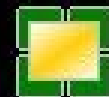


Cervical Spondylosis

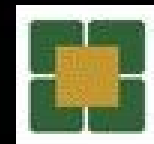
A Focus on Posture and Balance

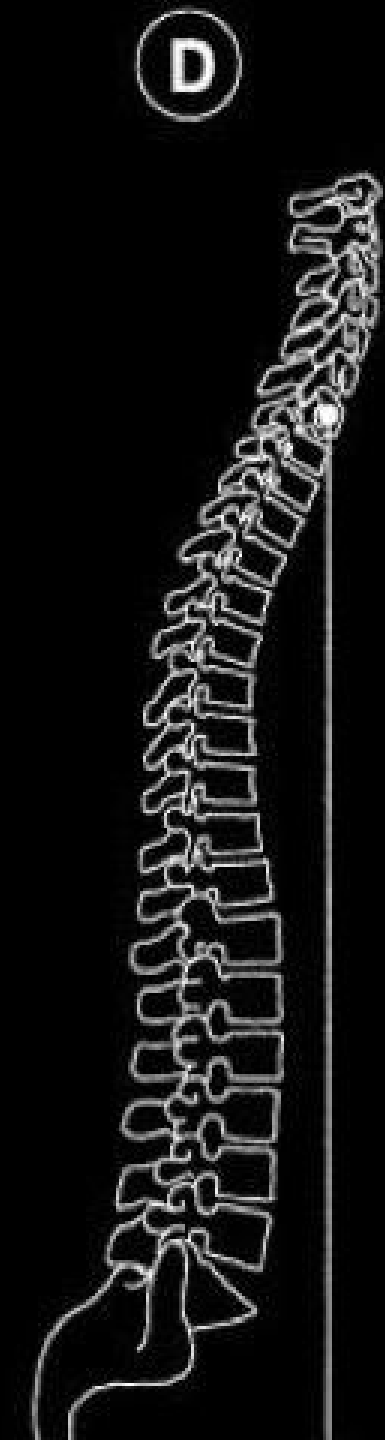
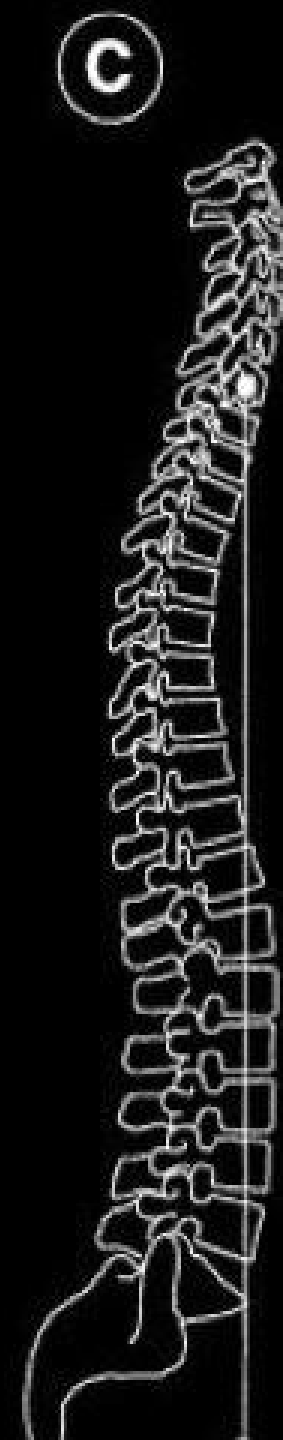
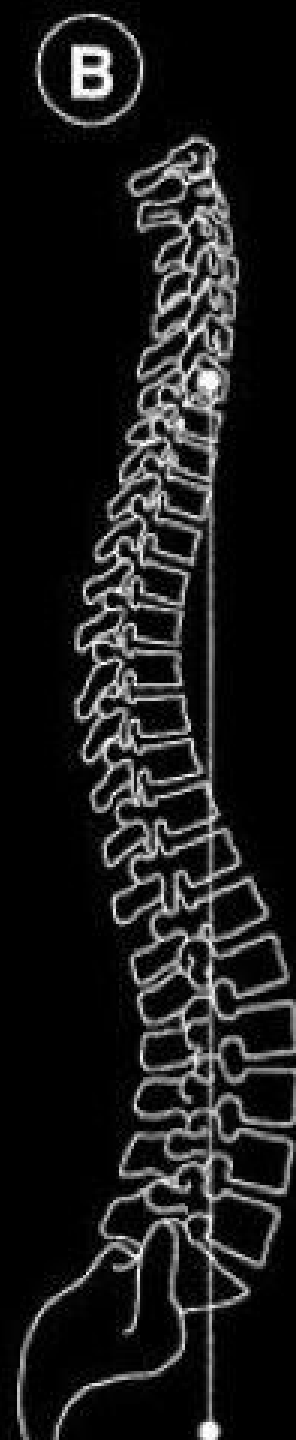
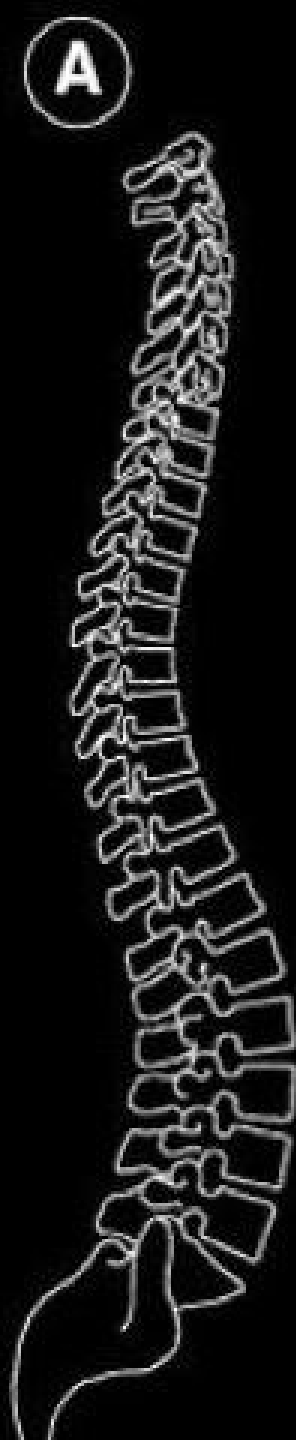
**Ed Benzel
Cleveland Clinic**



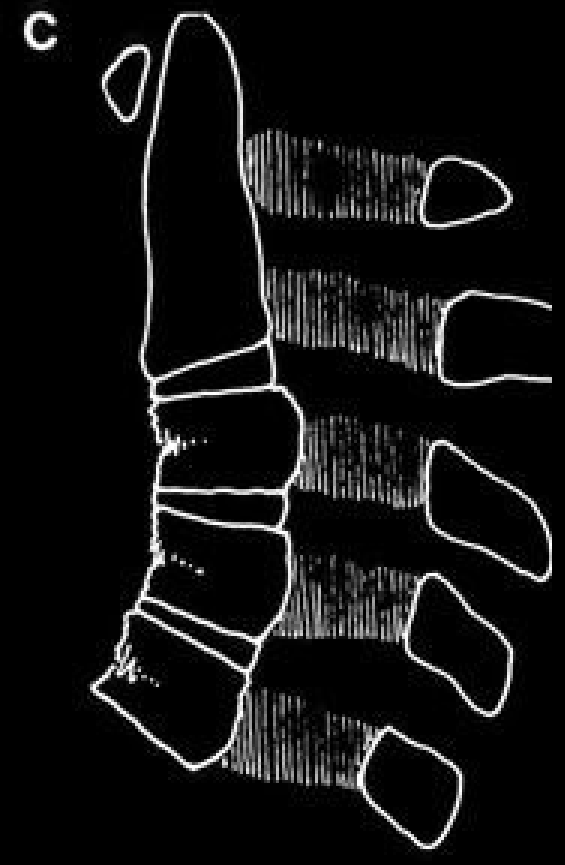
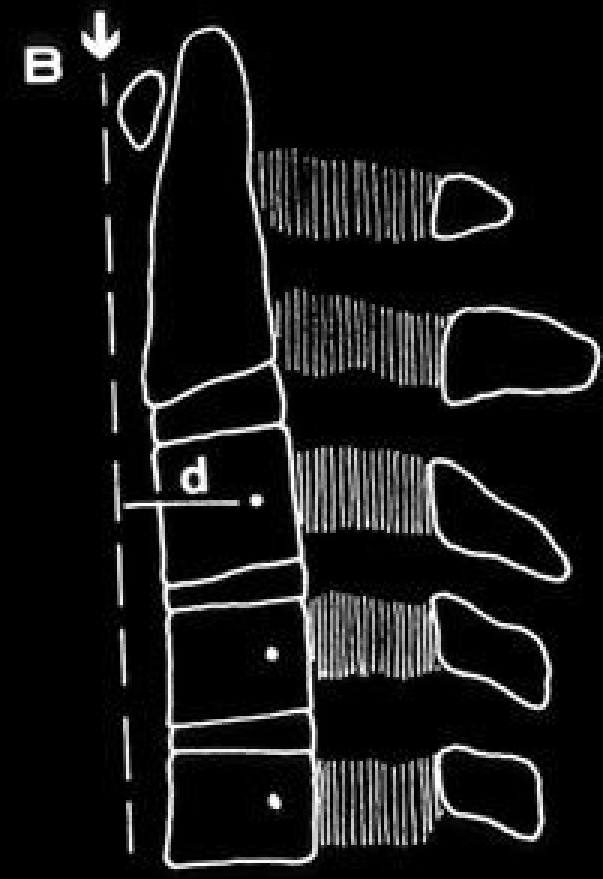
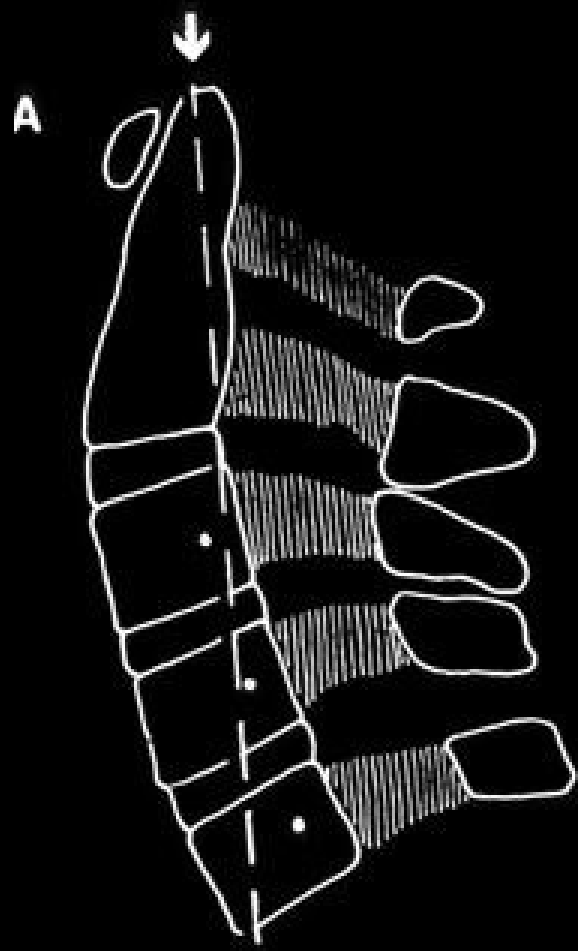
Cervical Spondylosis

Myelopathy
Deformity

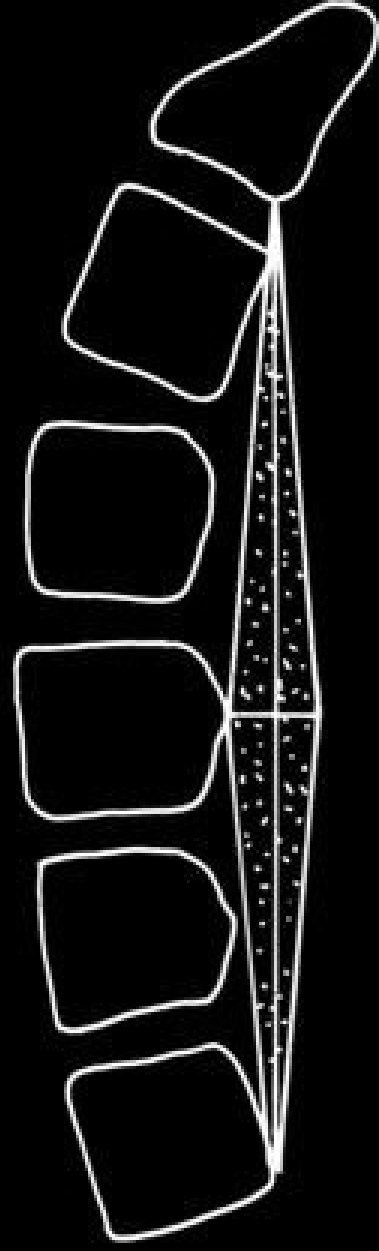
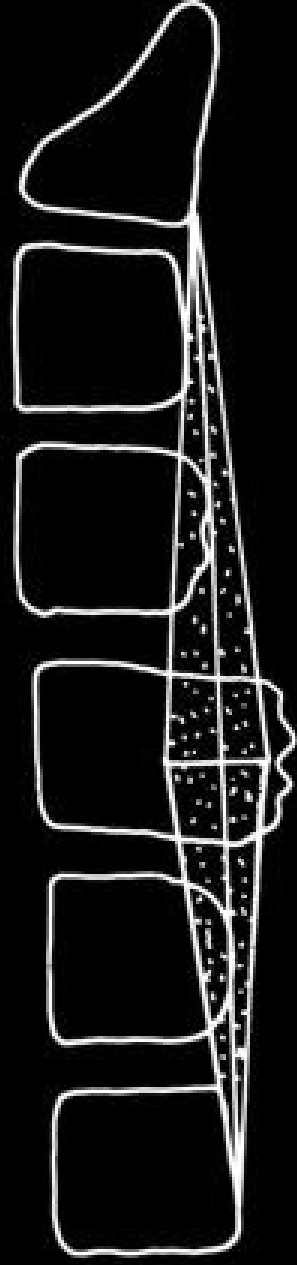
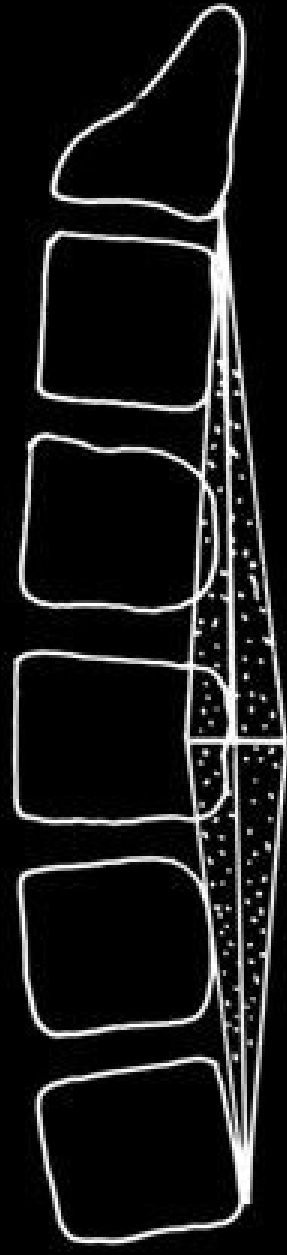






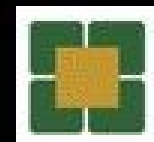




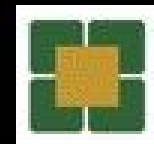


**ENCROACHMENT
TETHERING**

REPETITIVE TRAUMA



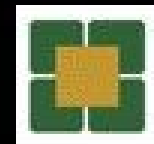
SURGICAL STRATEGIES



DECOMPRESSION

**DEFORMITY
PREVENTION**

**DEFORMITY
CORRECTION**



WHY?

Neck Pain

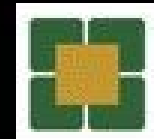
Myelopathy

Improve Short-Term Success

Decrease End Fusion

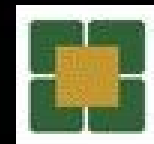
Changes

Improve Long-Term Success

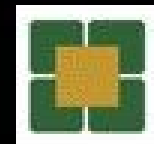


Intra-Operative Deformity Correction

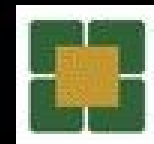
**Ventral
vs
Dorsal**



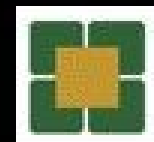
**Its all about the
leverage!!!**



**Dorsally, leverage
is
VEEEERRRYYY
difficult to
achieve!!!**

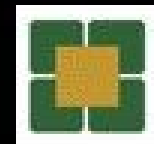


Polyaxial Screws



Exception

**Capital Flexion
and
Extension**

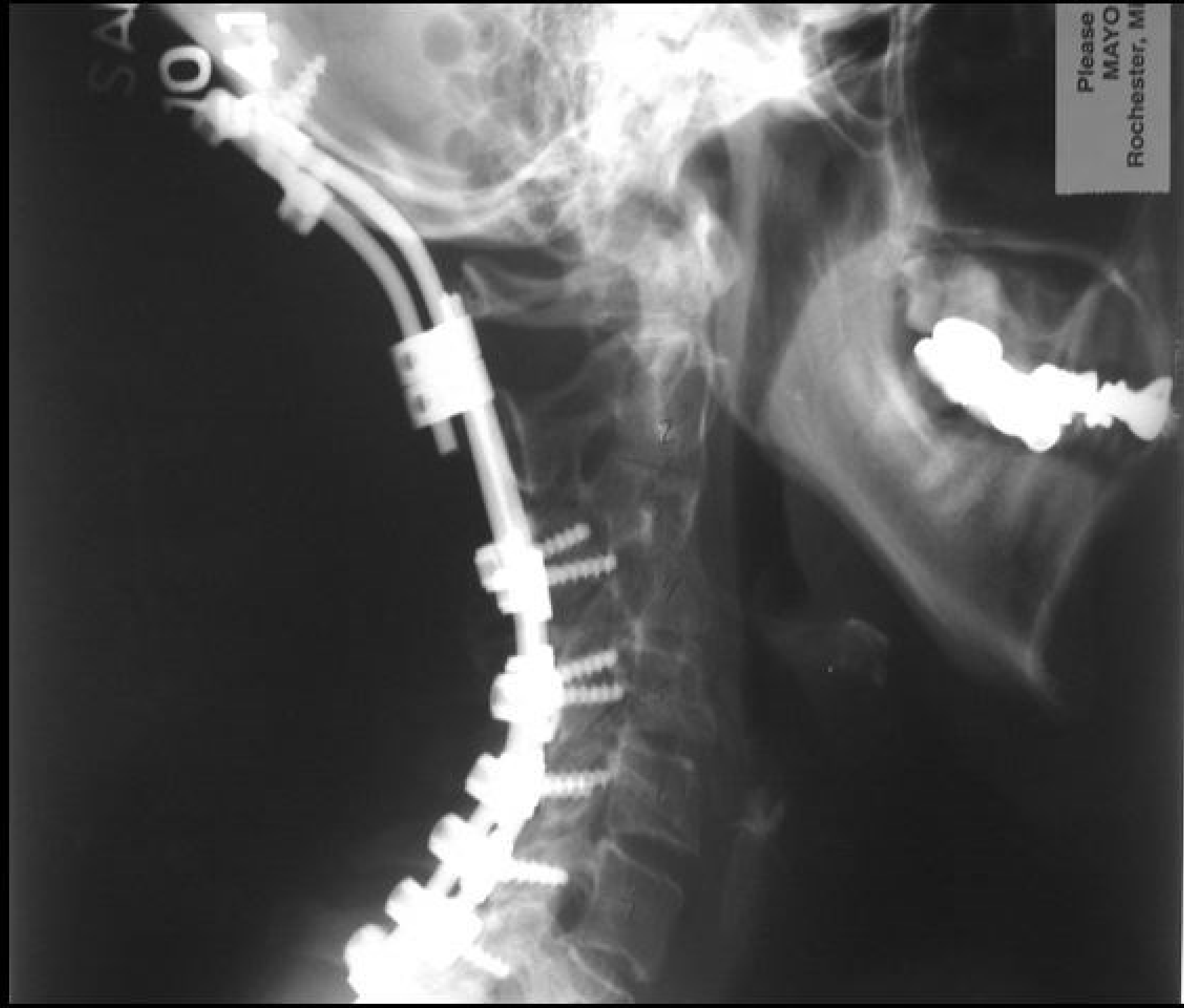




SAN

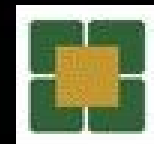
JOHN

Please
MAYO
Rochester, MI



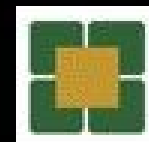
Ventral

**Another
Story**





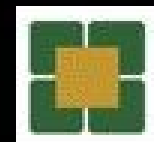
Back Pain

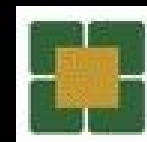






Kyphosis Trapezius Sign

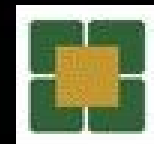


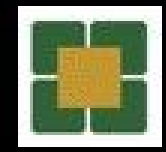
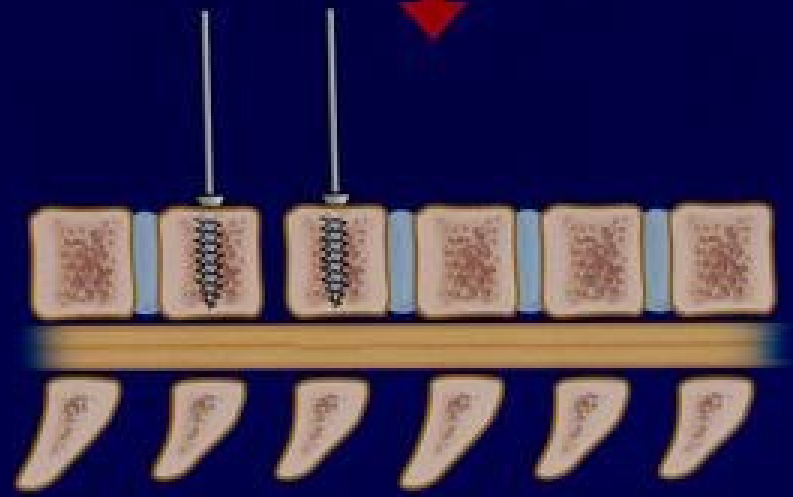
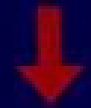
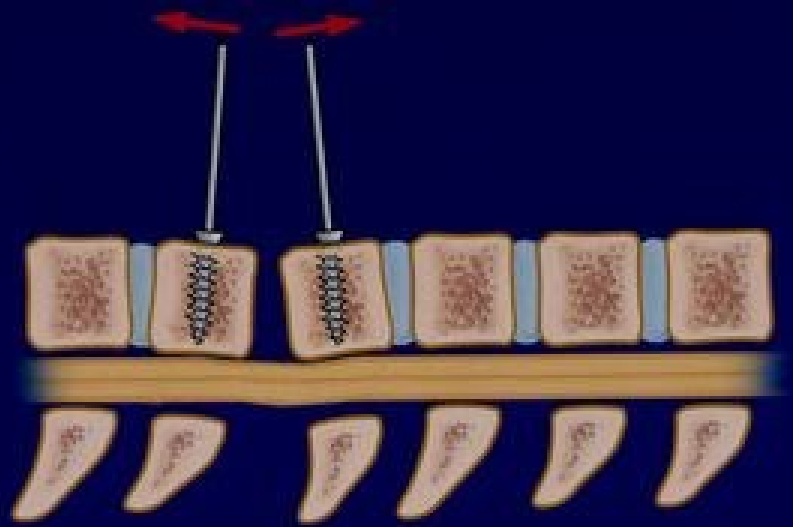


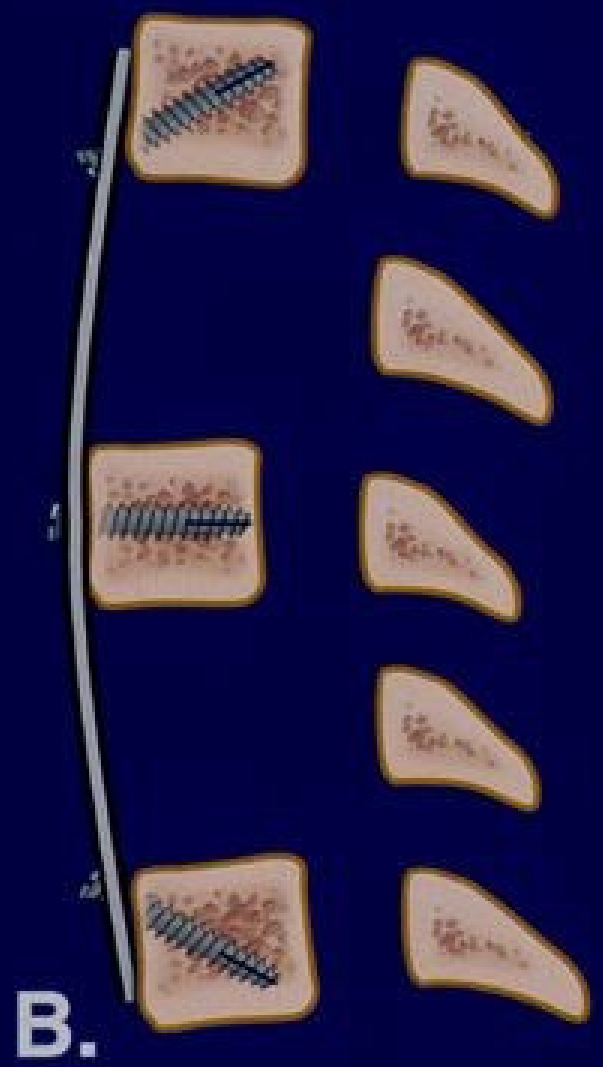
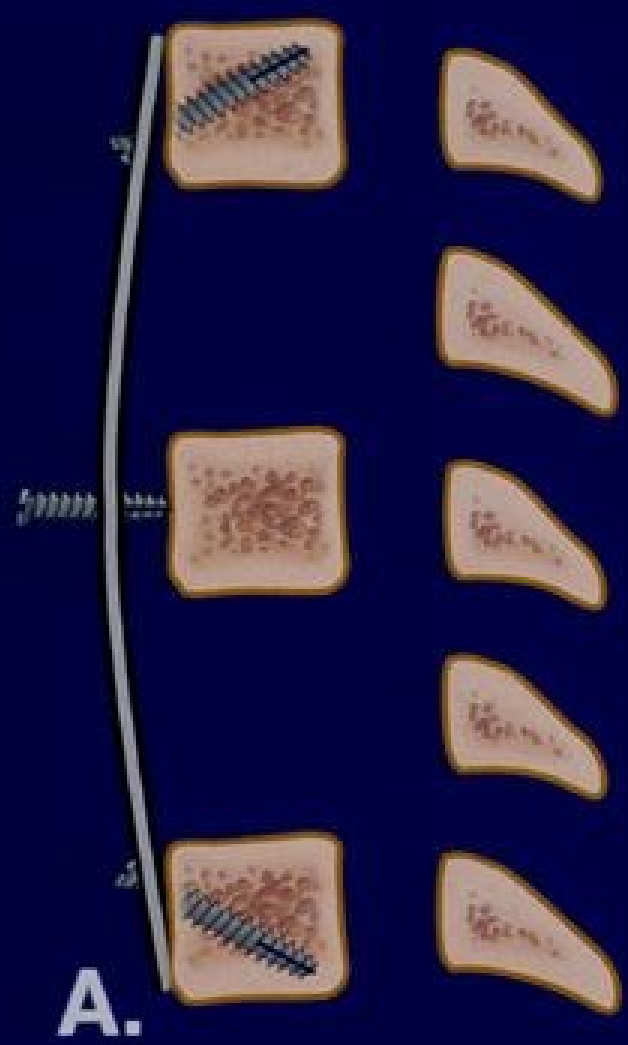


Intra-Operative Deformity Correction

**Ventral
vs
Dorsal**







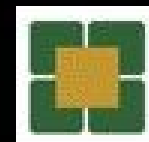


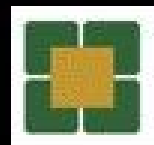






Gravity





93270349045
25-SEP-1940
11:14
11-SEP-1999
IMAGE 11
SER 1-2

HL Woodland Diagnostic
H-SP VB33A
+ : F A L

93270349045
25-SEP-1940
11:14
11-SEP-1999
IMAGE 12
SER 1-2

HL Woodland Diagnostic
H-SP VB33A
+ : F A L

A

A

tse1_7
*R
1 SAT
TR 4000.0
TE 114.0/1
TA 07:05
AC 2

EVOMR
TECH:MLP

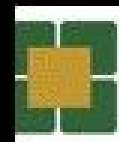
SP -0.0
SL 4.0
FoV 228*260
182 *256o
Sag-Tra -1
M 1162
C 478

tse1_7
*R
1 SAT
TR 4000.0
TE 114.0/1
TA 07:05
AC 2

EVOMR
TECH:MLP

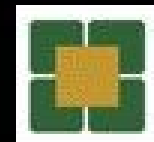
SP 5.3
SL 4.0
FoV 228*260
182 *256o
Sag-Tra -1

M 1162
C 478



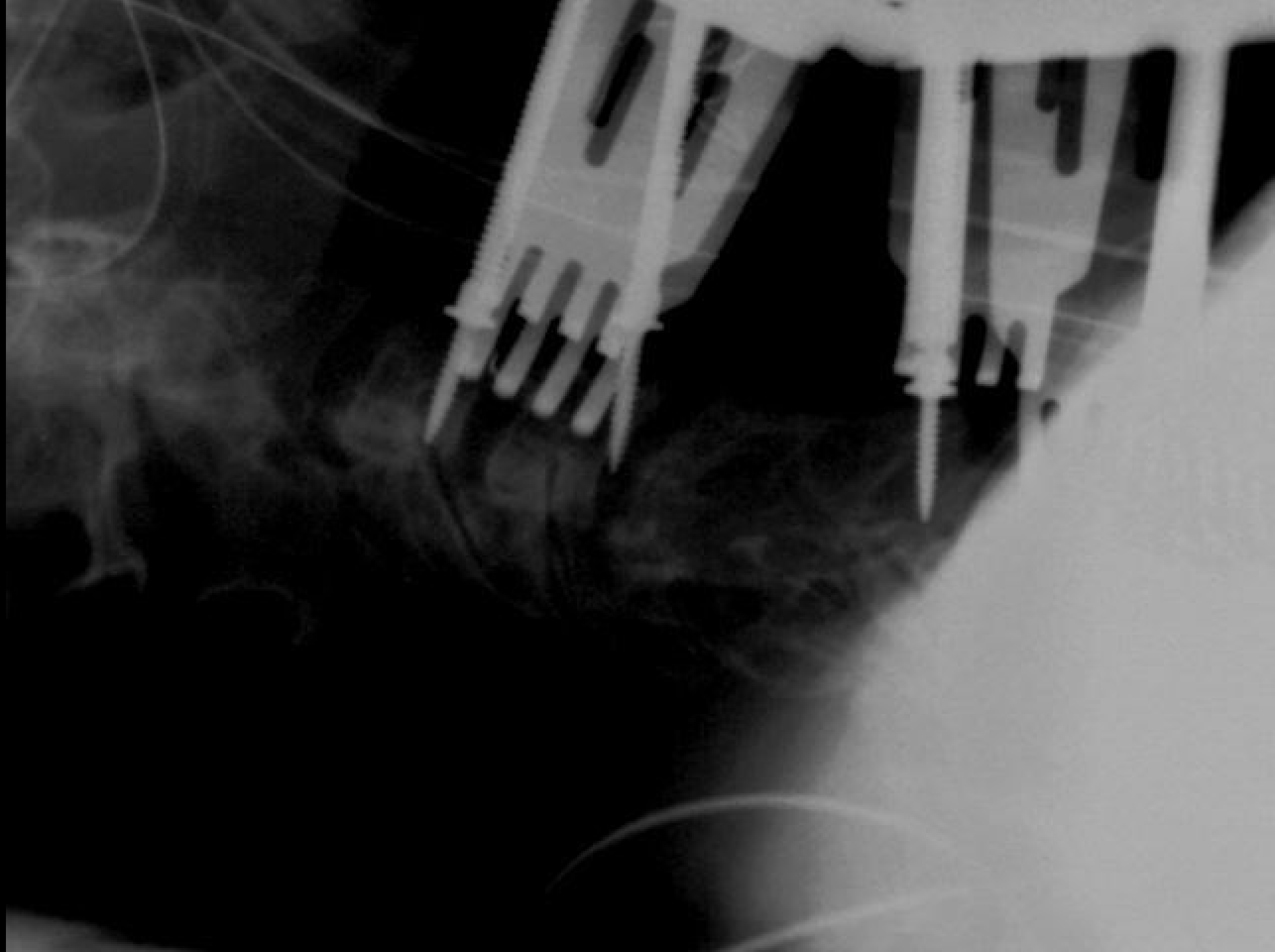
**Could Correct
Ventrally**

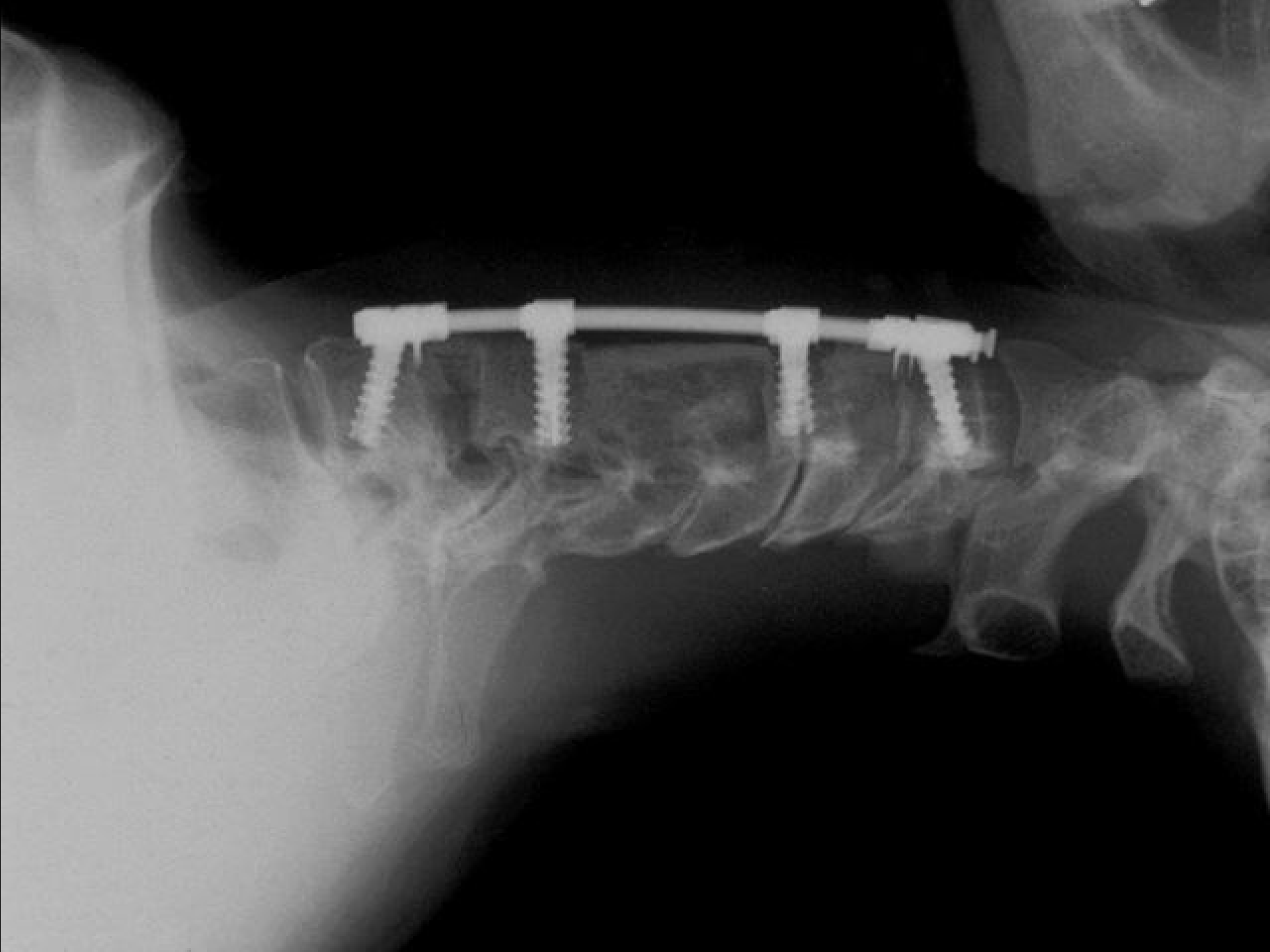
**Because Facets not
Ankylosed**



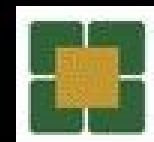




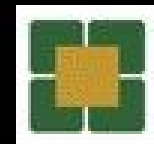


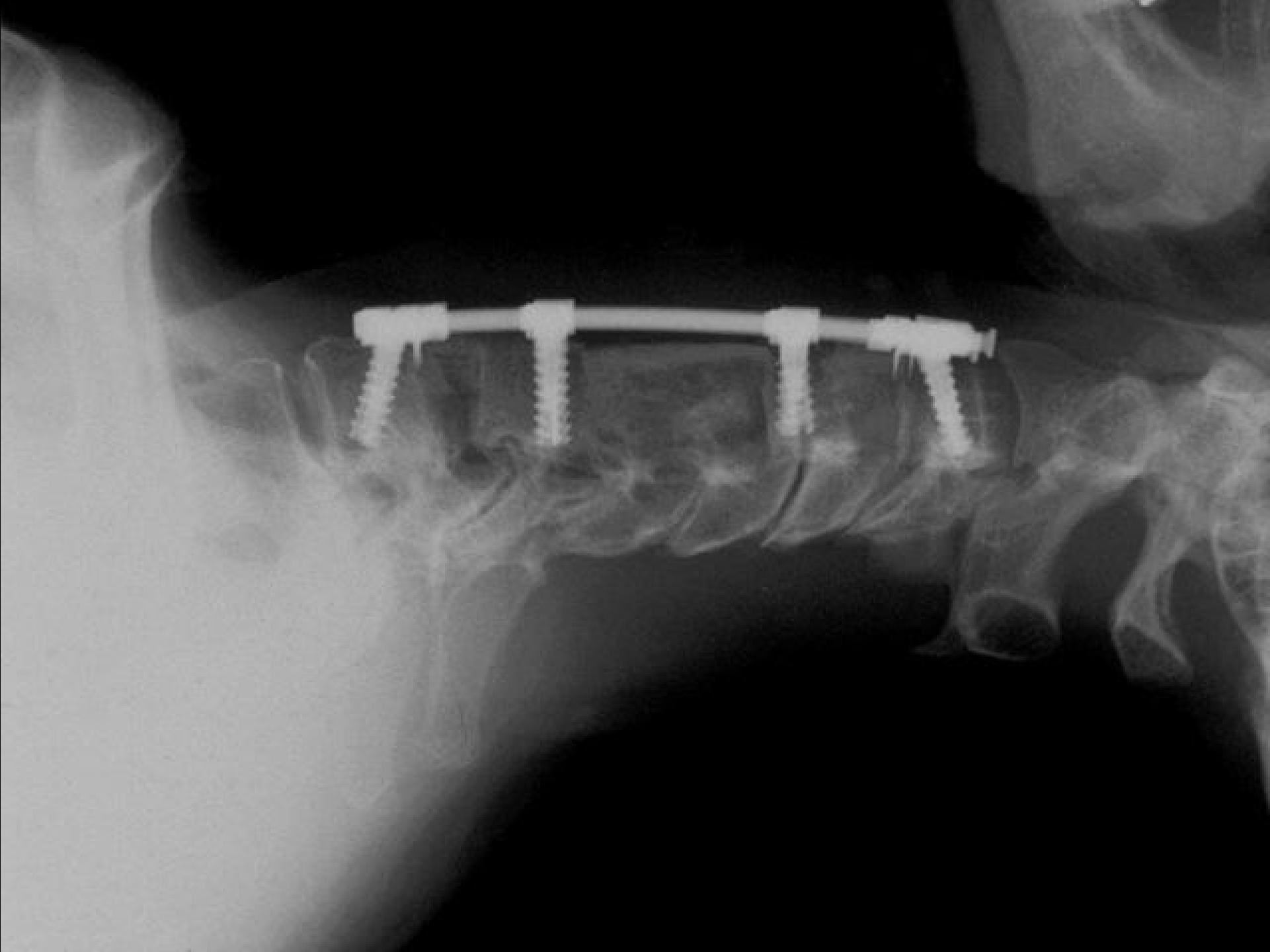


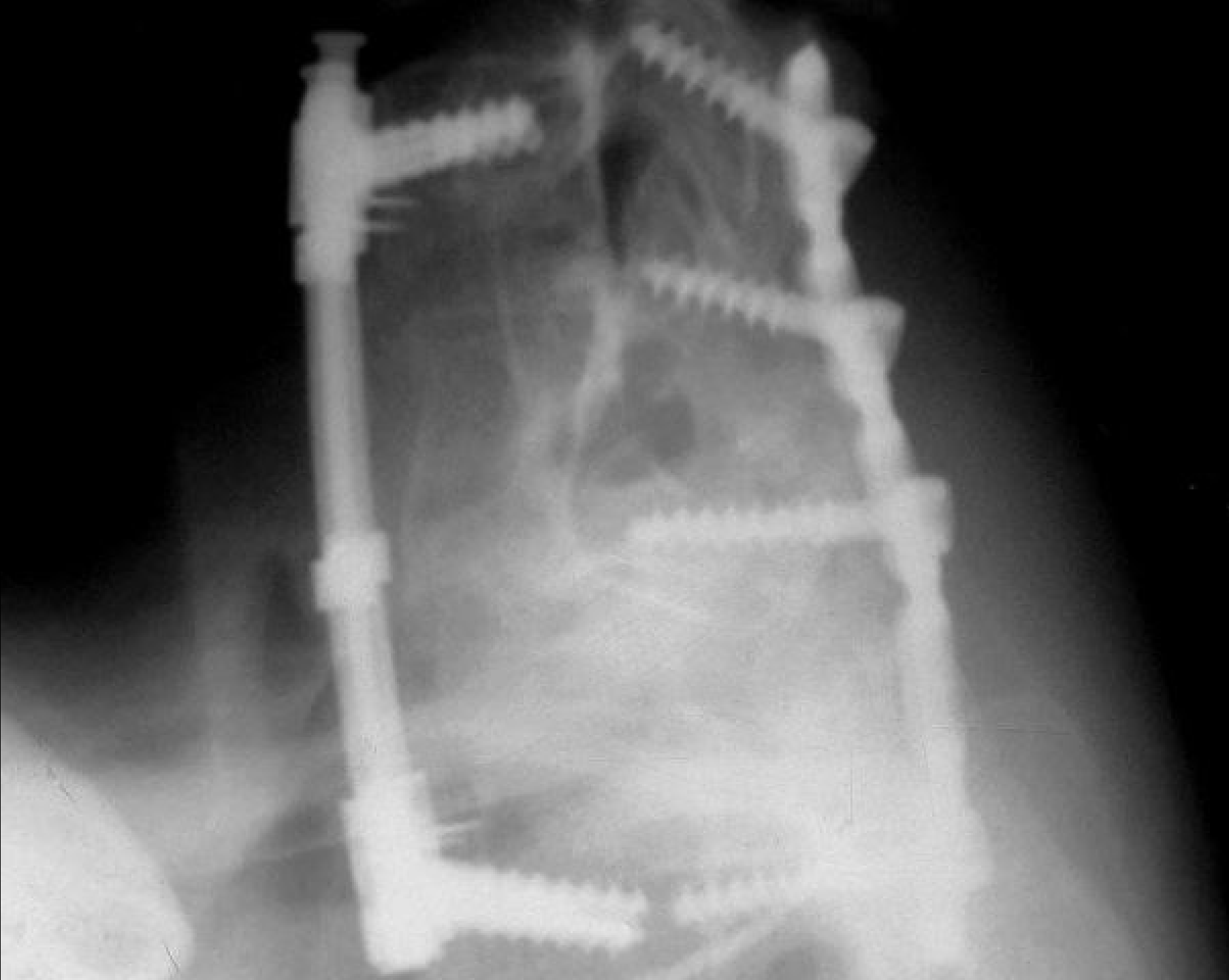
**Its all about
leverage!!!**

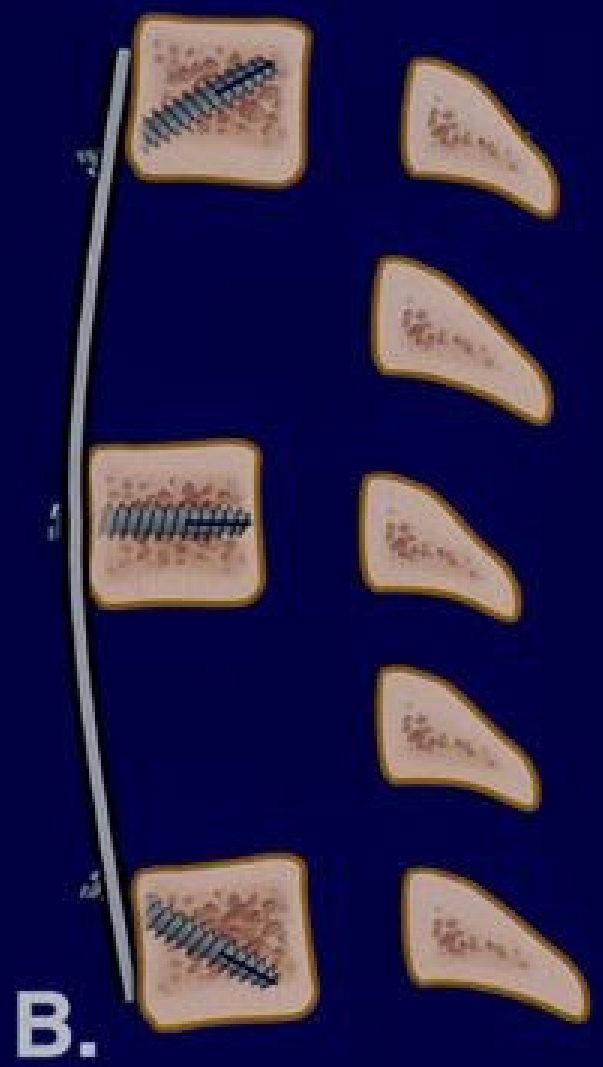
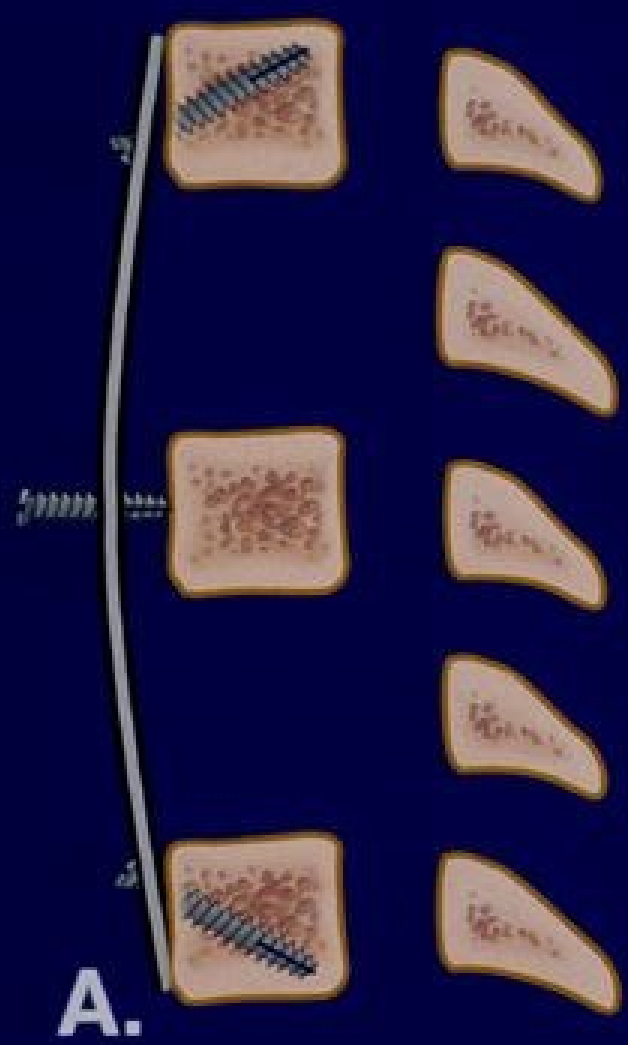


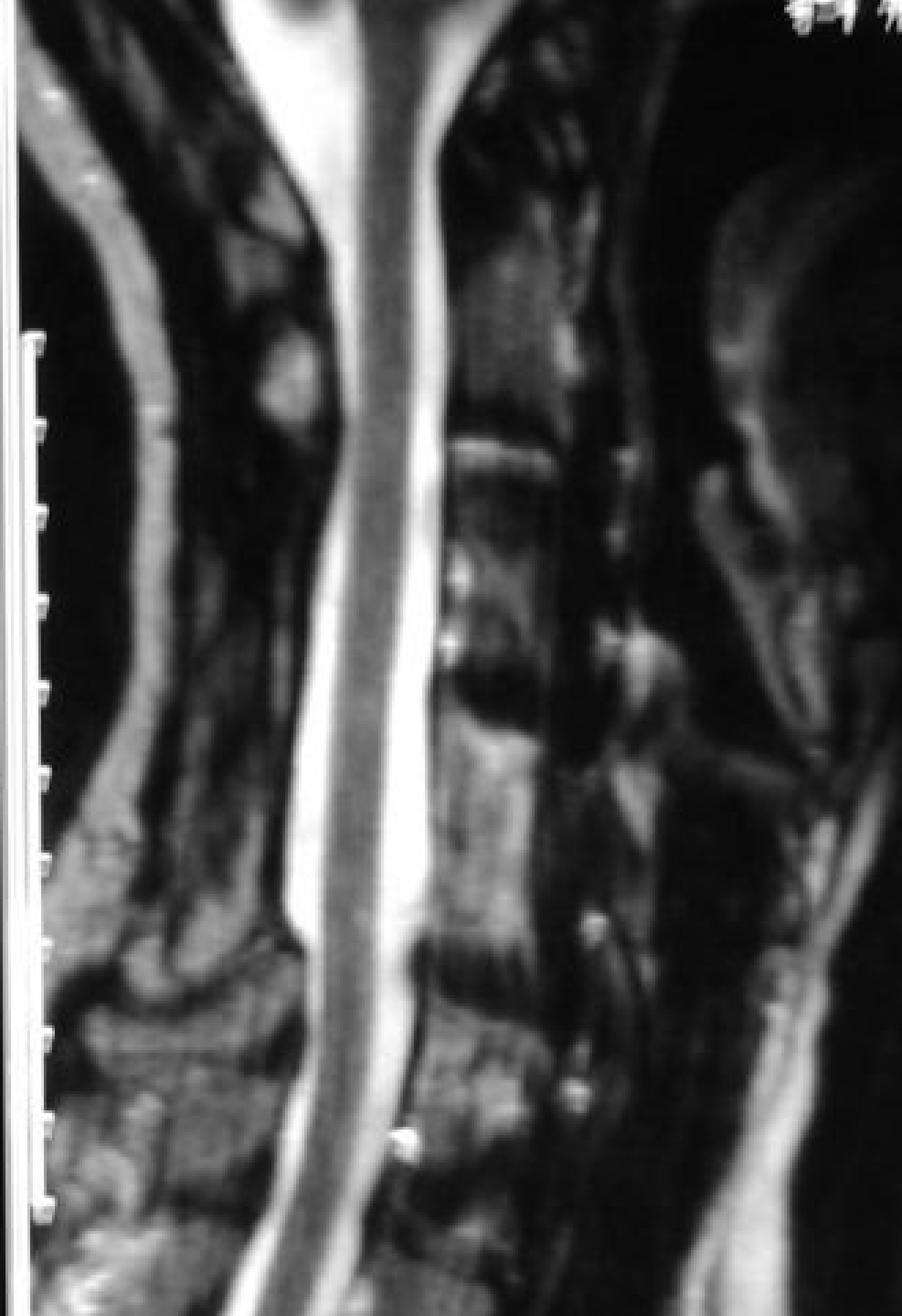
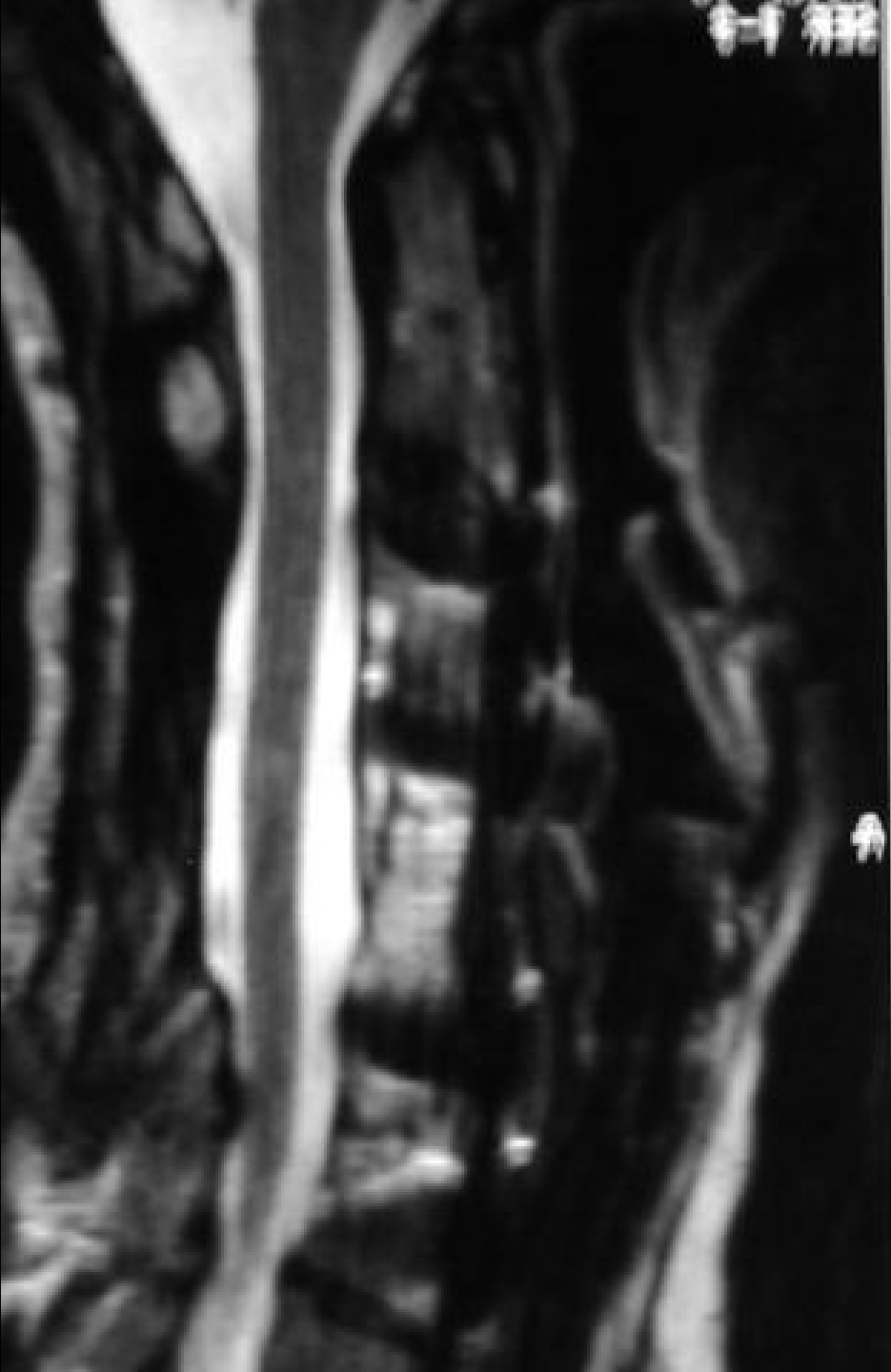
Fixation Follows!!!

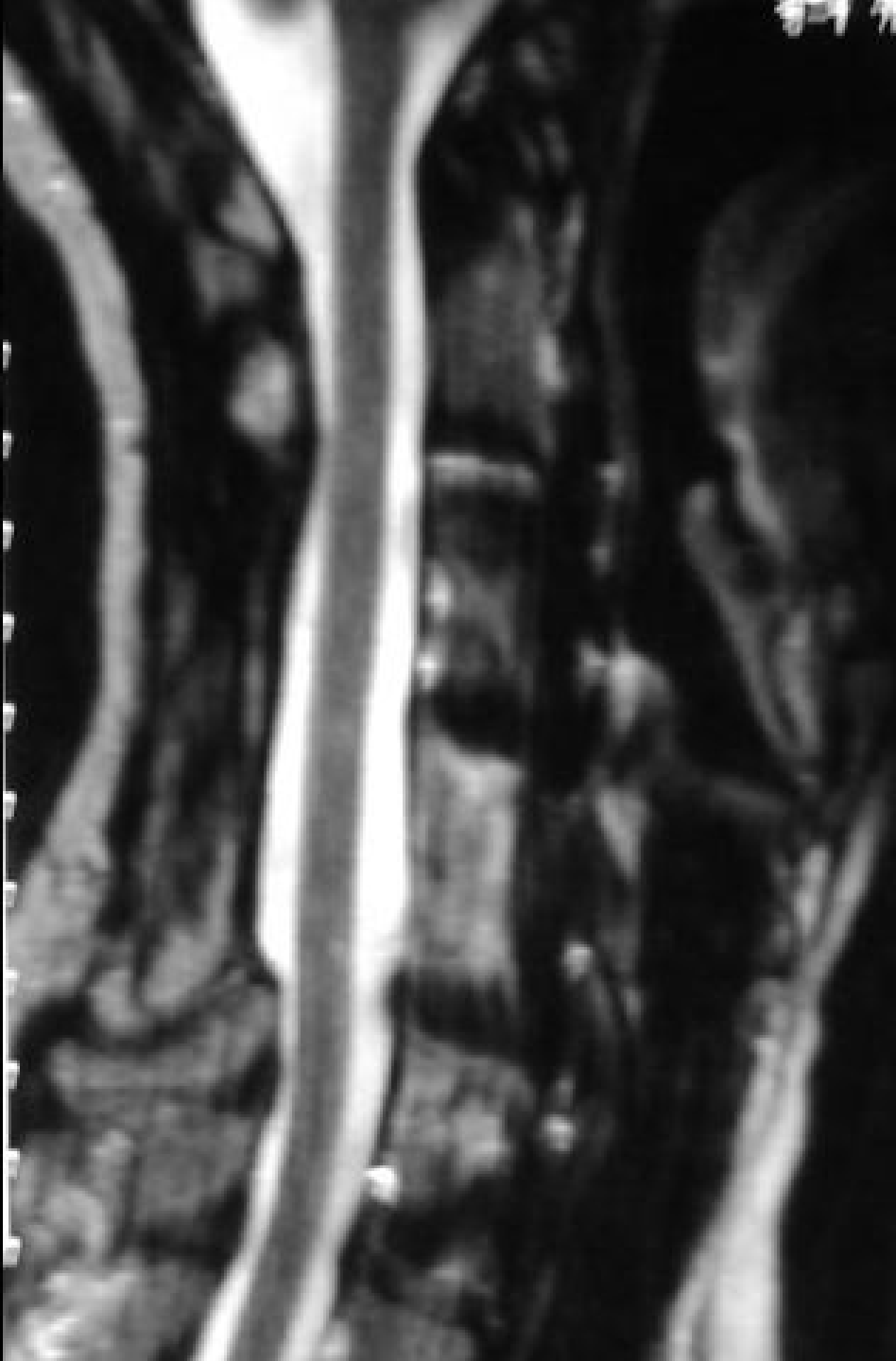


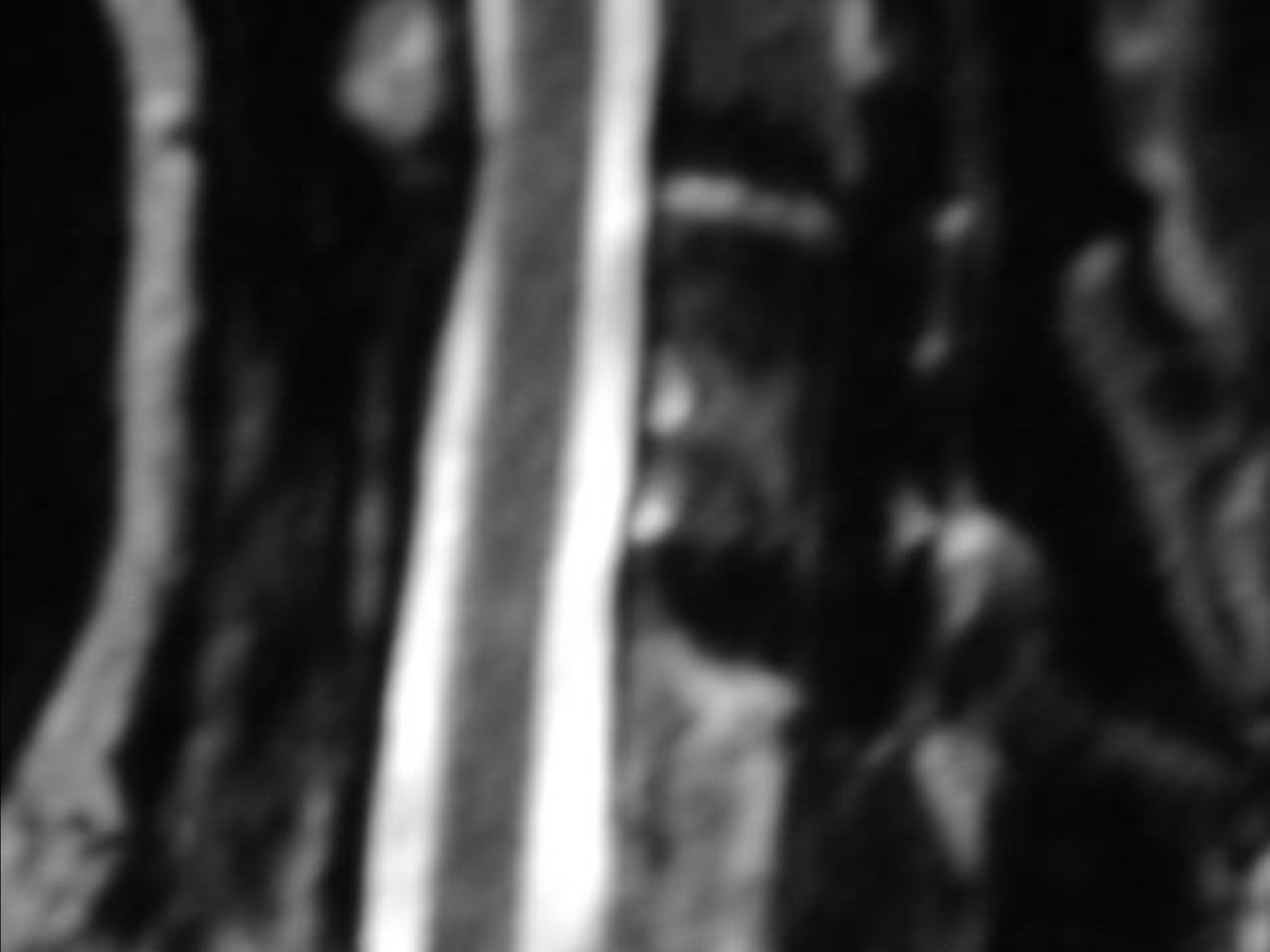


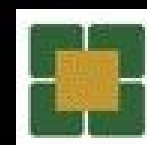
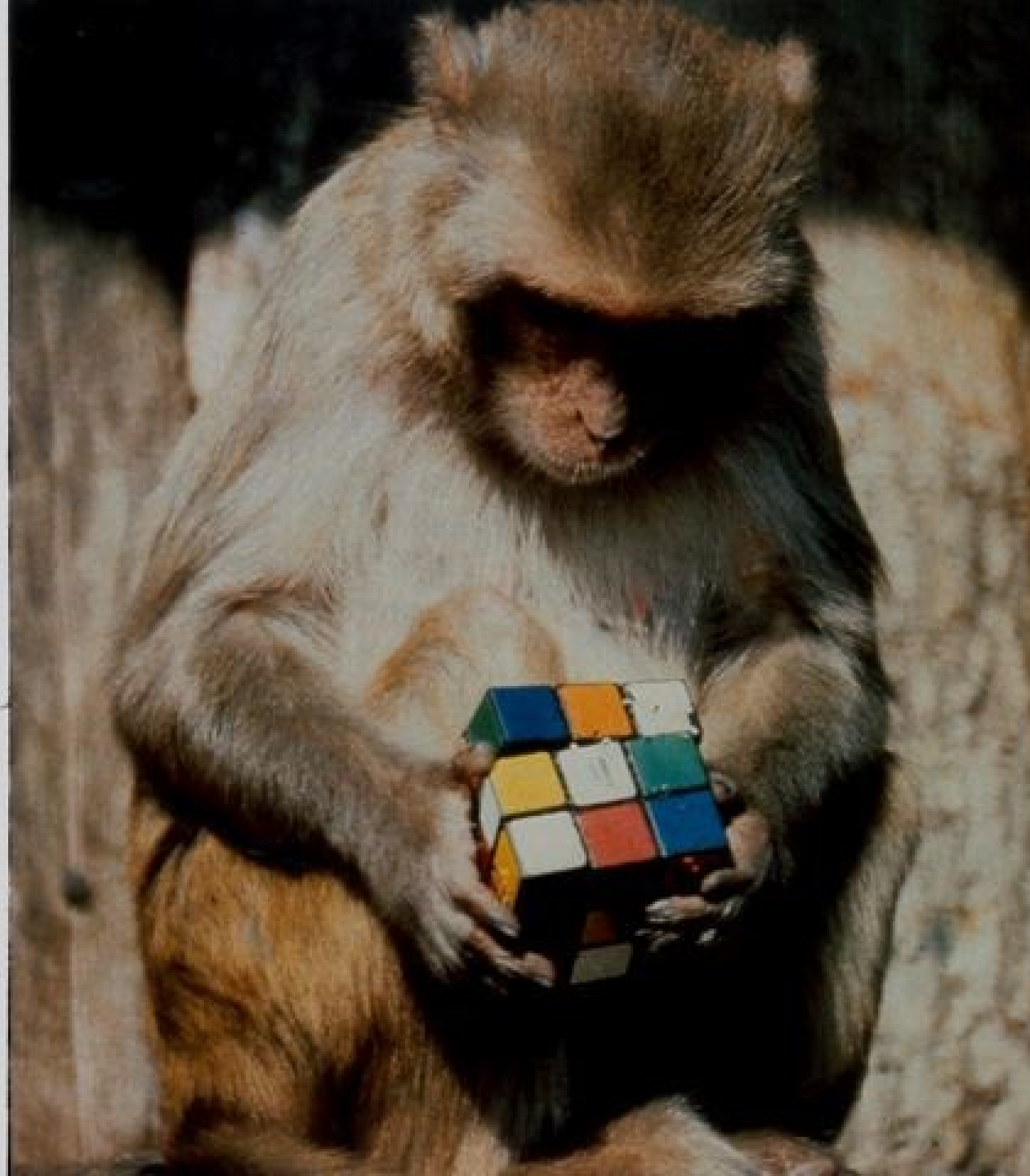






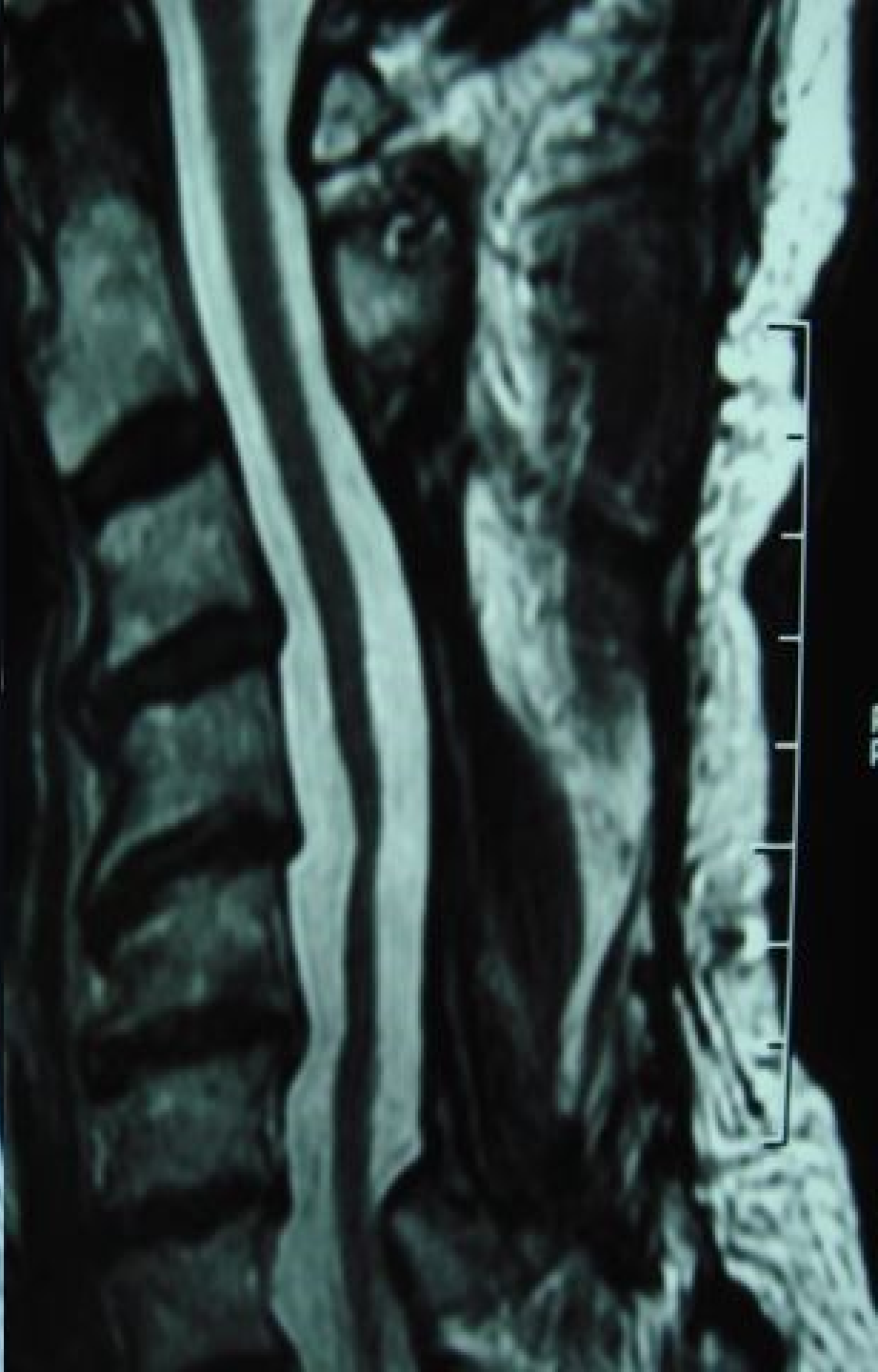






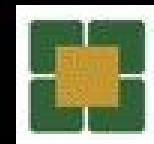


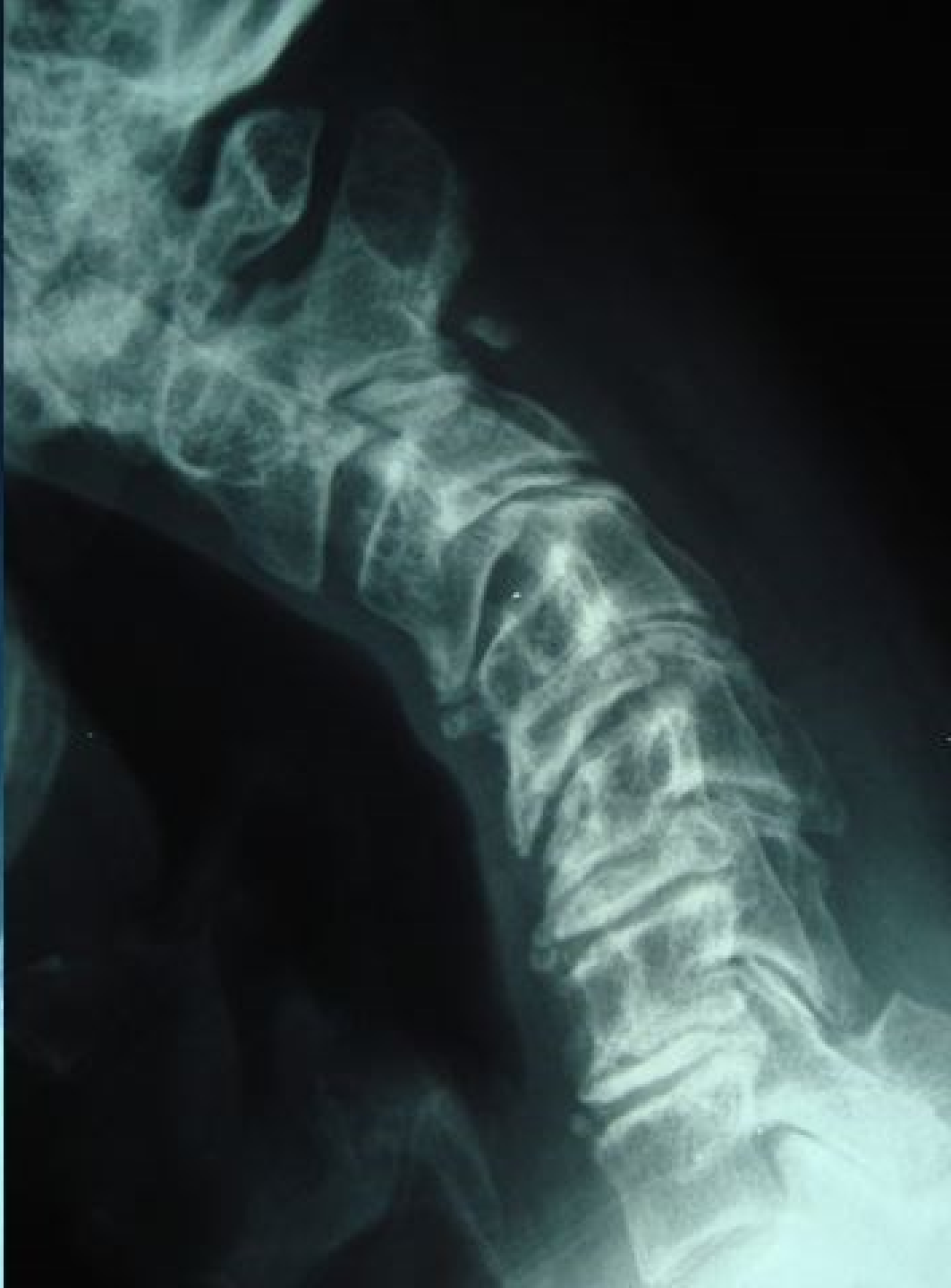
FRFSE-XL/90
TR:331.2

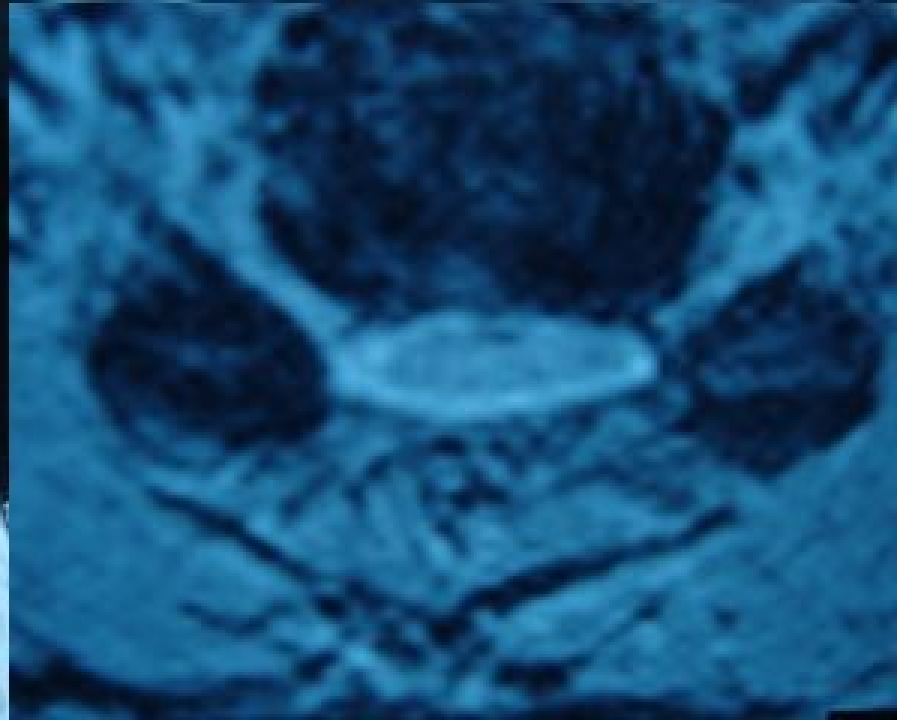
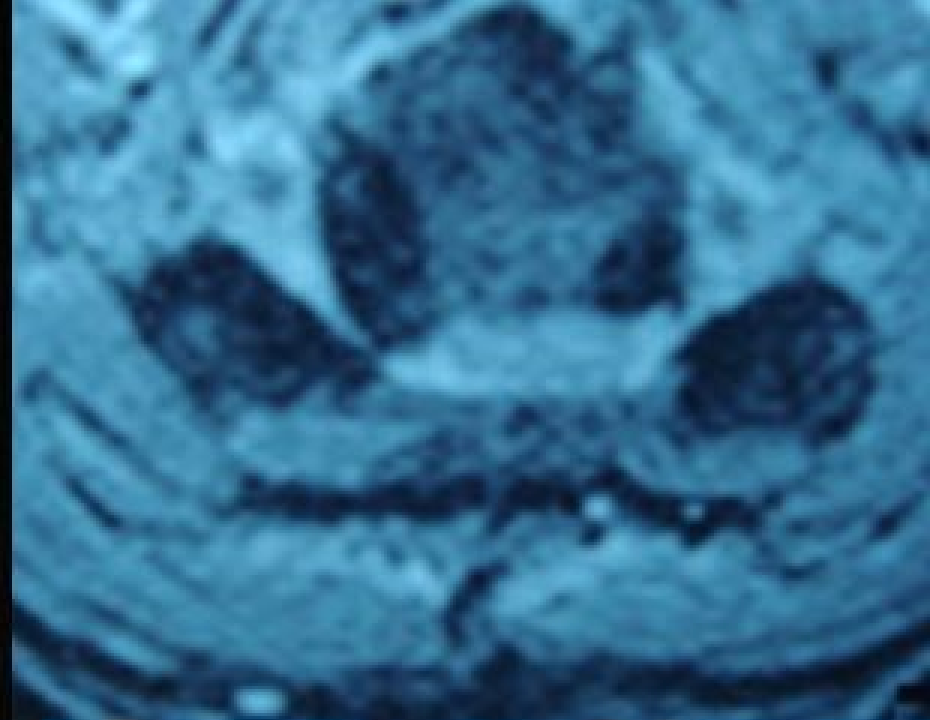
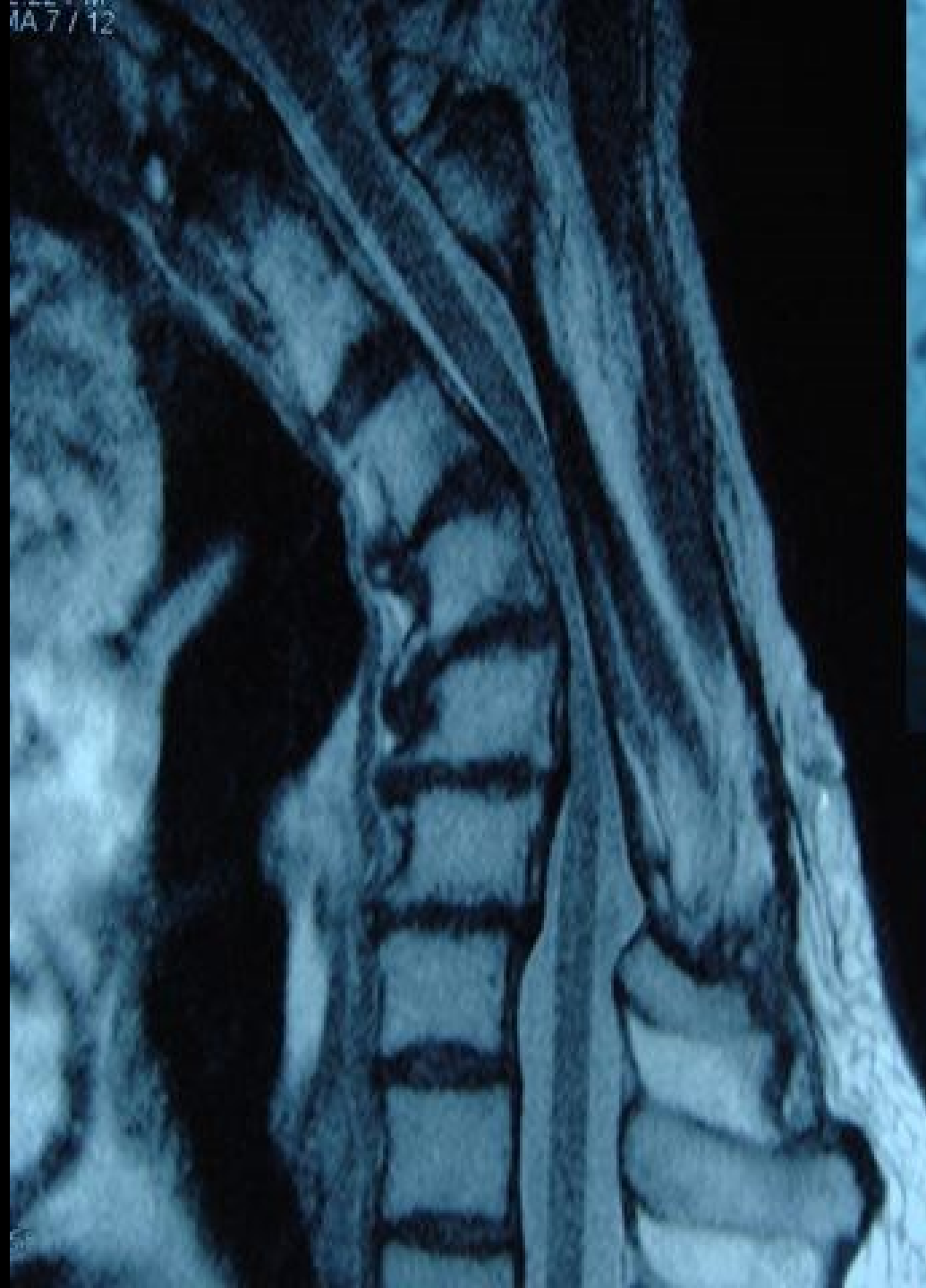


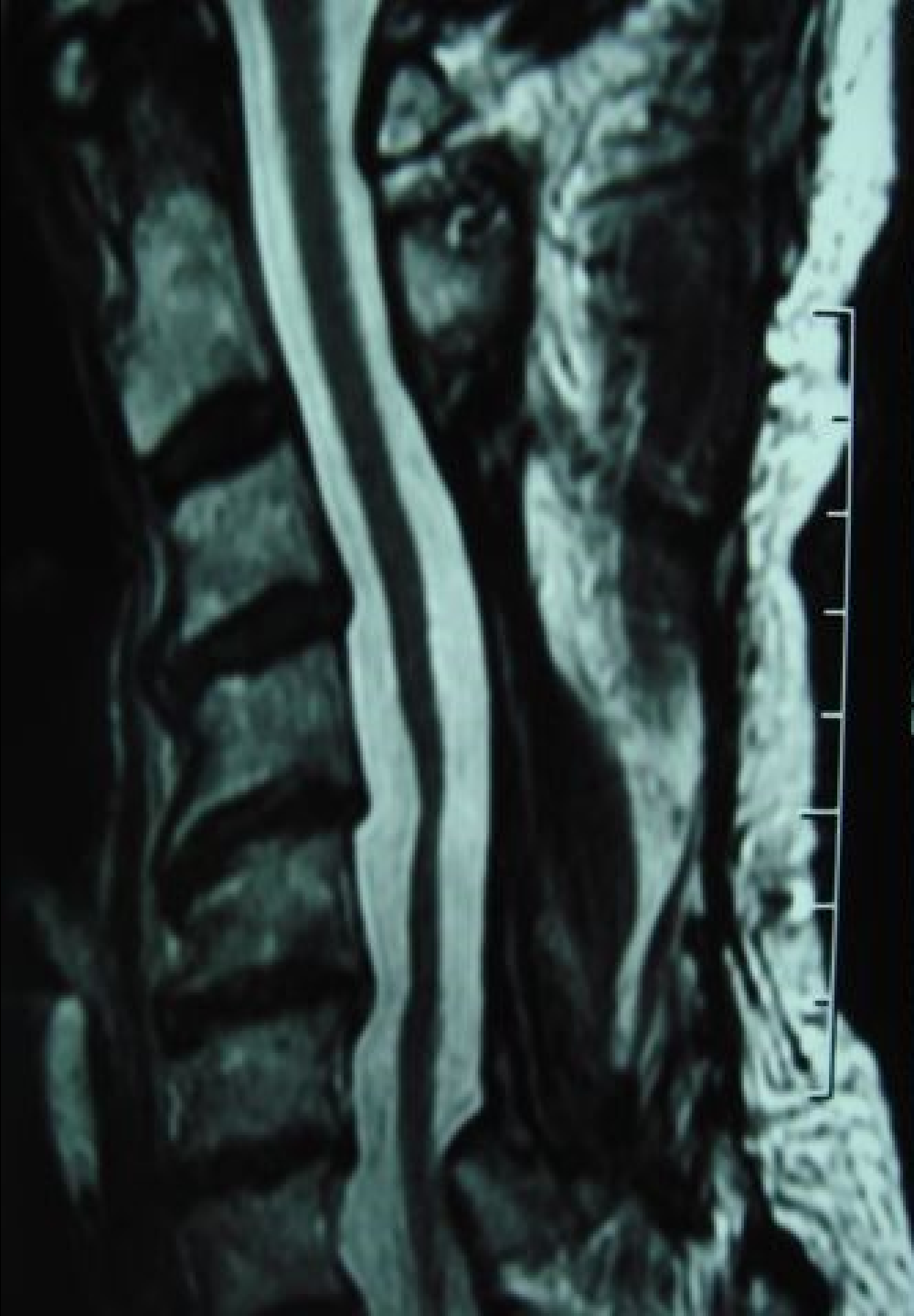
CSM

**Repetitive Trauma
and
Tethering / Distraction**





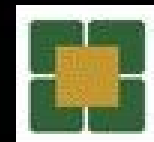


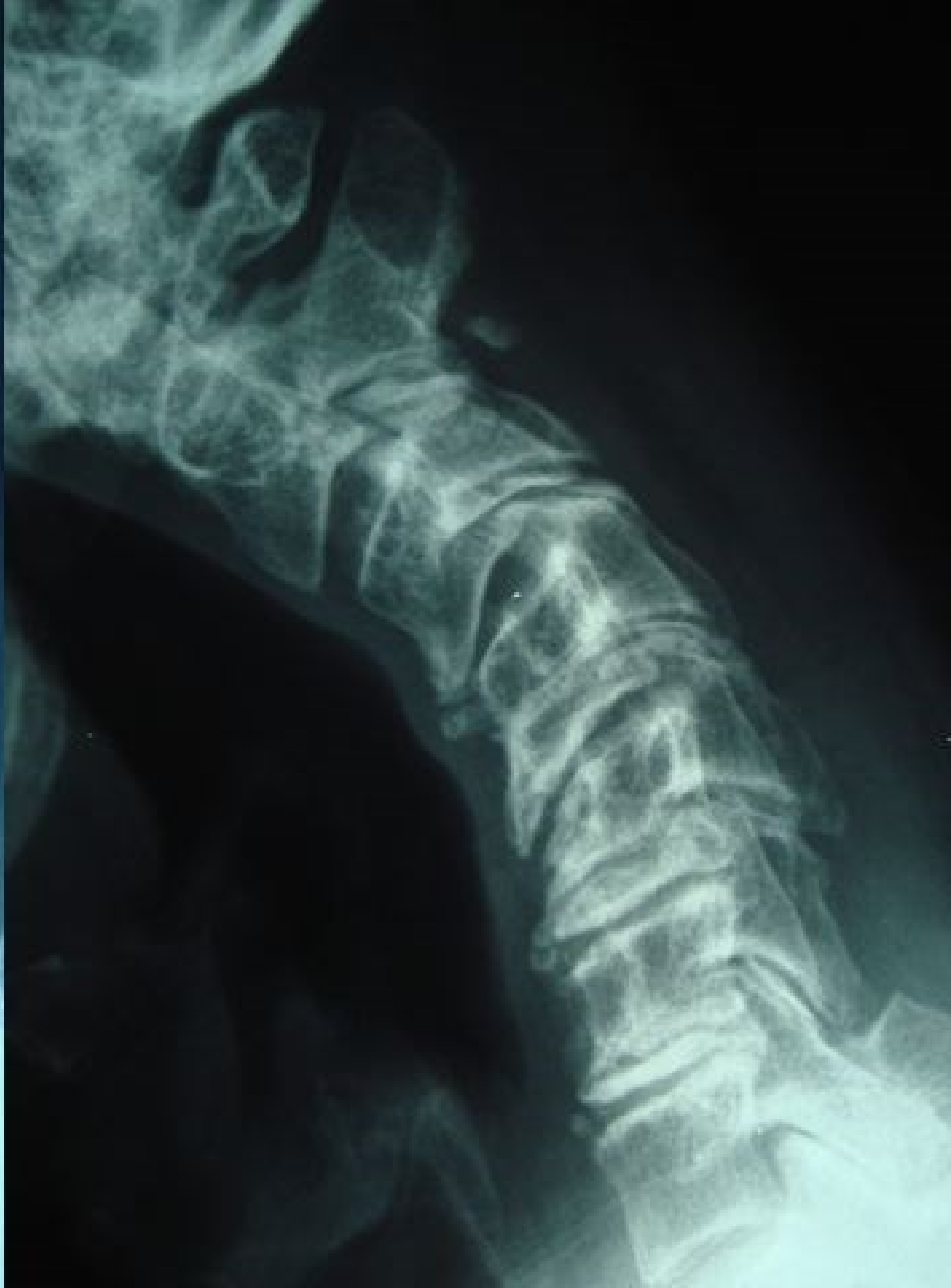


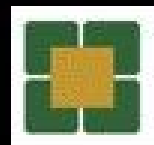
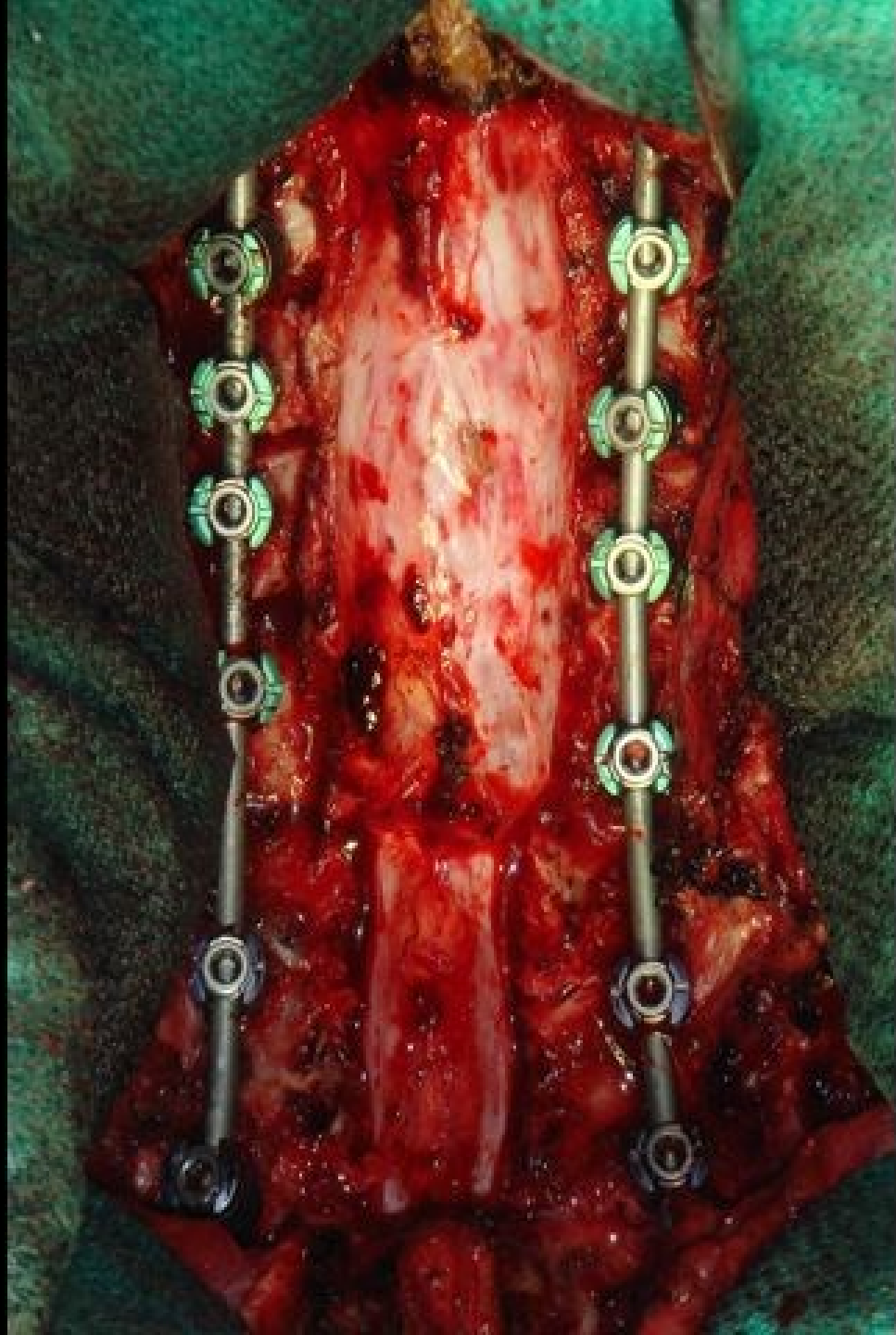


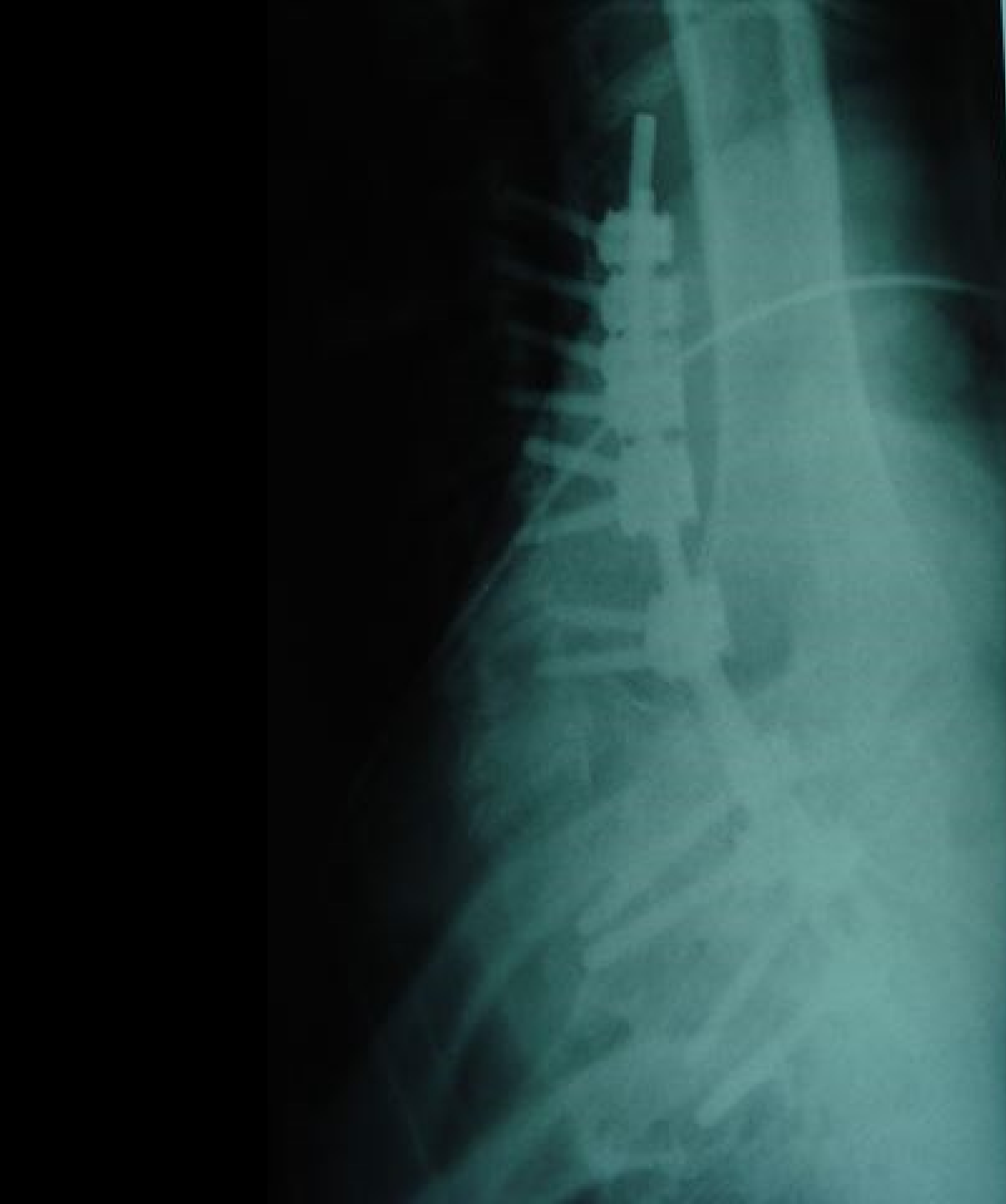
**Could Correct
Dorsally**

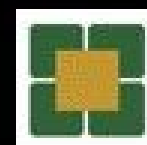
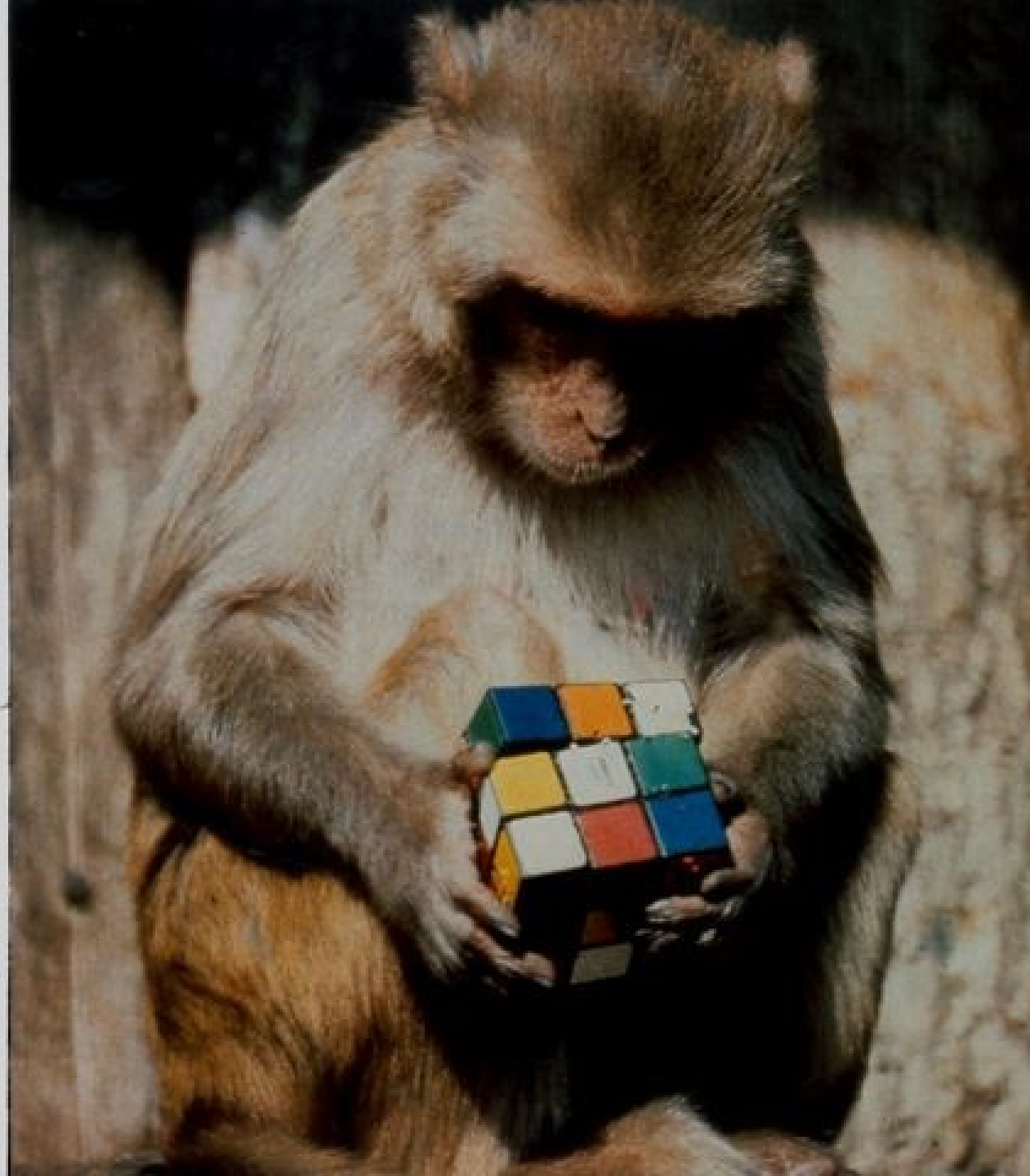
Because Relaxed/Released



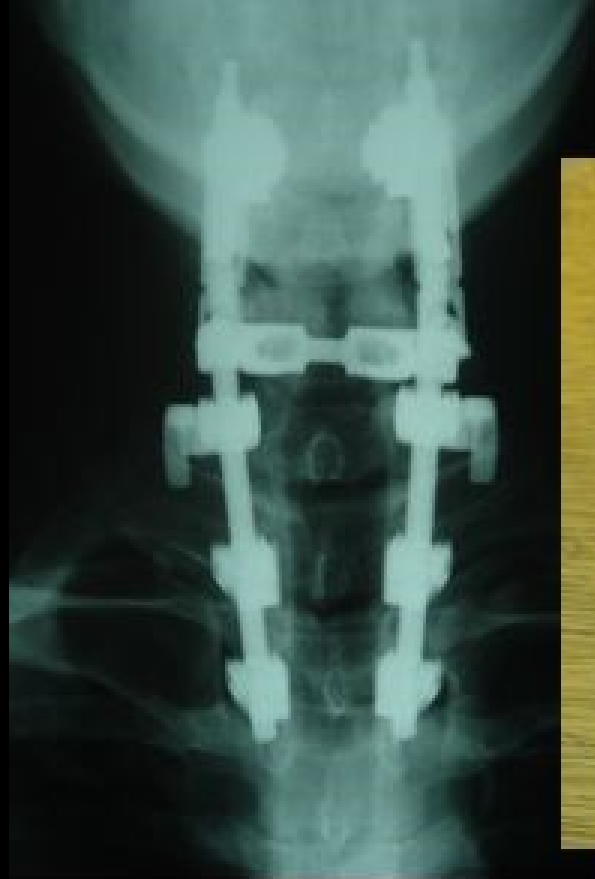


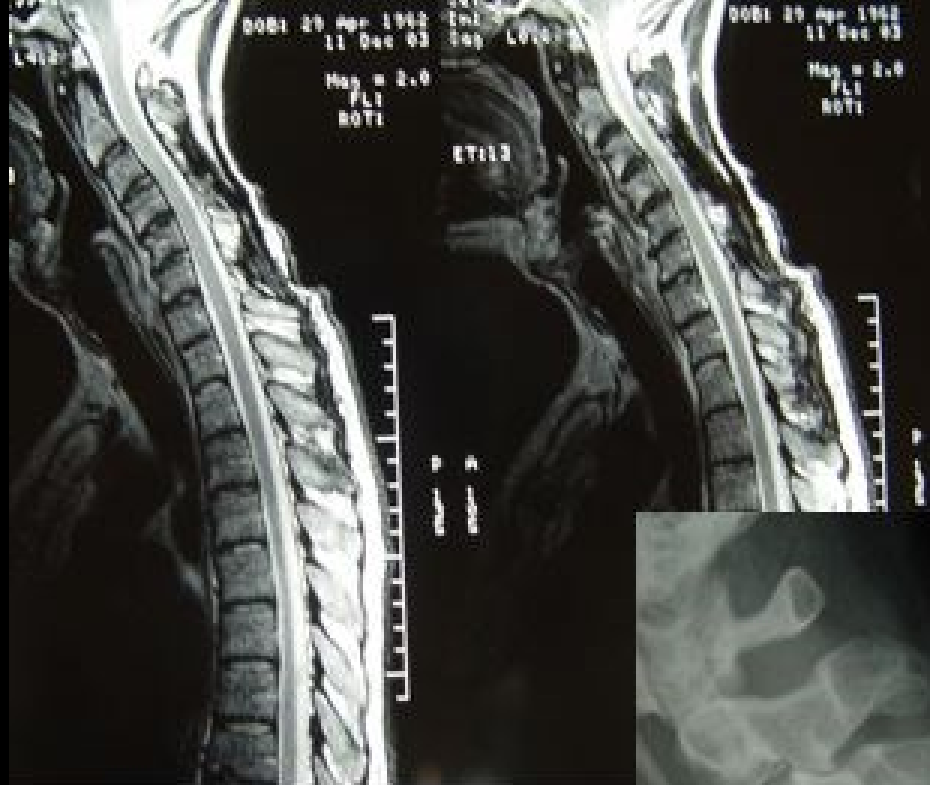






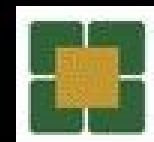








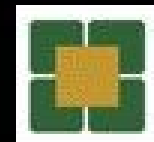
**Could Not Correct
Dorsally**



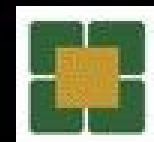


**Dorsal
Releasing (eg Osteotomy)
Fixation**

**Ventral
Releasing
Fixation
Correction**

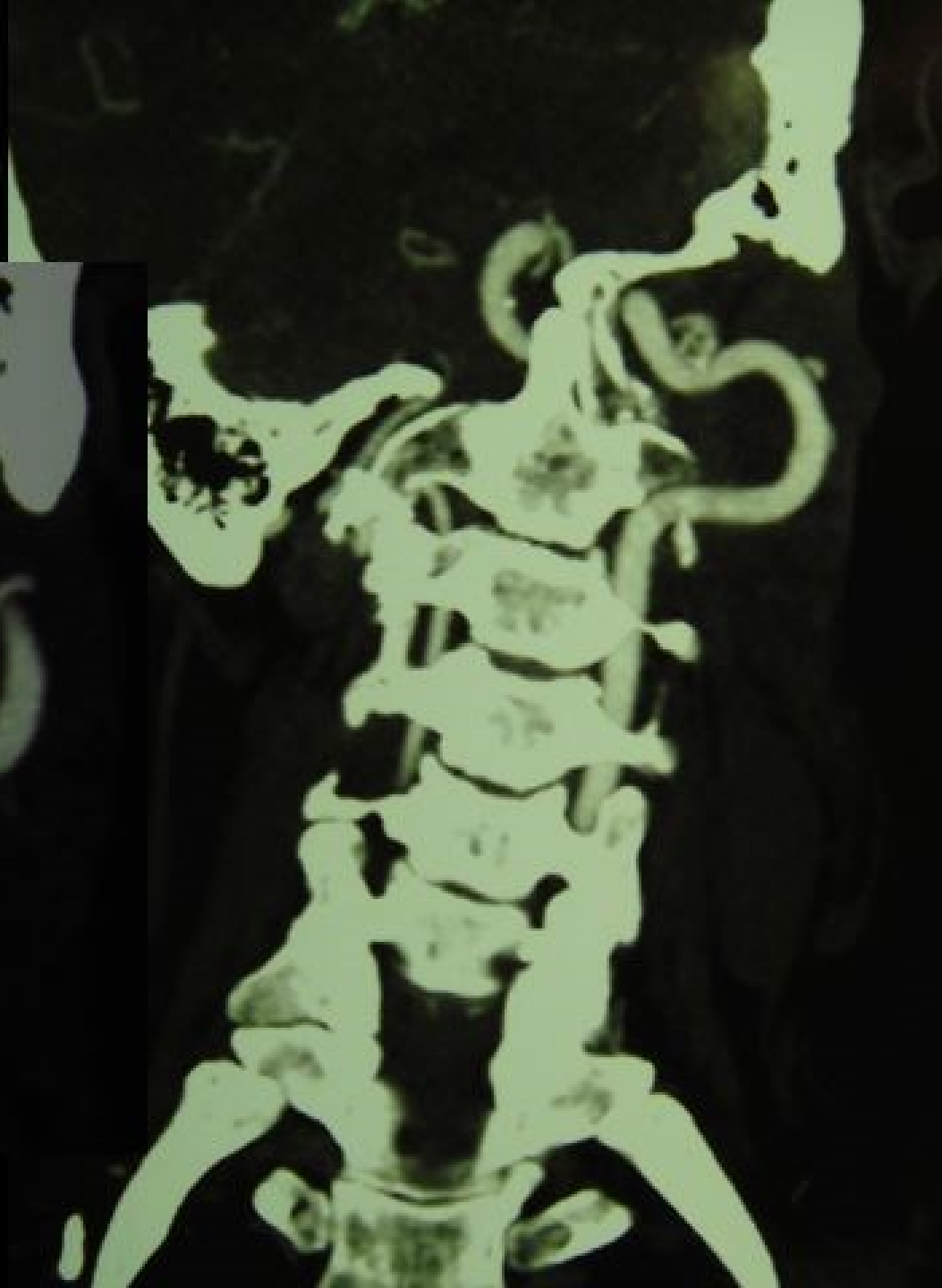
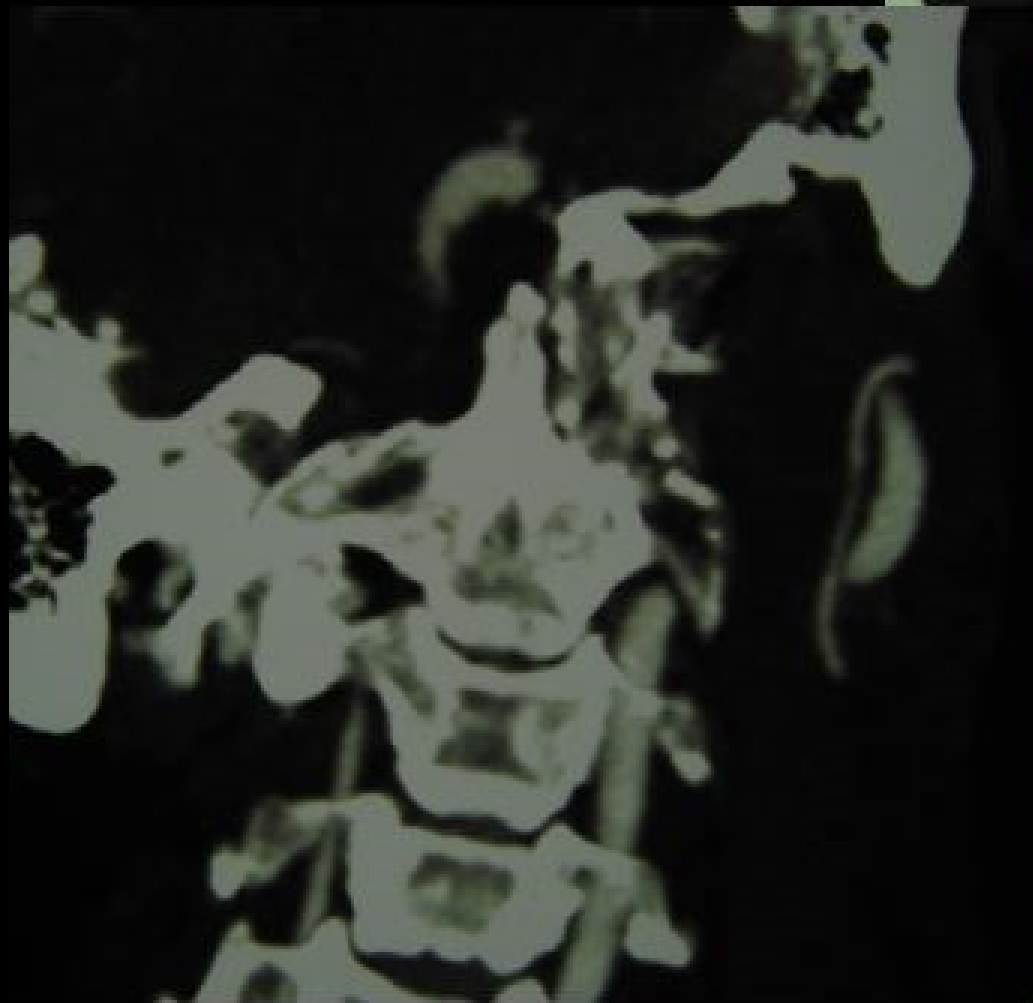


**Correct
at
Another Level**

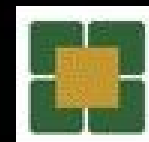






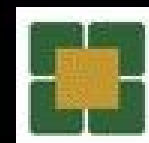
















F

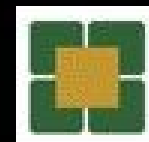
JNT-KAREN-F
026523
JAROTD 0.75 800
and Clinic CT4
Esp 54
p-2006

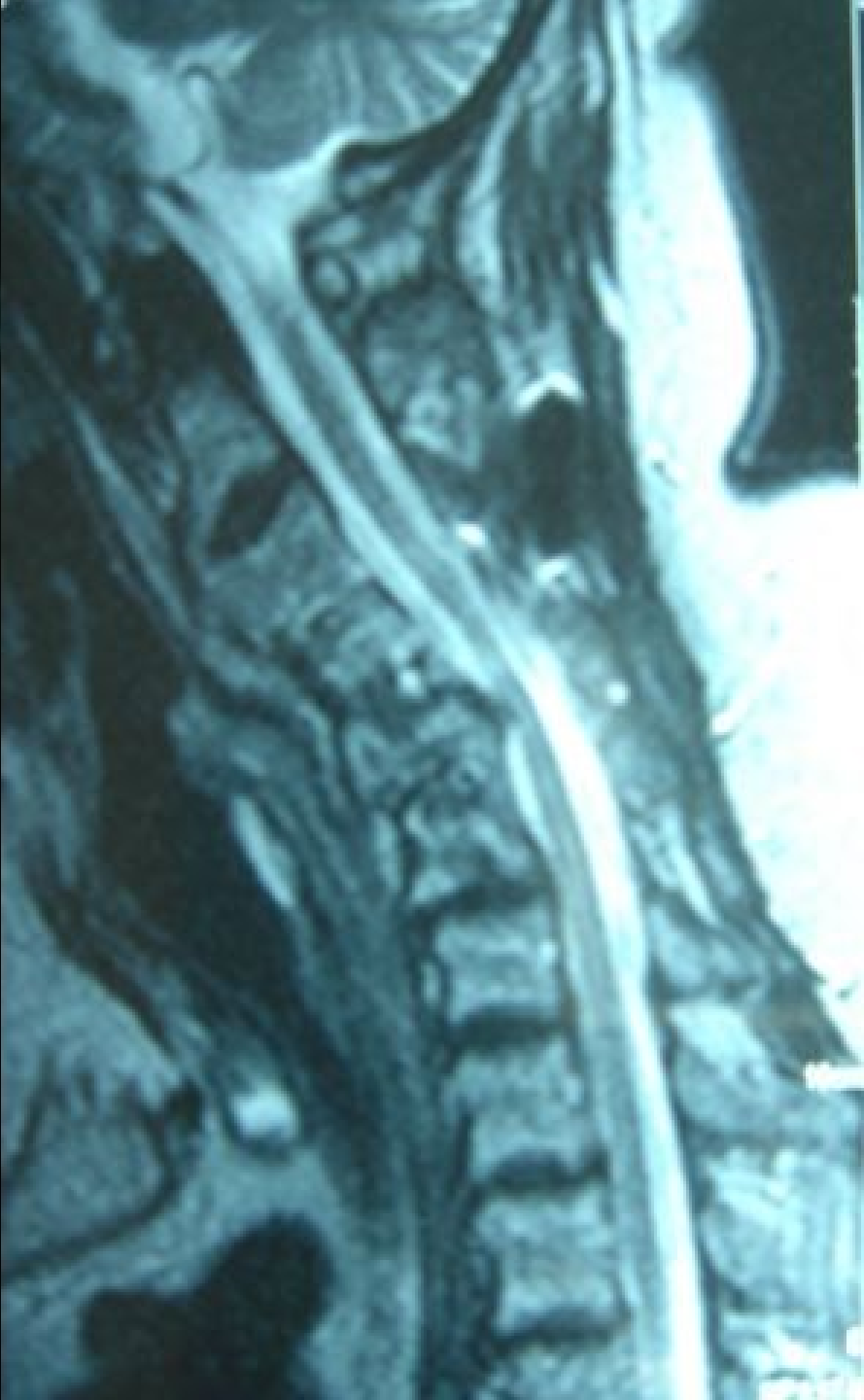
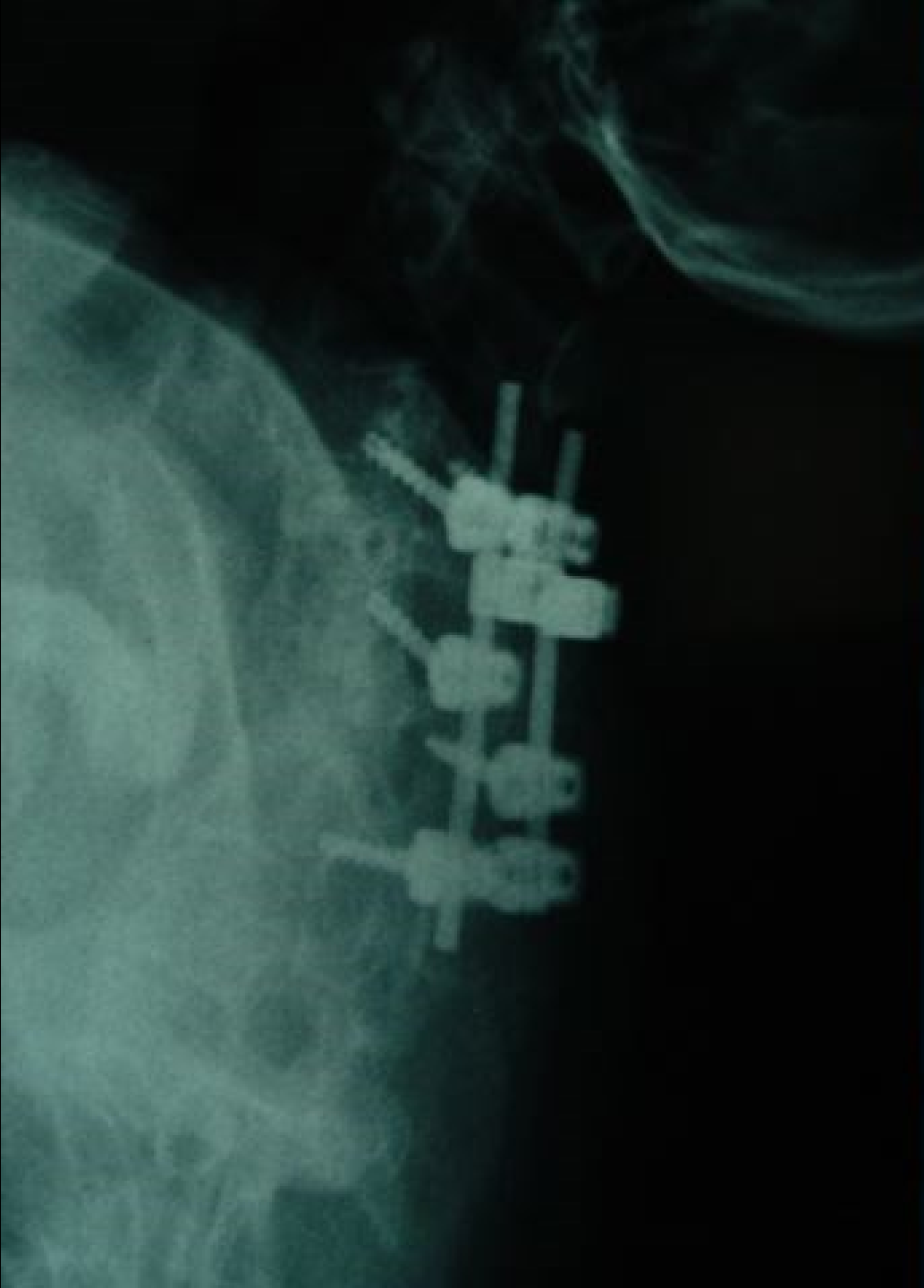


DUMONT-KAREN-F
004326523
CERVICAL 0.75 800
Cleveland Clinic CT3
Rotation 16
18/Oct/2006
CT



STAGING?

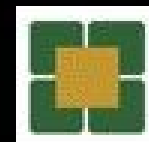


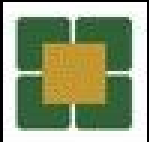


02 IMA 33
IPR 2

Spin: -90
Tilt: 0







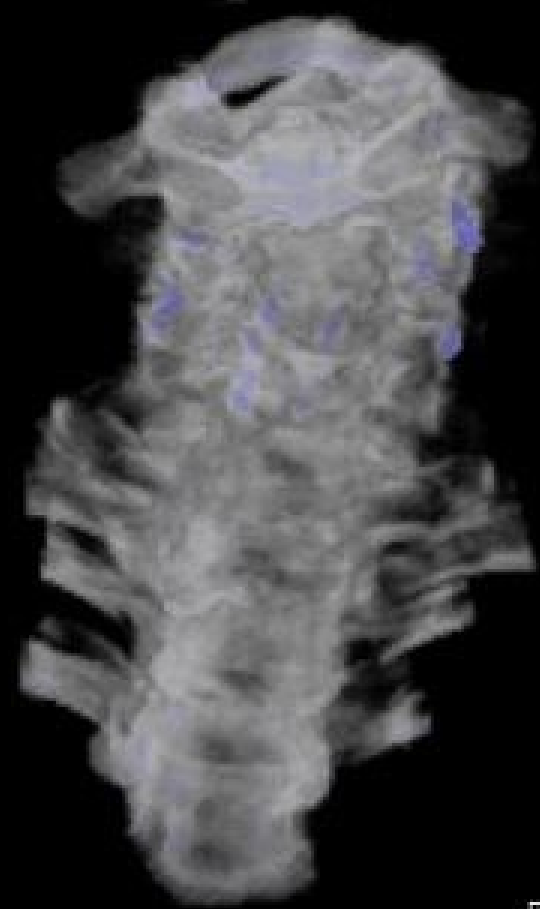


H

SHADE/SURF
LAO/RAO 1
CRAN/CAUD -4

R

L

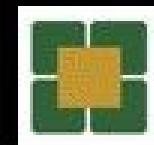


GT 0.0
kV 120
mA 123
SL 0.75
SP 0.7
PX 0.47
512x512x224 [12 bit]

B 100 W 2925
O 80 C 1569

A

F

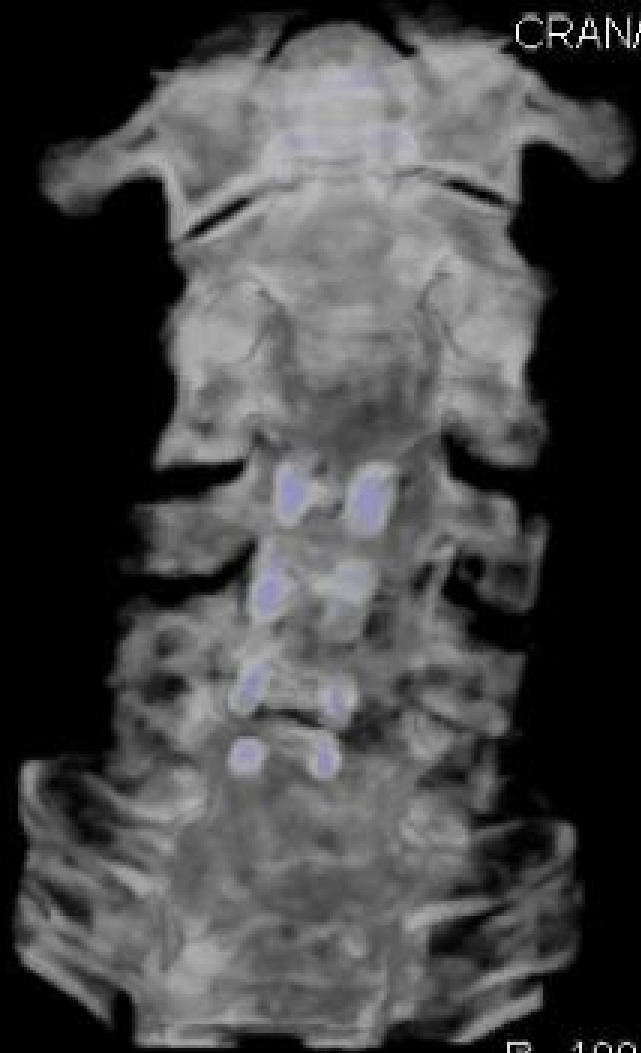


H

RES/SHADE/SURF
LAO/RAO 1
CRAN/CAUD -4

R

L

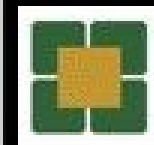


GT 0.0
kV 140
mA 96
SL 0.75
SP 0.7
PX 0.24
512x512x208 [12 bit]

B 100 W 2906
O 80 C 1572

A

F



H

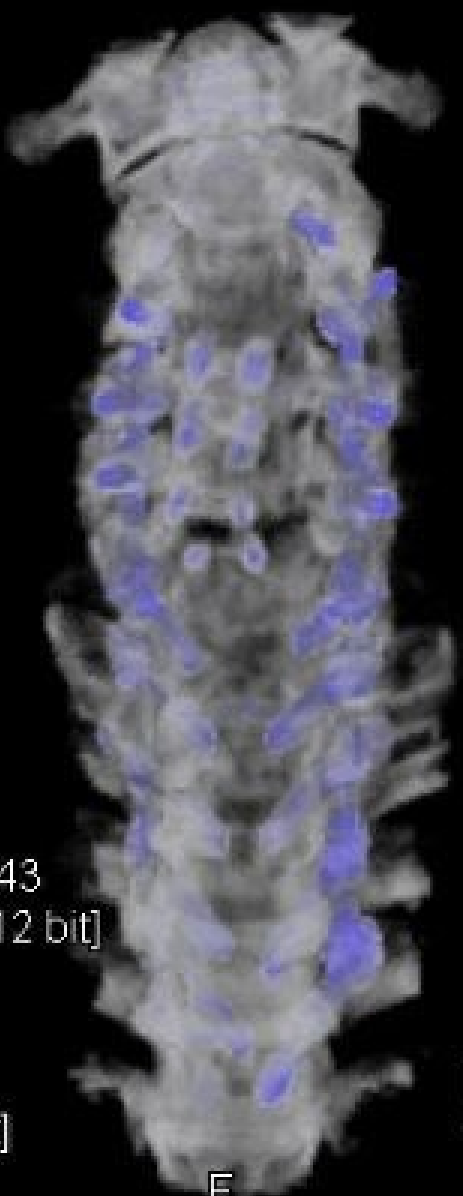
RES/SHADE/SURF
LAO/RAO 1
CRAN/CAUD -4

R

L

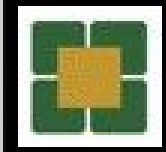
GT 0.0
KV 120
mA 187
LD VX 0.43x0.43x0.43
LD 512x512x1058 [12 bit]
SL 1
SP 0.4-1.2
PX 0.43
512x512x574 [12 bit]

F



A

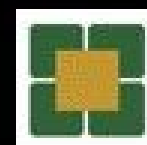
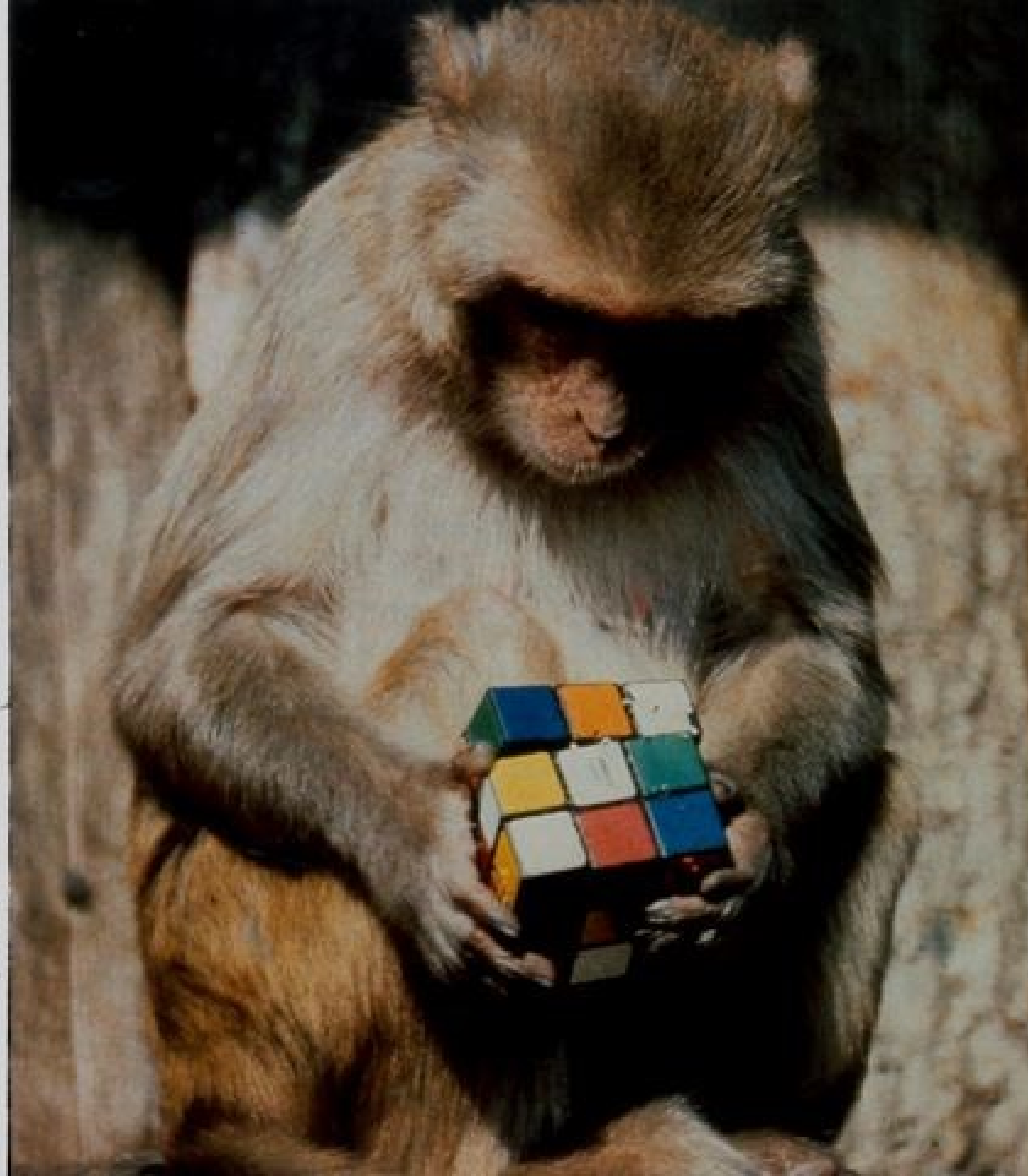
B 100 W 2927
O 80 C 1571



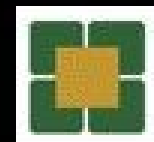




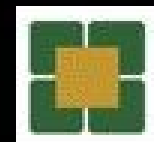


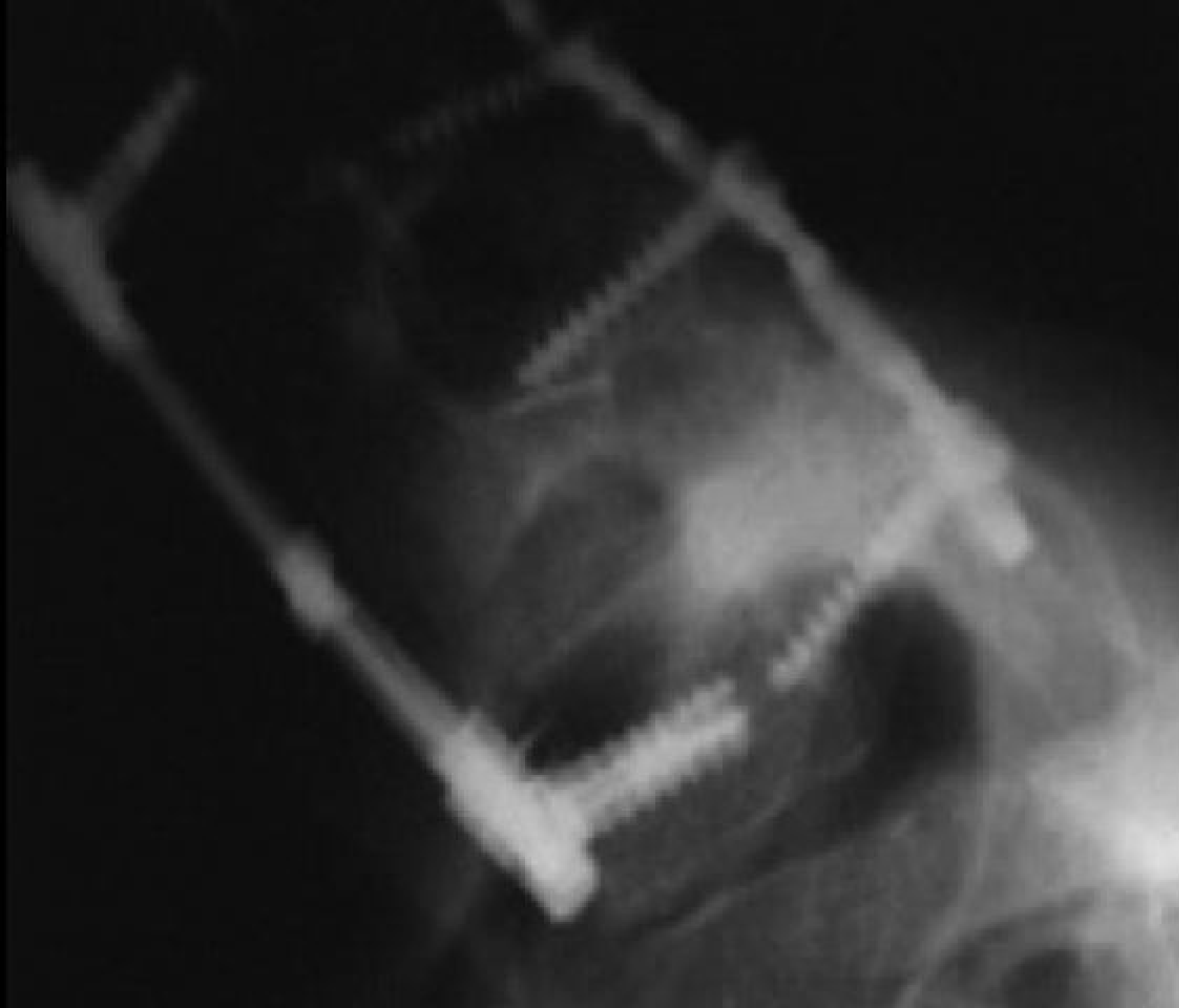


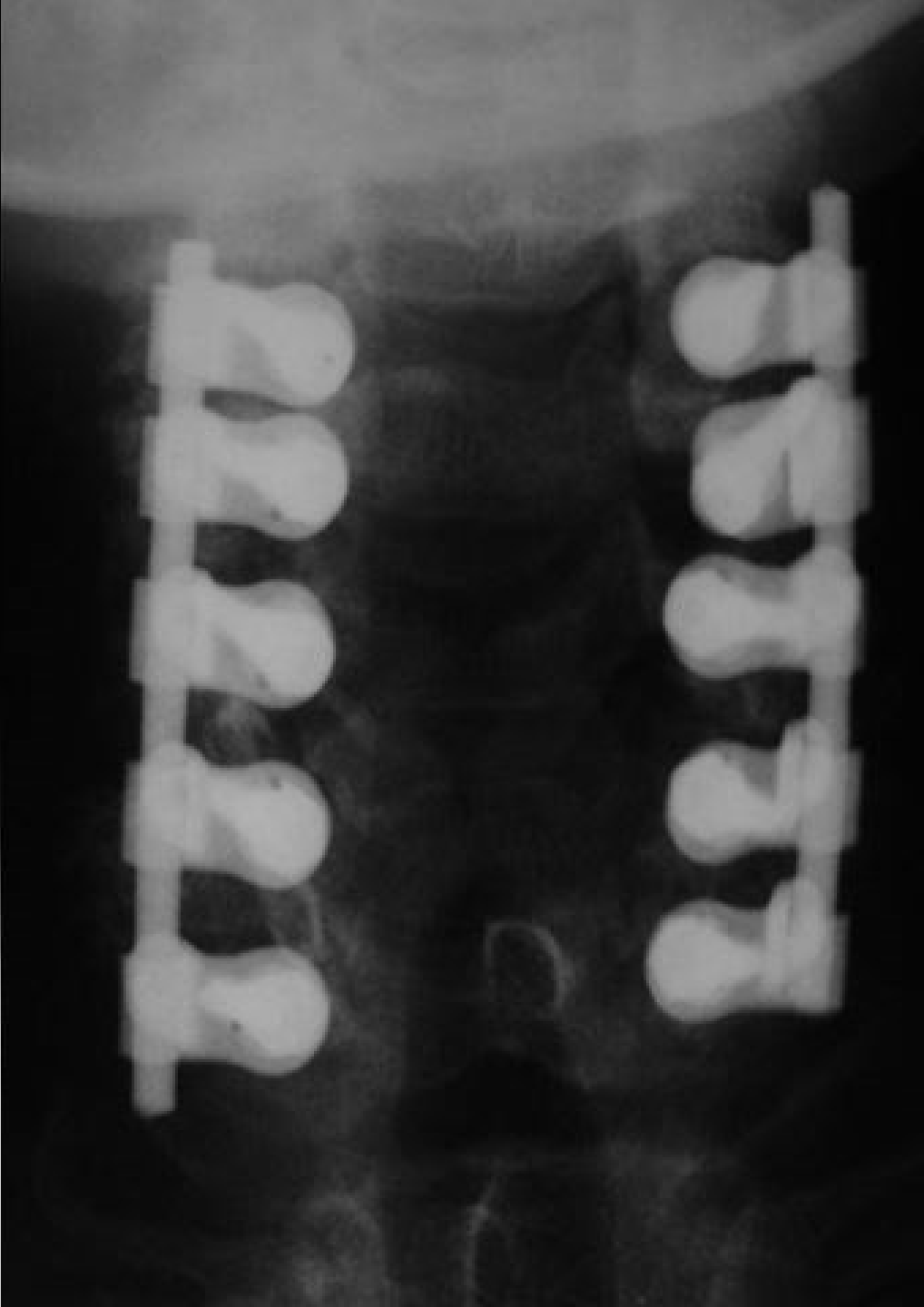
**Not Long
Enough**

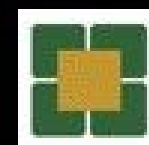


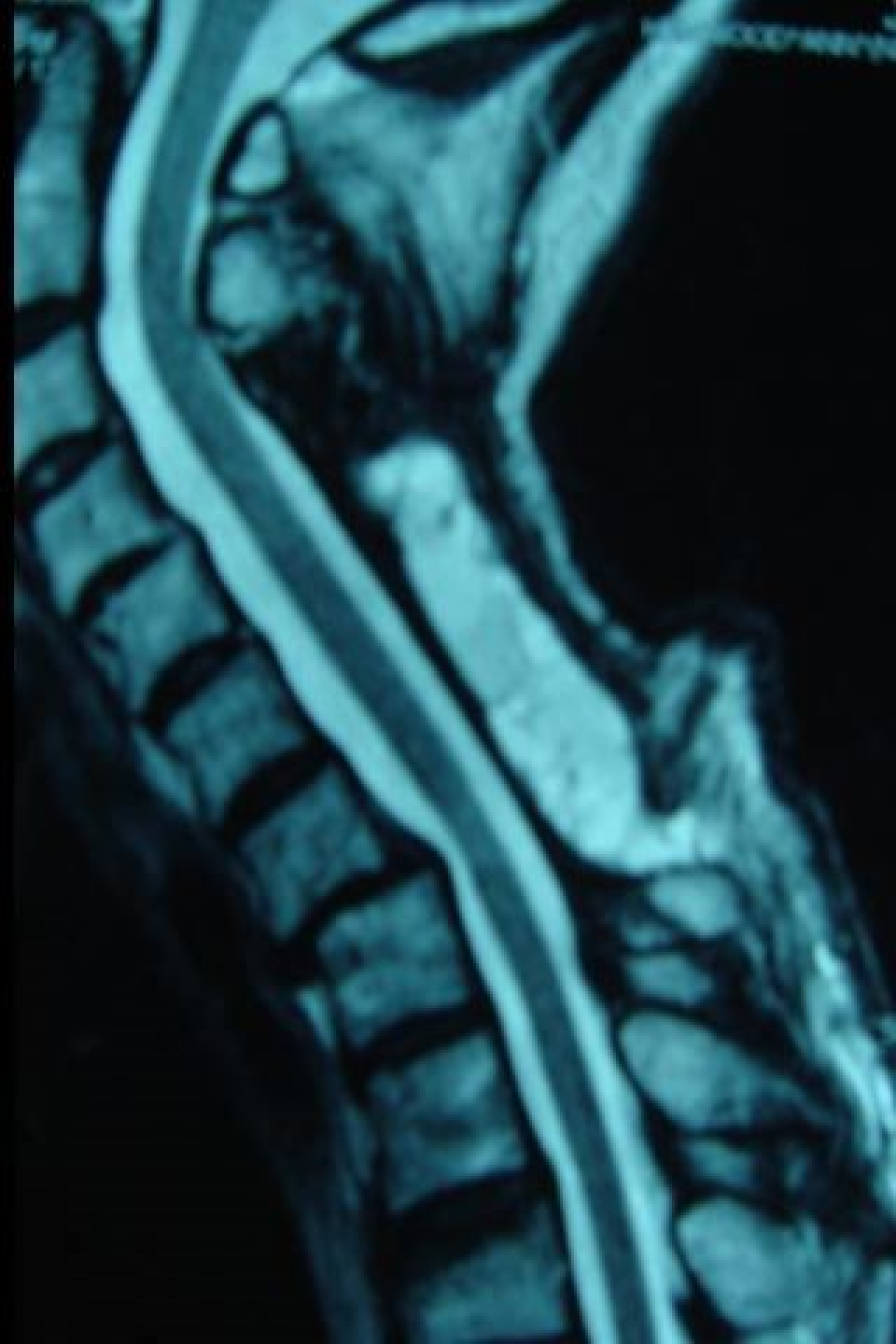
Ended at C7



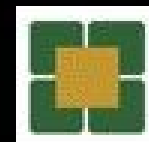








**Orientation
of
C7 – T1 Disc
Interspace
or
Pathology**



0211 D

0211 P

MORTON, ROBERT
226618

M 55 125 lb

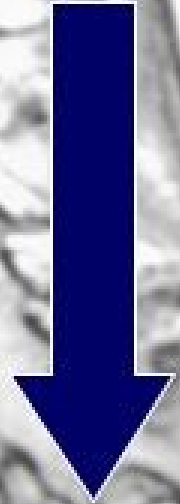
Mode: Multi
PSD: VE

St: Iap
FC VB

TR: 2000.0
TE: 30.0 16

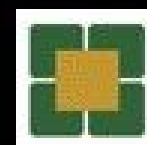
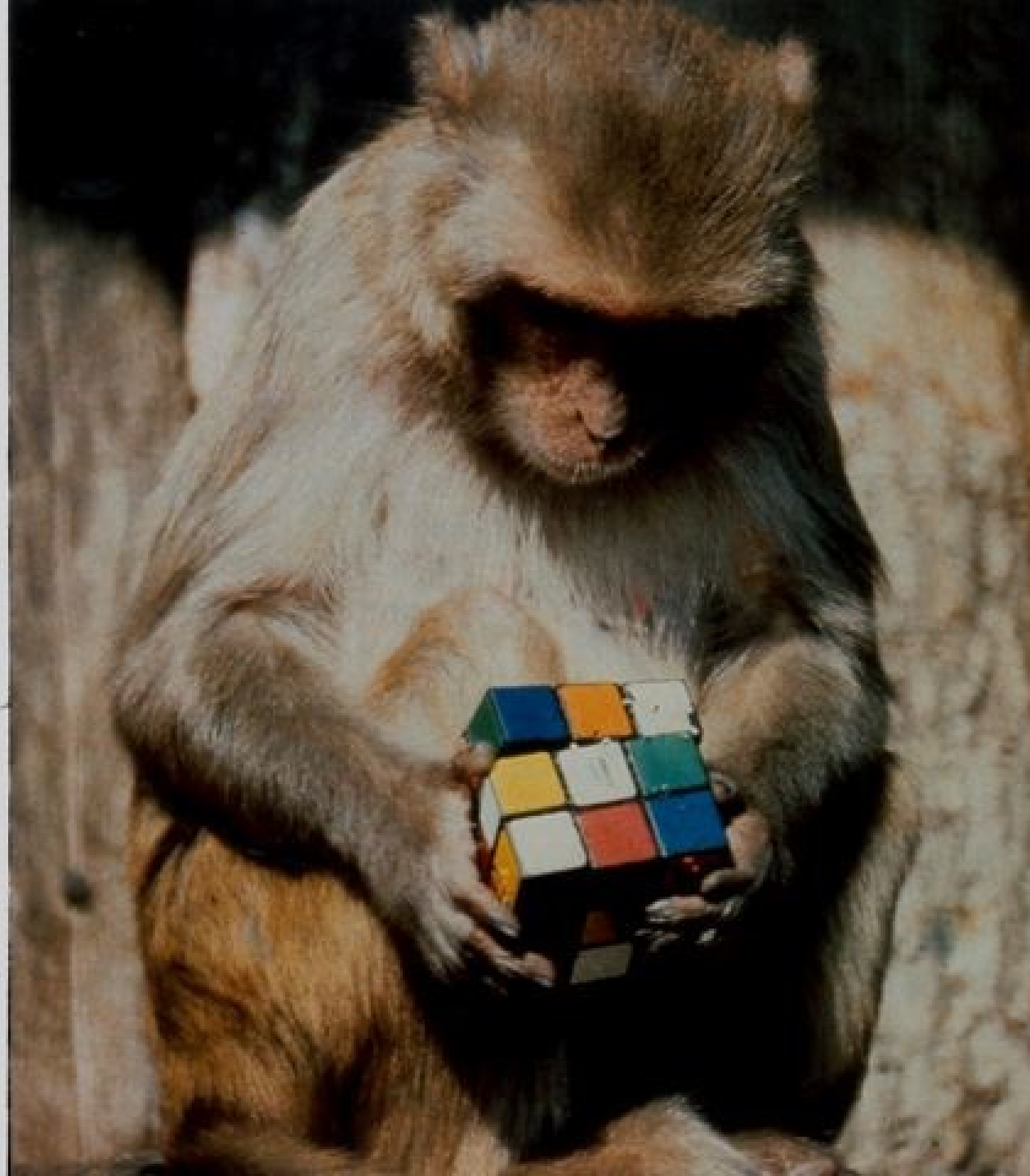
256x192/2.0

FOV: 24 cm
Thk: 4.0
Imgs: 16/12
AP NEC



T61

3 3'92

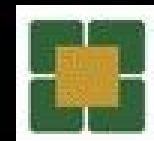


**Laminectomy
Ventral Multi-Level Corpectomies
Across the CTJ**

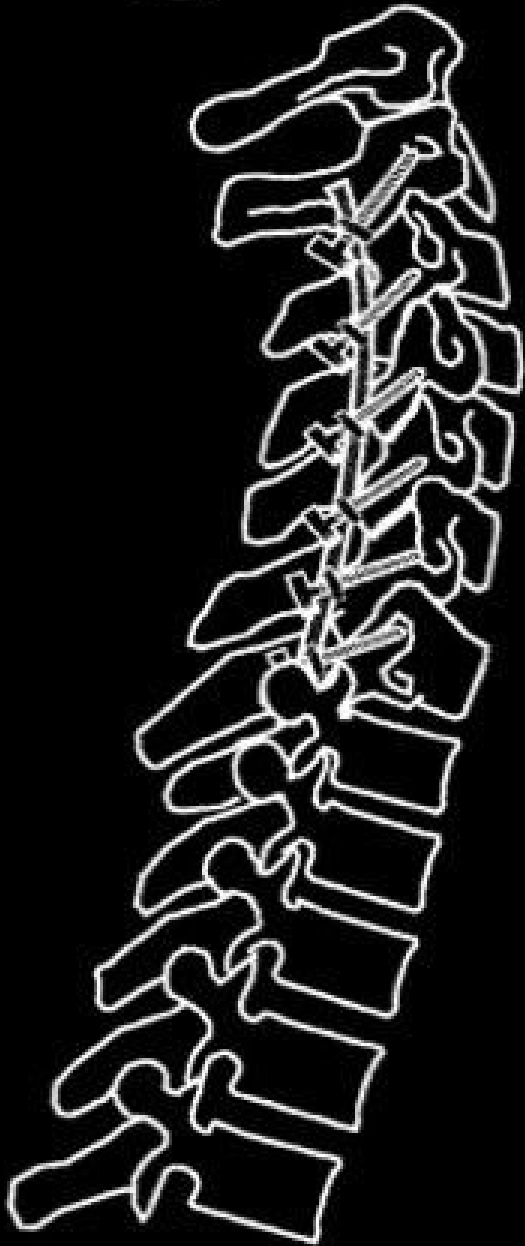
Associated with Failure

**Supplemental Dorsal Fixation to
T1,2**

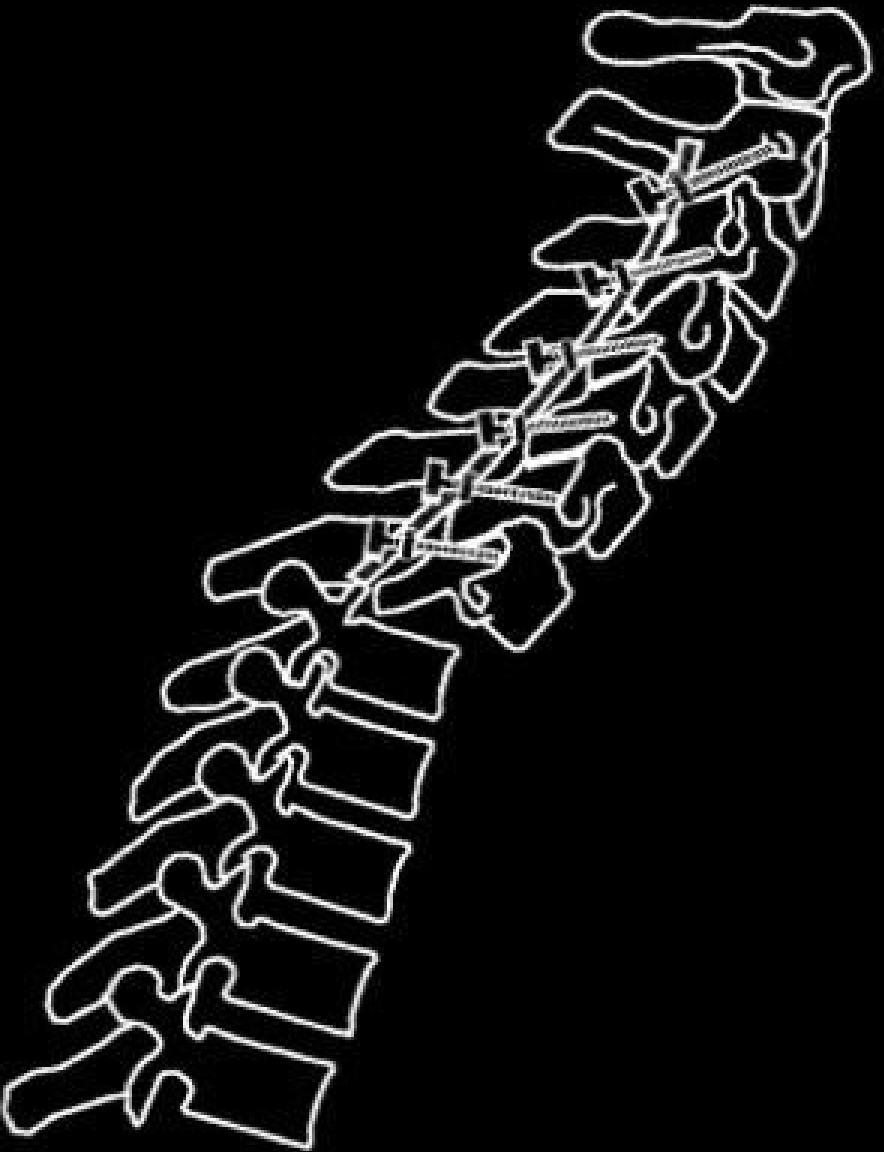
**Steinmetz, et al JNS Spine 2006
(14/593 patients structurally failed)**

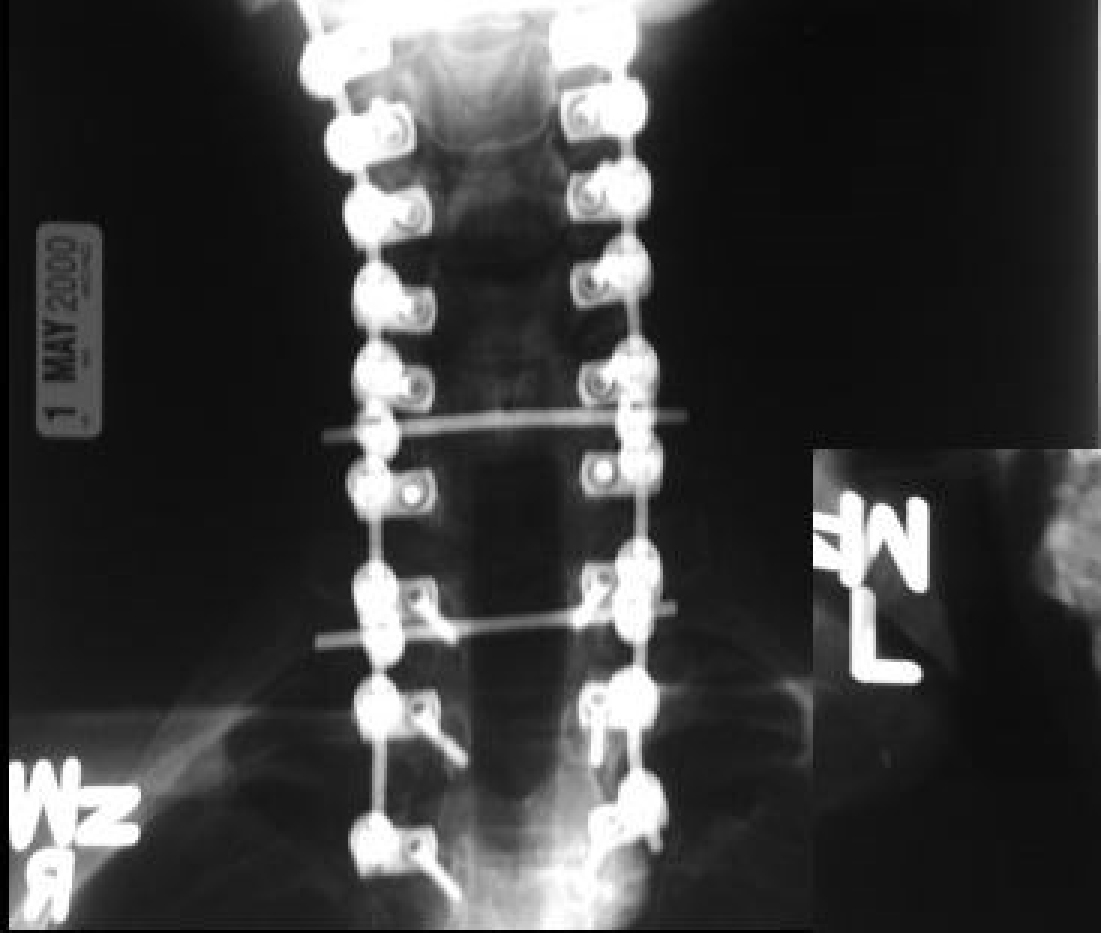


A

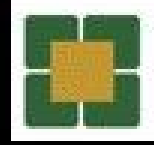
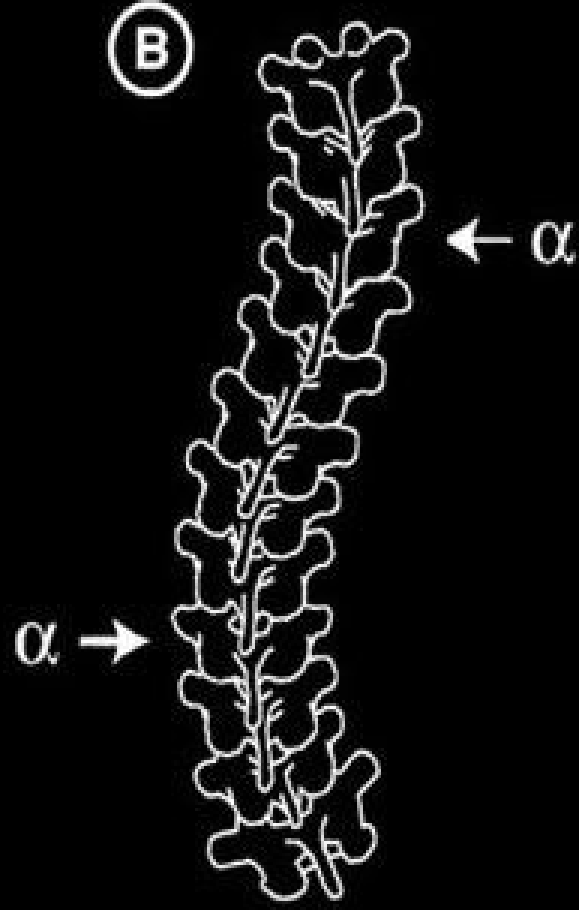
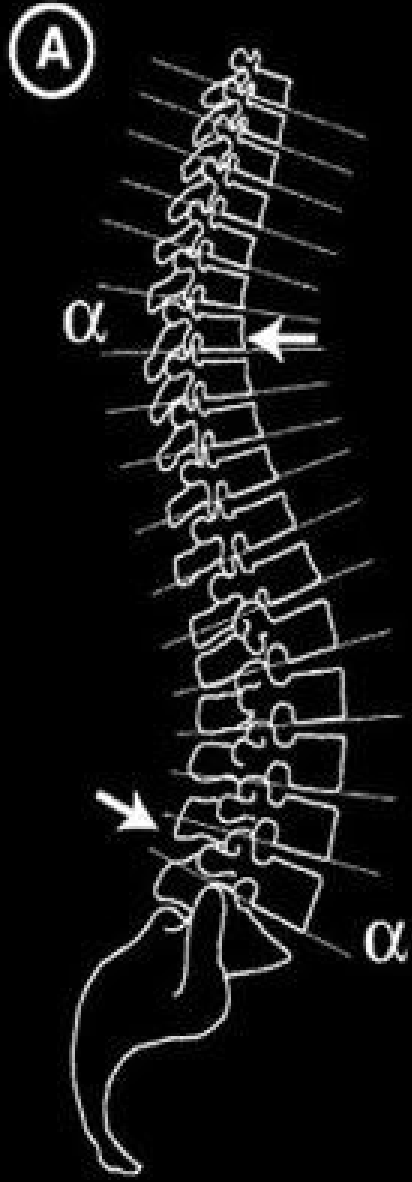


B

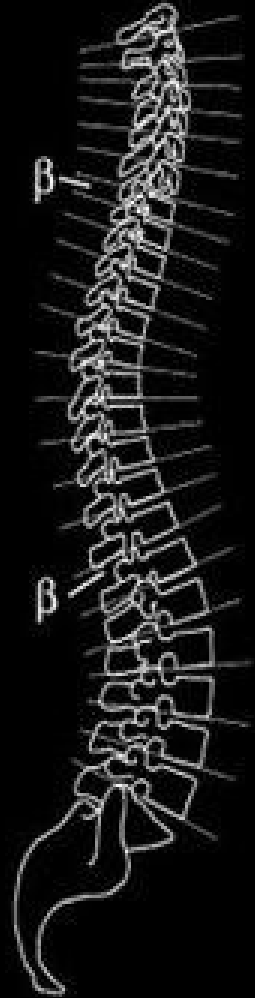




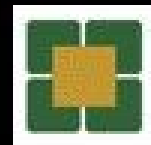
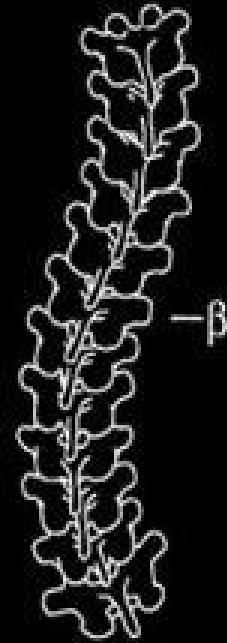




A



B



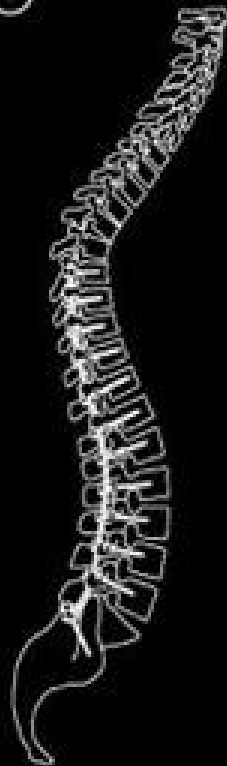
A



B



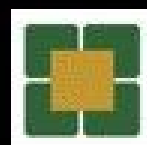
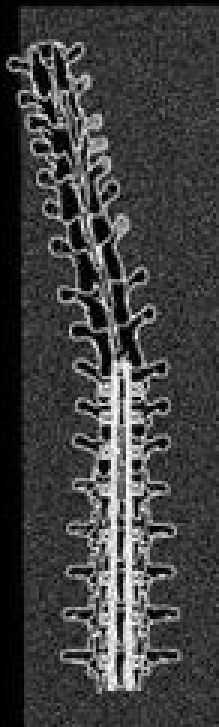
C



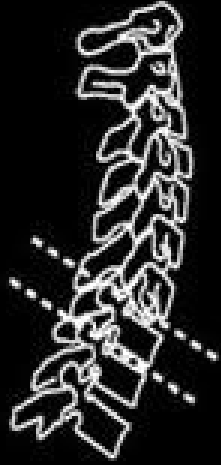
D



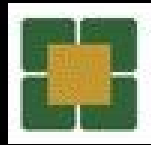
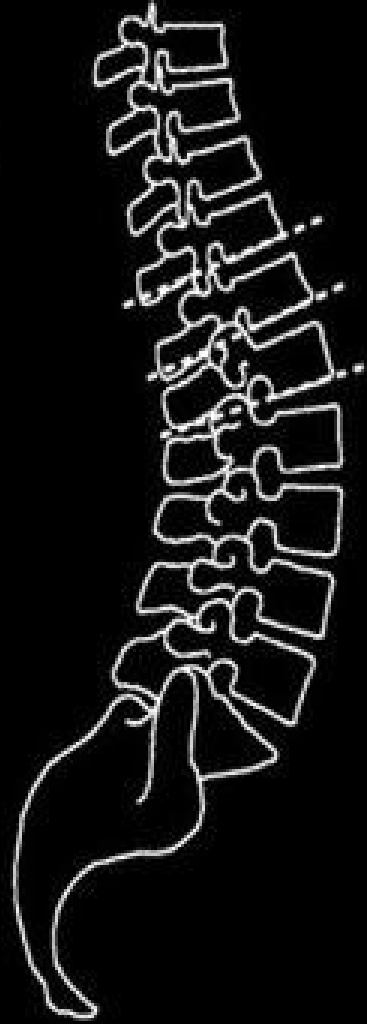
E



A



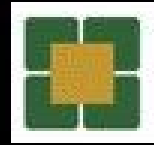
B



A



B



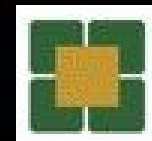
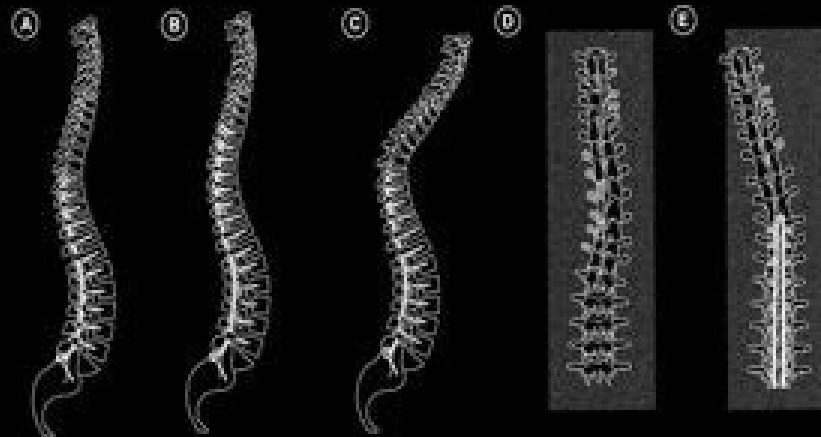
Where to End??

Good

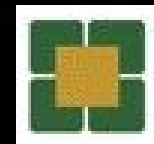
- C5, C6 (from R)
- T1, T2 (from R)
- T3-5 (from C)
- T10-11 (from R or C)
- L1 (\pm from R)
- L5, S1, I (from R)

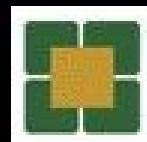
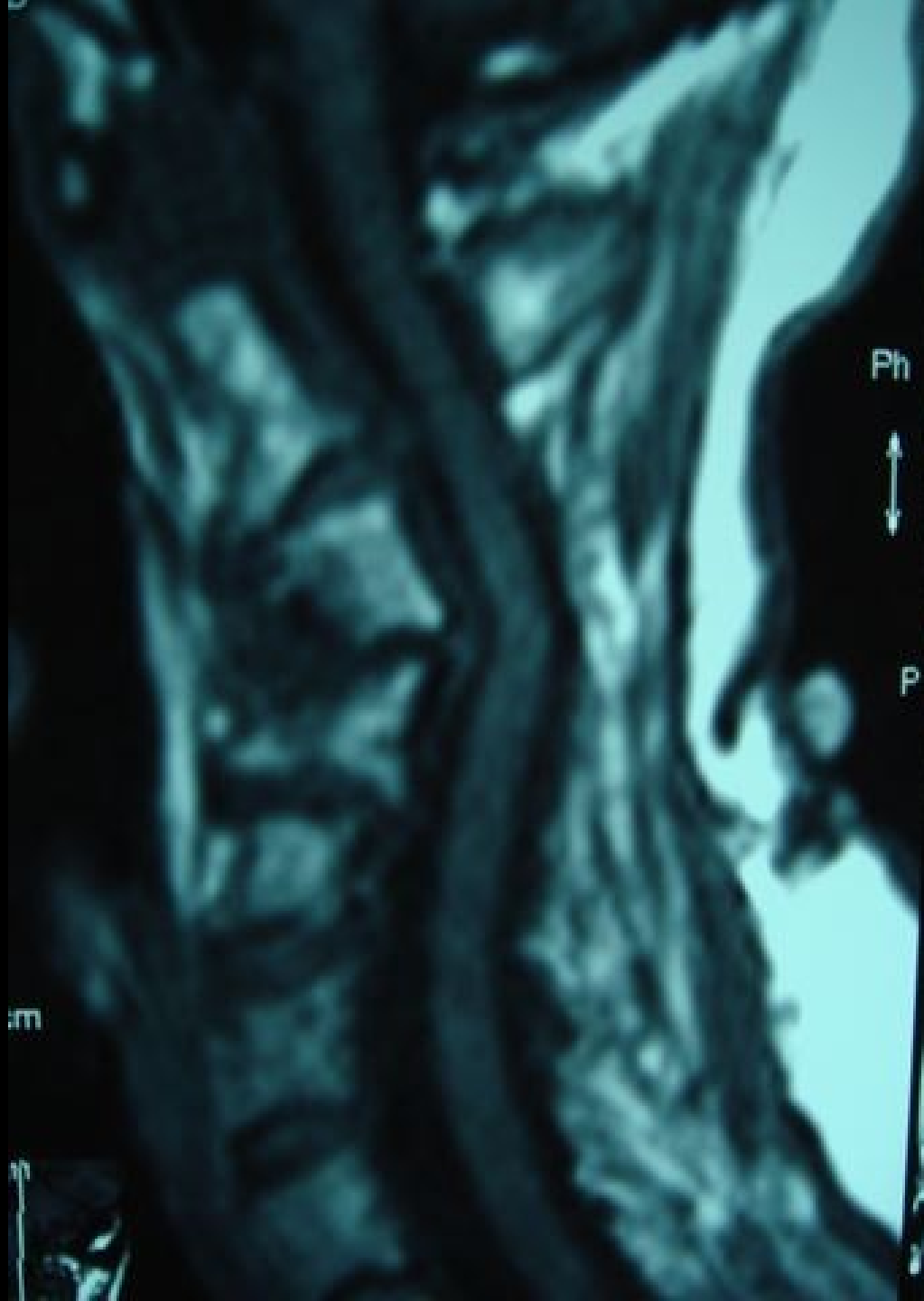
Bad

- C7 (\pm from R)
- T1 (from C)
- T 6-8 (from R or C)
- T12, L1 (from R or C)
- L3-4 (from R)
- L5 (from C if deg or def)

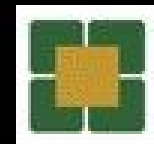


It's a Matter of Balance





Capital Motion and Posture

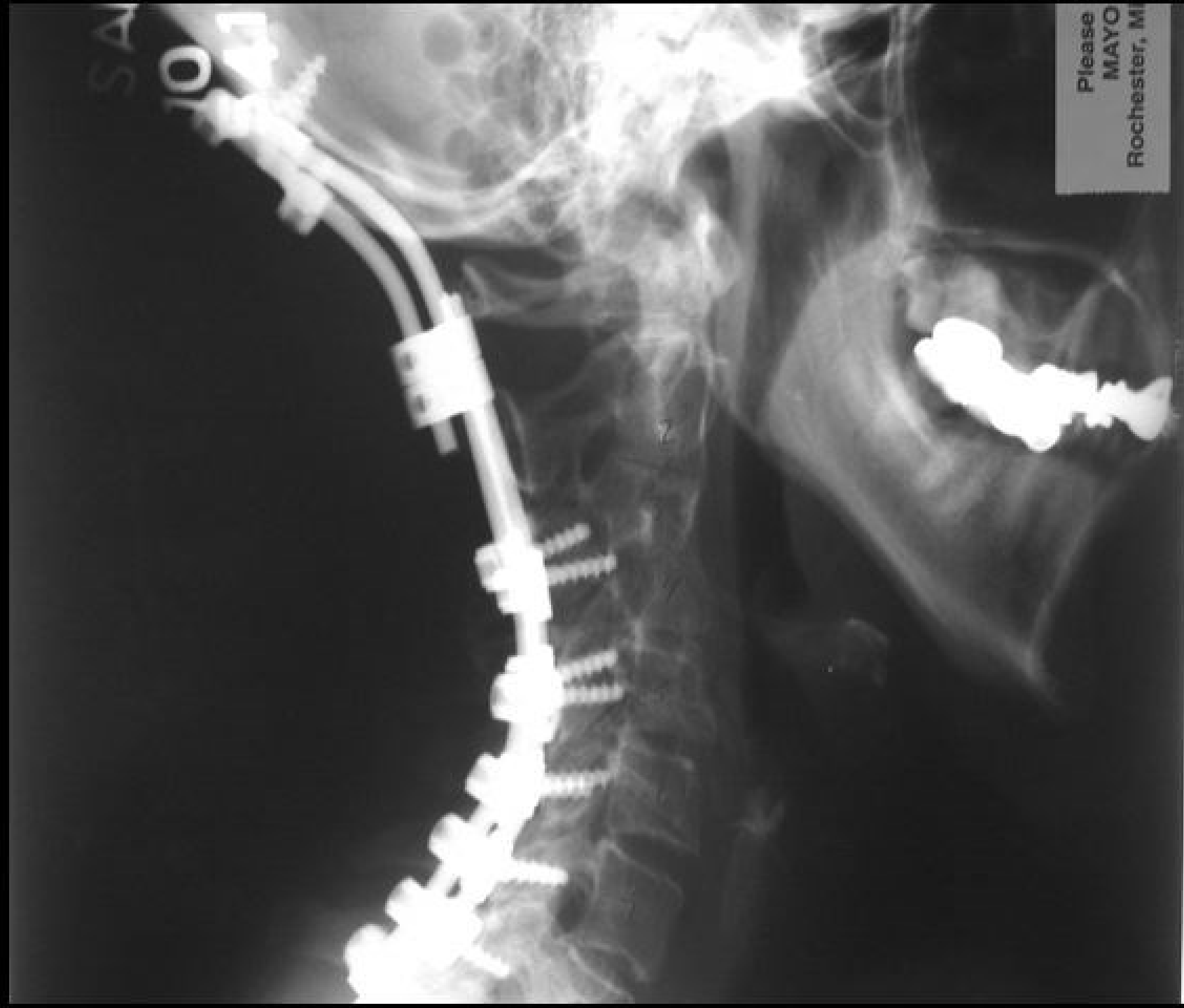




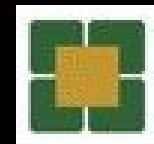
SAN

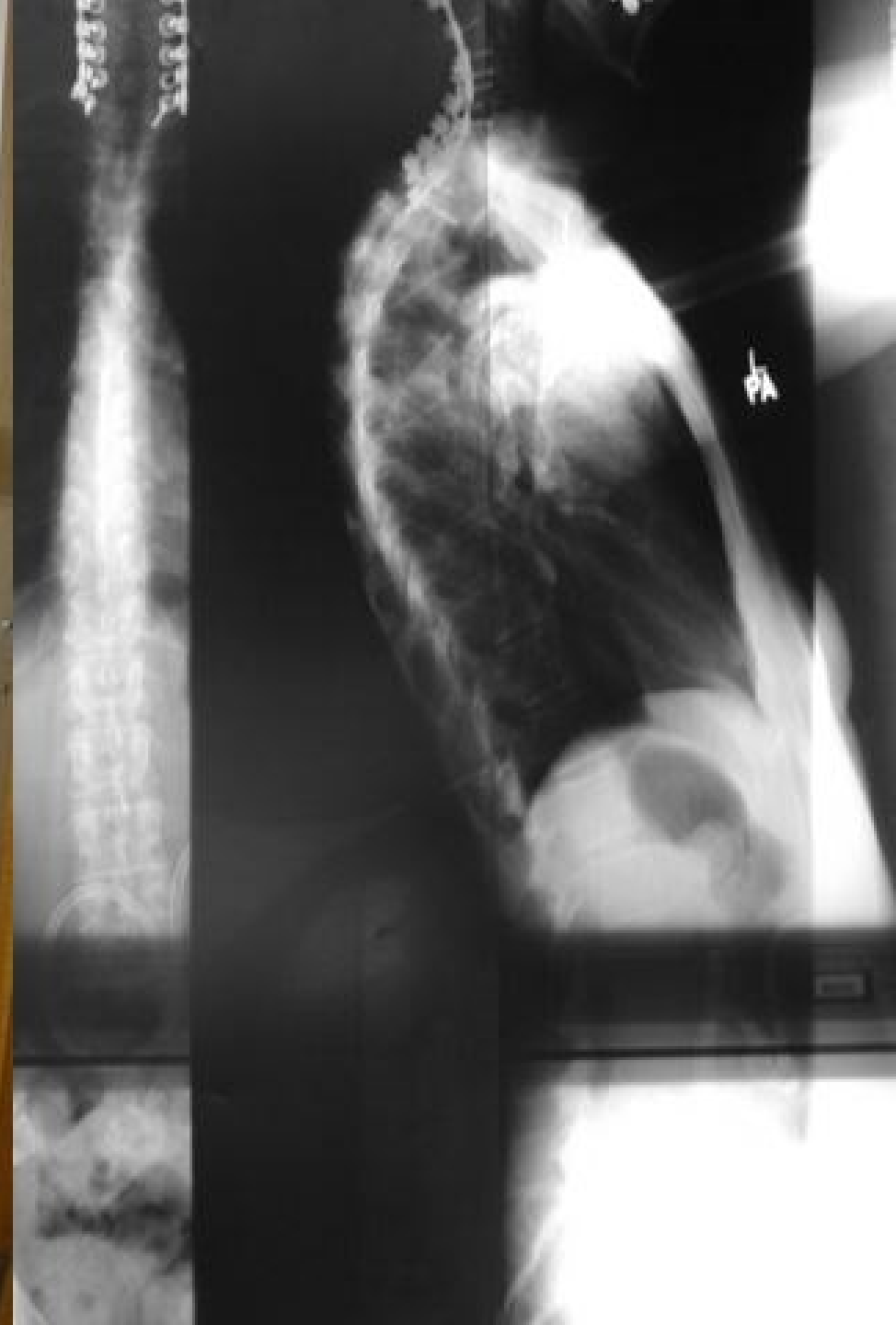
JOH

Please
MAYO
Rochester, MI

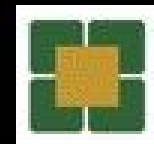


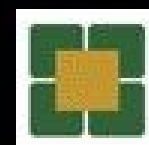
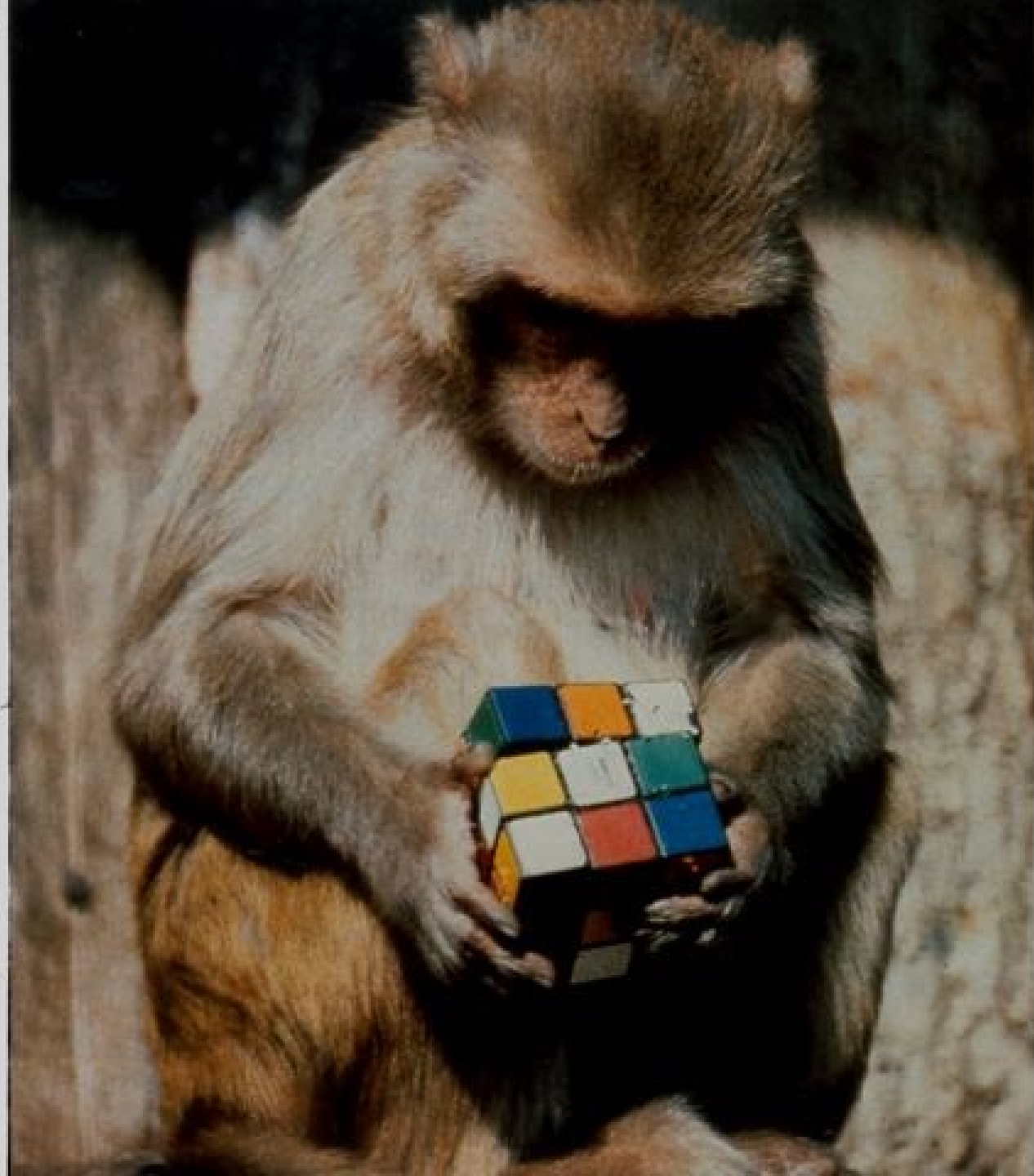
Back Pain





**Think
Globally**







THANK YOU

