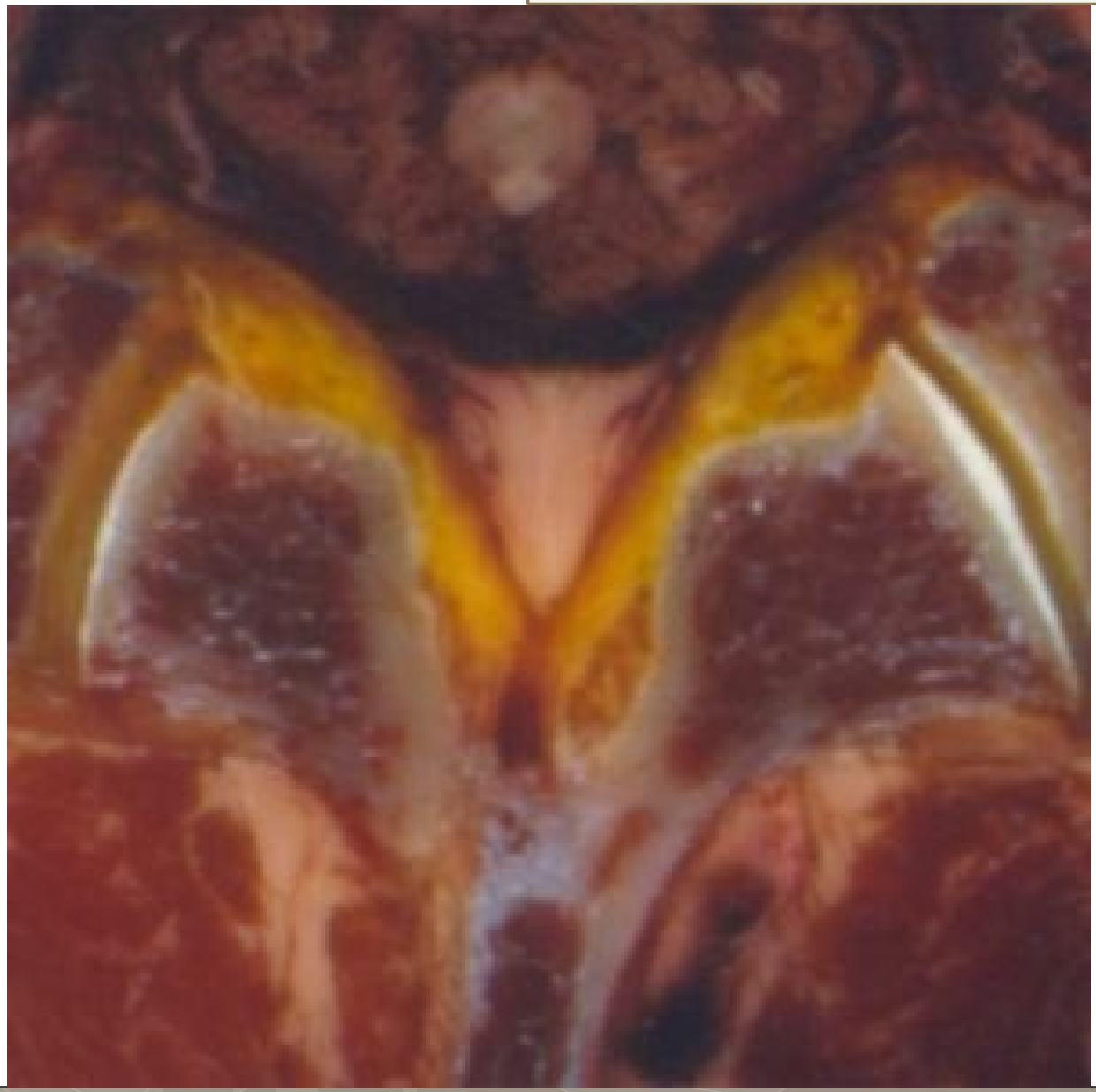
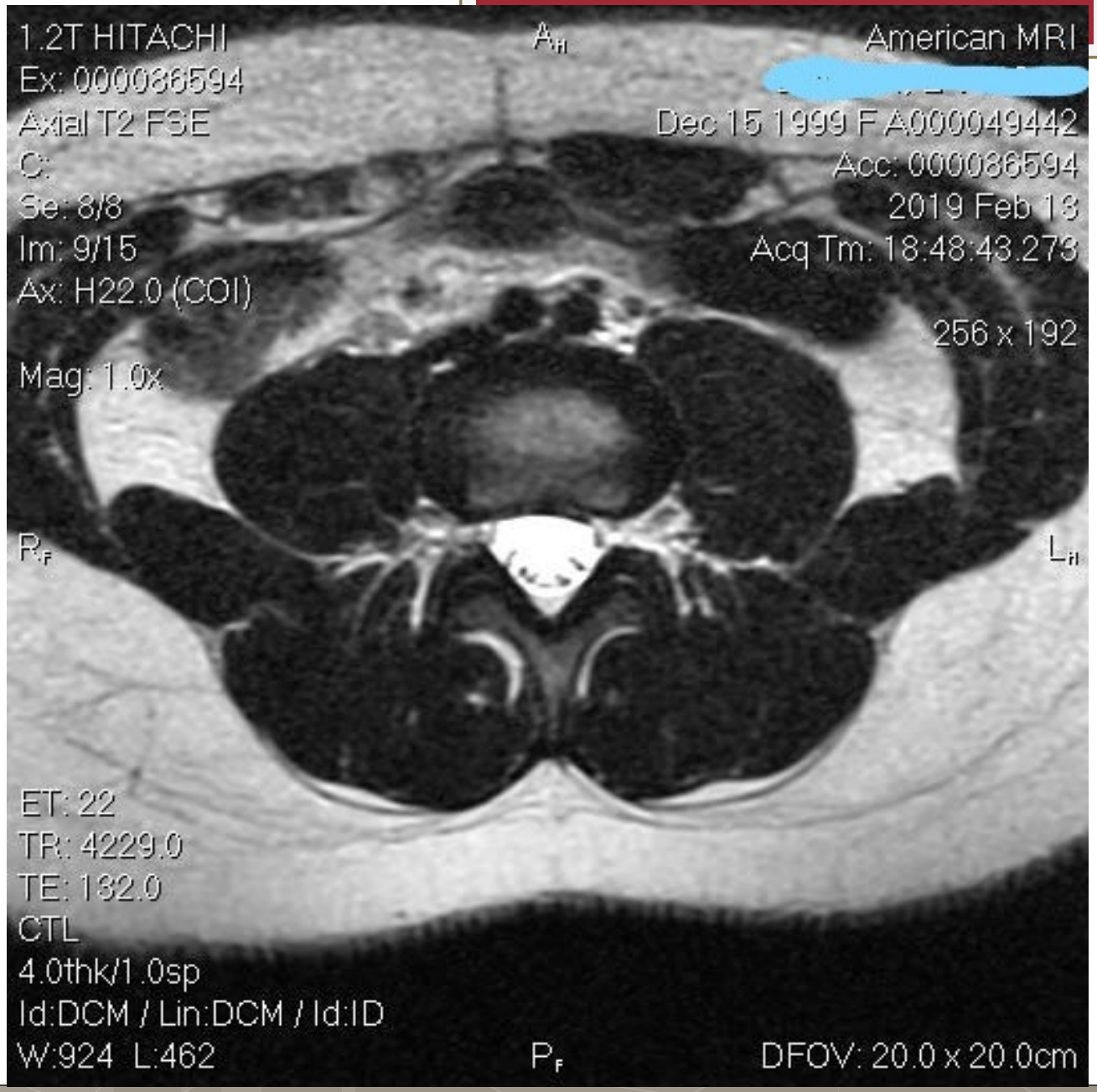
NUHS HOMECOMING 2022

MRI FACET ARTICULATIONS AND SPONDYLOLISTHESIS

FACET ARTICULATIONS

- CRUCIAL ANATOMIC REGION OF THE SPINE
- DIARTHRODIAL JOINT
- OPPOSING ARTICULAR CARTILAGE PROVIDING A LOW FRICTION ENVIRONMENT
- LIGAMENTOUS CAPSULE THAT ENCLOSES THE JOINT SPACE.



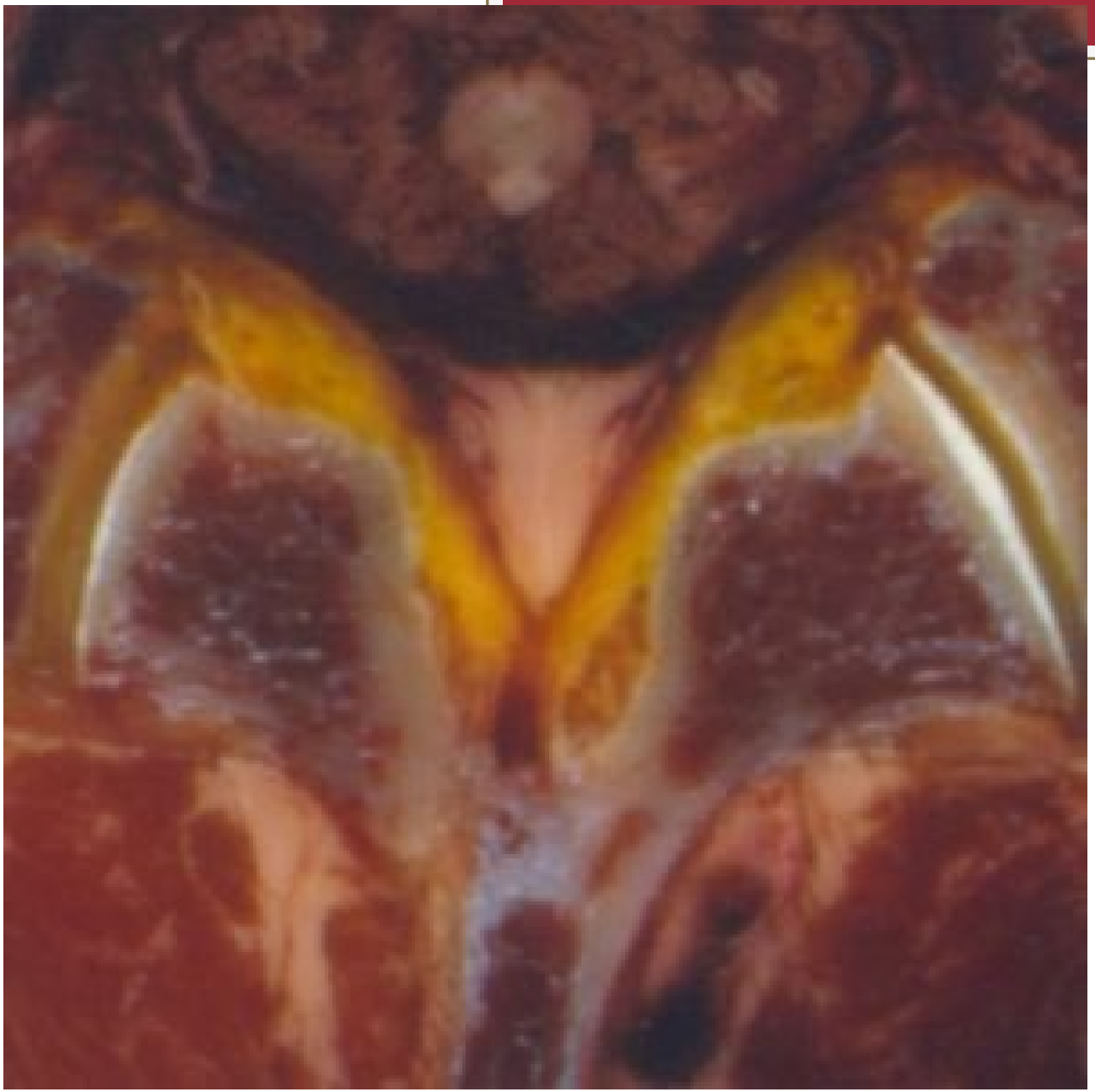

1.2T HITACHI
Ex: 000086594
Axial T2 FSE
C:
Se: 8/8
Im: 9/15
Ax: H22.0 (COI)
Mag: 1.0x
ET: 22
TR: 4229.0
TE: 132.0
CTL
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:924 L:462
A
American MRI
Dec 15 1999 F A000049442
Acc: 000086594
2019 Feb 13
Acq Tm: 18:48:43.273
256 x 192
P
L
P
DFOV: 20.0 x 20.0cm

FACET ARTICULATIONS

- ITS MECHANICAL BEHAVIOR ENSURES NORMAL HEALTH AND FUNCTION
- ABNORMALITY CAN LEAD TO DYSFUNCTION WHEN TISSUES ARE ALTERED BY TRAUMA, DEGENERATION, OR SURGICAL MODIFICATION

FACET ARTICULATIONS

- THESE ARTICULATIONS INSURE THE MECHANICAL STABILITY AND OVERALL MOBILITY
- BONY ARTICULAR PILLARS
- CARTILAGE
- SYNOVIUM
- LIGAMENTOUS CAPSULE



FACET ARTICULATIONS

- THE BONY PILLARS SUPPORT COMPRESSIVE LOADS
- CAPSULE LIGAMENTS RESISTS TENSILE FORCES

FACET ARTICULATIONS

- DISC—ANTERIOR COLUMN
- FACETS—TWO POSTEROLATERAL COLUMNS

- AXIAL LOADING– 70/30

FACET ARTICULATIONS

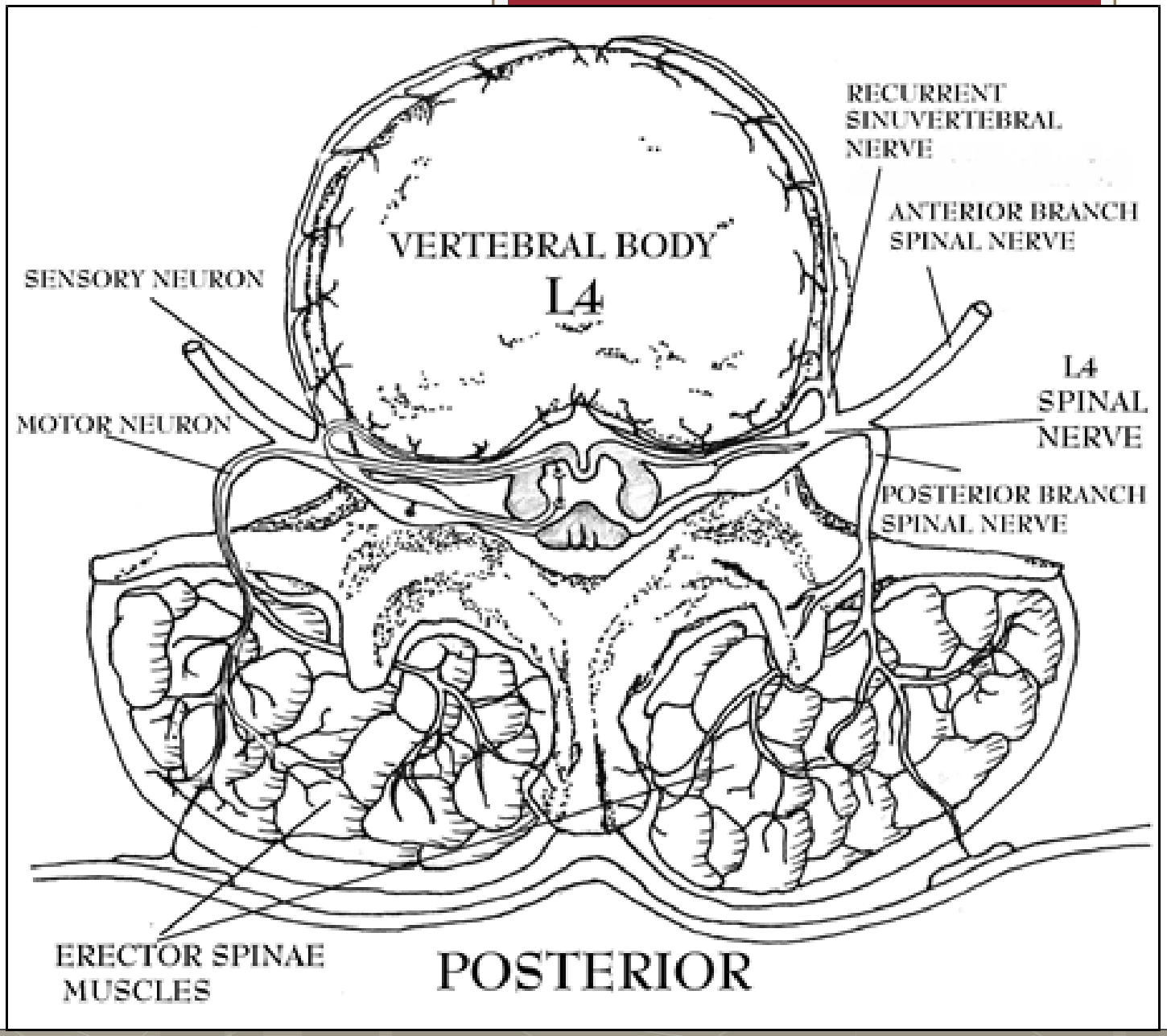
- IN THE LUMBAR SPINE FACETS BECOME VERTICALLY ORIENTED
- LIMITS FLEXABILITY IN LATERAL BENDING AND ROTATION
- PROTECTS THE DISC AND SPINAL NERVES FROM NONPHYSIOLOGICAL KINEMATIC MOTION TO CAUSE INJURY


ACHI
091456
FSE
Nov 29 1957 F A0
Acc: 0
20
Acq Tm: 13
9.5 (COI)
x
.0
ody
sp
Lin:DCM / Id:ID
L:594
DFOV: 30.0

- THE FACET CAPSULAR LIGAMENT COVERS THE FACET JOINT
- EACH CAPSULAR LIGAMENT HAS NONUNIFORM THICKNESS


1.2T HITACHI
A
American MRI
2019 Apr 20
256 x 192
Mag: 1.0x
R
L
ET: 20
TR: 2100.0
TE: 120.0
TR Body
5.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:1014 L:585
P
DFOV: 27.0 x 25.6cm

- THE CAPSULE, SUBCHONDRAL BONE, SYNOVIUM ARE RICHLY INNERVATED
- MECHANORECEPTIVE, PROPRIOCEPTIVE, AND NOCIRECEPTIVE NERVE ENDINGS
- MECHANICAL LOADING NERVE ENDINGS TO INITIATE THE DEVELOPMENT AND MAINTENANCE OF PAIN
- PROVIDE FEEDBACK TO CNS


RECURRENT
SINUVERTEBRAL
NERVE
ANTERIOR BRANCH
SPINAL NERVE
VERTEBRAL BODY
L4
SENSORY NEURON
MOTOR NEURON
L4
SPINAL
NERVE
POSTERIOR BRANCH
SPINAL NERVE
ERECTOR SPINAE
MUSCLES
POSTERIOR

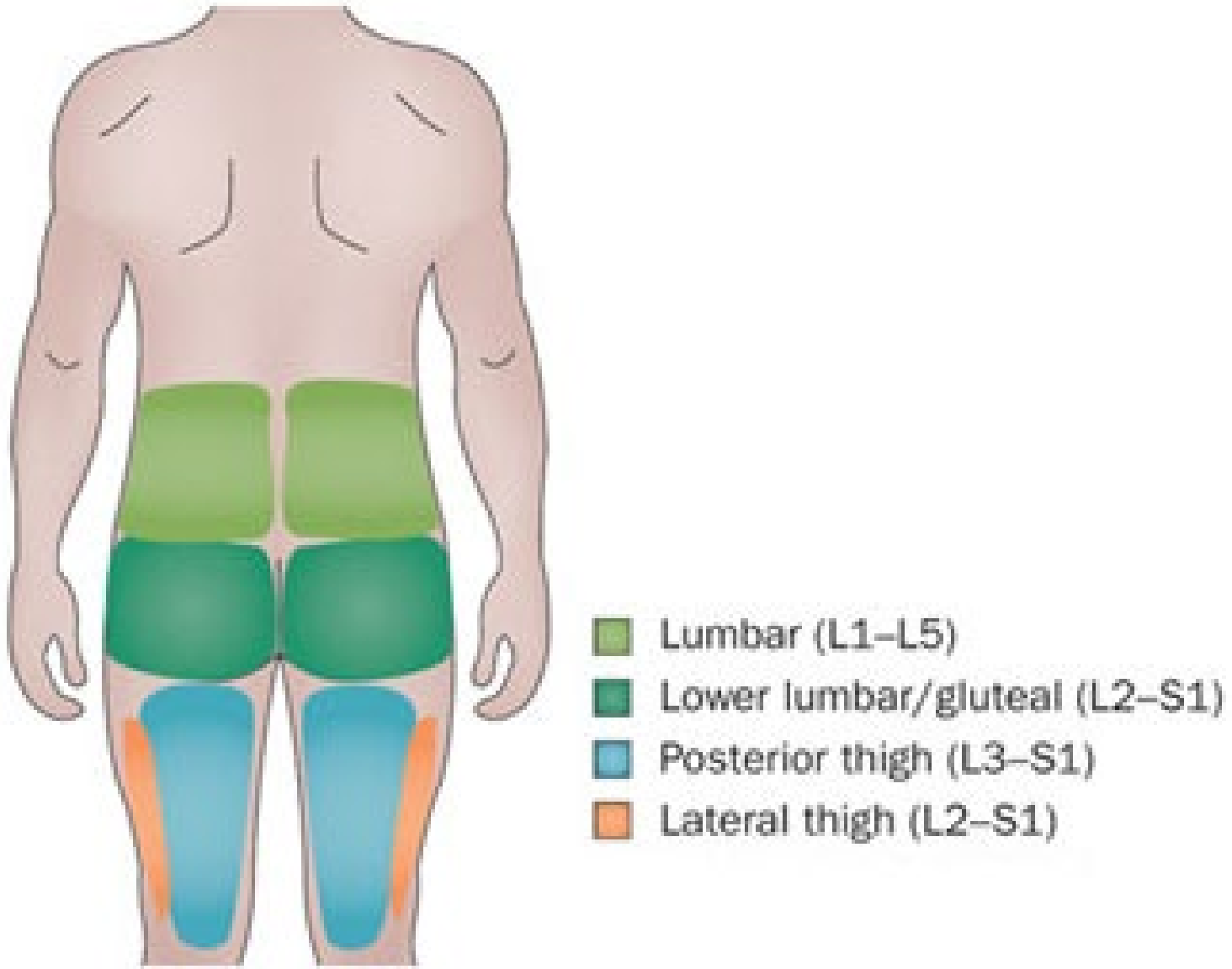
- RADIOLOGISTS ARE COMMONLY ASKED TO DETERMINE THE DEGREE OF FACET JOINT ARTHROSIS
- UNFORTUNATELY THERE IS NO REPORTS THAT CORRELATE
- ONGOING DEBATE WITH FACET DEGENERATIVE CHANGE AND LOW BACK PAIN

- FACET ARTHROSIS IS FUNCTIONALLY RELATED TO DEGENERATIVE DISC DISEASE WHICH AFFECTS THE ANTERIOR COLUMN

- FACET ARTHROSIS IS A CONTINUUM BETWEEN
  - LOSS JOINT SPACING
  - LOSS OF SYNOVIAL FLUID
  - LOSS OF CARTILAGE
  - BONY OVERGROWTH
  - CARTILAGE LOSS PROGRESSES RAPIDLY

- FACET ARTHROSIS EFFECTS VIRTUALLY EVERYONE AFTER THE AGE OF 60
- SUGGESTED THAT A MAJOR ROLE IN BACK PAIN IN THE ELDERLY
- NO GENDER PREFERENCE
- MOST LIKELY RELATED TO ABNORMAL MECHANICAL LOADING

- FACET ARTICULATIONS ARE CLINICALLY IMPORTANT IN SPINAL PAIN GENERATIORS
- INCREASE IN EXTENSION AND DECREASE IN FLEXION
- NO IRRADIATION BELOW THE KNEE
- POOR CORRELATION BETWEEN EXTENT OF DEGENERATIVE CHANGE AND PAIN


Lumbar (L1–L5)
Lower lumbar/gluteal (L2–S1)
Posterior thigh (L3–S1)
Lateral thigh (L2–S1)

- MECHANICAL STRESS IN FACETS THAT ARE MORE HORIZONTAL IN SAGITTAL PLANE TYPICALLY L4-L5


ACHI
091456
FSE
Nov 29 1957 F A0
Acq Tm:
.5 (COI)
Lin:DCM / Id:ID
L:594
DFOV: 30.0

TACHI
091456
FSE
9.5 (COI)
Ame
Nov 29 1957 F A0
Acc: 0
20
Acq Tm: 13
Lin:DCM / Id:ID
L:594
DFOV: 30.0

- IMAGING STUDIES HAVE SHOWN MORE EMPHASIS IN INFLAMATION OF THE JOINTS AND SURROUNDING SOFT TISSUES
- INFLAMMATION CAN CAUSE THE NON-RADIATING PAIN
- BONE PROLIFERATION IS THE RESPONSE INFLAMMATION AND AN ATTEMPT TO DIMINISH THE INFLAMMATORY RESPONSE


e

GRADE CRITERIA FOR FACET DEGENERATION

- 0 NORMAL FACET SPACE +/- 4MM
- 1 NARROWING OF THE JOINT SPACE AND/OR SMALL PROLIFERATION AND/OR HYPERTROPHY
- 2 NARROW JOINT SPACE AND/OR PROLIFERATION AND/OR HYPERTROPHY AND/OR BONE EROSIONS
- 3 NARROW JOINT SPACE AND/OR PROLIFERATION AND/OR HYPERTROPHY AND/OR SEVERE BONE EROSIONS

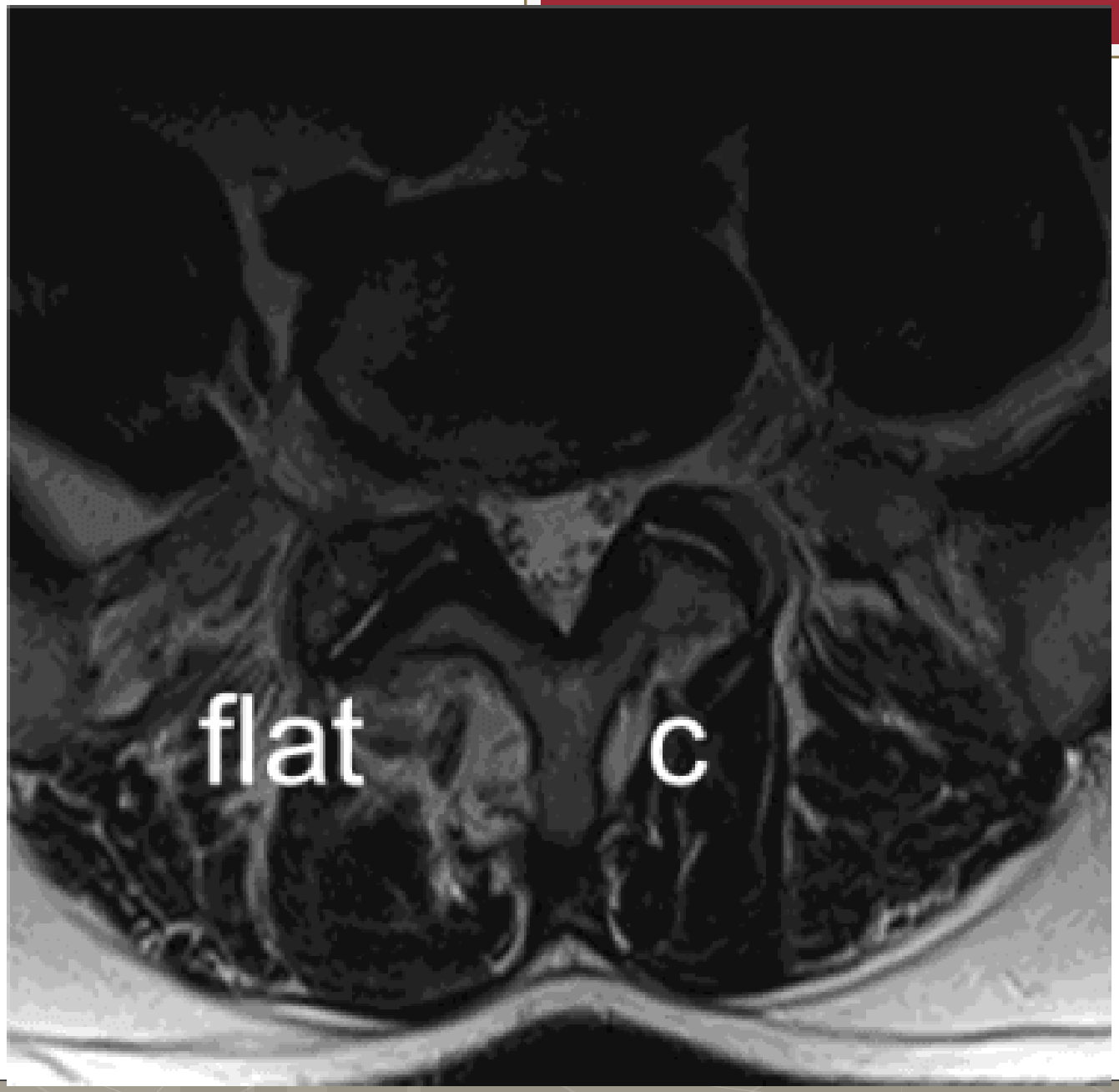
- WITH PROLIFERATIVE CHANGE ON THE FACET CAN CAUSE NEUROFORAMINAL COMPROMISE AND LEAD TO RADIATING PAIN

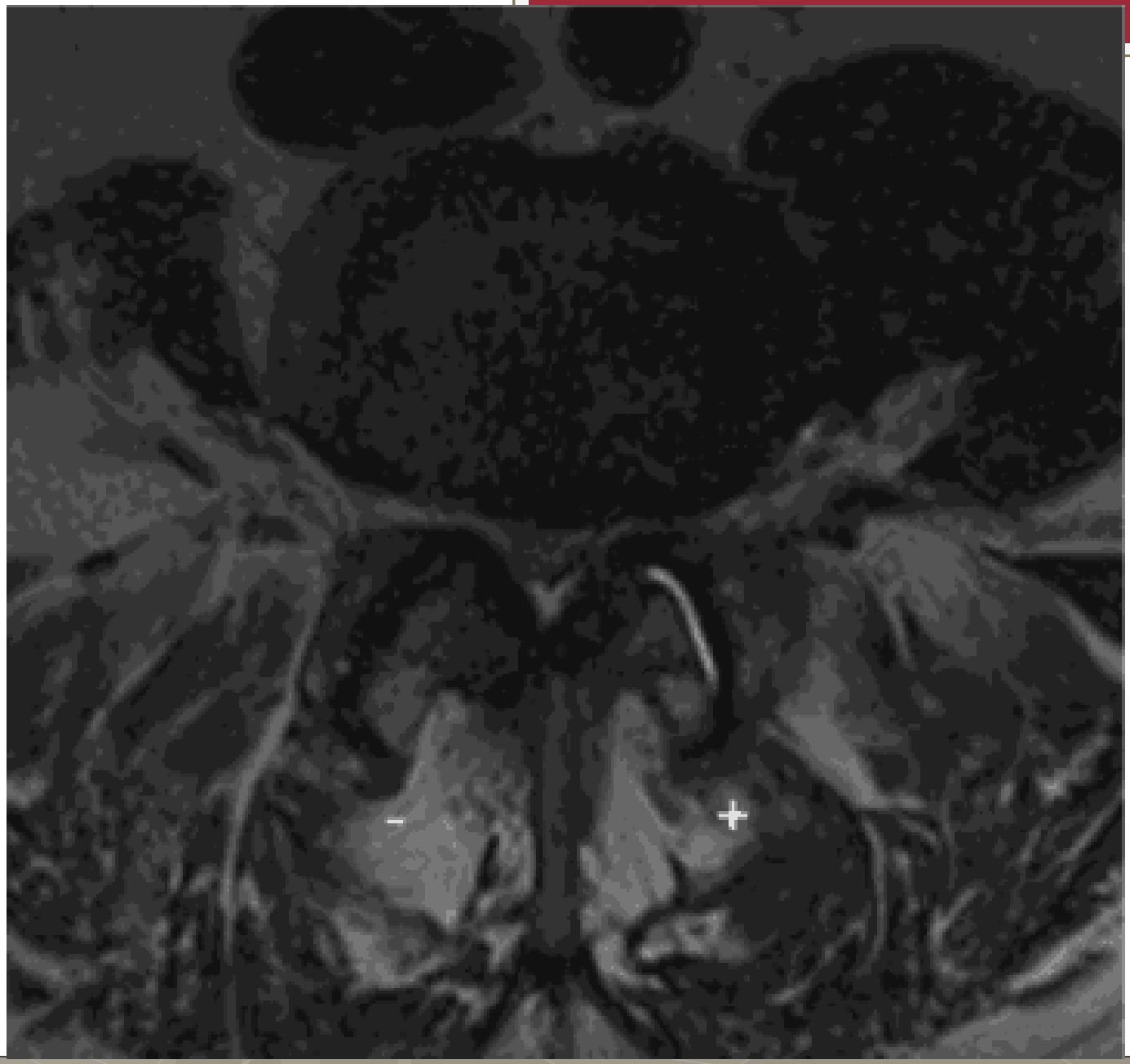
- SPONDYLOLISTHESIS (DEGENERATIVE TYPE)
- CAUSED BY FACET ARTHROSIS AND FAILURE OF THE MOTION SEGMENT
- LOSS OF CARTILAGE AND ARTICULAR REMODELING
- THE MORE SAGITTAL ORIENTATION OF FACETS THE LESS ABILITY OF RESTRAINT

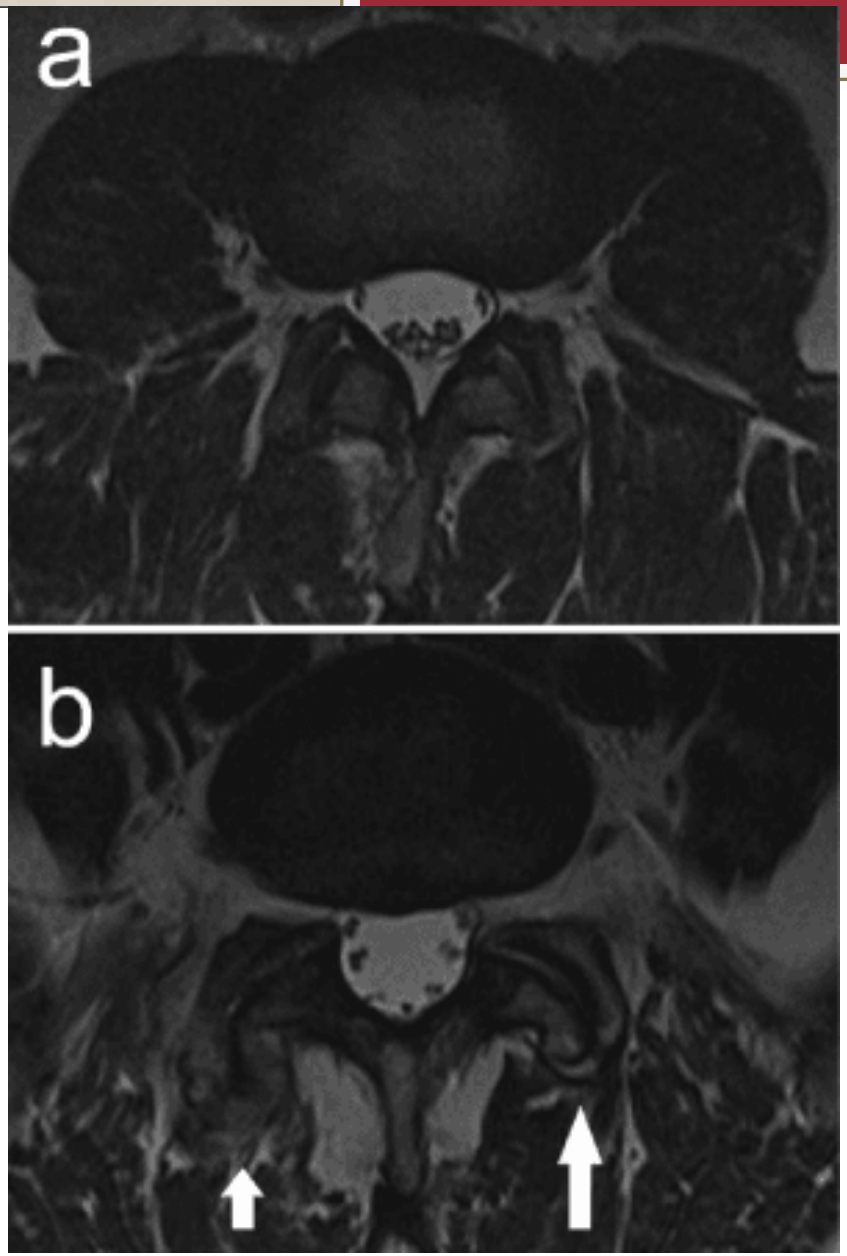
MEYERDING CLASSIFICATION

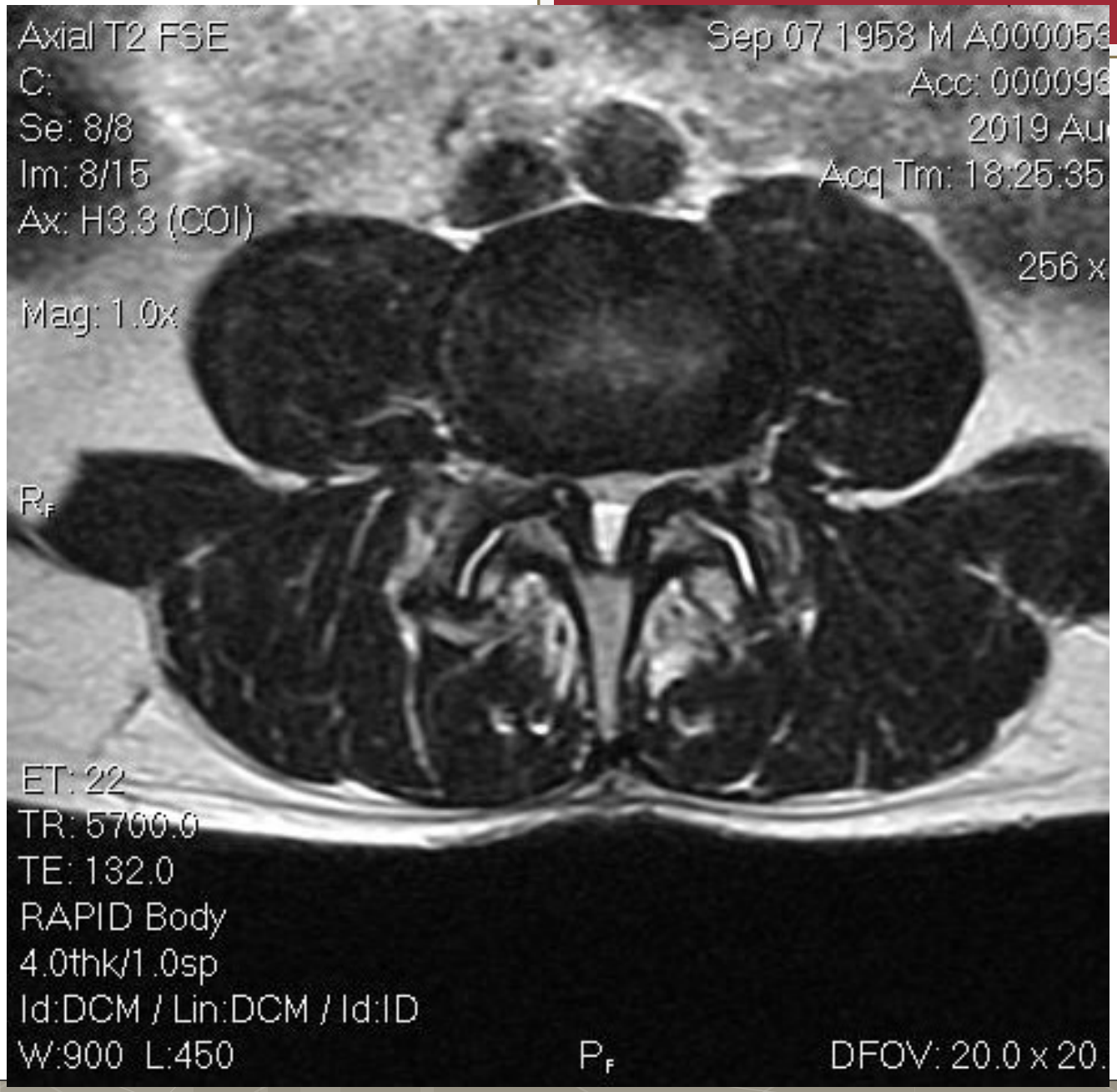
- 1 <25% DISPLACEMENT
- 2 25-50% DISPLACEMENT
- 3 50-75% DISPLACEMENT
- 4 >75% DISPLACEMENT
- 5 SPONYLOPTOSIS

- THE MORE HORIZONTAL THE ANGLE OF THE FACETS THE LACK OF RESTRAINT
- L4-L5 IS MOST COMMON OCCURRENCE
- LEADS TO SPINAL CANAL AND FORAMINAL COMPROMISE


flat
c




a
b


Axial T2 FSE
C:
Se: 8/8
Im: 8/15
Ax: H3.3 (COI)
Mag: 1.0x
Sep 07 1958 M A000053
Acc: 000093
2019 Au
Acq Tm: 18:25:35
256 x
R
ET: 22
TR: 5700.0
TE: 132.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:900 L:450
P
DFOV: 20.0 x 20.

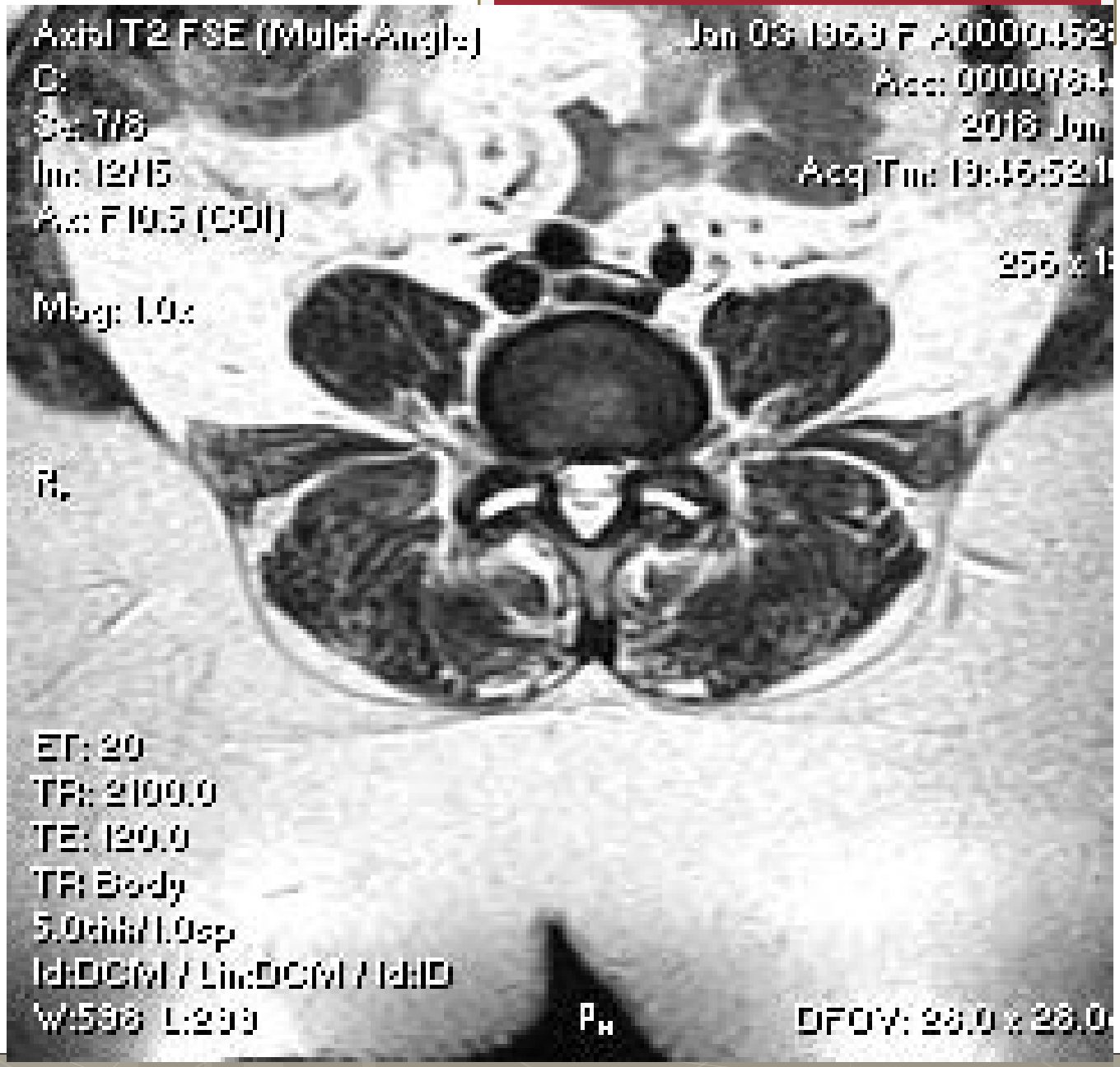
CASE 1


Sag T2 FSE
C:
Se: 6/8
Im: 10/15
Sag: R12.4 (COI)
Mag: 1.0x
A
ET: 20
TR: 3731.0
TE: 120.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:1023 L:397
Jan 06 1978 F A0000494
Acc: 0000865
2019 Feb
Acq Tm: 03:32:47.8
320 x 2
DFOV: 30.0 x 30.0


Axial T2 FSE
C:
Se: 9/8
Im: 11/19
Ax: F17.6 (COI)
Mag: 1.0x
Jan 06 1978 F A0000494
Acc: 0000865
2019 Feb
Acq Tm: 08:46:33.7
256 x 1
R
ET: 22
TR: 5700.0
TE: 132.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:1207 L:603
P
DFOV: 20.0 x 20.0

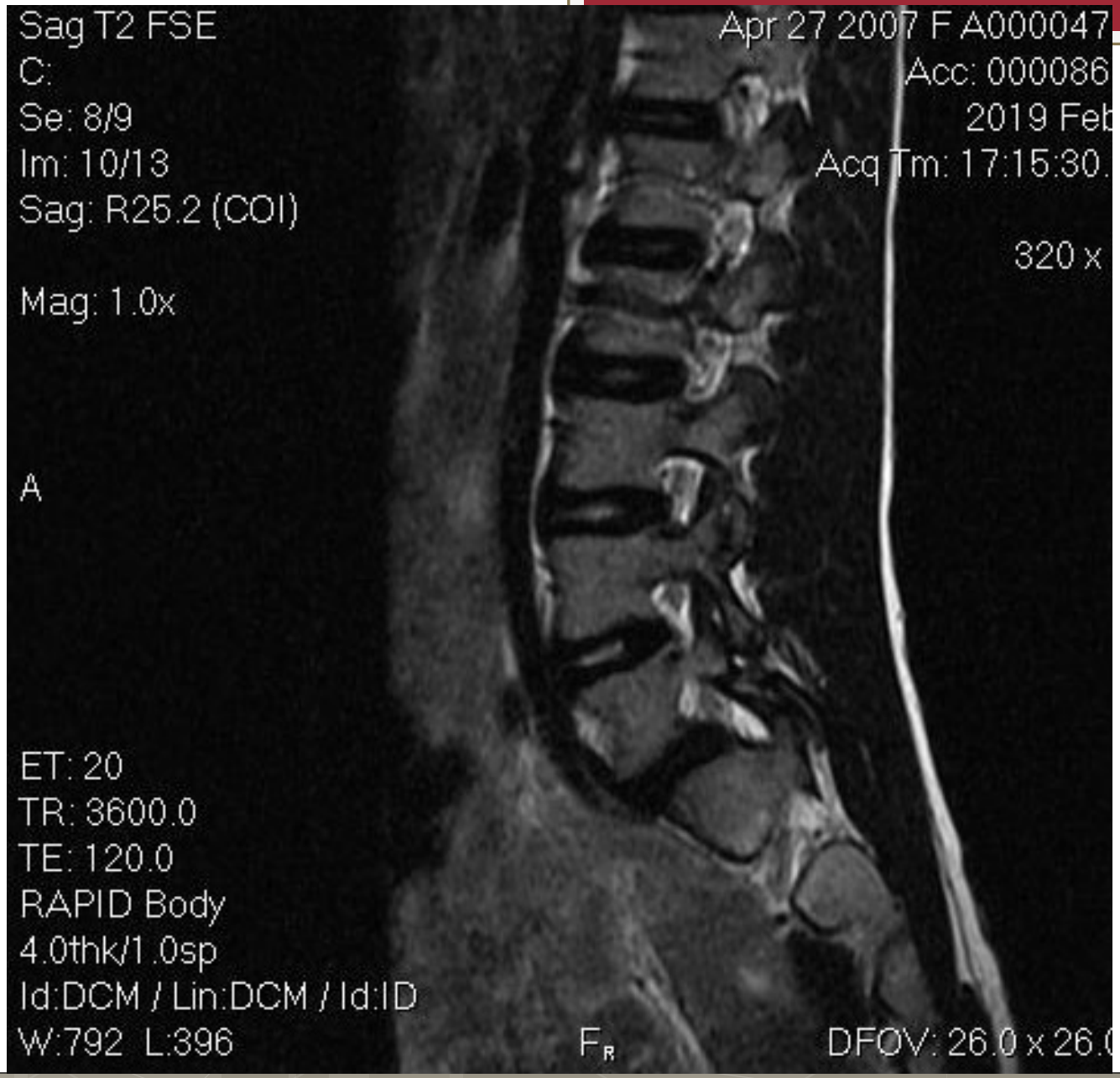
CASE 2


Sag T2 FSE
C:
Se: 4/8
Im: 7/13
Sag: L4.3 (COI)
Mag: 1.0x
A R
ET: 20
TR: 4000.0
TE: 120.0
TR Body
5.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:1249 L:625
Jan 03 1969 F A0000452
Acc: 0000784
2018 Jun
Acq Tm: 19:32:54.
256 x 1
F L
DFOV: 34.0 x 34.0


Axial T2 FSE (Multi-Angle)
C:
Se: 7/8
Im: 12/15
Ax: F 10.5 (COI)
Mag: 1.0x
R
ET: 20
TR: 2100.0
TE: 120.0
TR: Body
5.0thk/1.0sp
IdDCM / LinDCM / IdHD
W:536 L:293
DFOV: 28.0 x 28.0

CASE 3


Sag T2 FSE
C:
Se: 8/9
Im: 8/13
Sag: R15.2 (COI)
Mag: 1.0x
A
ET: 20
TR: 3600.0
TE: 120.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:792 L:396
Apr 27 2007 F A000047
Acc: 000086
2019 Feb
Acq Tm: 17:15:30
320 x
DFOV: 26.0 x 26.0


Sag T2 FSE
C:
Se: 8/9
Im: 10/13
Sag: R25.2 (COI)
Mag: 1.0x
A
ET: 20
TR: 3600.0
TE: 120.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:792 L:396
Apr 27 2007 F A000047
Acc: 000086
2019 Feb
Acq Tm: 17:15:30.
320 x
DFOV: 26.0 x 26.0

CASE4

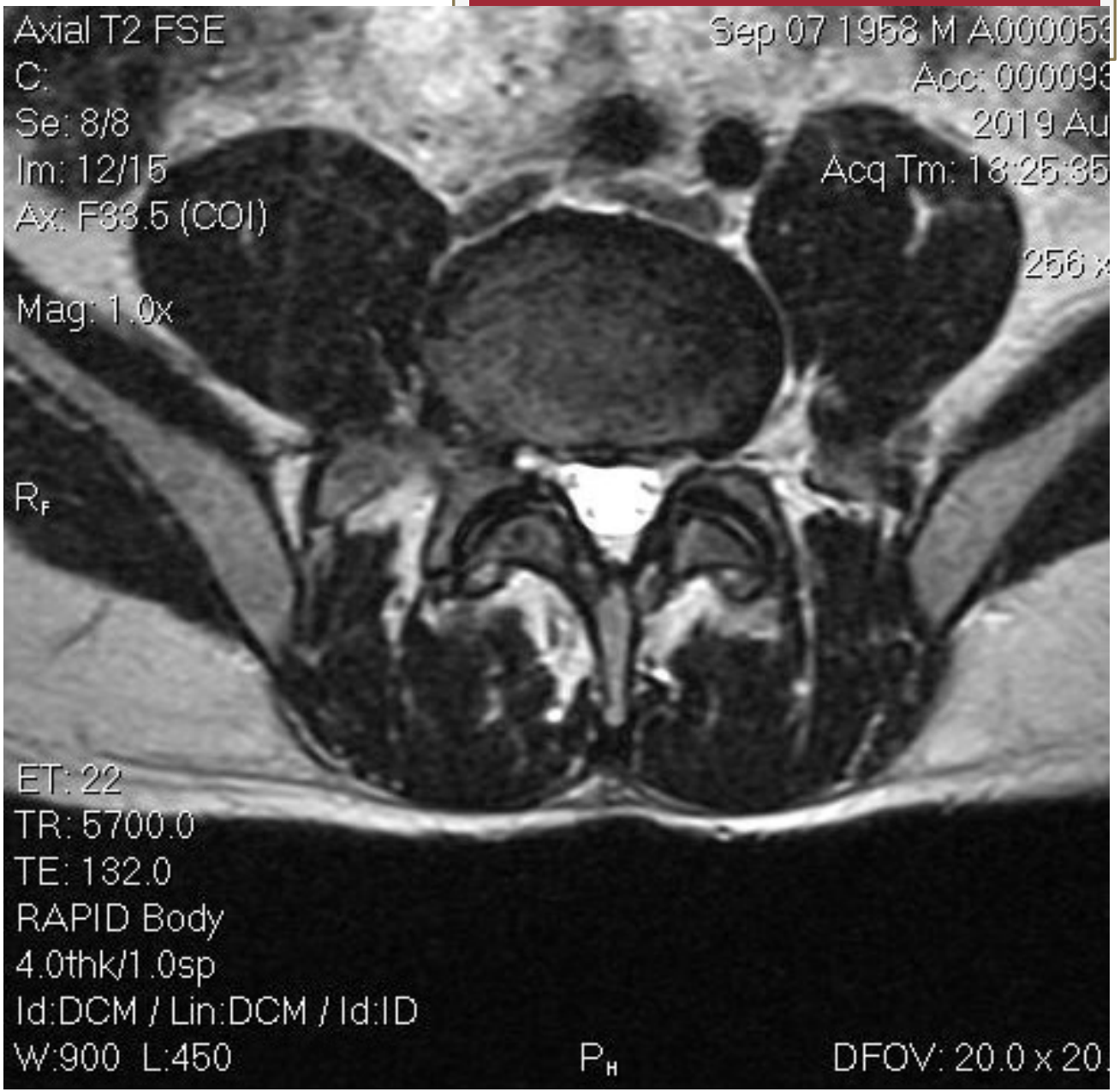

Sag T2 FSE-2
C:
Se: 8/8
Im: 9/15
Sag: R14.8 (COI)
Mag: 1.0x
A
ET: 20
TR: 3600.0
TE: 120.0
QD Flex Body(L)
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:1239 L:619
Sep 22 1953 M A0000487
Acc: 0000851
2018 Dec
Acq Tm: 15:32:36.6
288 x 1
DFOV: 30.0 x 30.0

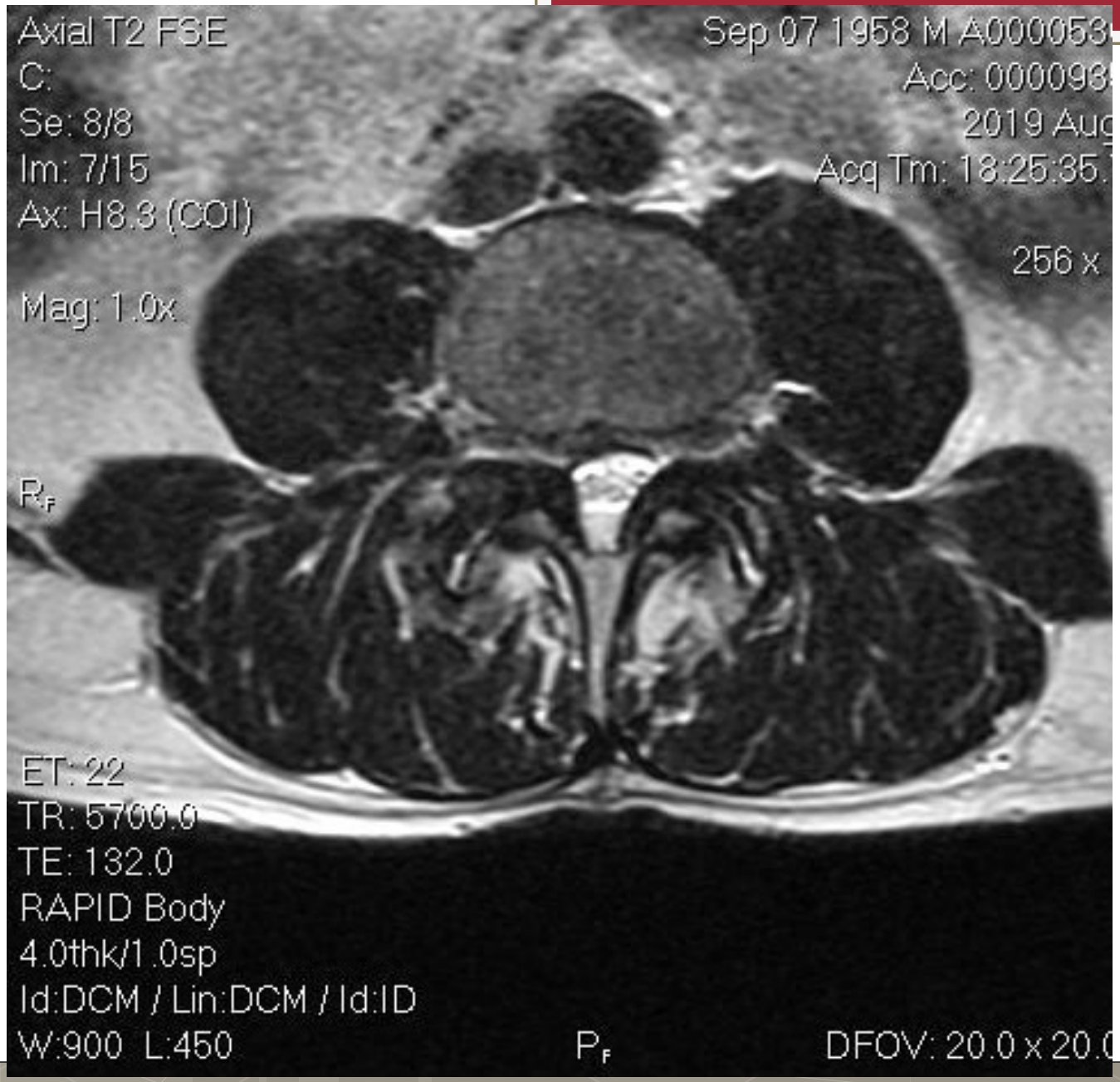

Sag T2 FSE-2
C:
Se: 8/8
Im: 9/15
Sag: R14.8 (COI)
Mag: 1.0x
A
ET: 20
TR: 3600.0
TE: 120.0
QD Flex Body(L)
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:1239 L:619
Sep 22 1953 M A000048
Acc: 000085
2018 Dec
Acq Tm: 15:32:36.
288 x
DFOV: 30.0 x 30.0

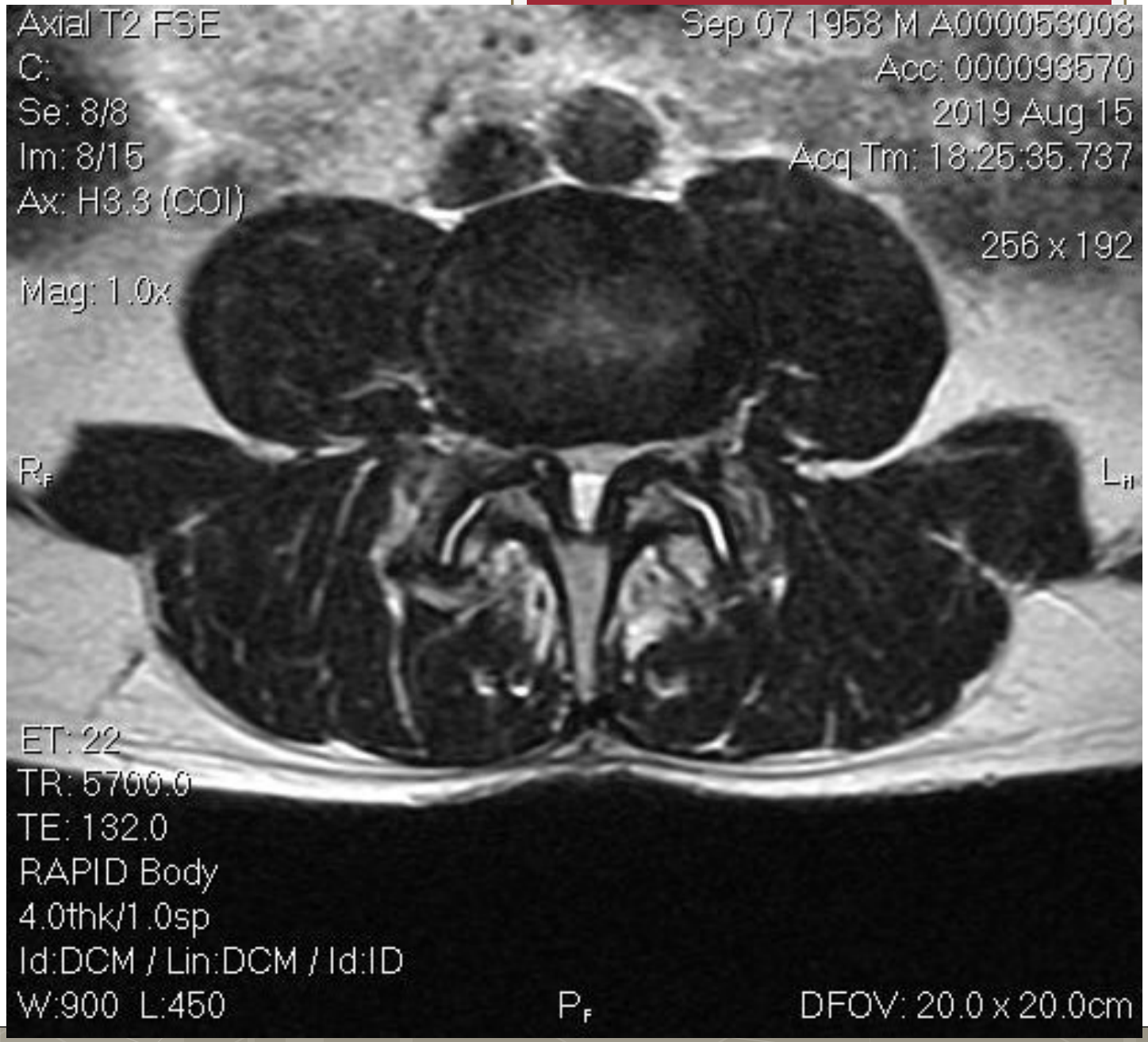

1.2T HITACHI
Ex: 000085116
Axial T2 FSE
C:
Se: 11/8
Im: 12/19
Ax: F48.0 (COI)
Mag: 1.0x
A F
American MRI
CHIKO, JOSEPH
Sep 22 1953 M A000048710
Acc: 000085116
2018 Dec 27
Acq Tm: 15:43:27.317
256 x 180
R F
L H
ET: 22
TR: 5259.0
TE: 132.0
QD Flex Body(L)
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:807 L:407
P H
DFOV: 23.0 x 23.0cm

CASE 5


Sag T2 FSE
C:
Se: 5/8
Im: 8/15
Sag: R4.9 (COI)
Mag: 1.0x
A
ET: 20
TR: 3731.0
TE: 120.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:758 L:375
Sep 07 1958 M A0000530
Acc: 0000935
2019 Aug
Acq Tm: 18:13:02.8
320 x 2
DFOV: 28.0 x 28.0


Axial T2 FSE
C:
Se: 8/8
Im: 12/15
Ax: F33.5 (COI)
Mag: 1.0x
Sep 07 1958 M A000053
Acc: 000093
2019 Au
Acq Tm: 18:25:35
256 x
R
ET: 22
TR: 5700.0
TE: 132.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:900 L:450
P
DFOV: 20.0 x 20.


Axial T2 FSE
C:
Se: 8/8
Im: 7/15
Ax: H8.3 (COI)
Mag: 1.0x
256 x
ET: 22
TR: 5700.0
TE: 132.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:900 L:450
DFOV: 20.0 x 20.0


Axial T2 FSE
C:
Se: 8/8
Im: 8/15
Ax: H3.3 (COI)
Mag: 1.0x
Sep 07 1958 M A000053008
Acc: 000093570
2019 Aug 15
Acq Tm: 18:25:35.737
256 x 192
R
L
ET: 22
TR: 5700.0
TE: 132.0
RAPID Body
4.0thk/1.0sp
Id:DCM / Lin:DCM / Id:ID
W:900 L:450
P
DFOV: 20.0 x 20.0cm

CASE 6