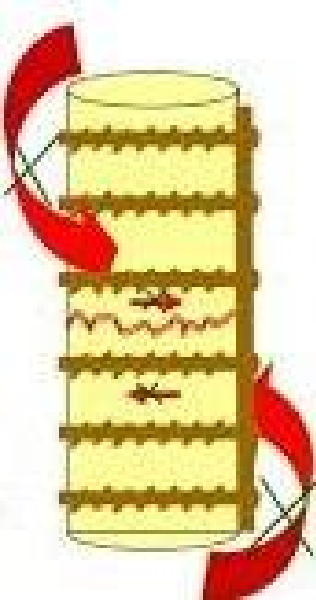
Compression plate



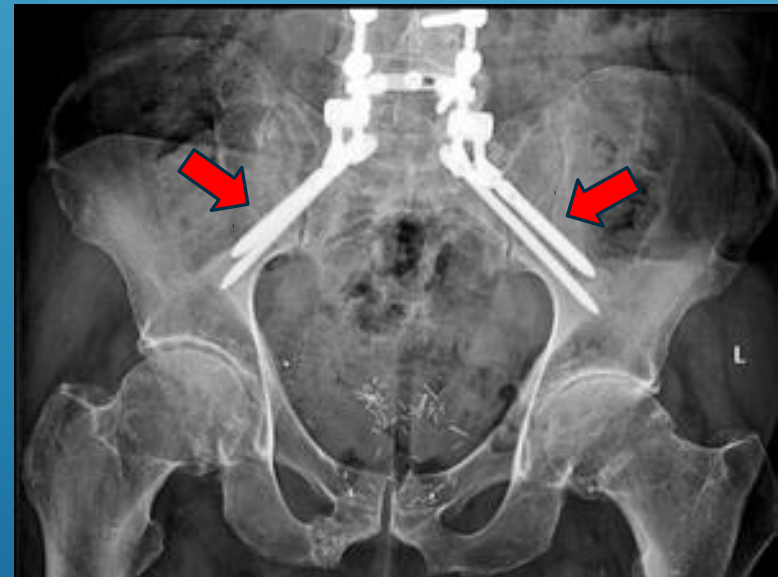
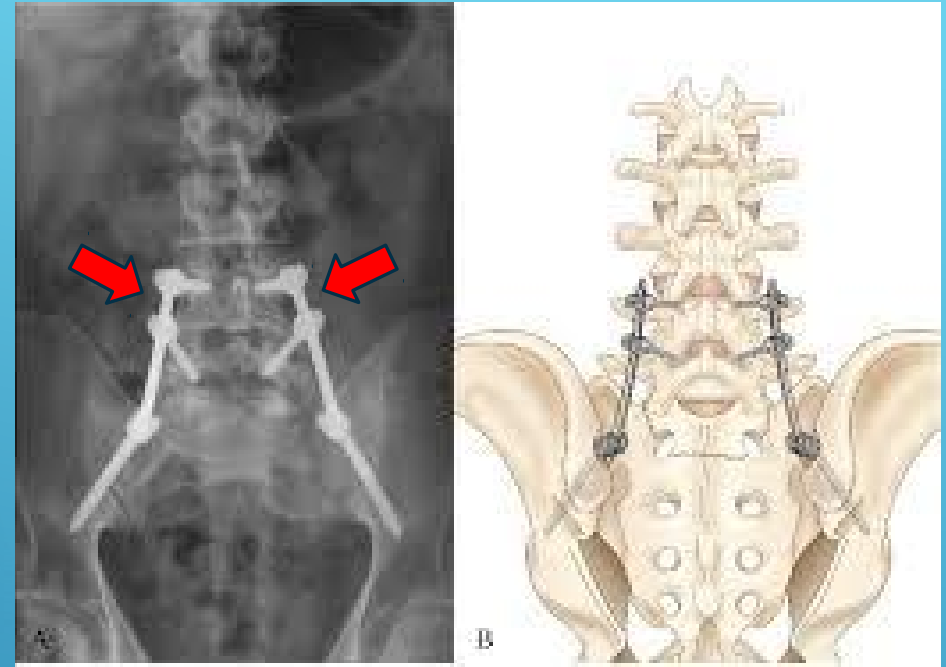
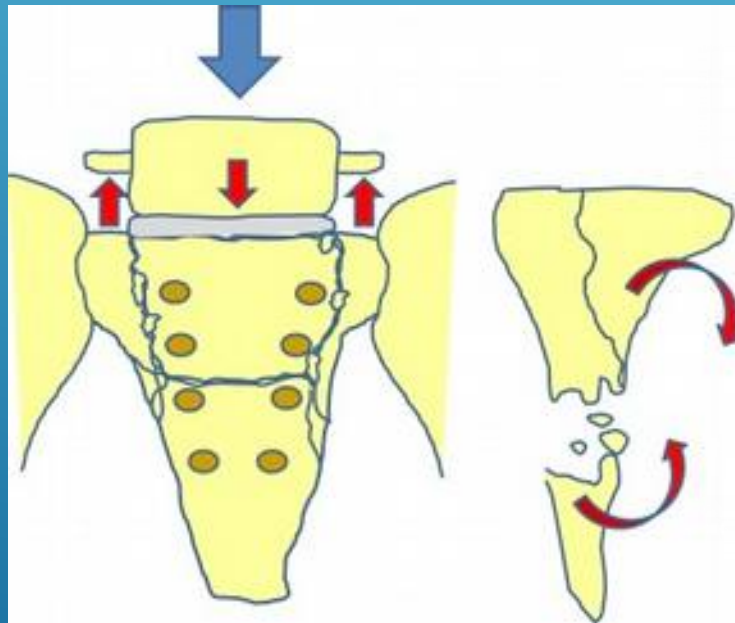
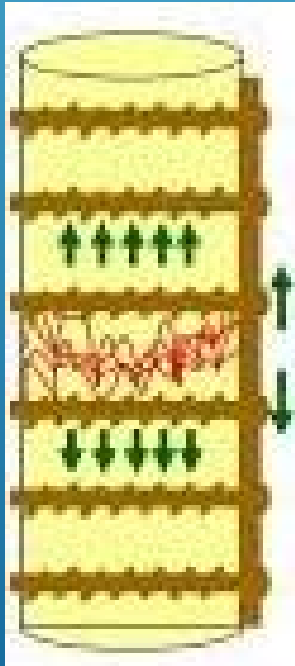
Lag screw + neutralization plate



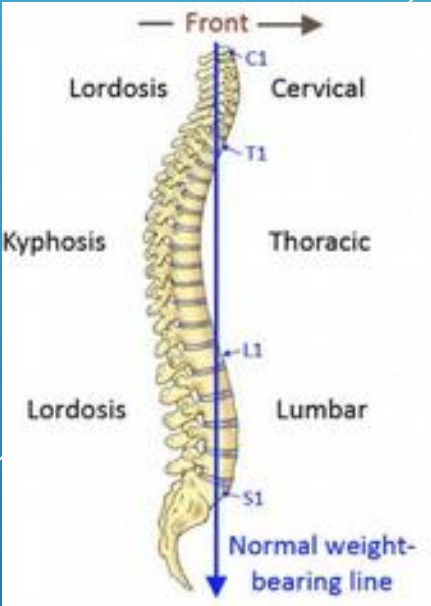
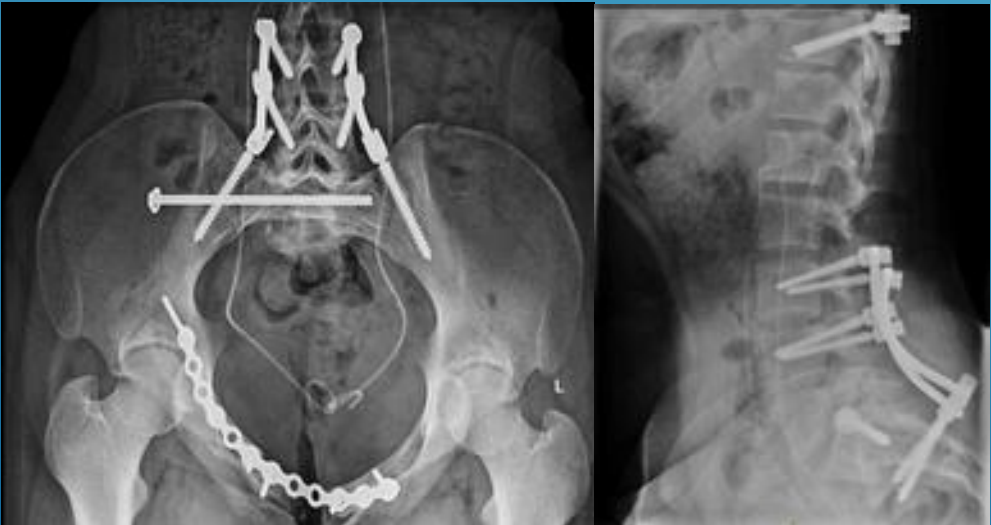
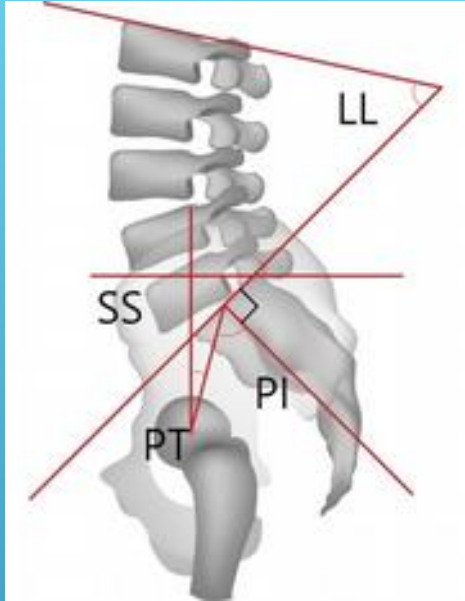
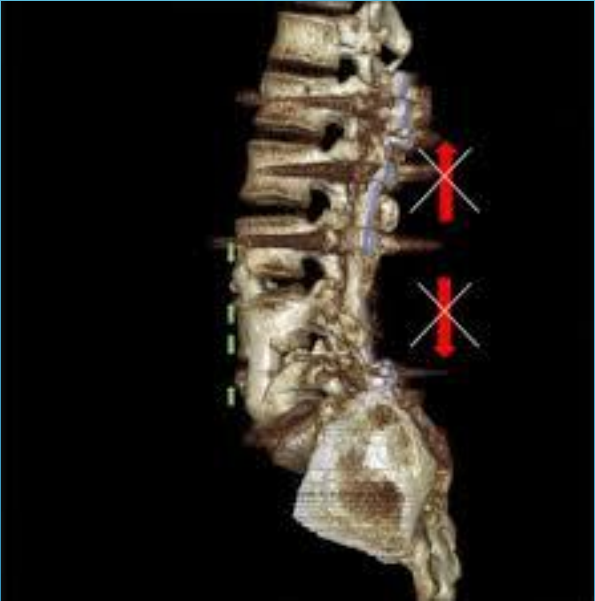
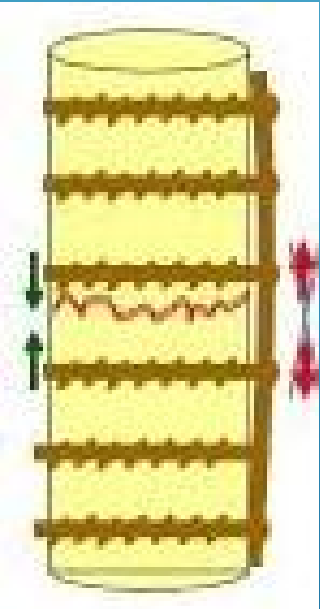
2. neutralization



3. bridging



4. tension band, springing



The key points of spinopelvic fixation

Timing

Positioning

Approach

Traction

Laminectomy

Construction

Bilateral fixation

Posterolateral fusion


Screw length

Weight bearing

Removal of osteosynthesis

- only in case of assembly failure ?

Conclusion

- **almost always a consequence of high energy trauma**
 - **these injuries are serious and complex**
 - **the treatment requires a good medical knowledge and technical support**
 - **care in specialist centrum**
- 
- A decorative graphic consisting of several parallel white lines of varying lengths and orientations, located in the bottom right corner of the slide.

Take home message !

Optimal assembly :

Bilateral + Bisegmental (L4, 5) + Biscrews (iliac)

2 + 2 + 2

Thanks for your attention



I have not competing interest