ПОЗВОНОЧНИК: ТРАВМА + ДЕГЕНЕРАТИВНЫЕ ИЗМЕНЕНИЯ

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SPINE: TRAUMA + DEGERATION

J. Kramer
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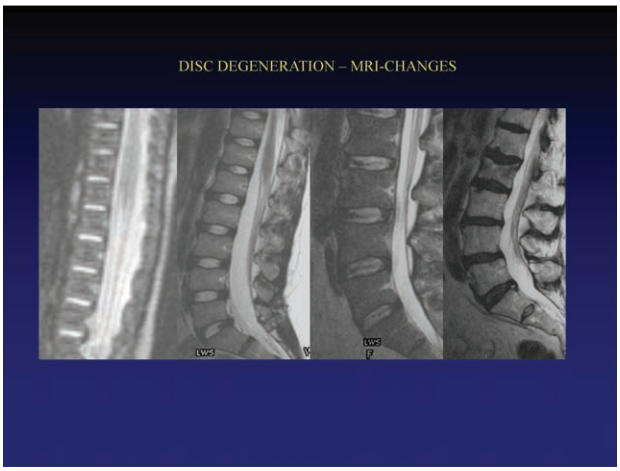
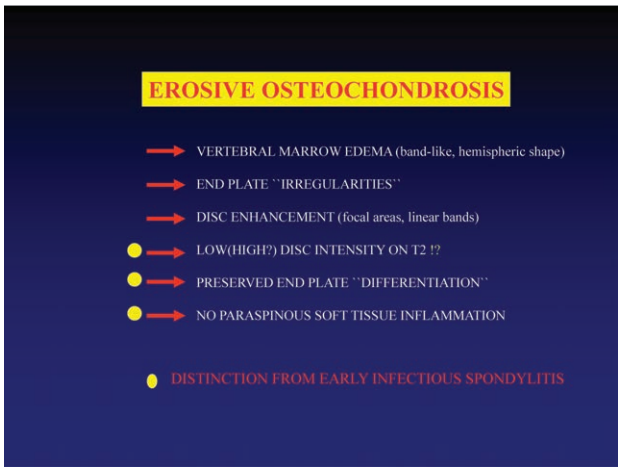
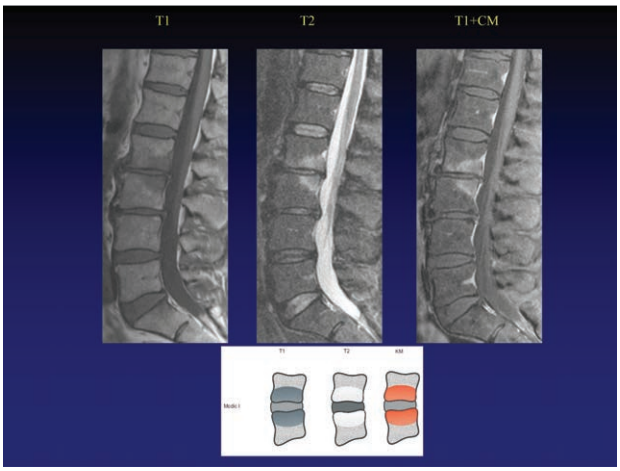
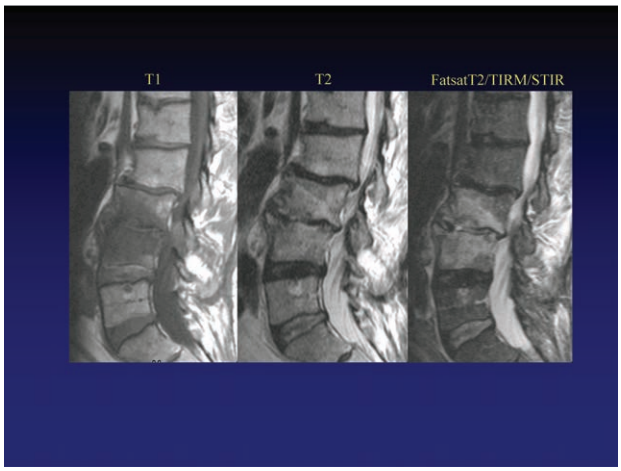
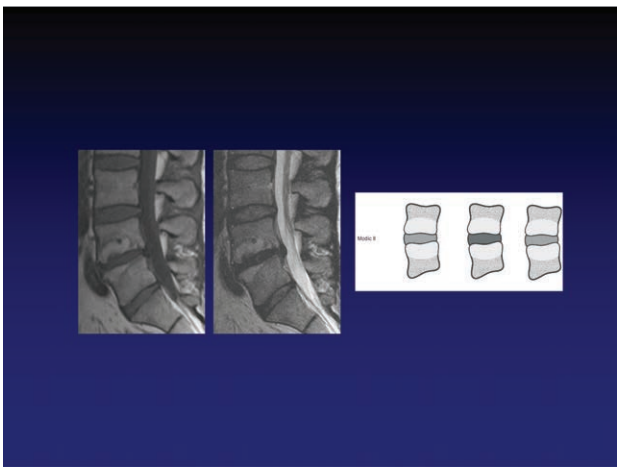
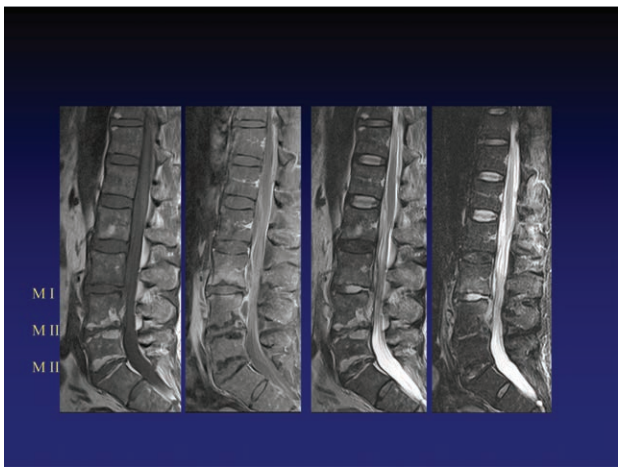


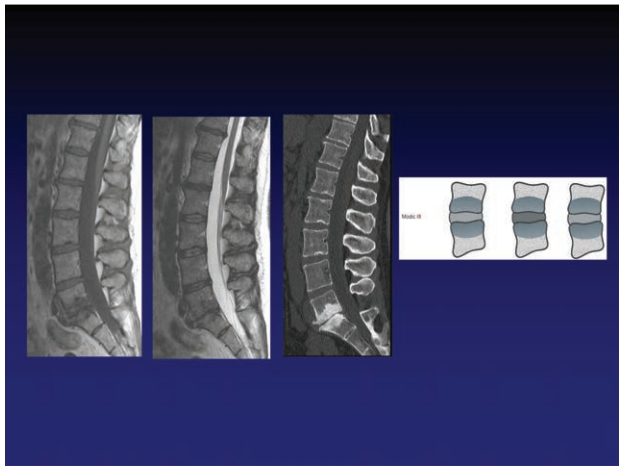


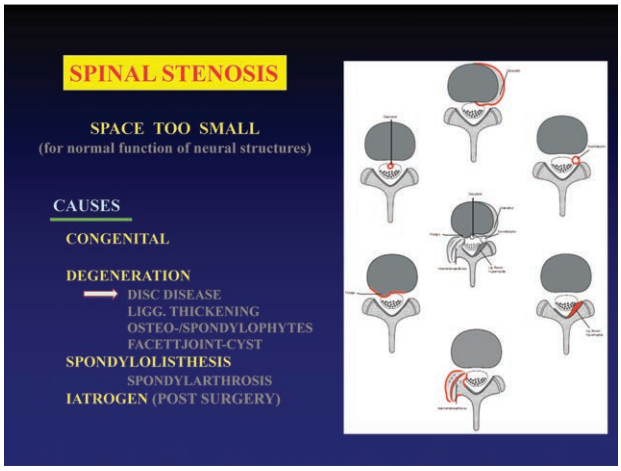


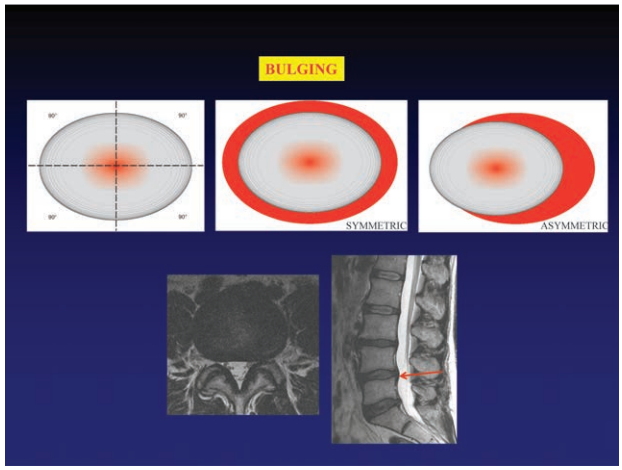


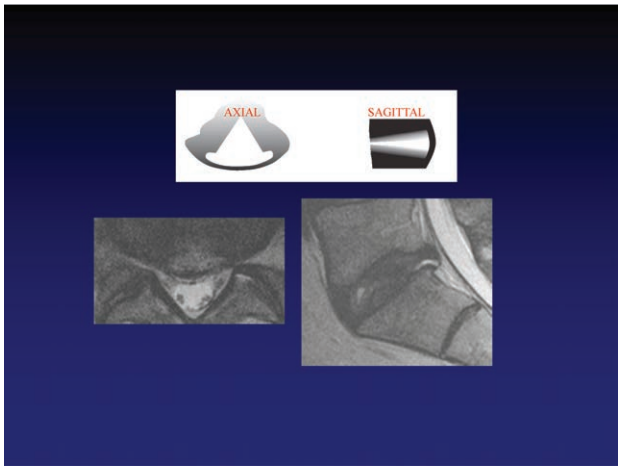


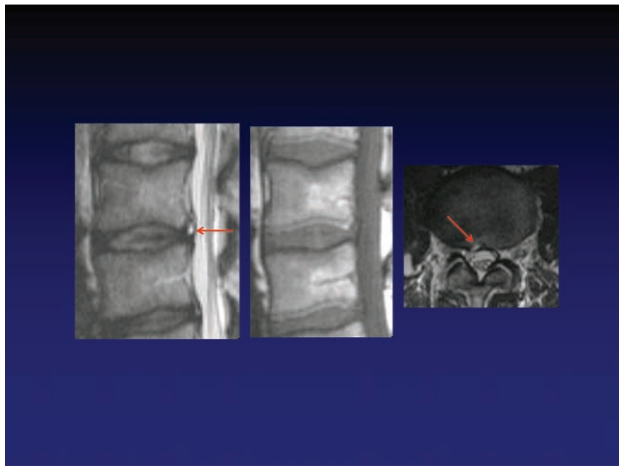


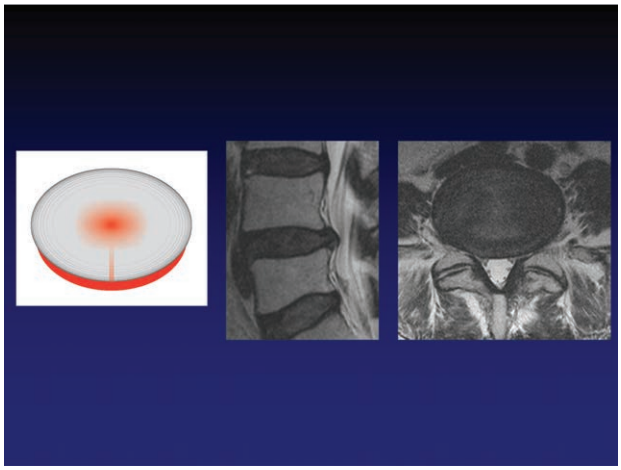


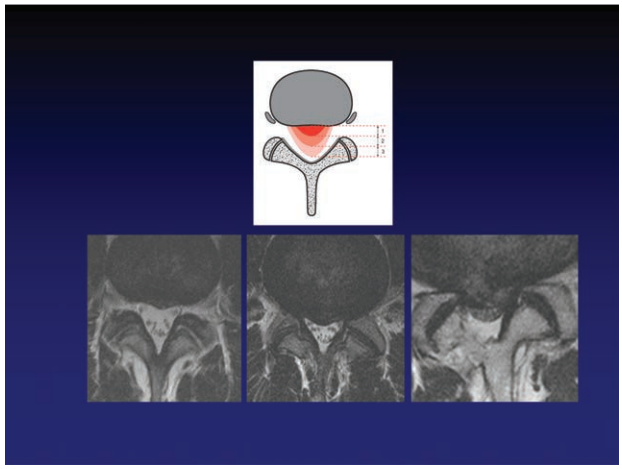

SPINAL STENOSIS
SPACE TOO SMALL
(for normal function of neural structures)
CAUSES
CONGENITAL
DEGENERATION
DISC DISEASE
LIGG. THICKENING
OSTEO-/SPONDYLOPHYTES
FACETTJOINT-CYST
SPONDYLOLISTHESIS
SPONDYLARTHROSIS
IATROGEN (POST SURGERY)

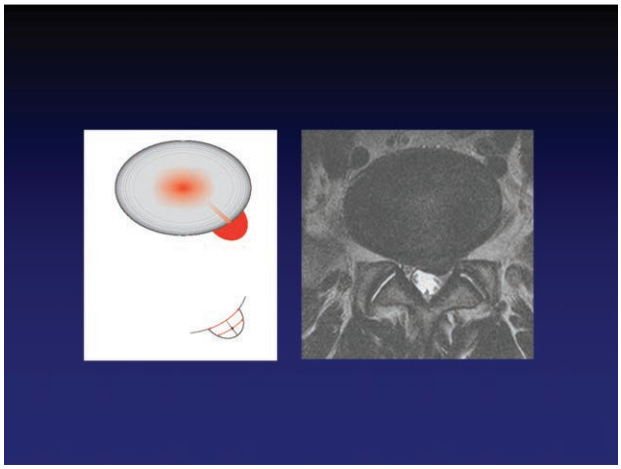

BULGING
SYMMETRIC
ASYMMETRIC

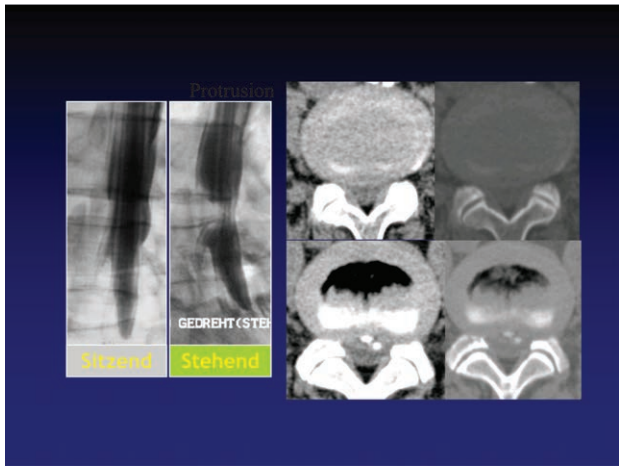

AXIAL
SAGITTAL

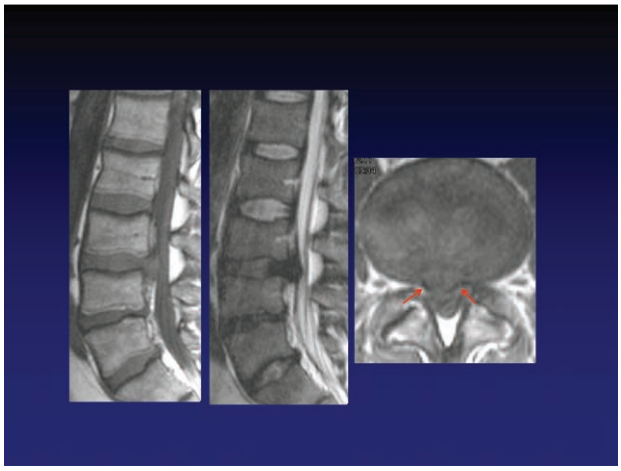


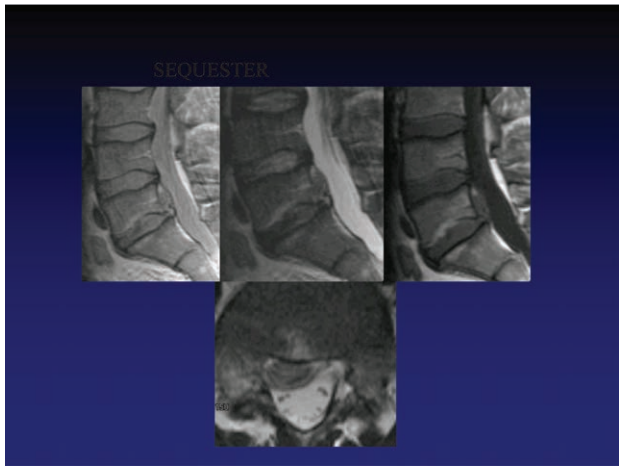


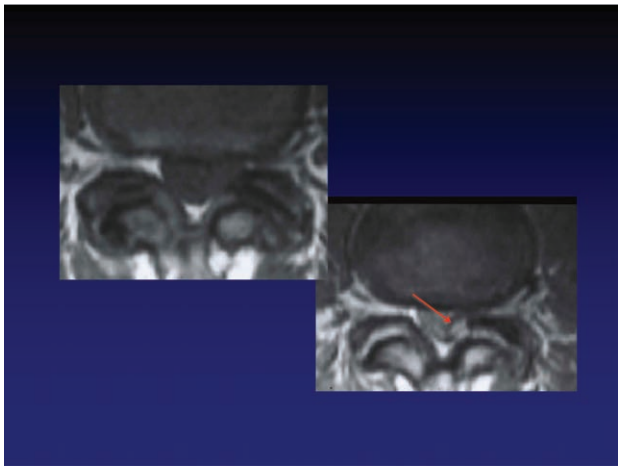


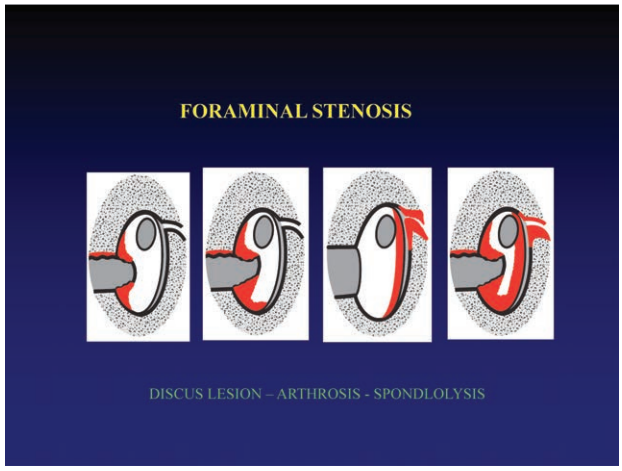


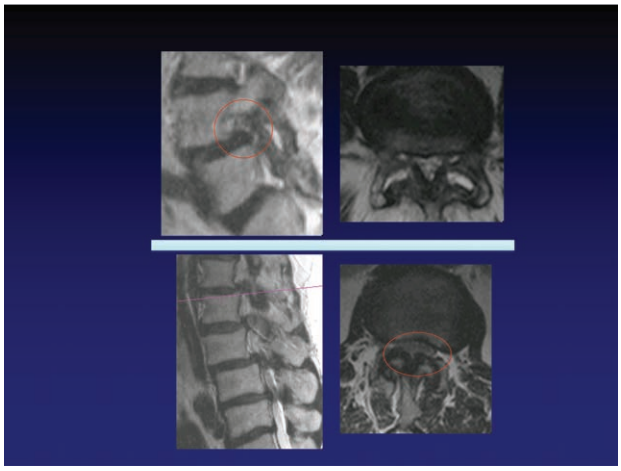

Protrusion
GEDREHT (STE
Sitzend
Stehend

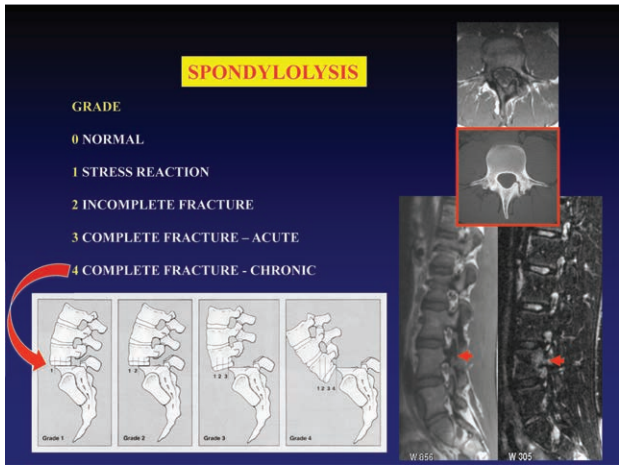


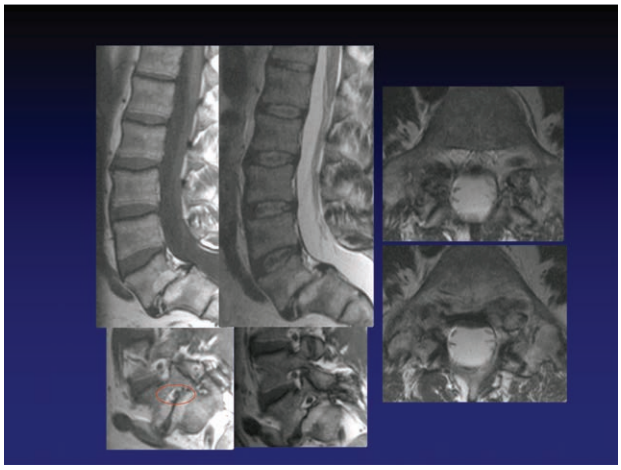

SEQUESTER




FORAMINAL STENOSIS
DISCUS LESION – ARTHROSIS - SPONDLOLYSIS




SPONDYLOLYSIS
GRADE
0 NORMAL
1 STRESS REACTION
2 INCOMPLETE FRACTURE
3 COMPLETE FRACTURE – ACUTE
4 COMPLETE FRACTURE - CHRONIC



TRAUMATIC LESIONS

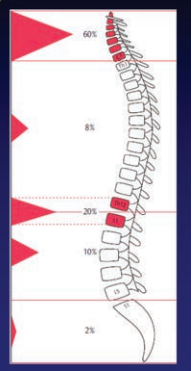
- MEN : WOMEN = 3 : 1

FREQUENT CAUSES
- MVA 47%
- SPORTS INJURIES 24 %

I) YOUNG PEOPLE (16 – 25 YRS)
HIGH ENERGY ACCIDENTS

II) MIDDLE AGED (+)
SPINAL CANAL STENOSIS (SPONDYLOSIS)

III) DIRECT TRAUMA
e.g. GUNSHOT WOUND



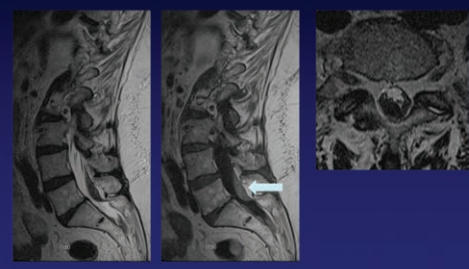
QUESTIONES TO RADIOLOGISTS -ANSWERED BY MRI ??

- NEUROLOGICAL FUNCTION
  - MYELON
  - NERVE ROOTS
- BIOMECHANICAL INTEGRITY
  - BONY STUCTURES
  - SOFT TISSUE ELEMENTS
    - DISCUS
    - LIGAMENTS
- BONE MARROW EDEMA

AIM OF TREATMENT
OPTIMAL NEUROLOGICAL FUNCTION TOGETHER WITH MINIMAL (LOWEST) BIOMECHANICAL INSTABILITY !!

CONTUSION

EPIDURAL HEMORRHAGE
(POSTTRAUMATIC COMPLICATION)

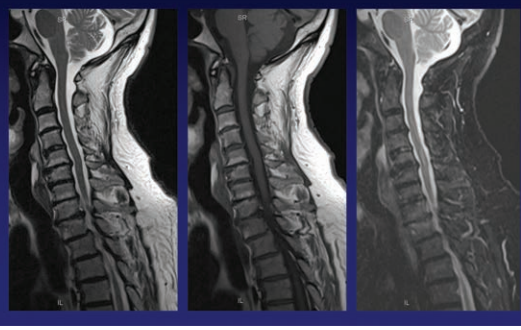


TRANSSECTION OF THE MYELON

(MRI-) PROGNOSTIC FACTORS

QUALITY	QUANTITY
INTRAMEDULLARY BLEEDING	COMPRESSION OF MYELON
EDEMA OF MYELON (SWELLING)	CONSTRICTION OF SPINAL CANAL
FOCAL VOLUME INCREASE	CRANIOCAUDAL EXTENTION OF INJURY
SOFT TISSUE INJURIES	
DISCUS HERNIATION	
SPINAL STENOSIS PRIOR TO INJURY	

POSTTRAUMATIC MYELOPATHY
(PREEXISTING STENOSIS OF SPINAL CANAL)

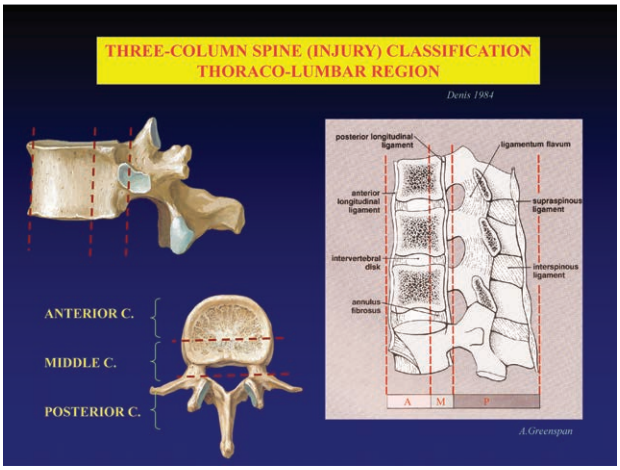


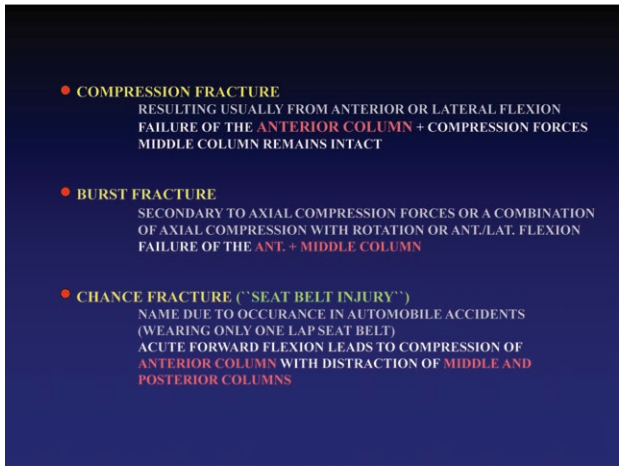
THREE-COLUMN SPINE (INJURY) CLASSIFICATION THORACO-LUMBAR REGION

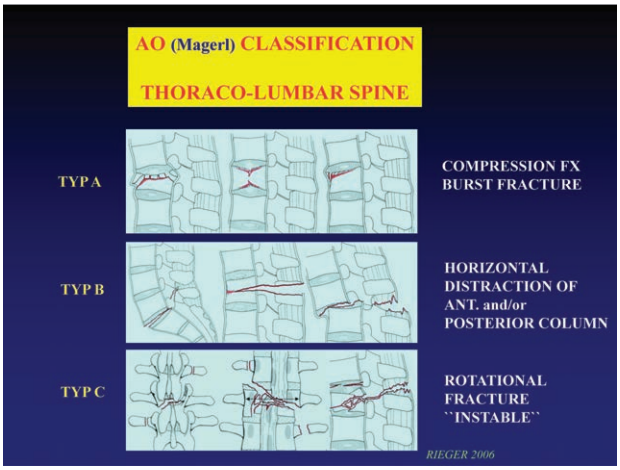
Denis 1984

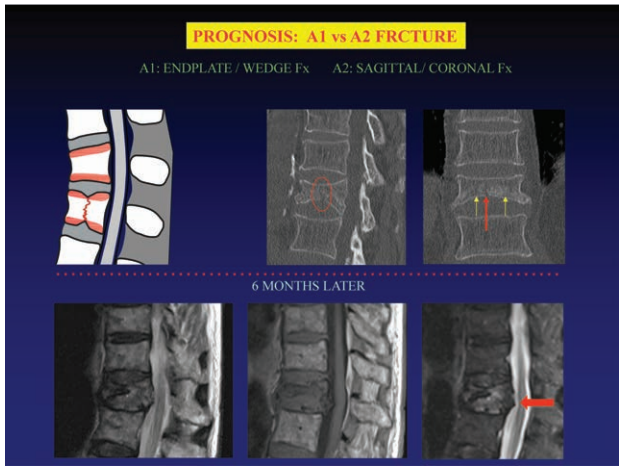
- ANTRIOR COLUMN
  - ANTERIOR TWO THIRDS OF THE ANNULUS FIBROSUS
  - ANTERIOR TWO THIRDS OF THE VERTEBRAL BODY
  - ANTERIOR LONGITUDINAL LIGAMENT
- MIDDLE COLUMN
  - POSTERIOR LONGITUDINAL LIGAMENT
  - POSTERIOR THIRD OF THE ANNULUS FIBROSUS
  - POSTERIOR THIRD OF THE VERTEBRAL BODY
- POSTERIOR COLUMN
  - POSTERIOR LIGAMENT COMPLEX
    - SUPRASPINOUS LIGAMENT
    - INFRASPINOUS LIGAMENT
    - CAPSULE OF THE INTERVERTEBRAL JOINTS
    - LIGAMENTUM FLAVUM
  - POSTERIOR PORTION OF THE NEURAL ARCH

1C – STABLE 2C – MAYBE STABLE 3C - UNSTABLE

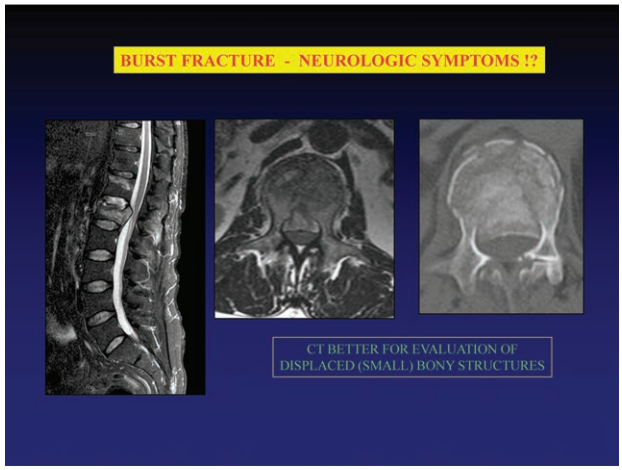

THREE-COLUMN SPINE (INJURY) CLASSIFICATION
THORACO-LUMBAR REGION
Denis 1984
ANTERIOR C.
MIDDLE C.
POSTERIOR C.
posterior longitudinal ligament
ligamentum flavum
anterior longitudinal ligament
supraspinous ligament
intervertebral disk
interspinous ligament
annulus fibrosus
A
M
P
A.Greenspan

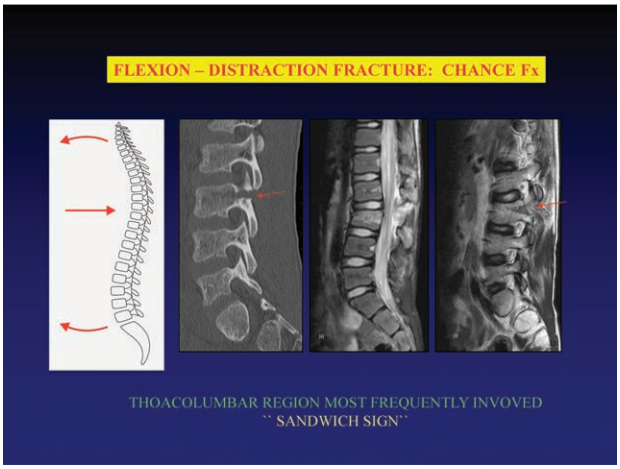

COMPRESSION FRACTURE
RESULTING USUALLY FROM ANTERIOR OR LATERAL FLEXION
FAILURE OF THE ANTERIOR COLUMN + COMPRESSION FORCES
MIDDLE COLUMN REMAINS INTACT
BURST FRACTURE
SECONDARY TO AXIAL COMPRESSION FORCES OR A COMBINATION
OF AXIAL COMPRESSION WITH ROTATION OR ANT./LAT. FLEXION
FAILURE OF THE ANT. + MIDDLE COLUMN
CHANCE FRACTURE (``SEAT BELT INJURY``)
NAME DUE TO OCCURANCE IN AUTOMOBILE ACCIDENTS
(WEARING ONLY ONE LAP SEAT BELT)
ACUTE FORWARD FLEXION LEADS TO COMPRESSION OF
ANTERIOR COLUMN WITH DISTRACTION OF MIDDLE AND
POSTERIOR COLUMNS

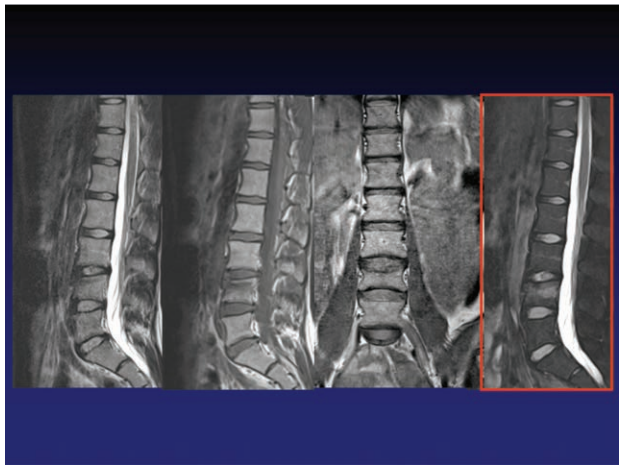

AO (Magerl) CLASSIFICATION
THORACO-LUMBAR SPINE
TYP A
COMPRESSION FX
BURST FRACTURE
TYP B
HORIZONTAL
DISTRACTION OF
ANT. and/or
POSTERIOR COLUMN
TYP C
ROTATIONAL
FRACTURE
``INSTABLE``
RIEGER 2006


PROGNOSIS: A1 vs A2 FRCTURE
A1: ENDPLATE / WEDGE Fx
A2: SAGITTAL/ CORONAL Fx
6 MONTHS LATER

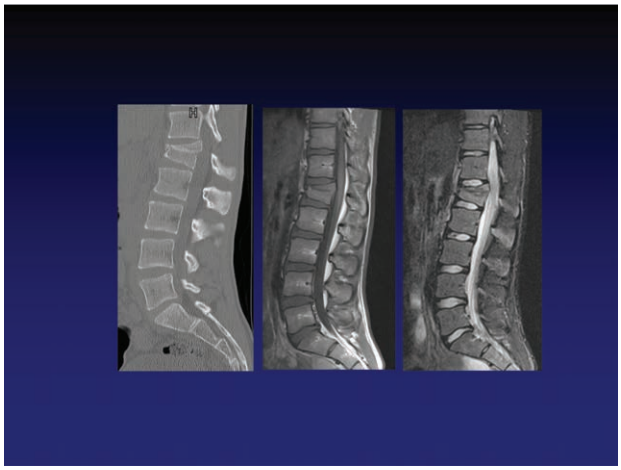

BURST FRACTURE - SPINAL CANAL STENOSIS

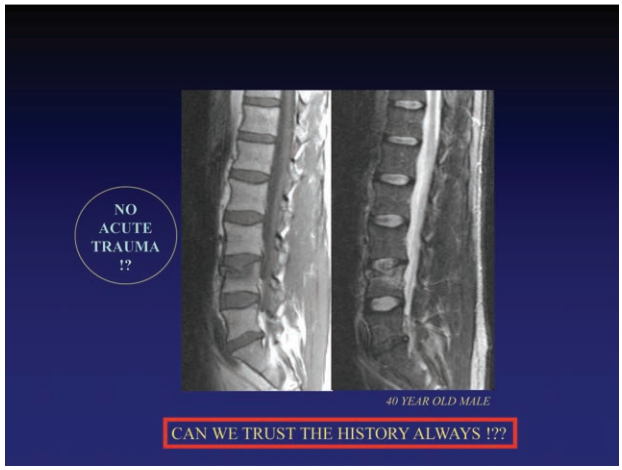

BURST FRACTURE - NEUROLOGIC SYMPTOMS !?
CT BETTER FOR EVALUATION OF
DISPLACED (SMALL) BONY STRUCTURES


FLEXION – DISTRACTION FRACTURE: CHANCE Fx
THOACOLUMBAR REGION MOST FREQUENTLY INVOVED
`` SANDWICH SIGN``

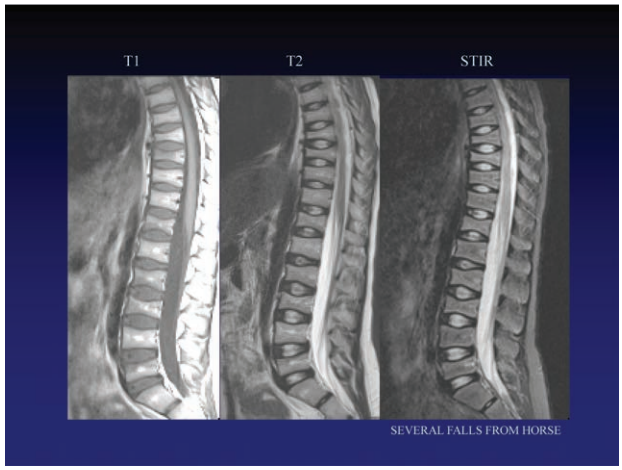


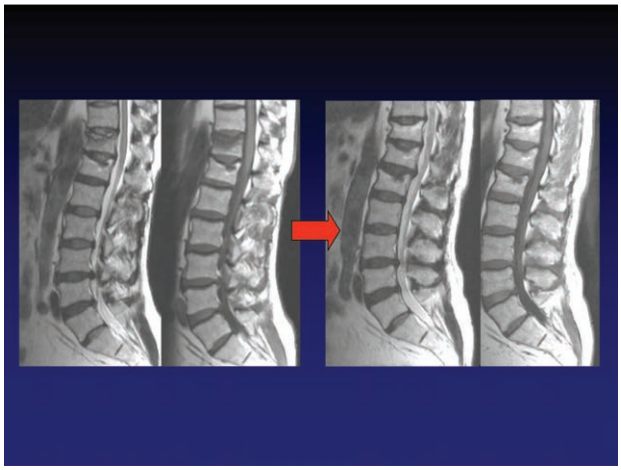

1 YEAR LATER



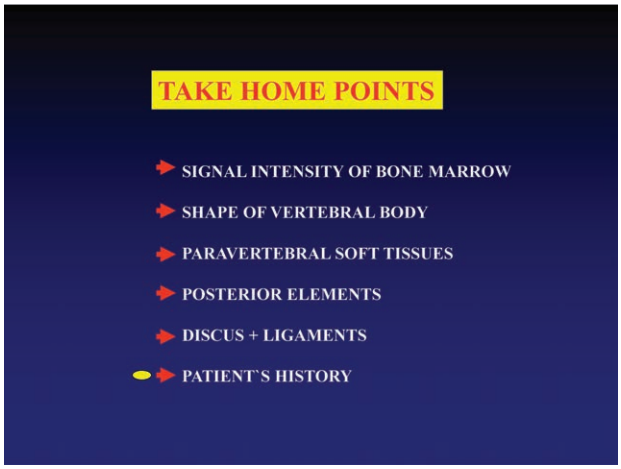

NO
ACUTE
TRAUMA
!?
40 YEAR OLD MALE
CAN WE TRUST THE HISTORY ALWAYS !??


FLEXION INJURY - HIGH VELOCITY TRAUMA


T1
T2
STIR
SEVERAL FALLS FROM HORSE




IMPORTANT !!
EXACT DESCRIPTION
BONY/NERVAL STRUCTURES
SPINAL CANAL
FORAMINAL NARROWING
LIGAMENTS – SOFT TISSUES
INTEGRITY / STABILITY
CLASSIFCATION !??


TAKE HOME POINTS
SIGNAL INTENSITY OF BONE MARROW
SHAPE OF VERTEBRAL BODY
PARAVERTEBRAL SOFT TISSUES
POSTERIOR ELEMENTS
DISCUS + LIGAMENTS
PATIENT`S HISTORY