KRONİK BEL AĞRISININ KONTROLÜNDE CERRAHİ İŞLEMLER

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VKV Amerikan Hastanesi



İTÜ Fen Bilimleri Enstitüsü

Kronik bel ağrısı ?

- Konservatif tedavi seçeneklerinden fayda görmeyen
- 6 aydan uzun semptomları olan
- Ağrıdan dolayı günlük yaşam aktivitesi engellenen
- Psikolojik rahatsızlığı olmayan
- İş gücü kaybı ön planda olan (olmayan değil !)

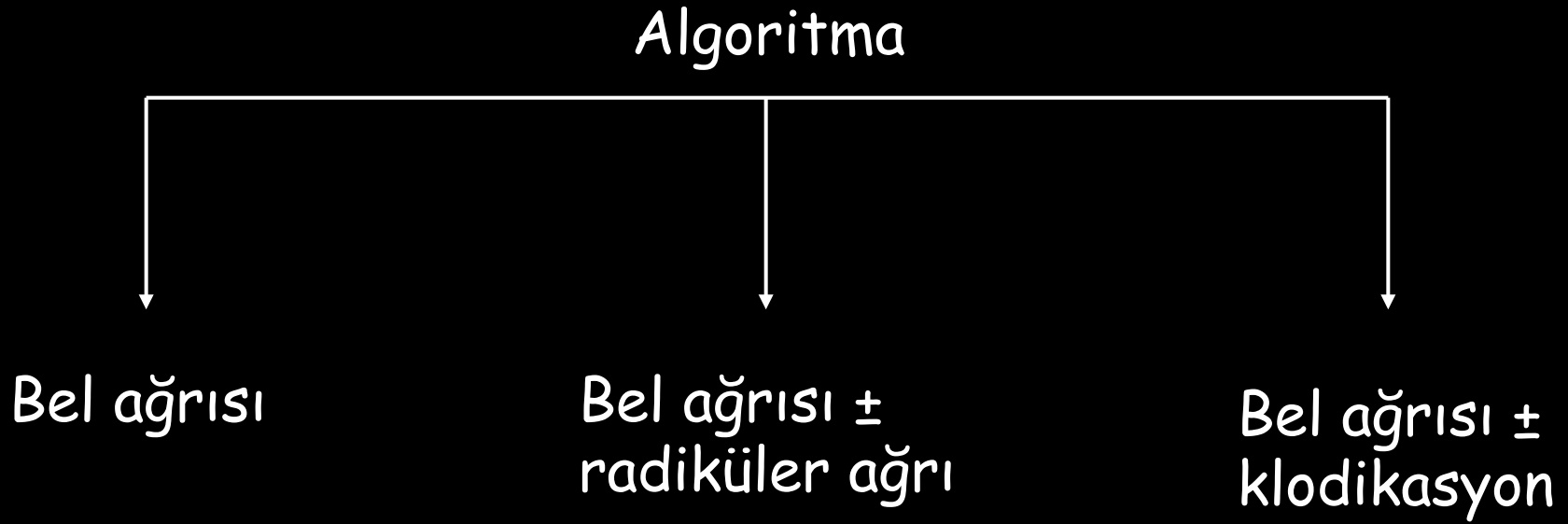
Değerlendirme

- Klinik
- Görüntüleme
- Etyopatogenez
- Olgu analizi

Klinik

- Nörolojik defisit ?
  - radiküler ağrı/ klodikasyon
  - motor güç kaybı
  - duysal defisit
  - kauda equina semptomları
- Sistemik hastalık ?
- Psikososyal durum ?

Klinik değerlendirme sonucu



Görüntüleme

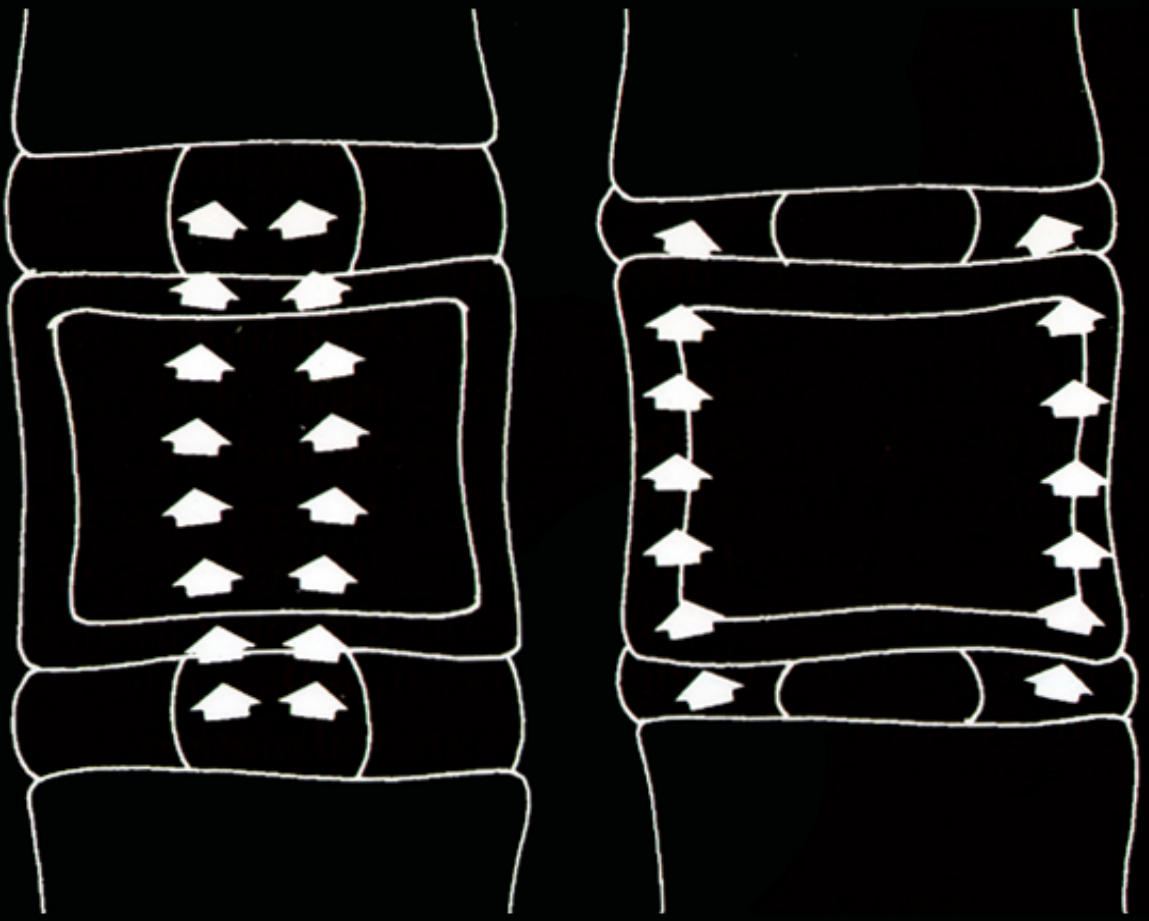
- Direk grafiler
- Dinamik grafiler (hiperfleksiyon/ hiperekstansiyon)
- Oblik grafiler
- BT (± myelo)
- MR
- Diskografi
- Kemik sintigrafi

Etyopatogenez

- Disk patolojileri
  - Dejeneratif disk hastalığı
  - Anuler yırtık
  - Disk herniasyonu
  - Nüks disk hernileri
- Dar spinal kanal (spondiloz)
- Spondilolistezis
- Travma
- Faset osteoartriti
- Osteoporoz
- İnfeksiyon
- Spinal tümör
- Primer/ metastatik vertebra tümörleri
- Deformite

Dejeneratif disk hastalığı

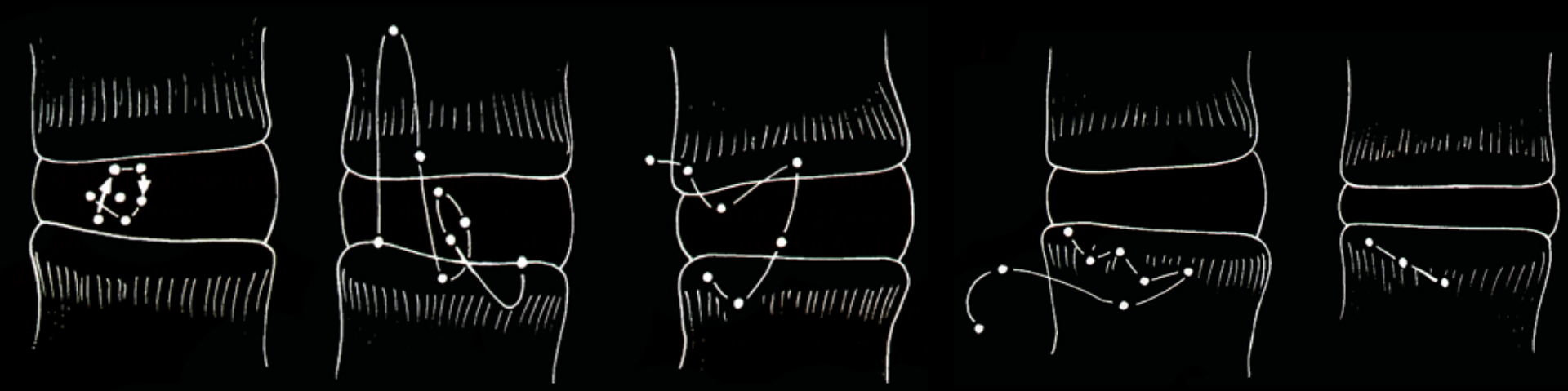
Yük geçişi

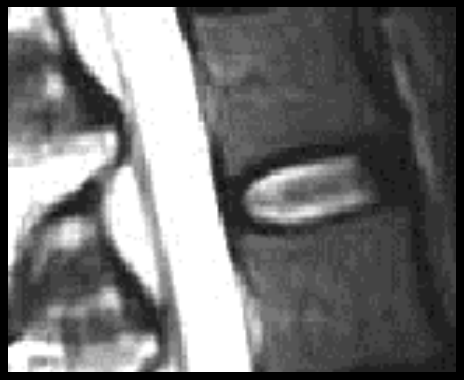


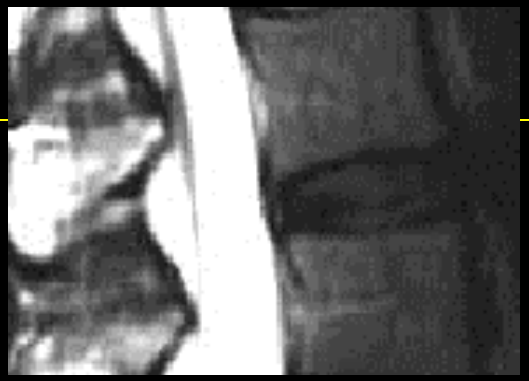
Normal

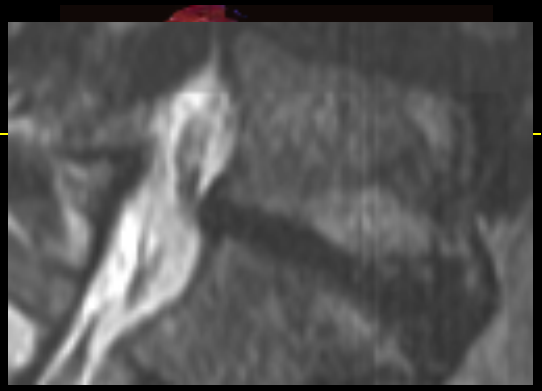
Dejenere

Sagittal Planda Rotasyonun Anlık Ekseni





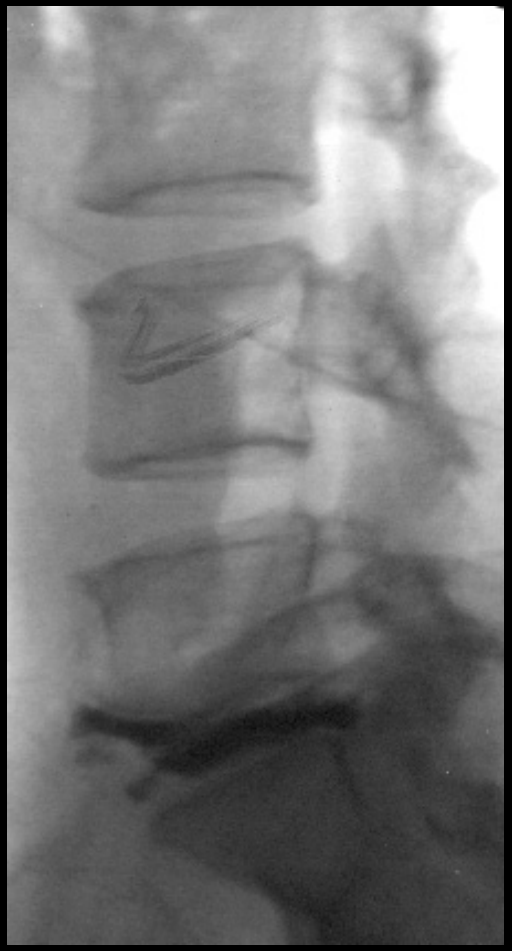




Dejeneratif disk hastalığı



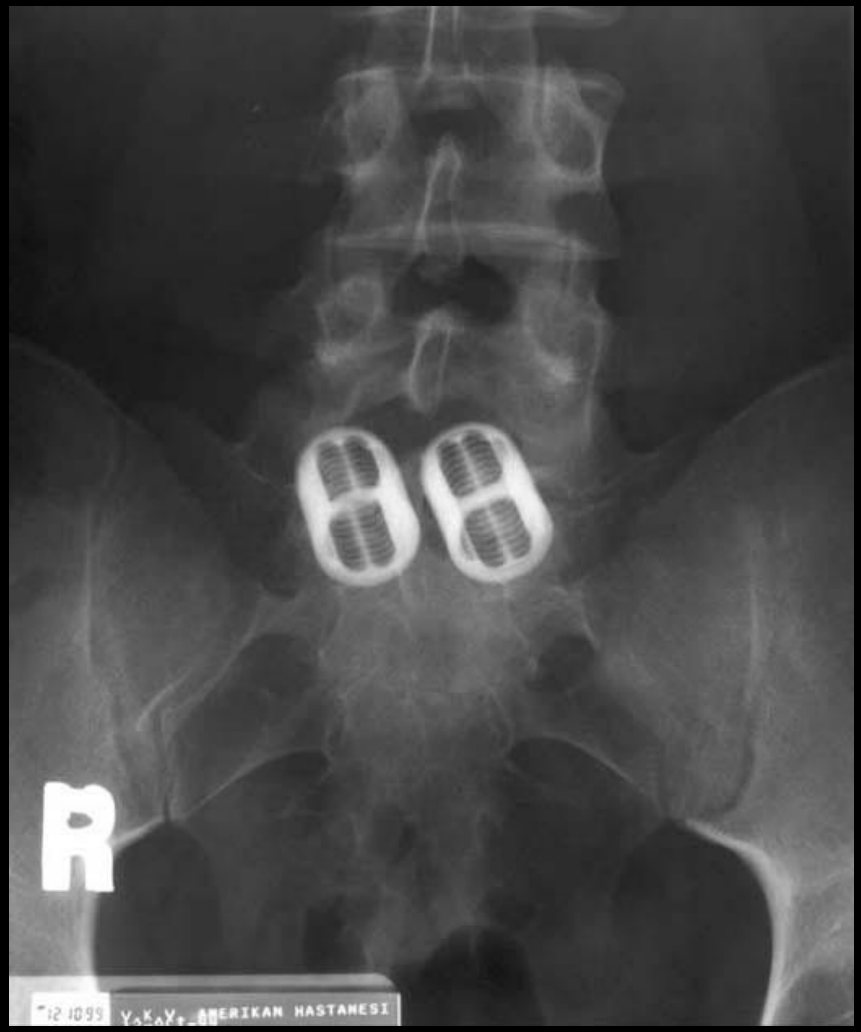




Dejeneratif disk hastalığı



Anterior lomber intervertebral füzyon (ALIF)





Anterior lomber intervertebral füzyon (ALIF)







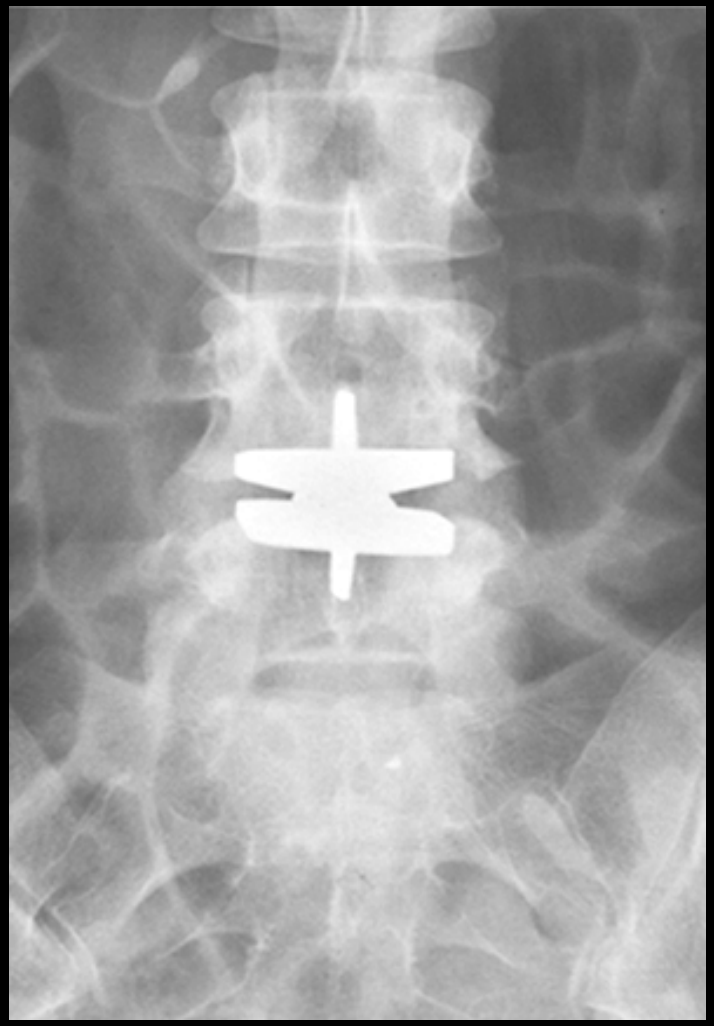
L4-L5 provokatif ağrı (+)

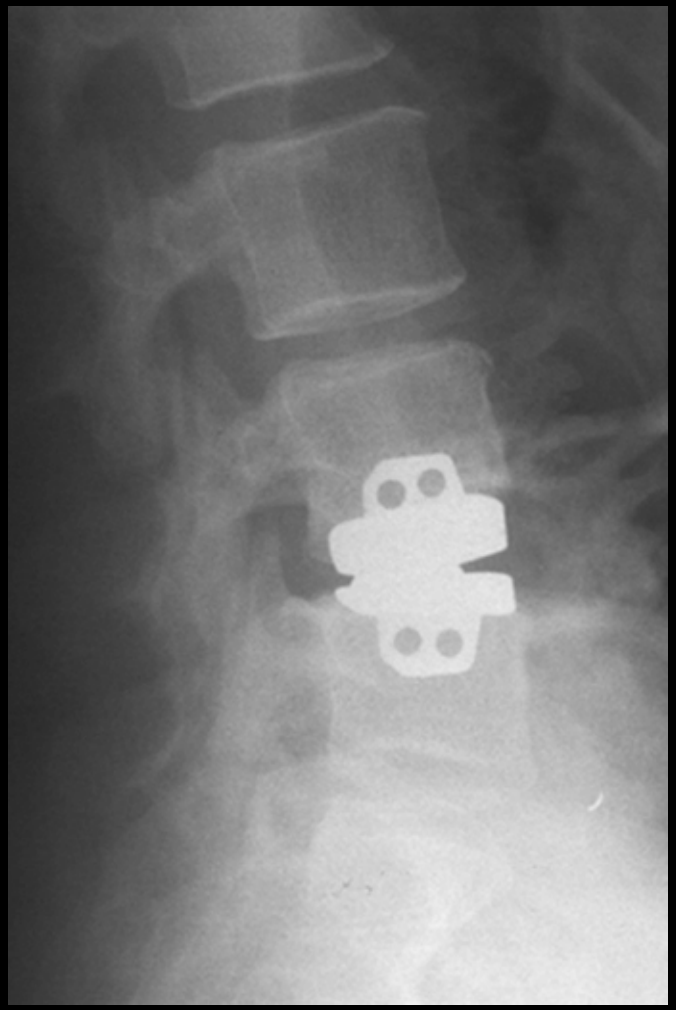
Disk protezi



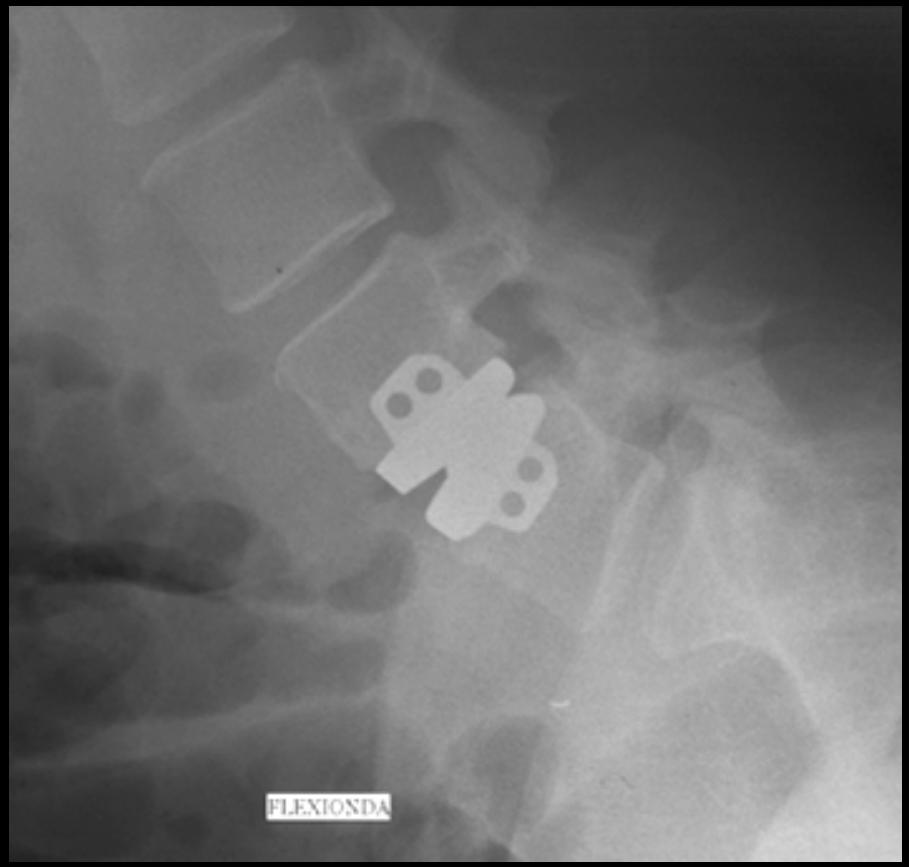


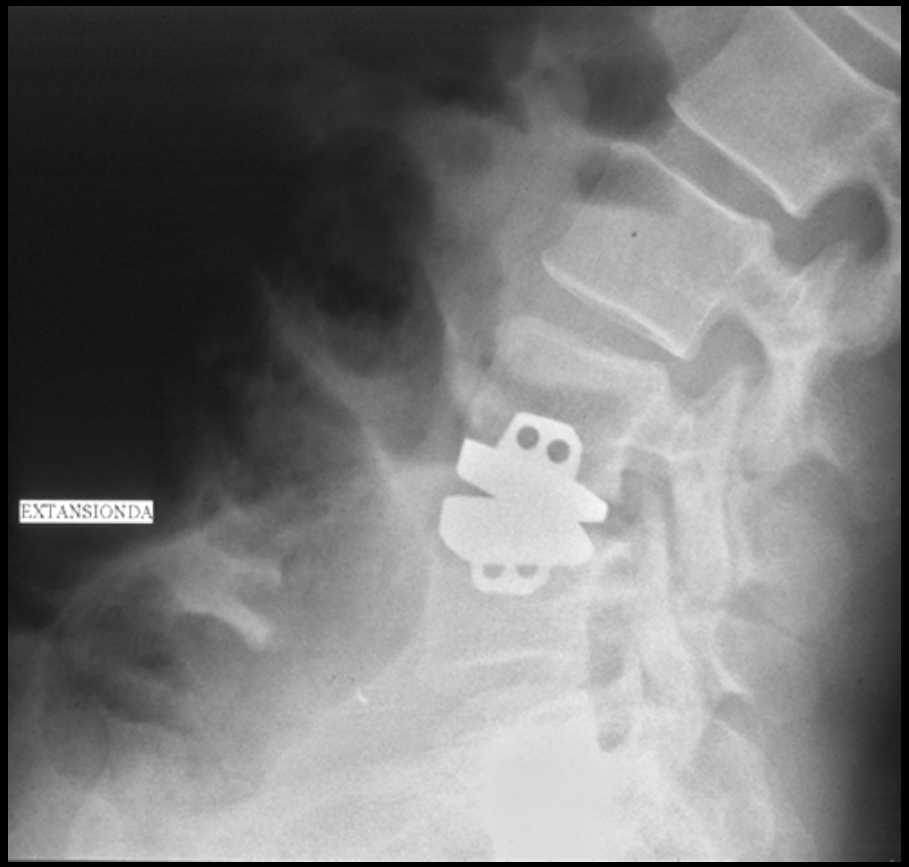
Disk protezi





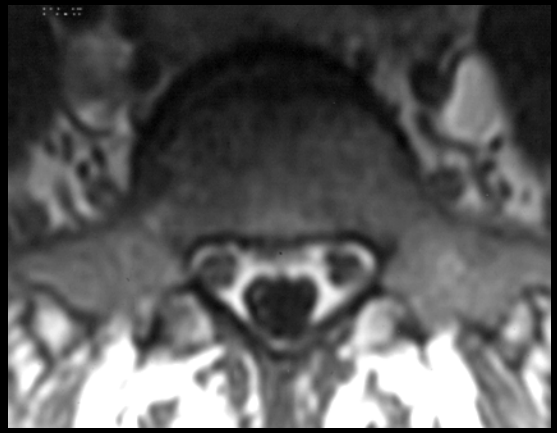
Hareket aralığı ?



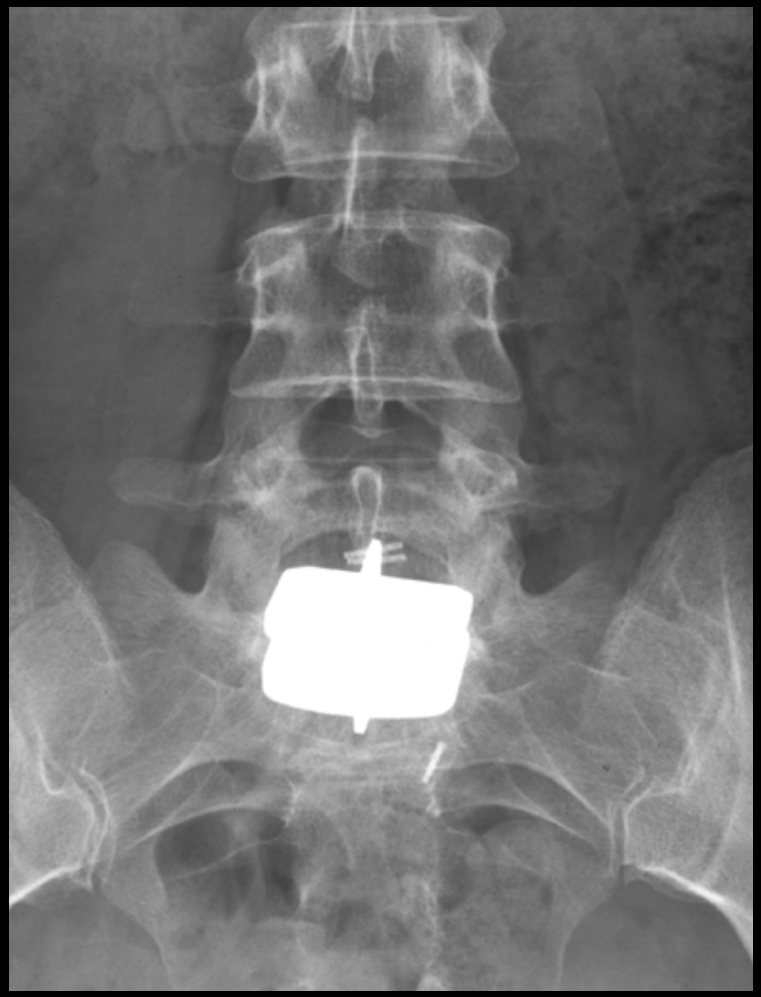


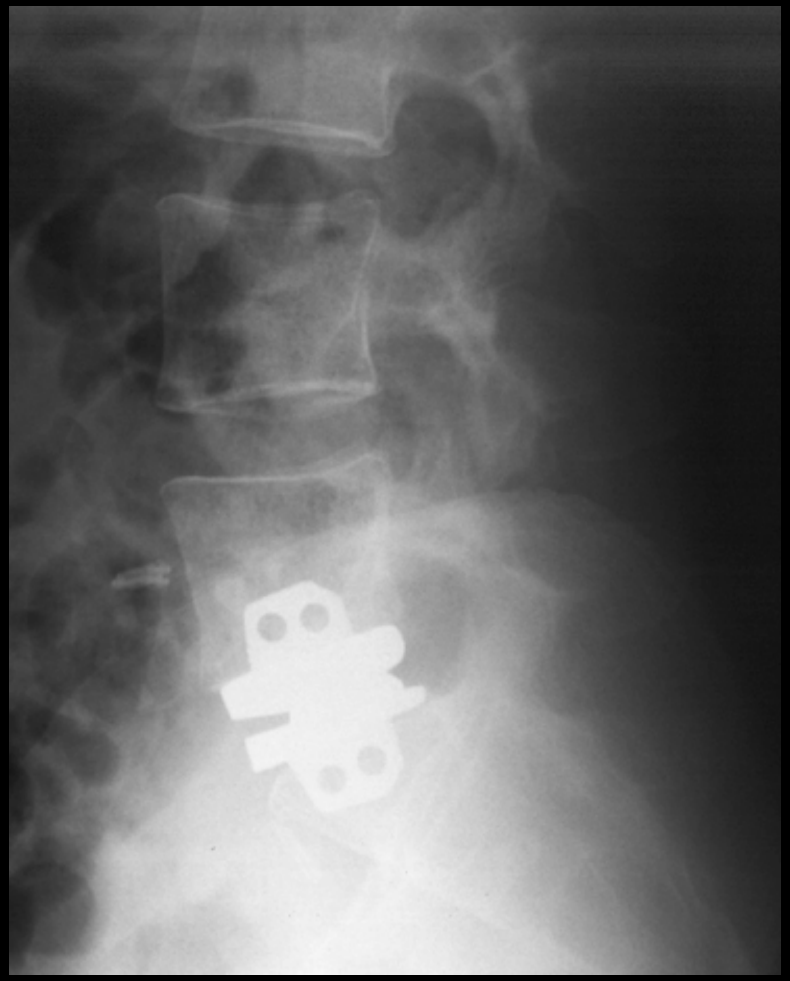
Disk protezi





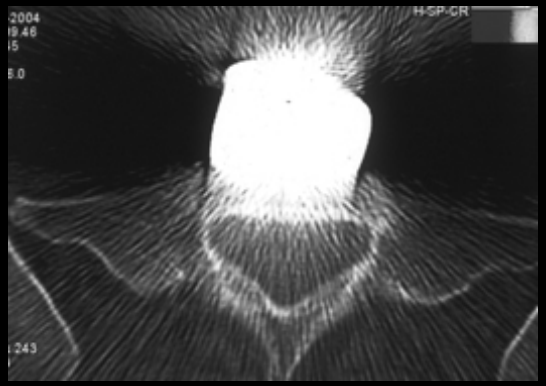
Disk protezi

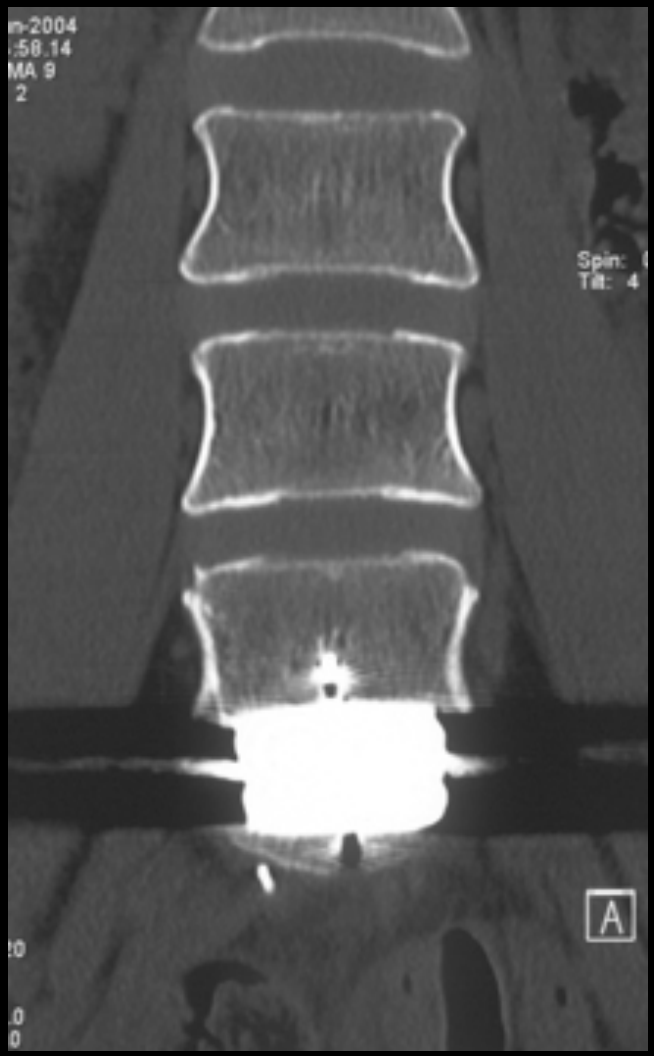




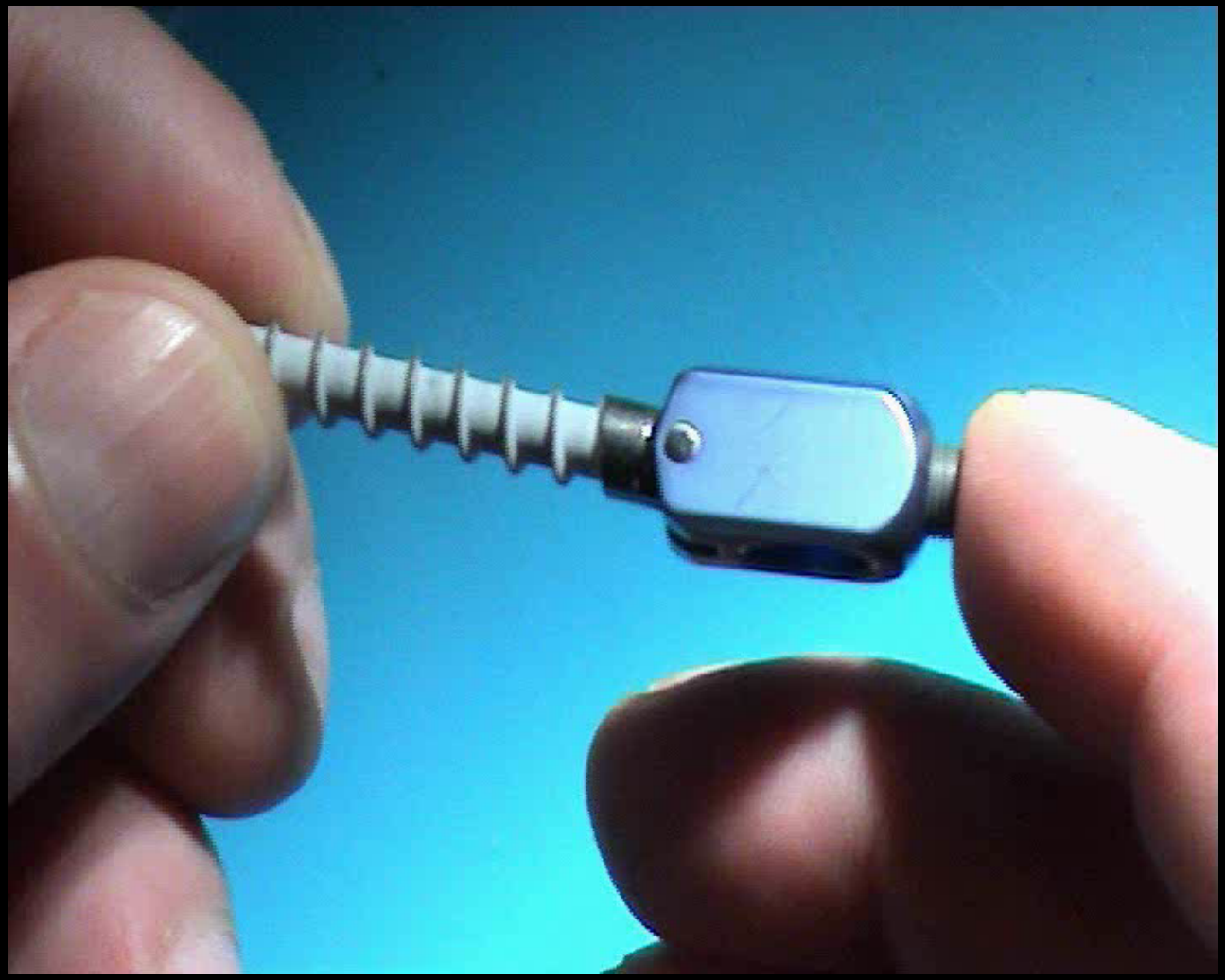
Artefak ?



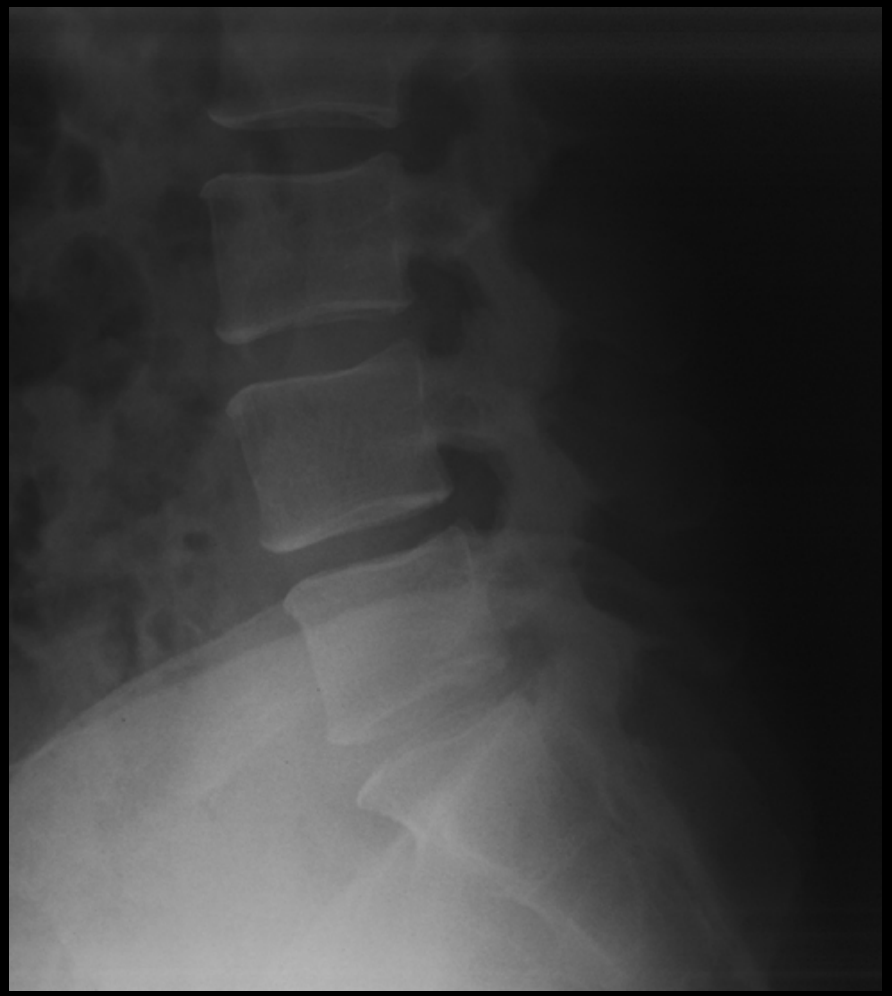




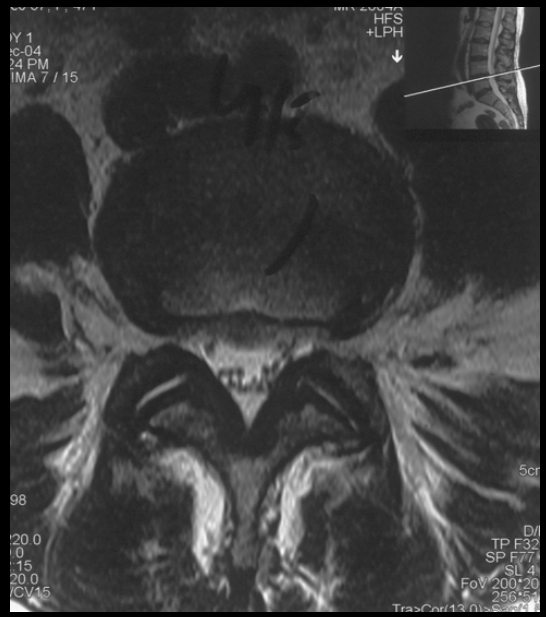
Dinamik pedikül vidaları



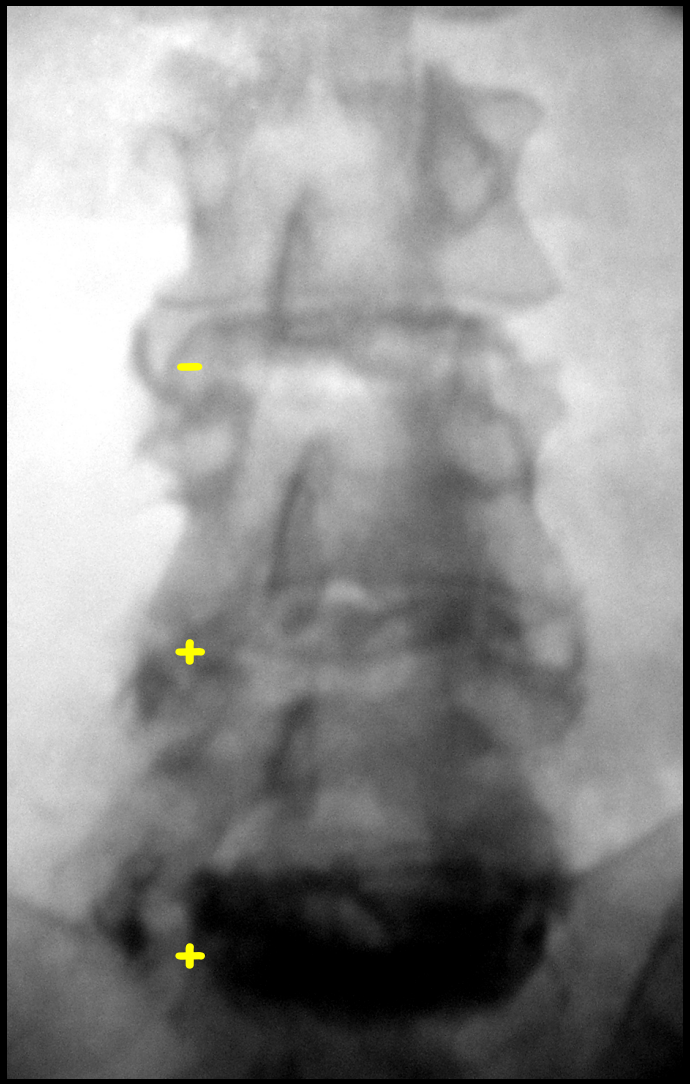


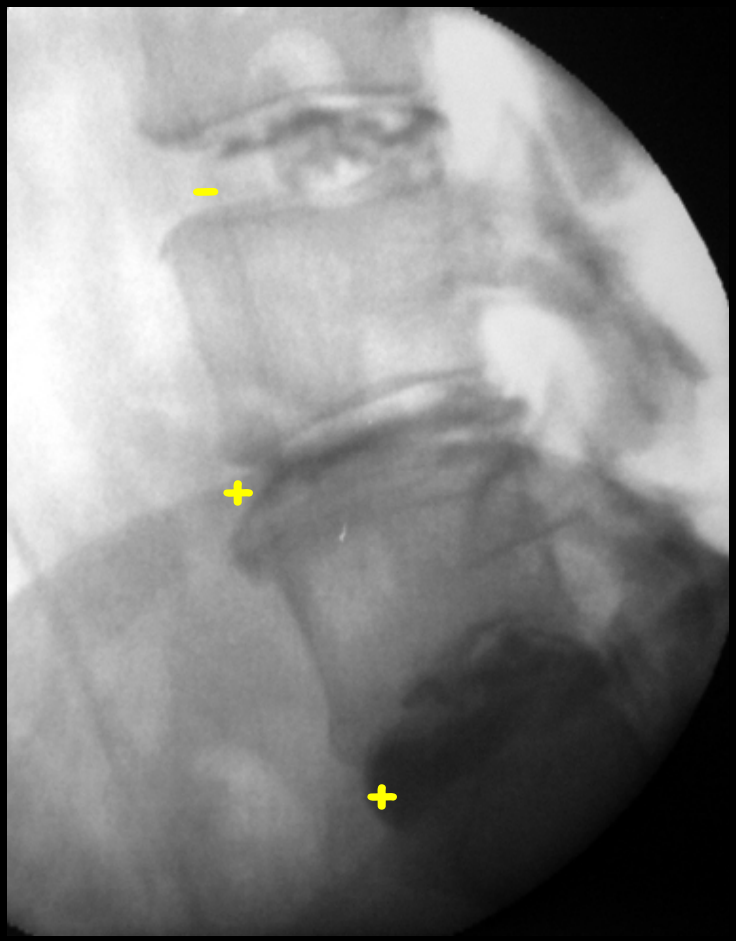



STUDY 1
20-Dec-04
6:32:34 PM
5003 IMA 6 / 12
STUDY 1
20-Dec-04
6:32:32 PM
5003 IMA 7 / 12
MF 1.83
TR 4280.0
TE 125.0
TA 02:42
BW 190.0
M/N/D/CV15
A2/SAT1
SP2-6
tse2d1_25 / 150

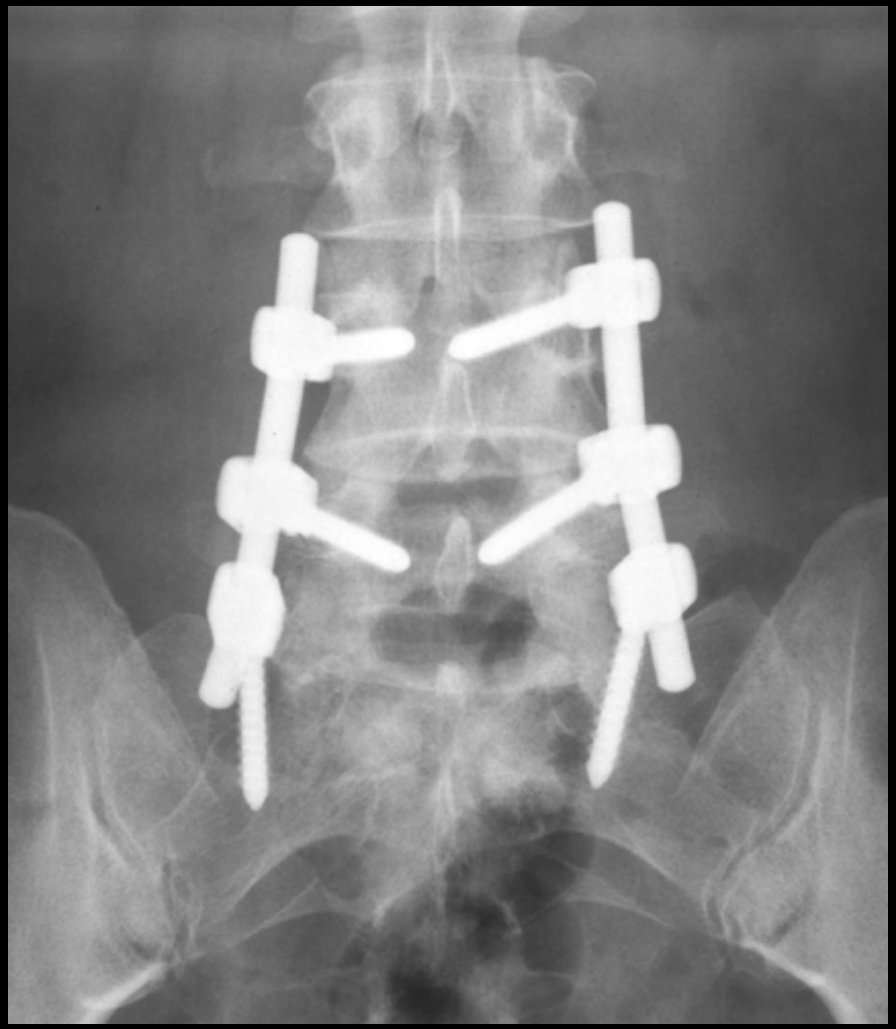

HFS
+LPH
IMA 7 / 15

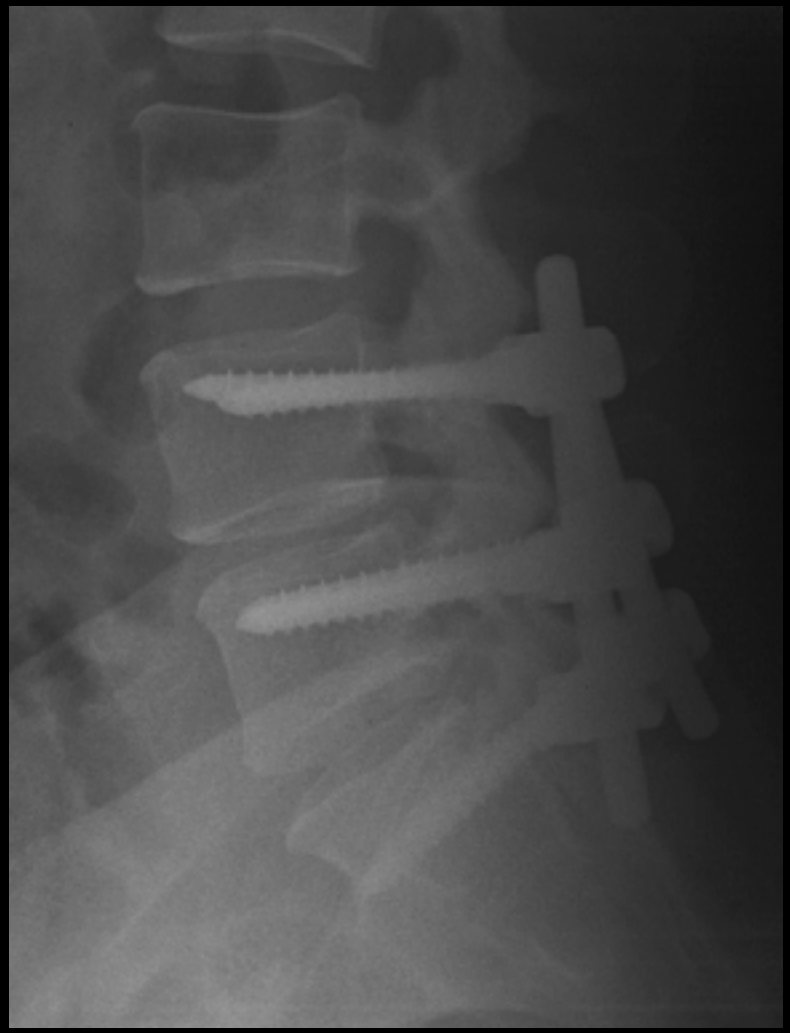
Diskografi



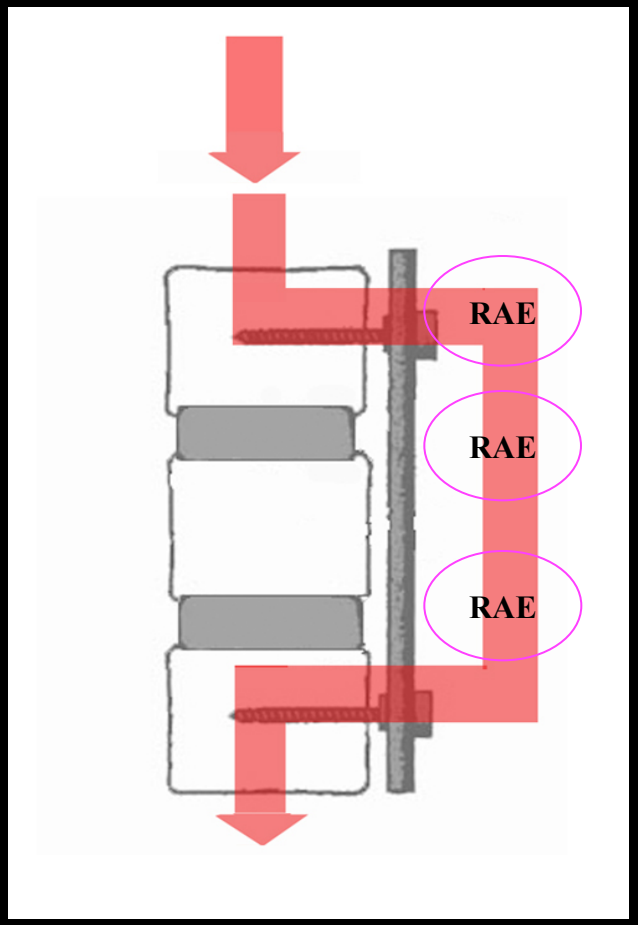


Dinamik pedikül vida fiksasyonu

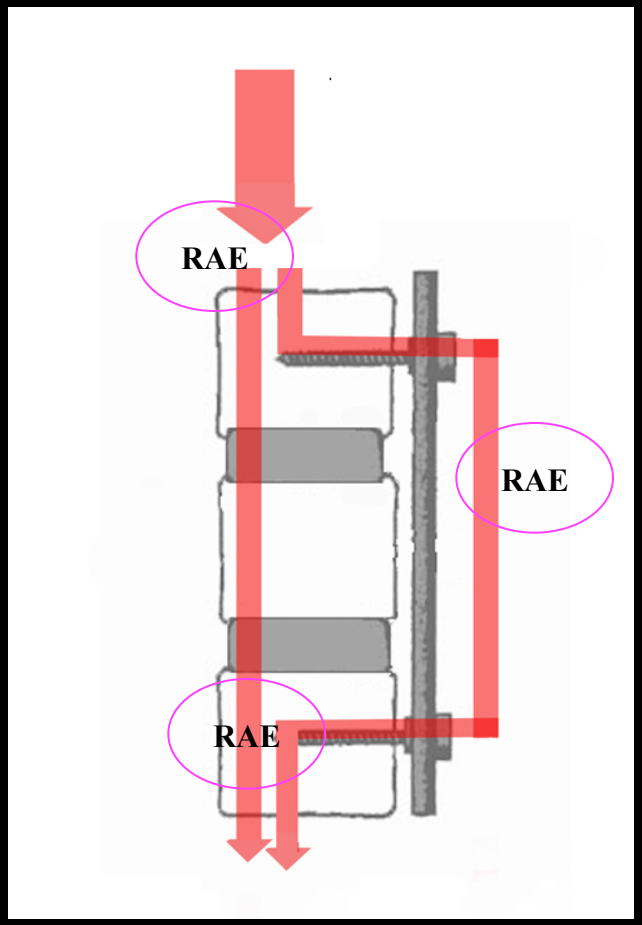




Rijit/dinamik sistem yük dağılımı



rijit

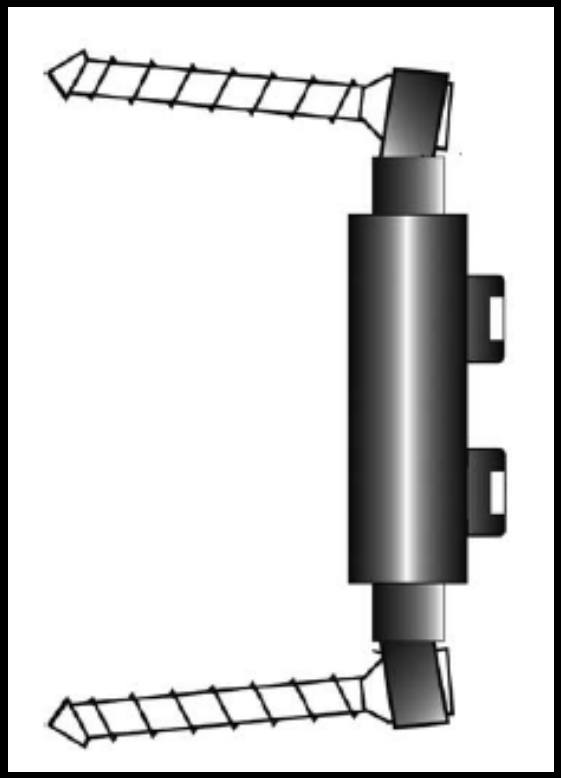


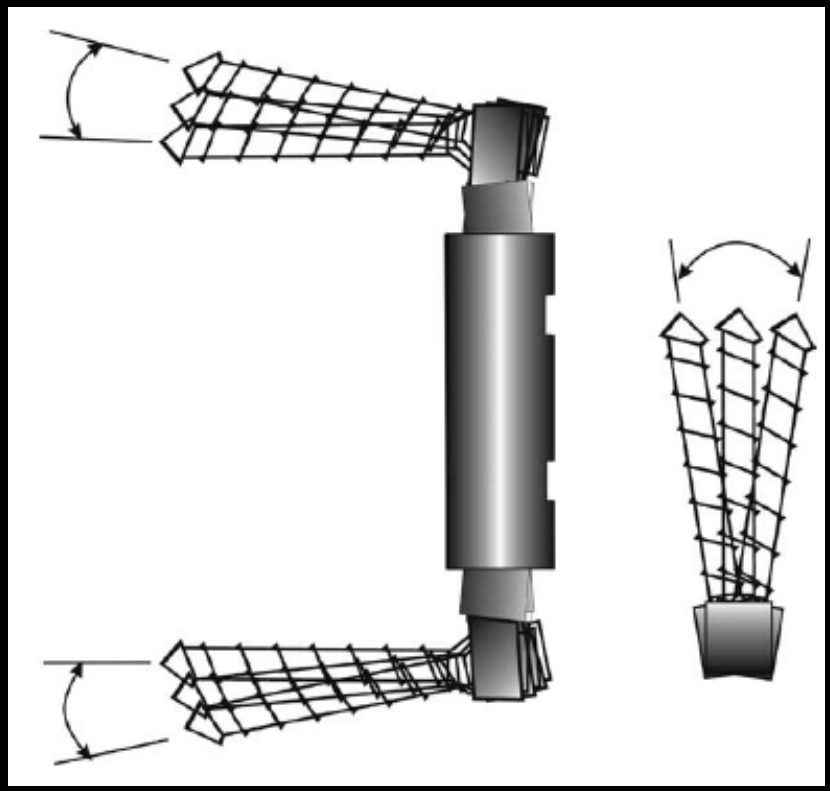
dinamik

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Clinical Biomechanics xxx (2006) xxx–xxx
CLINICAL BIOMECHANICS
www.elsevier.com/locate/clinbiomech

Biomechanical evaluation of a dynamic pedicle screw fixation device

Hua-Zi Xu [a,*], Xiang-Yang Wang [b], Yong-Long Chi [a], Qing-An Zhu [c], Yan Lin [a], Qi-Shan Huang [a], Li-Yang Dai [b]





Dinamik ve rijit pedikül vida farkı ?

- DPV, RPV ile benzer stabilizasyon sağlıyor.
- RPV' dan geçen yük DPV' dan geçenden daha fazla,
- DPV ile fiksasyondan geçen yük disk ile paylaşılıyor.
- DPV füzyonun oluşmasını kolaylaştırıyor

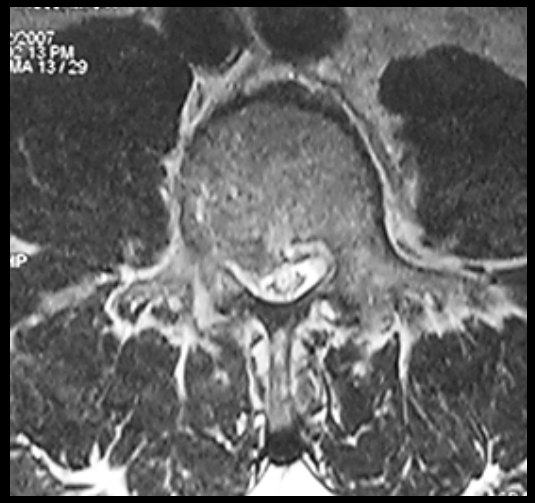
Scifert JL, ve ark., Spine 1999
Goel VK, ve ark.,JPO 2001,
Xu HZ, ve ark., Clin Biomech 2006

Rijit-dinamik rod-vida kombinasyonu



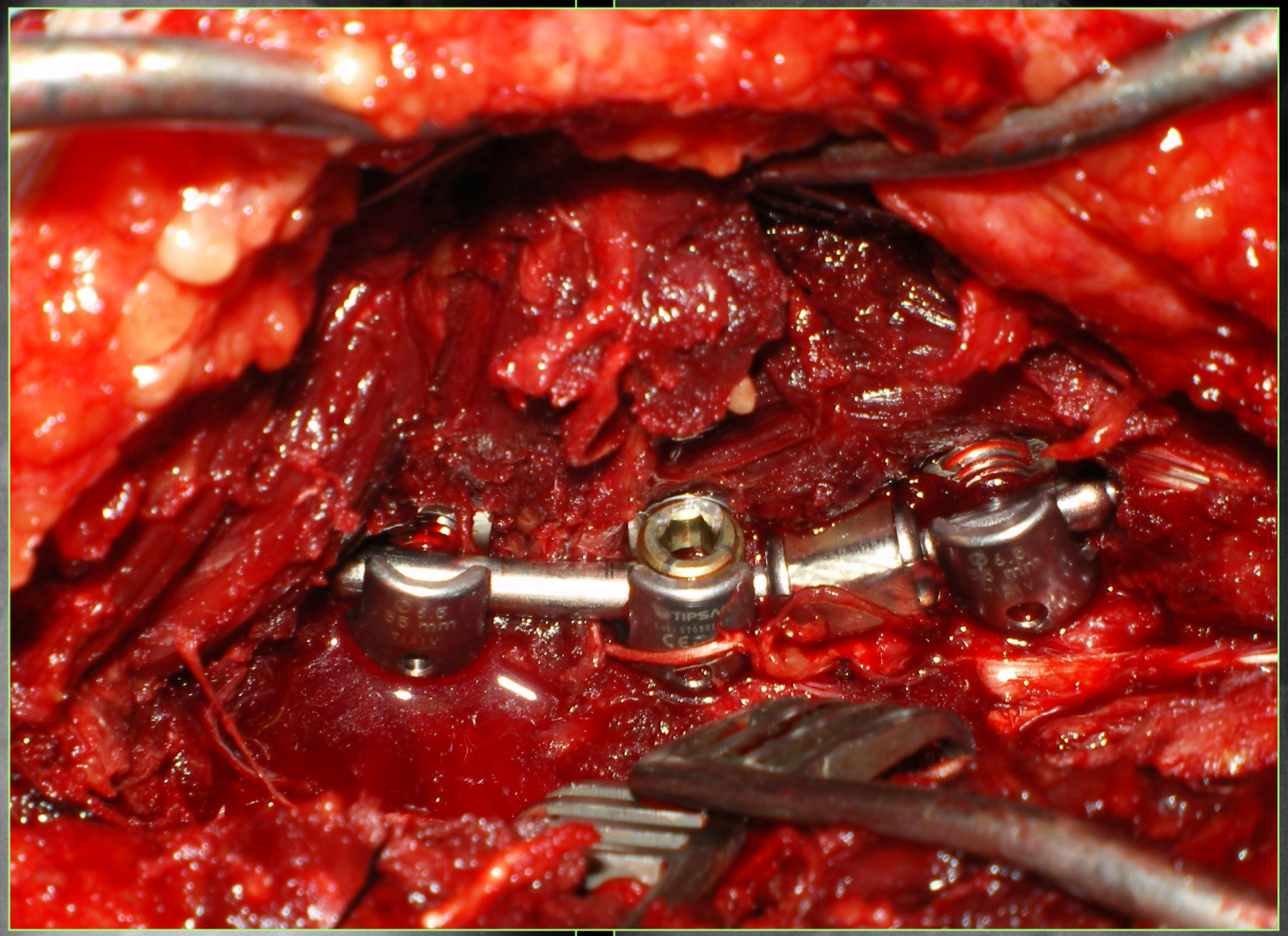
Rijit-dinamik rod kombinasyonu







Rijit-dinamik rod kombinasyonu



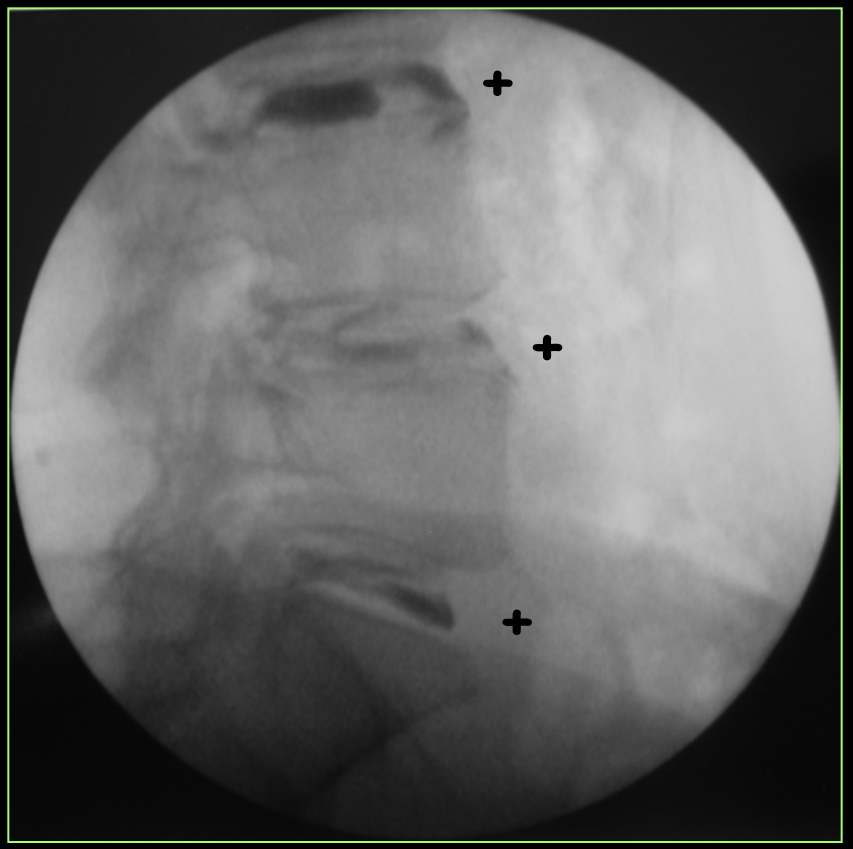
Rijit-dinamik rod kombinasyonu



Rijit-dinamik rod kombinasyonu

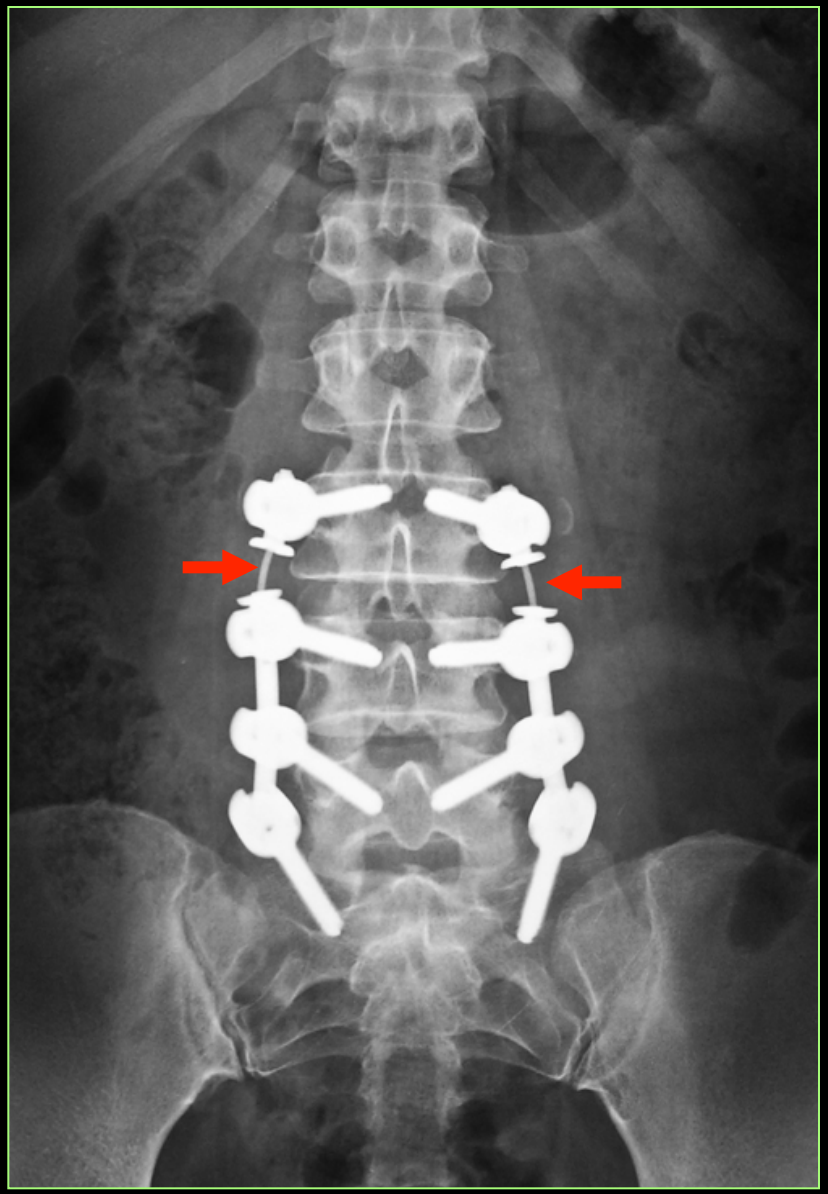
Ağrı provokasyonu





Rijit-dinamik rod kombinasyonu



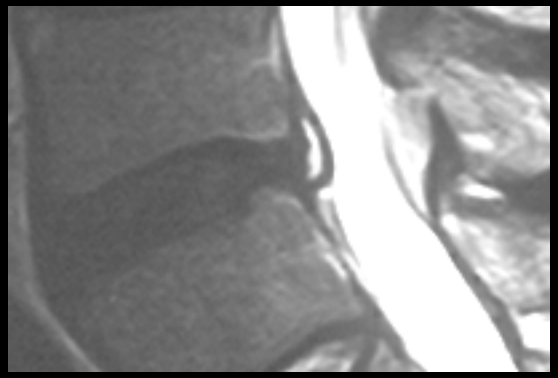


Anuler yırtık

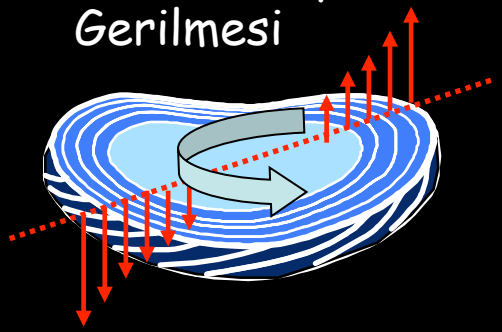
Anuler yırtık

Düşük Çekme Gerilmesi Dayanımı





Yüksek Kayma Gerilmesi







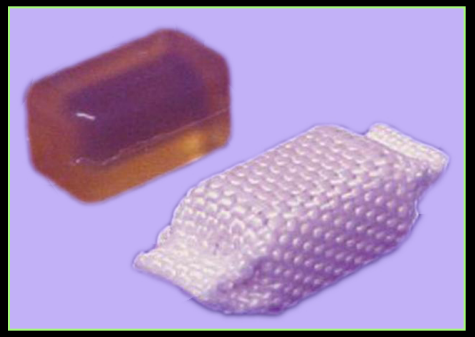
Teknoloji



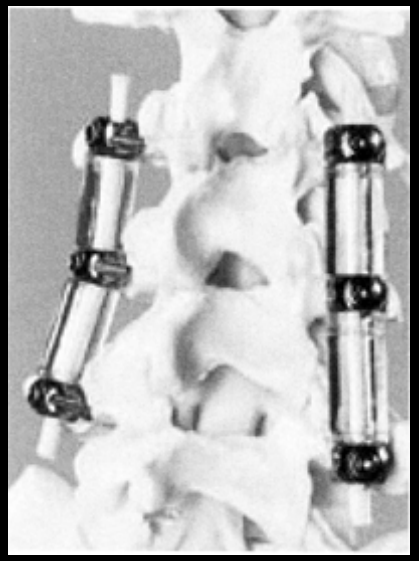
Cosmic



X-Stop



PDN



Dynesis



Bioflex



TAFS

Charite

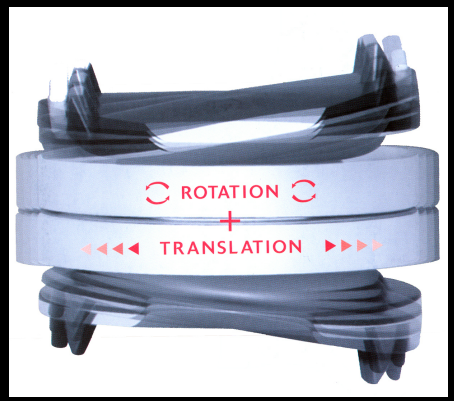
Modulus C

Agile





TOPS





Disk herniasyonu

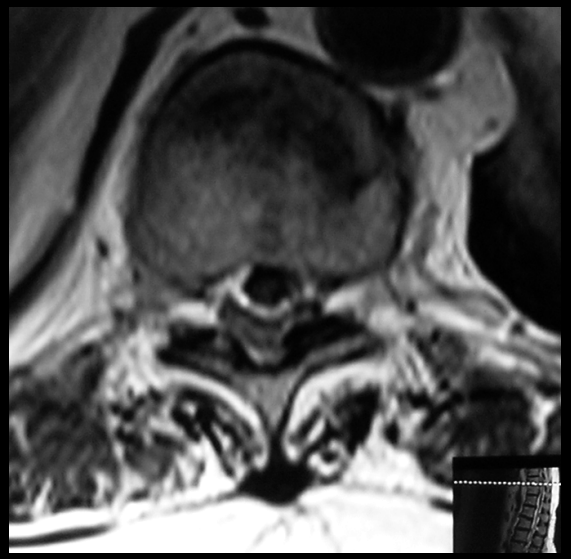




Postop. 3.yıl

Postop. 3.yıl









Nüks disk herniasyonu

Foraminal disk hernisi

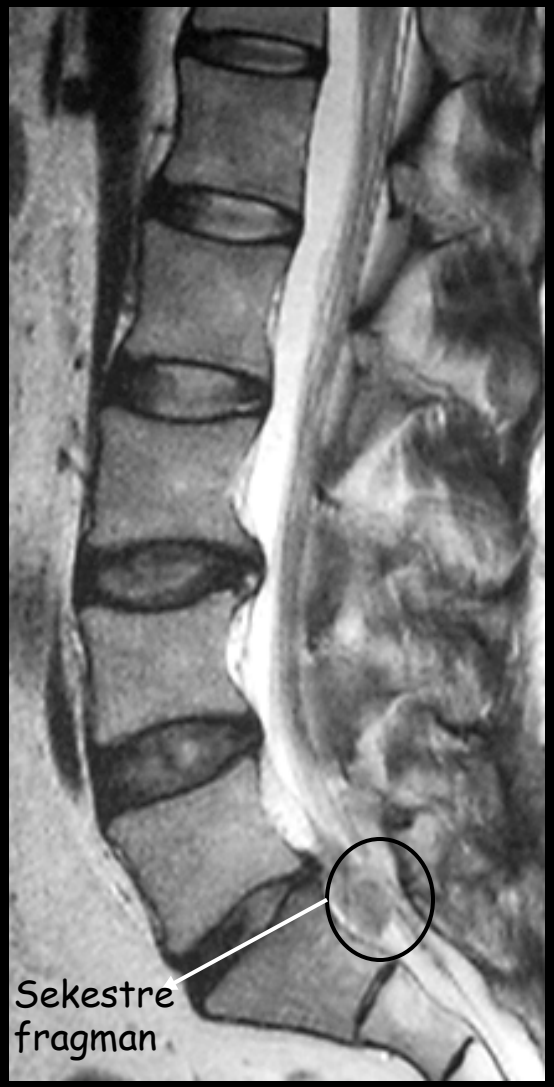






Postop. 6.ay

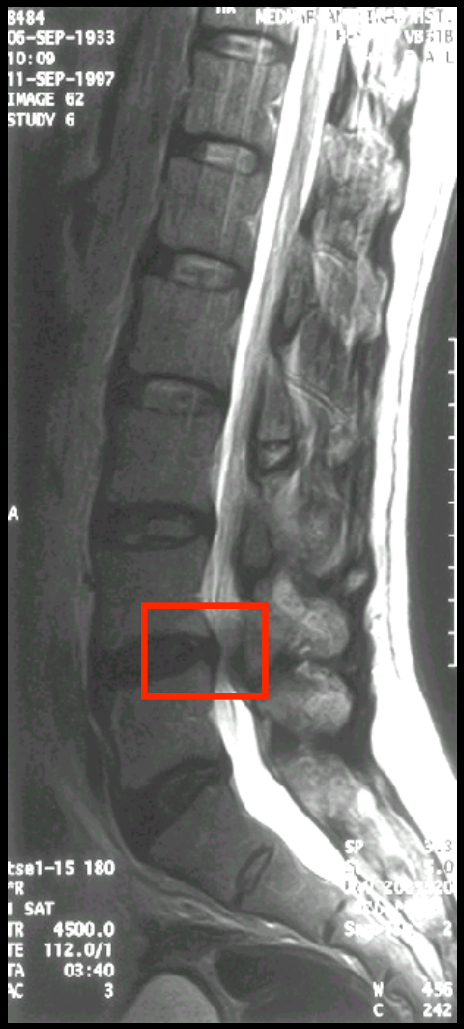




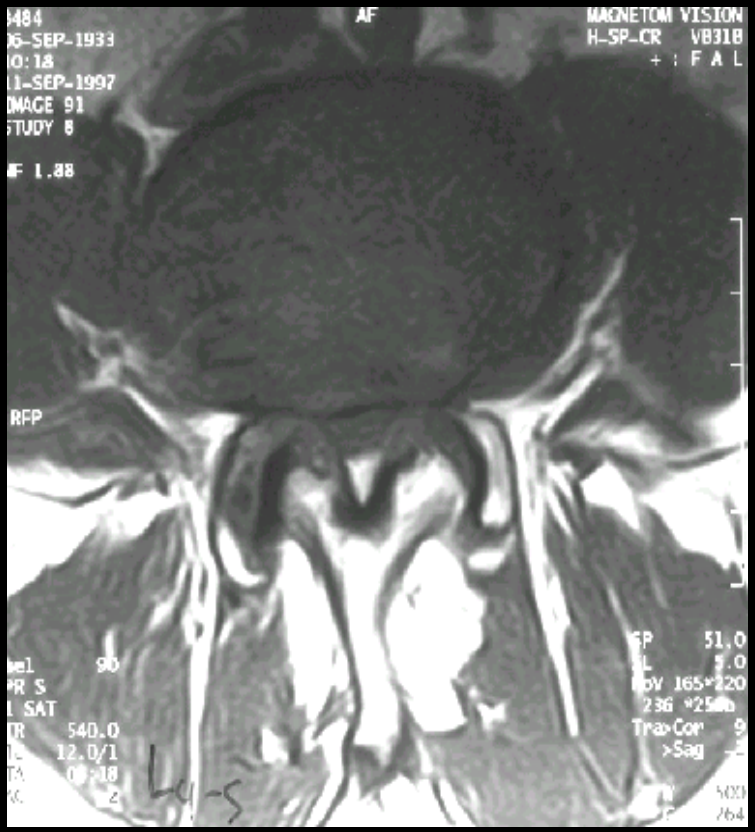




Dar spinal kanal


3484
06-SEP-1933
10:09
11-SEP-1997
IMAGE 62
STUDY 6
A
SAT
TR 4500.0
TE 112.0/1
TA 03:40
W 456
C 242


M 65
A
R

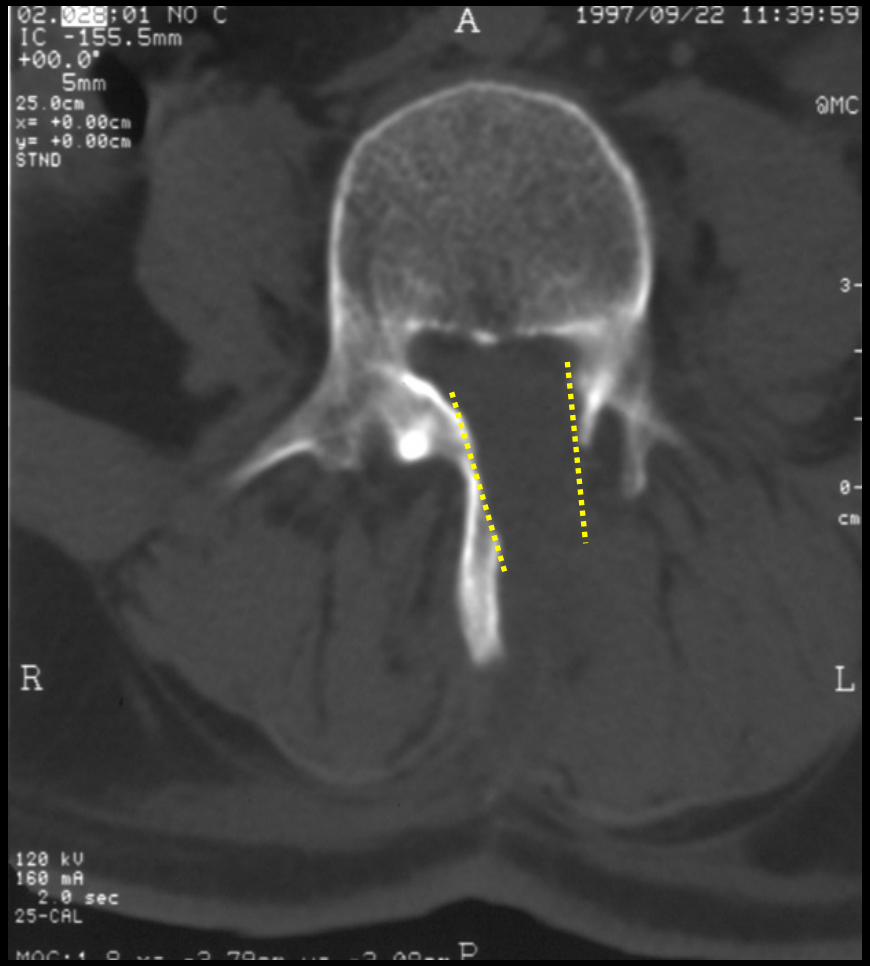

AF
MAGNETOM VISION
H-SP-CR VB31B
RFP
540.0
L4-5


A
1997/09/16 14:23:16
IC -100.5mm
3mm
L4
R
L
120 kV
200 mA
2.0 sec
25-CAL
MAG:2.1 x= -1.32cm y= -0.37cm
P


03.035:01 NO C
IC -76.5mm
+00.0°
3mm
25.0cm
x= +0.00cm
y= +2.30cm
STND
A
1997/09/16 14:22:15
L4
0HS0HC
2.5
1
0
cm
R
L
120 kV
200 mA
2.0 sec
25-CAL
<1> D= +1.20cm
H= -88.3°

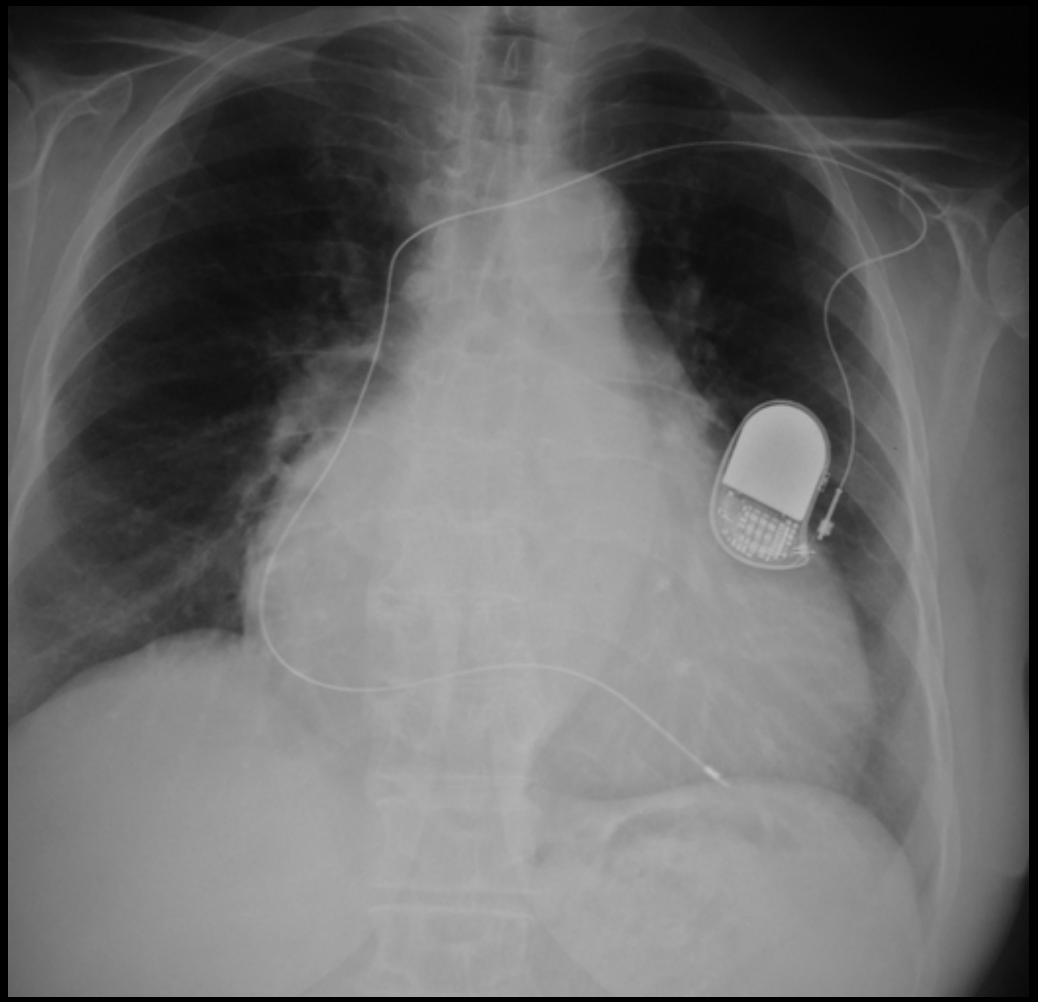

02.030:01 NO C
IC -165.5mm
+00.0°
5mm
25.0cm
x= +0.00cm
y= +0.00cm
STND
A
1997/09/22 11:40:05
0MC
3
0
cm
R
L
120 kV
160 mA
2.0 sec
25-CAL


03.043:01 NO C
IC -100.5mm
+00.0°
3mm
25.0cm
x= +0.00cm
y= +2.30cm
STND
A
1997/09/16 14:23:16
0MC
2.5
0
cm
R
L
120 kV
200 mA
2.0 sec
25-CAL
<1> D- +2.21cm
H= 0.3°
V- -89.7°
MAG:2.1 x= -1.32cm y= -0.37cm P


02.028:01 NO C
IC -155.5mm
+00.0°
5mm
25.0cm
x= +0.00cm
y= +0.00cm
STND
A
1997/09/22 11:39:59
0MC
3
0
cm
R
L
120 kV
160 mA
2.0 sec
25-CAL
P

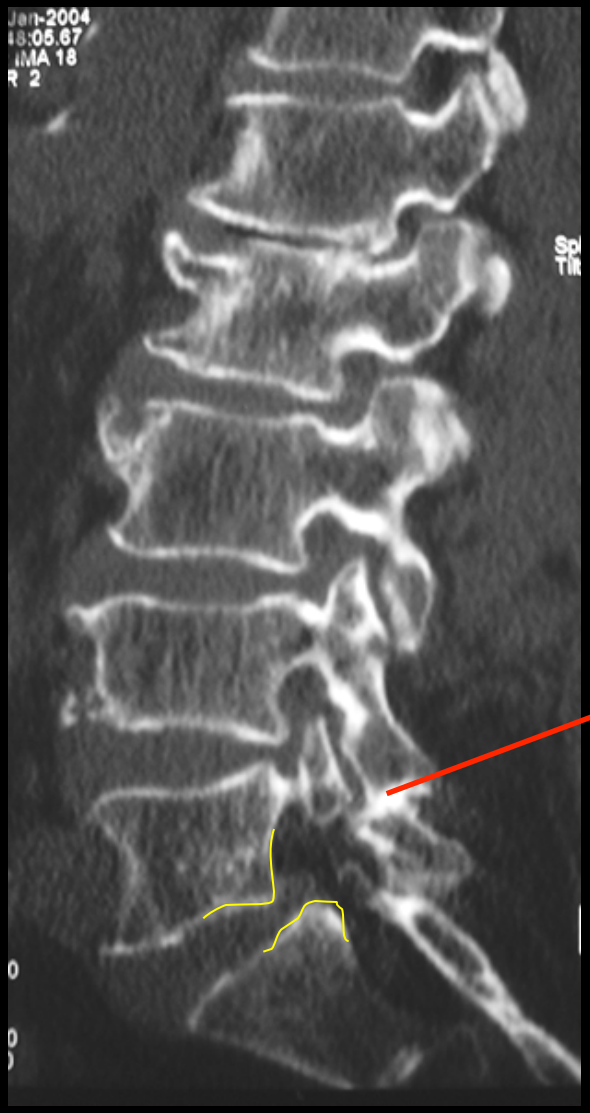
Riskler ?

Pace var, MR olmaz !



BT





Myelografi







Myelo-BT

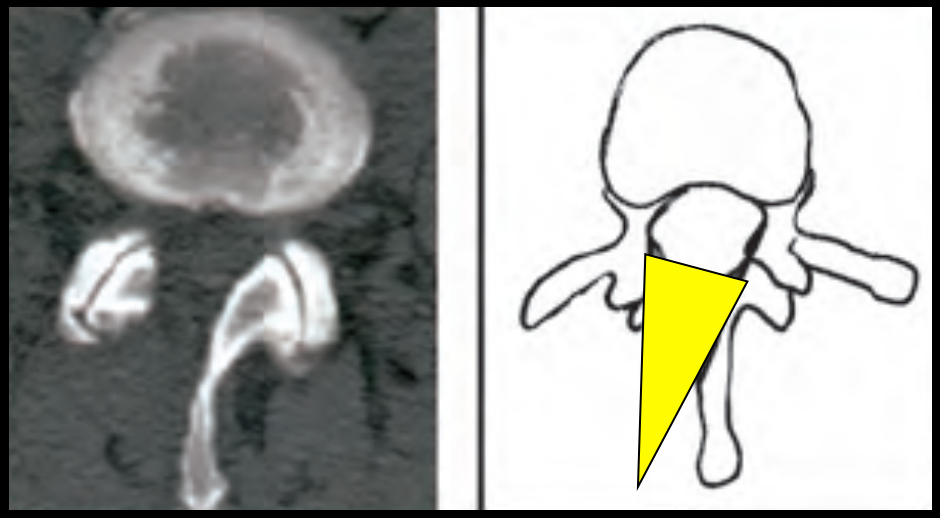


Hipertrofik ligamantum flavum





Hemilaminektomi



Rezeksiyon alanı;

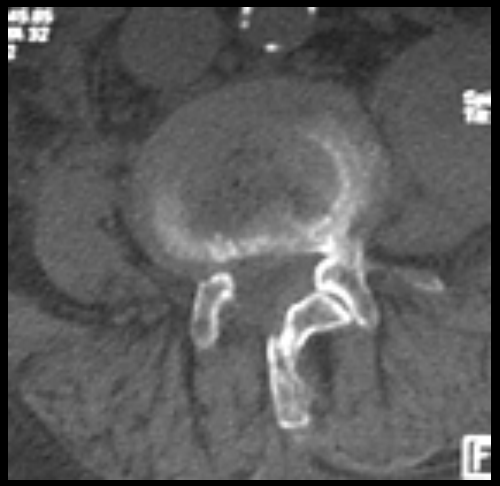
- Unilateral lamina
- Unilateral faset medyal yüzü
- Spinoz proses altı
- Uni ve kontralateral flavum

Supra/interspinoz ligaman ve bir kısım spinoz proses sağlam kalıyor.

Postop. 1.yıl









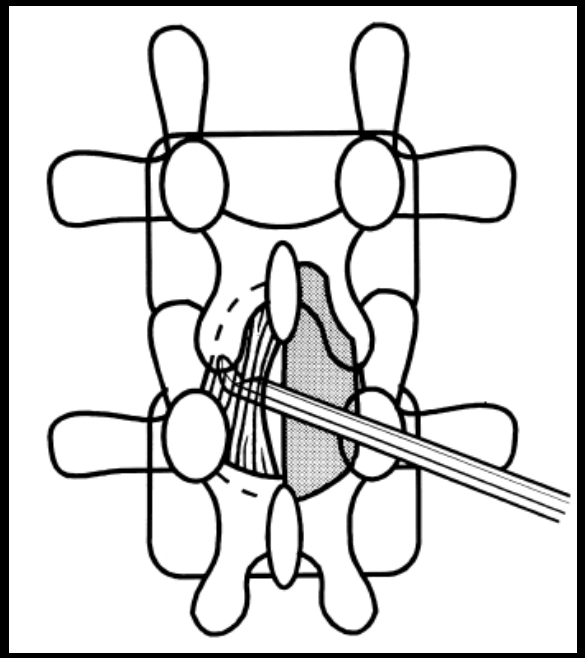


Micro-hemilaminektomi ile yeterli dekompresyon ?

SPINE Volume 24, Number 21, pp 2268–2272
©1999, Lippincott Williams & Wilkins, Inc.

Microdecompression for Lumbar Spinal Canal Stenosis

Bradley K. Weiner, MD, Matthew Walker, MD, Richard S. Brower, MD,
and John A. McCulloch, MD FRCS(C)



Results. The technique affords an excellent decompression while minimizing destruction to tissues not directly involved in the pathologic process. Functional outcome scores doubled, and 87% of patients reported high satisfaction rates.

Başarı %87

Uni/Bilateral Laminatomi veya Laminektomi

J Neurosurg: Spine 3:129–141, 2005

Outcome after less-invasive decompression of lumbar spinal stenosis: a randomized comparison of unilateral laminotomy, bilateral laminotomy, and laminectomy

CLAUDIUS THOMÉ, M.D., DIMITRIS ZEVGARIDIS, M.D., OLAF LEHETA, M.D., HANSJÖRG BÄZNER, M.D., CHRISTIANE PÖCKLER-SCHÖNIGER, M.D., JOHANNES WÖHRLE, M.D., AND PETER SCHMIEDEK, M.D.

Object. Recently, limited decompression procedures have been proposed in the treatment of lumbar stenosis. The authors undertook a prospective study to compare the safety and outcome of unilateral and bilateral laminotomy with laminectomy.

Methods. One hundred twenty consecutive patients with 207 levels of lumbar stenosis without herniated discs or instability were randomized to three treatment groups (bilateral laminotomy [Group 1], unilateral laminotomy [Group 2], and laminectomy [Group 3]). Perioperative parameters and complications were documented. Symptoms and scores, such as visual analog scale (VAS), Roland–Morris Scale, Short Form–36 (SF-36), and patient satisfaction were assessed preoperatively and at 3, 6, and 12 months after surgery.

Adequate decompression was achieved in all patients. The overall complication rate was lowest in patients who had undergone bilateral laminotomy (Group 1). The minimum follow up of 12 months was obtained in 94% of patients. Residual pain was lowest in Group 1 (VAS score 2.3 ± 2.4 and 4 ± 1 in Group 3; $p < 0.05$ and 3.6 ± 2.7 in Group 2; $p < 0.05$). The Roland–Morris Scale score improved from 17 ± 4.3 before surgery to 8.1 ± 7, 8.5 ± 7.3, and 10.9 ± 7.5 (Groups 1–3, respectively; $p < 0.001$ compared with preoperative) corresponding to a dramatic increase in walking distance. Examination of SF-36 scores demonstrated marked improvement, most pronounced in Group 1. The number of repeated operations did not differ among groups. Patient satisfaction was significantly superior in Group 1, with 3, 27, and 26% of patients unsatisfied (in Groups 1, 2, and 3, respectively; $p < 0.01$).

Conclusions. Bilateral and unilateral laminotomy allowed adequate and safe decompression of lumbar stenosis, resulted in a highly significant reduction of symptoms and disability, and improved health-related quality of life. Outcome after unilateral laminotomy was comparable with that after laminectomy. In most outcome parameters, bilateral laminotomy was associated with a significant benefit and thus constitutes a promising treatment alternative.

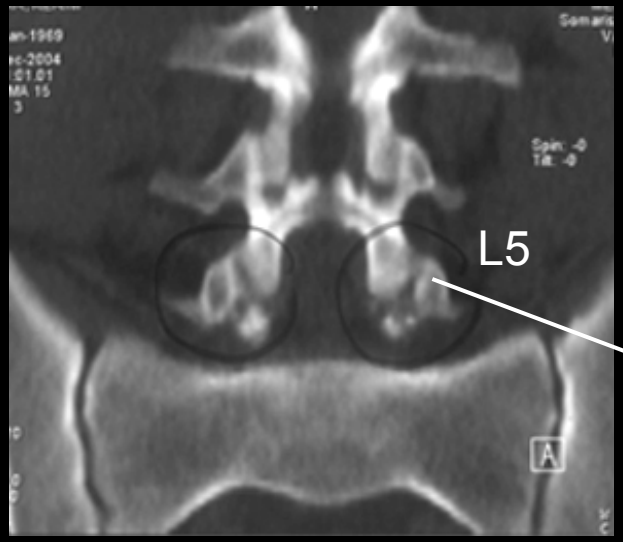
Tek veya iki taraflı laminatomi yeterli dekompresyon sağlıyor

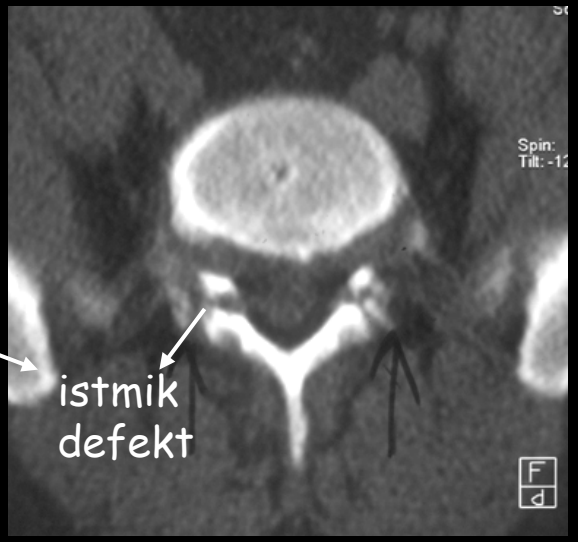
Spondilolistezis

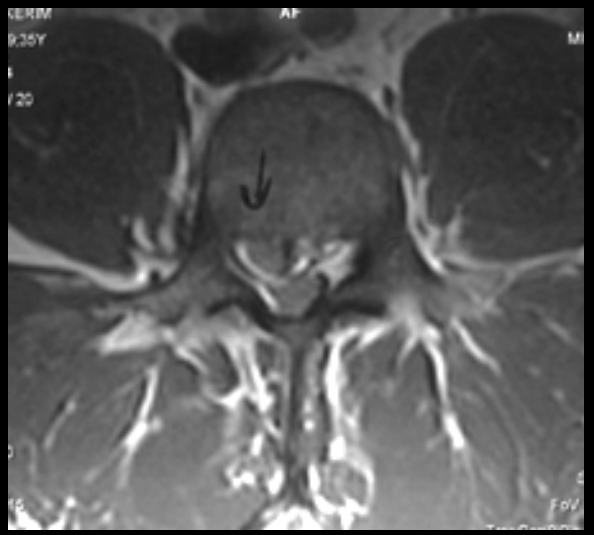
BT/MR

L4-5 sekestre disk fragmanı



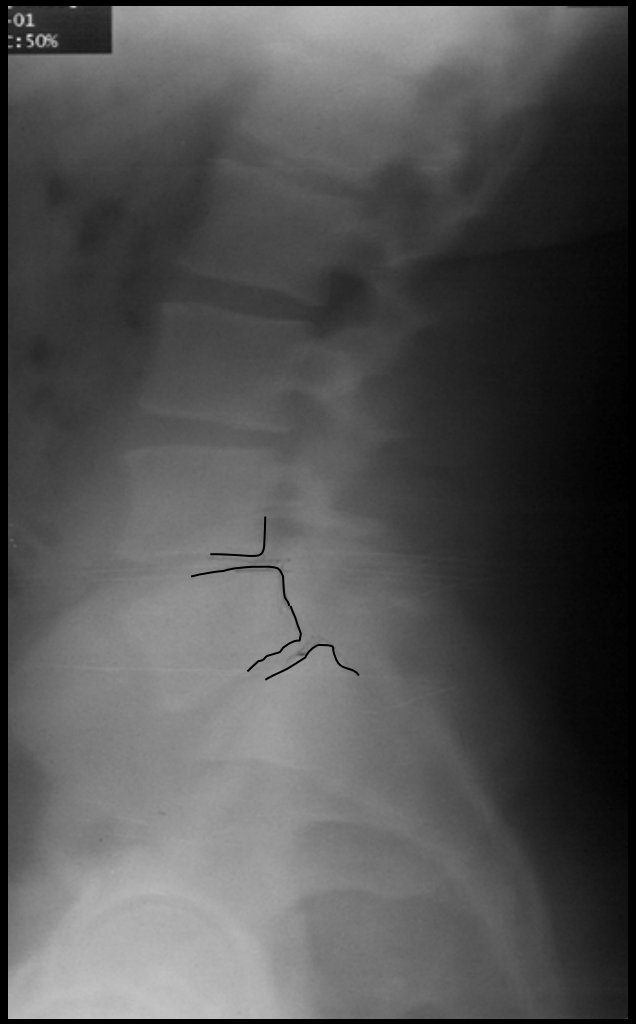






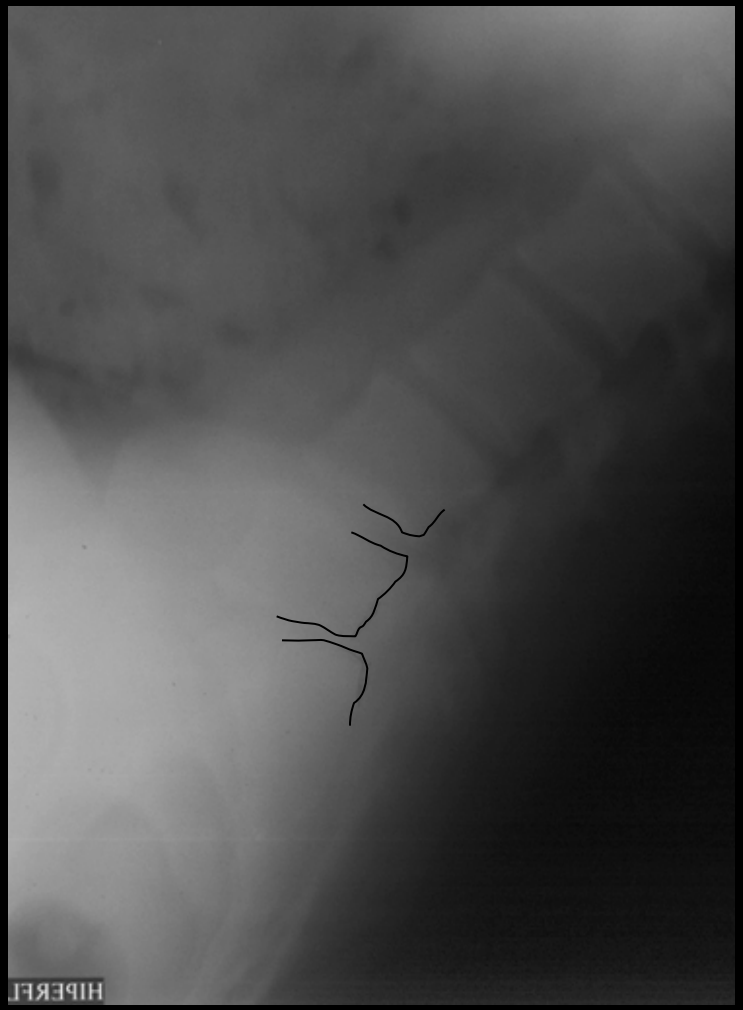
Grade I, L4-5-S1 listezis

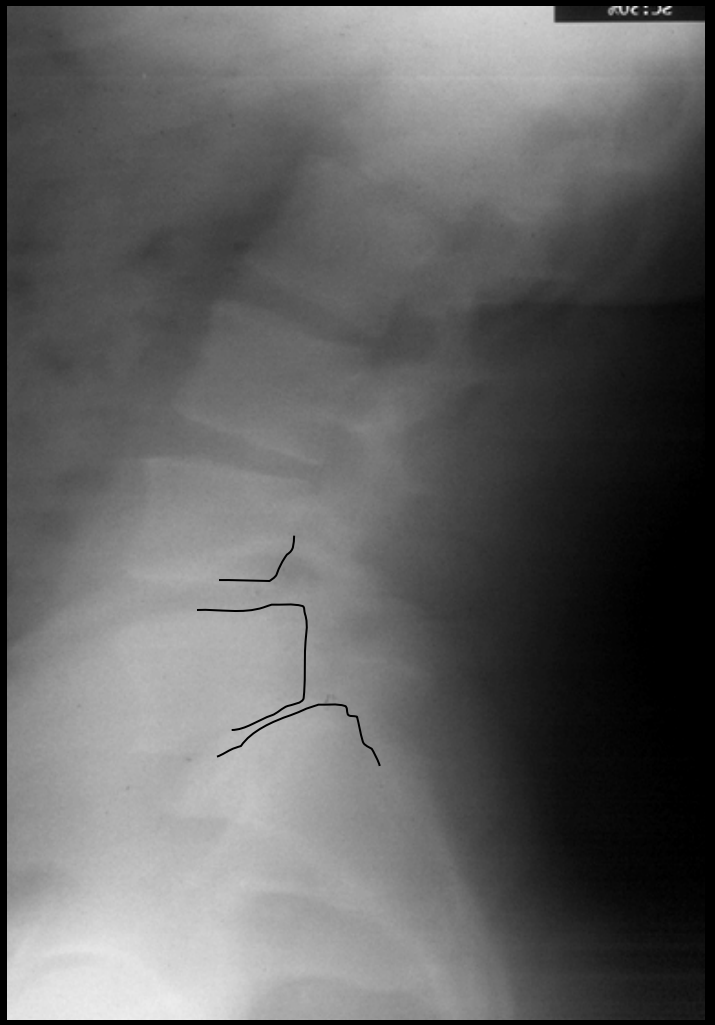




Dinamik Grafiler

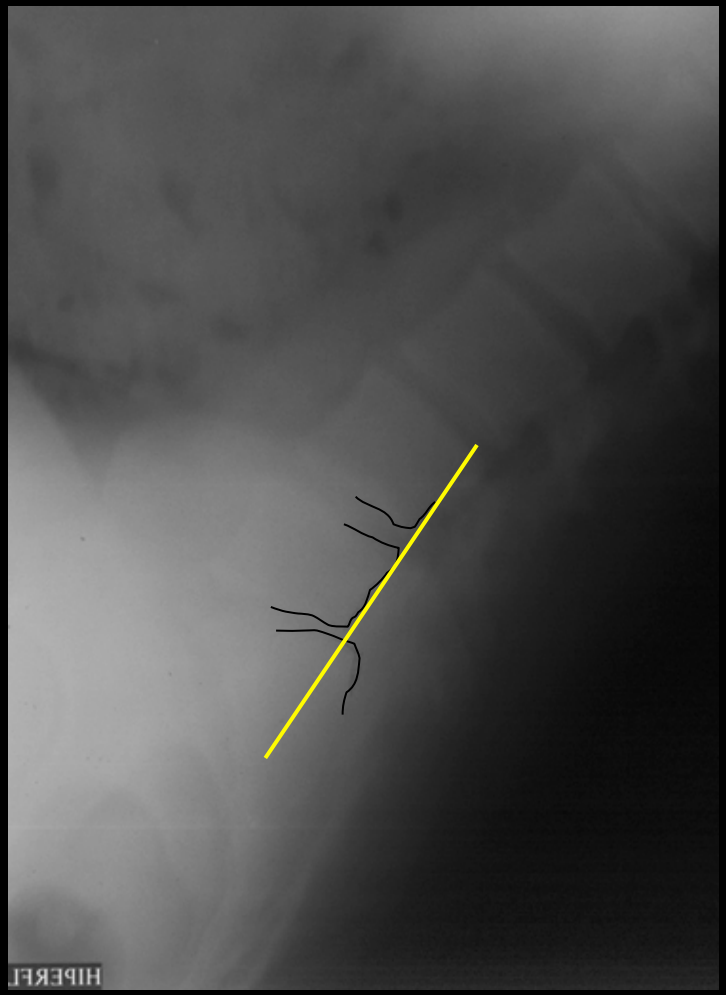
Listezis !

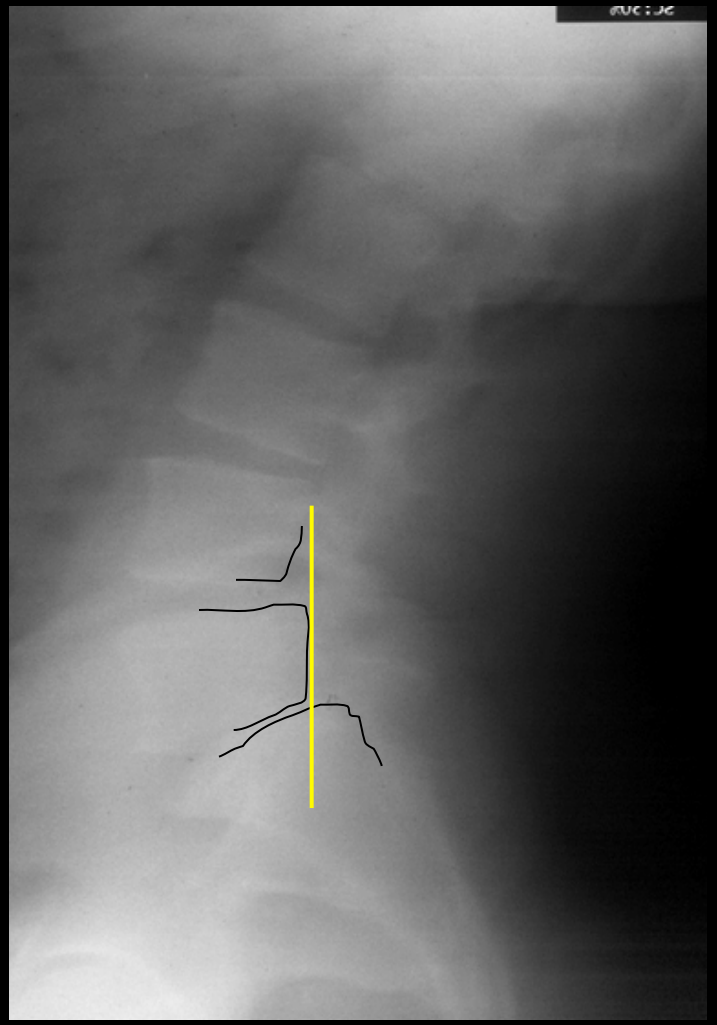




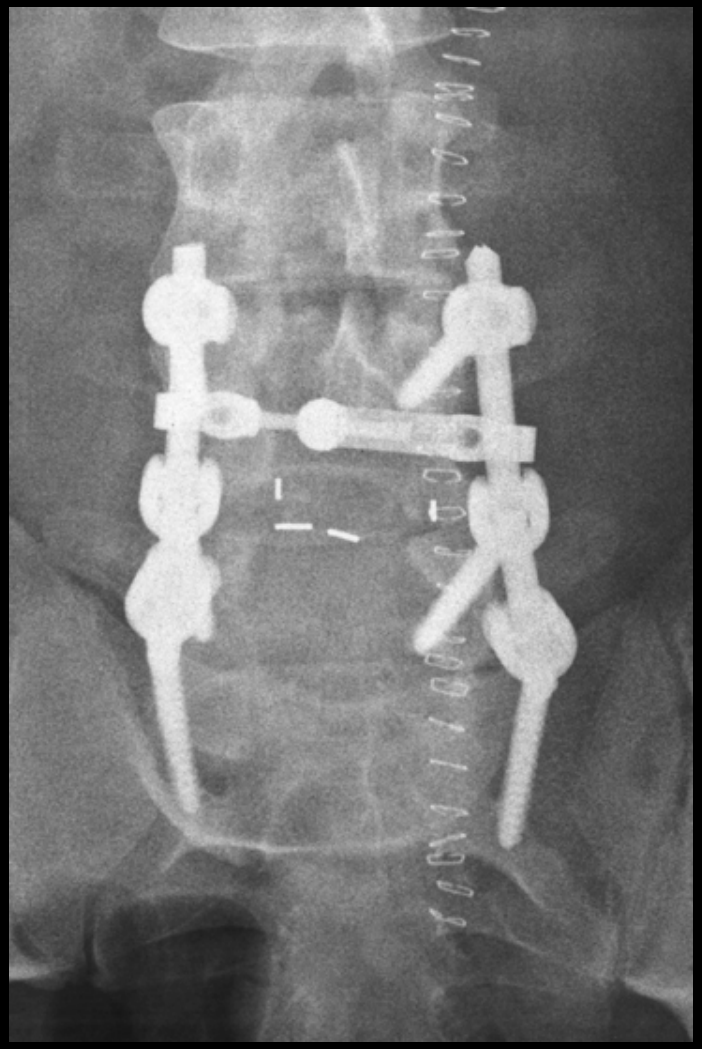
Dinamik Grafiler

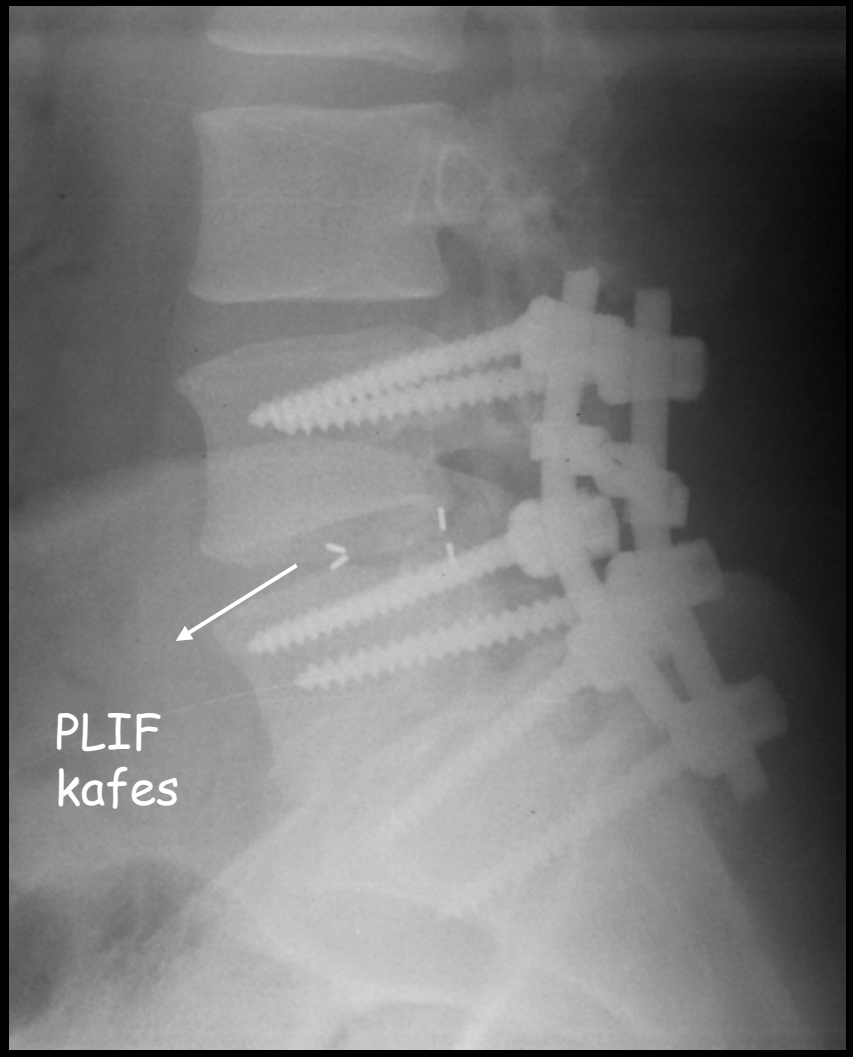
Listezisde artış var





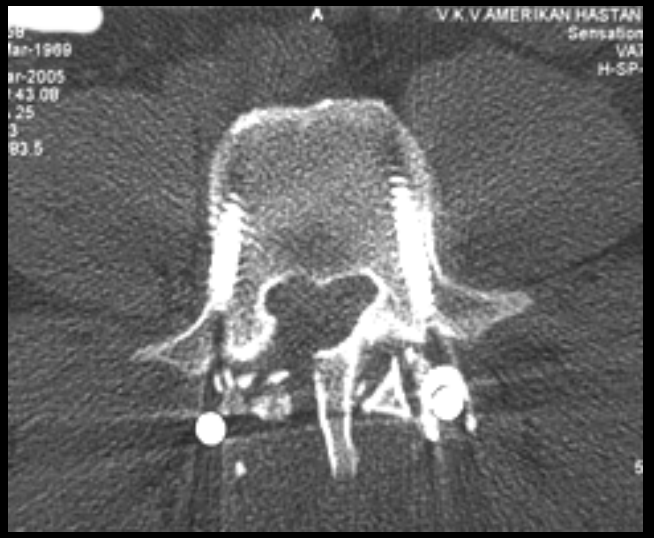
Erken Postop.





Postop.6.ay







Dekompresyon Başarısı ?

- Yalnız dekompresyon (füzyonsuz) yapılan olgularda %60-96 klinik başarı

Dall BE ve ark, Spine 1985
Lombardi JS ve ark., Spine 1985

Dekompresyon ± Füzyon Başarısı ?

- Klinik başarı;
  - yalnız dekompresyon yapılanlarda %46
  - dekompresyon ve füzyon yapılanlarda %96,

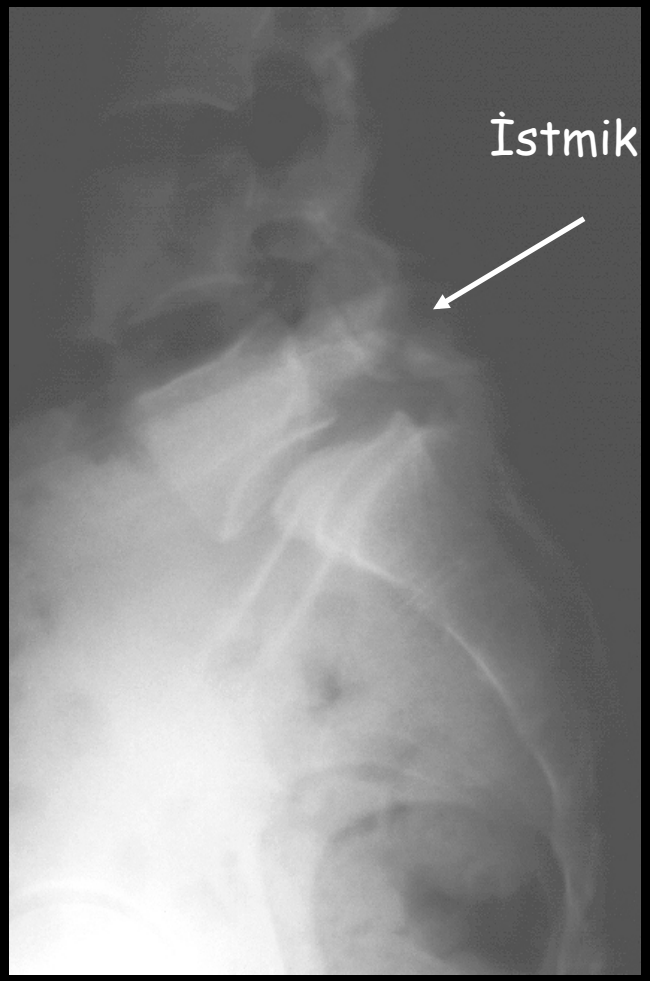
Herkowitz AN, Kurz LT, JBJS 1991

Dekompresyon+Füzyon+Enstrumantasyon Başarısı ?

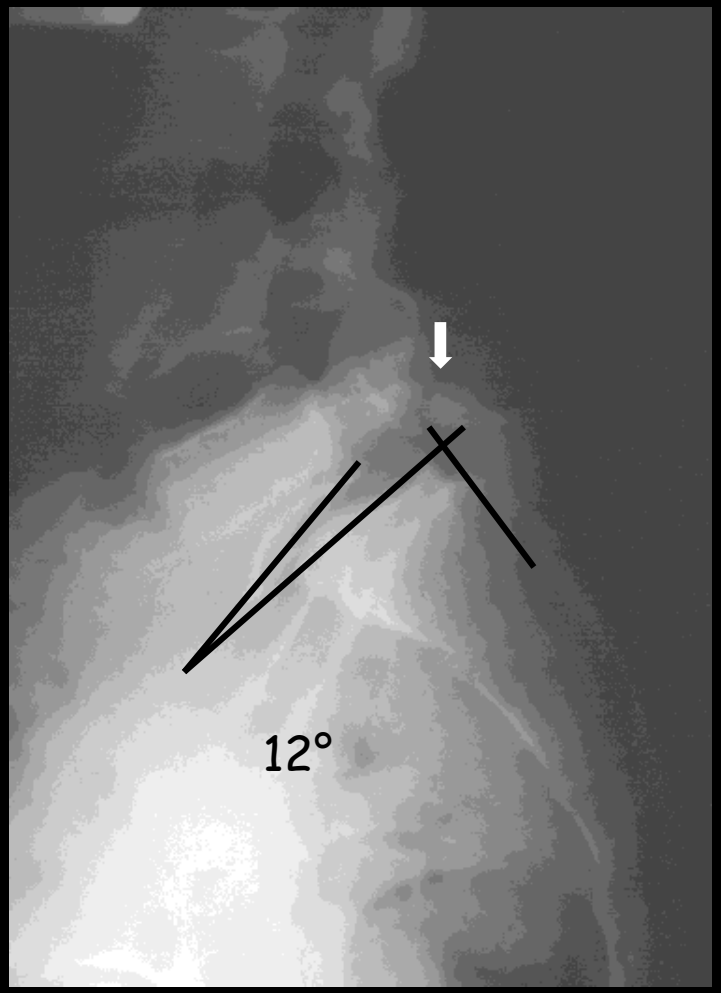
- 2684 hasta, kohort çalışma sonucu;
- Pedikül vida fiksasyonu yapılan olgularda füzyon %82.5
- Fiksasyon yapılmayanlarda füzyon %74.5

Yuan HA, ve ark., Spine 1994

Preoperatif Grade II Listezis

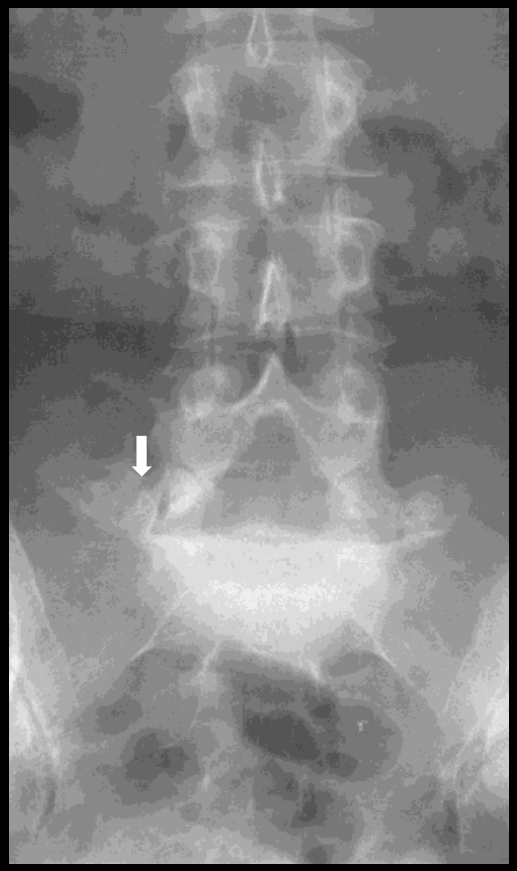


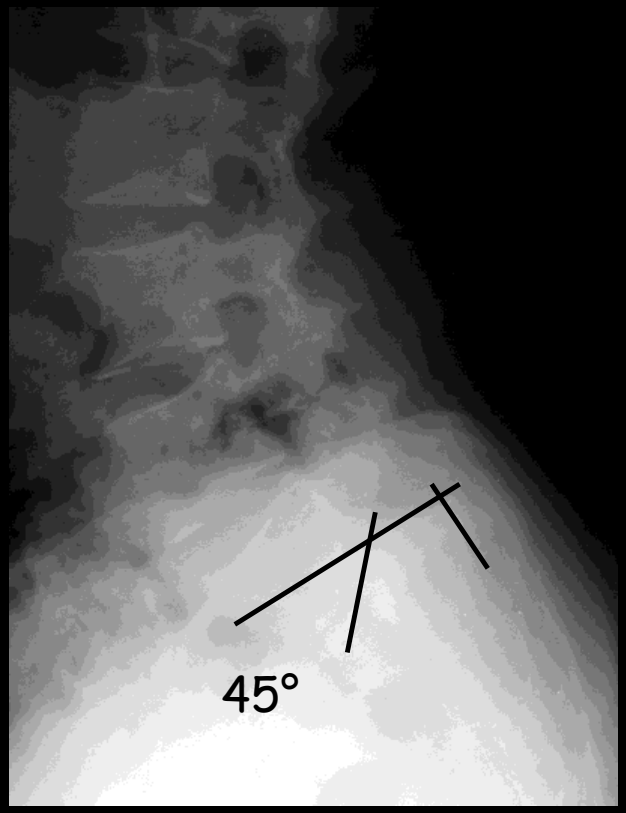
1995 preop.



Kayma Derecesi ve Açısı Artışı

- 1996 yılında
- L5-S1 dekompresif hemilaminektomi
- Posterolateral füzyon







2002

J Neurosurg (Spine 1) 100:62–65, 2004

Transvertebral interbody cage and pedicle screw fixation for high-grade spondylolisthesis

Case report

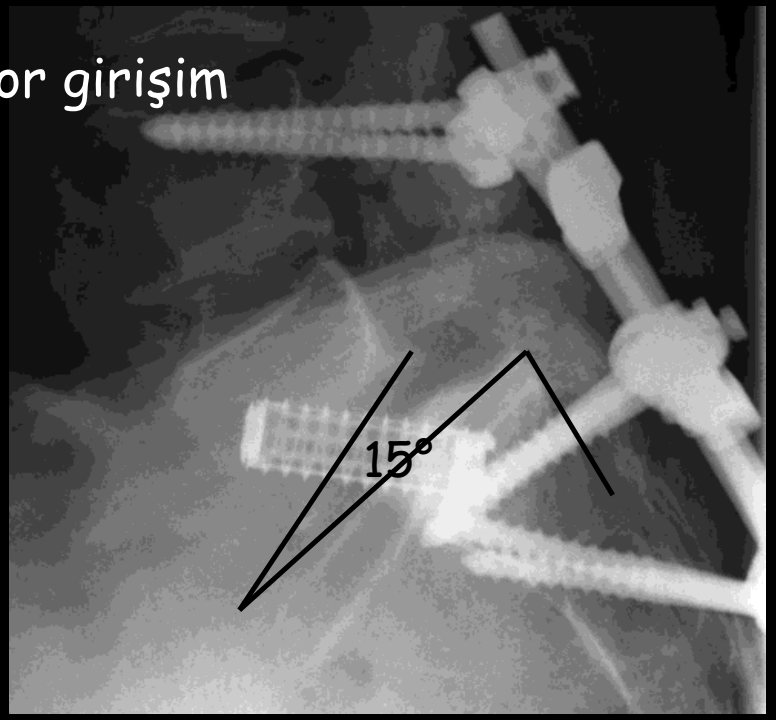
HAKAN BOZKUS, M.D., AND CURTIS A. DICKMAN, M.D.

Department of Neurosurgery, VKV American Hospital, Istanbul, Turkey; and Division of Neurological Surgery, Barrow Neurological Institute, St. Joseph's Hospital and Medical Center, Phoenix, Arizona

Yalnız posterior girişim



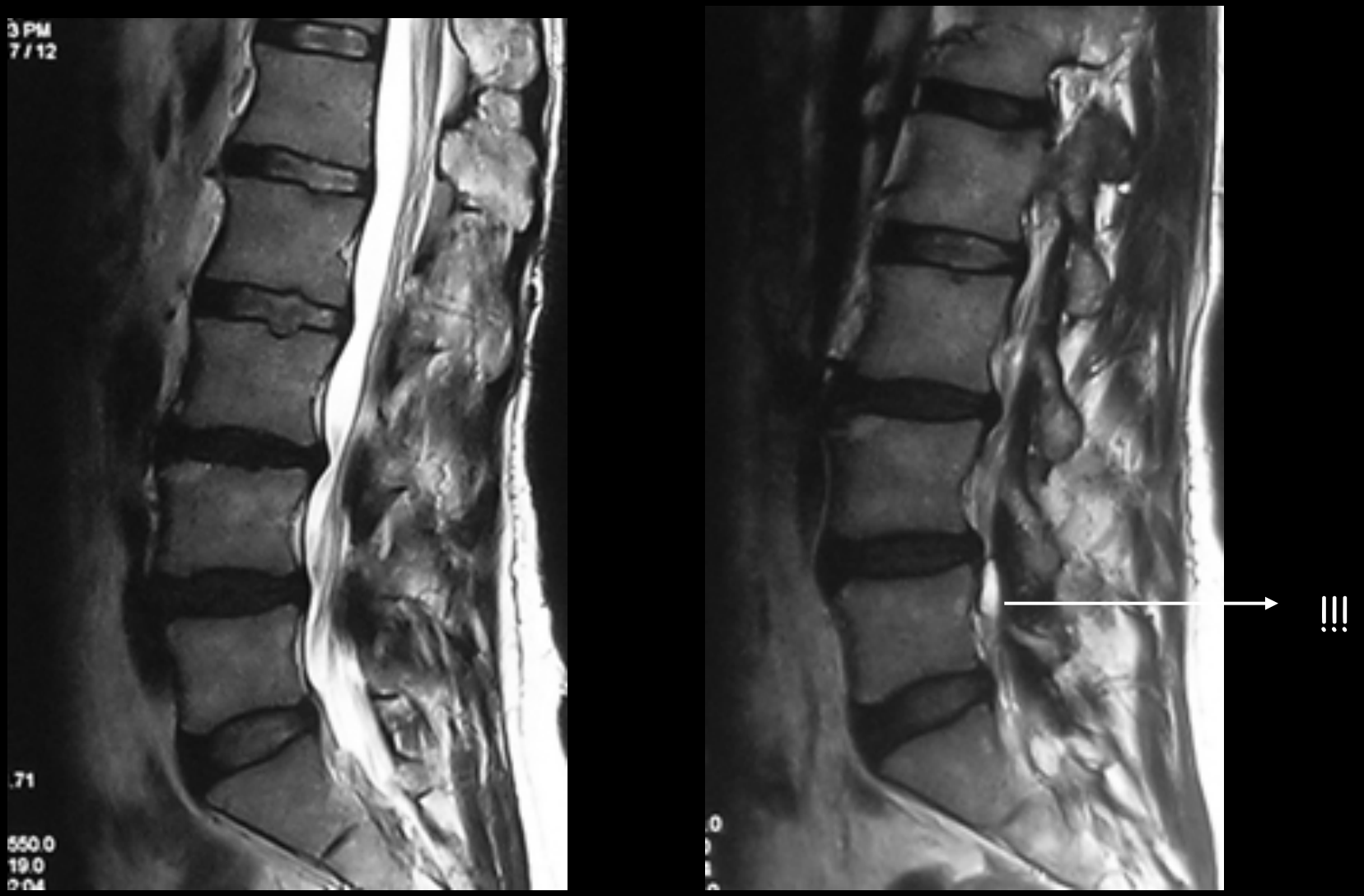
Preop.



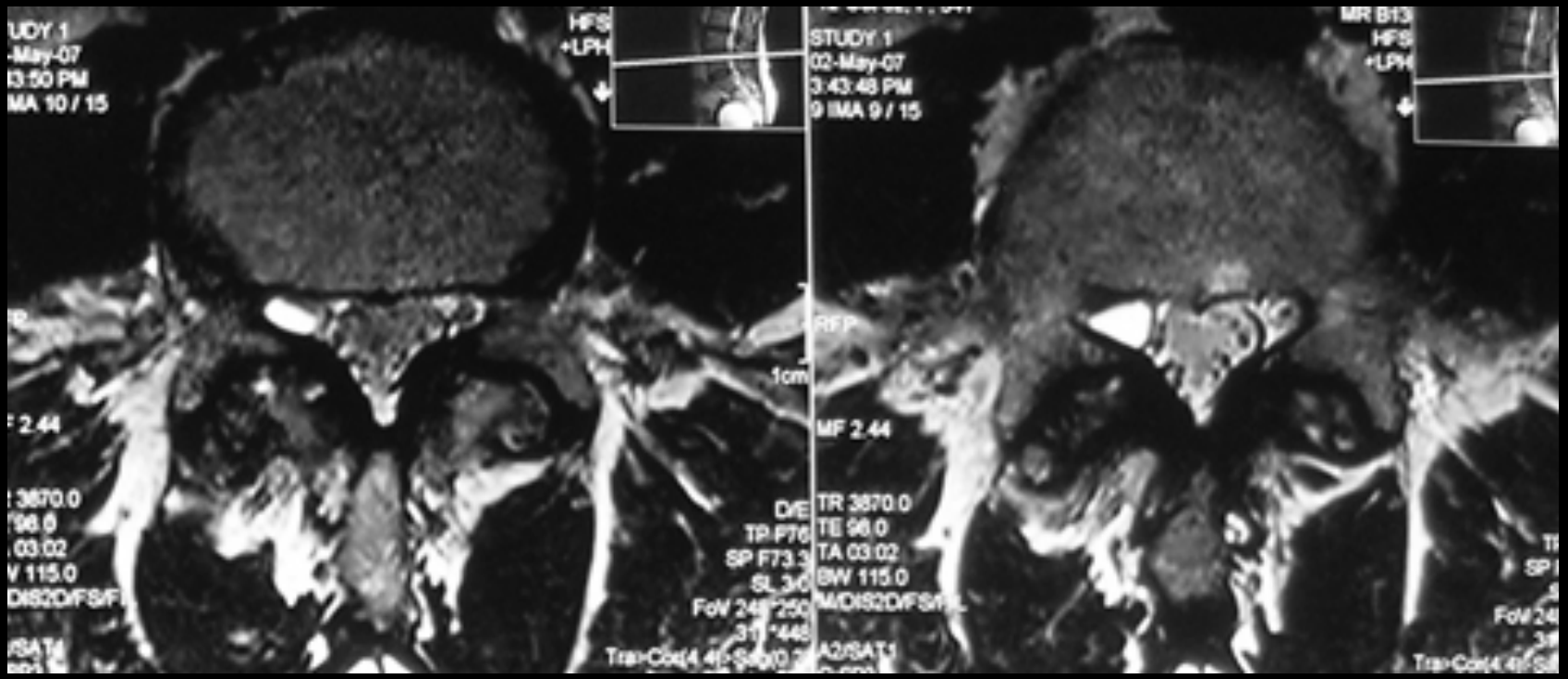
Postop.

Faset osteoartriti/ synovial kist

L4-5 synovial kist



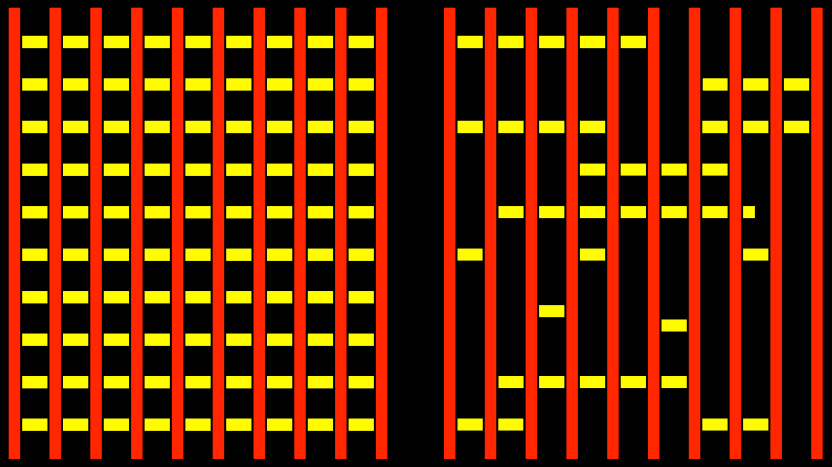
L4-5 synovial kist



Osteoporoz

Trabeküler kemik

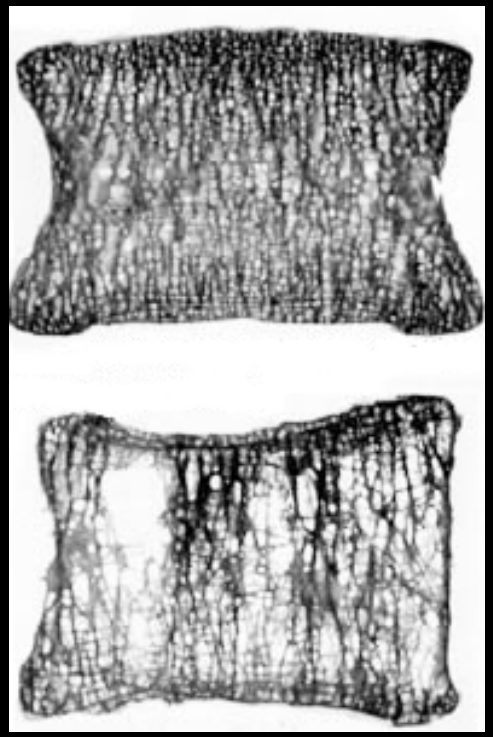
Osteoporozda ana yük taşıyıcı dikey trabeküler kemik

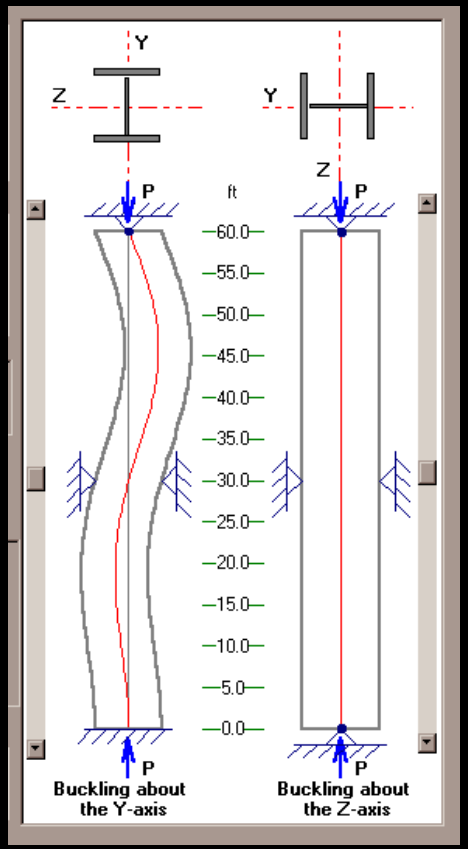




Euler eğilme teoremi

- Bir silindirin eğilmeye dayanımı, silindirin;
  - Çapı, uzunluğu, ara bağlantıları ile doğru
  - Elastisik modululusu ile ters orantılıdır

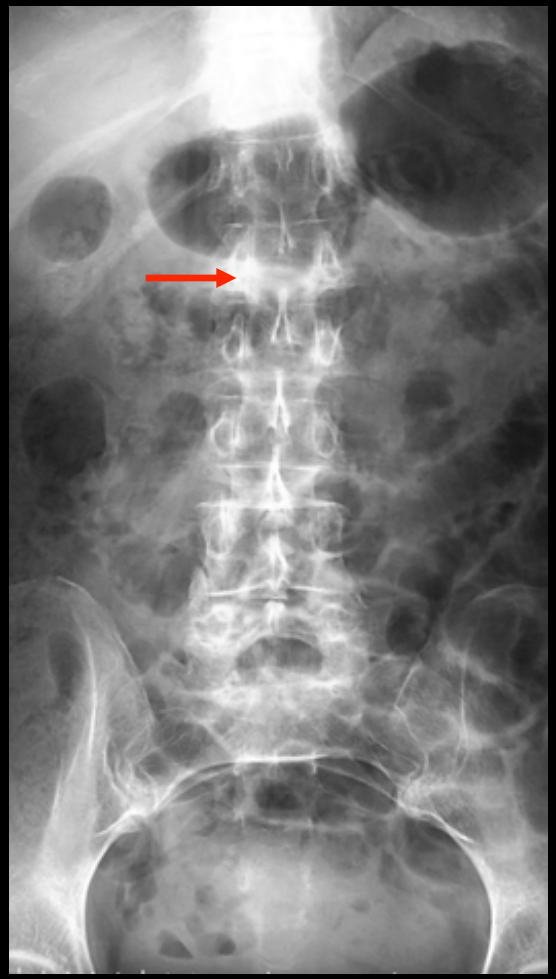




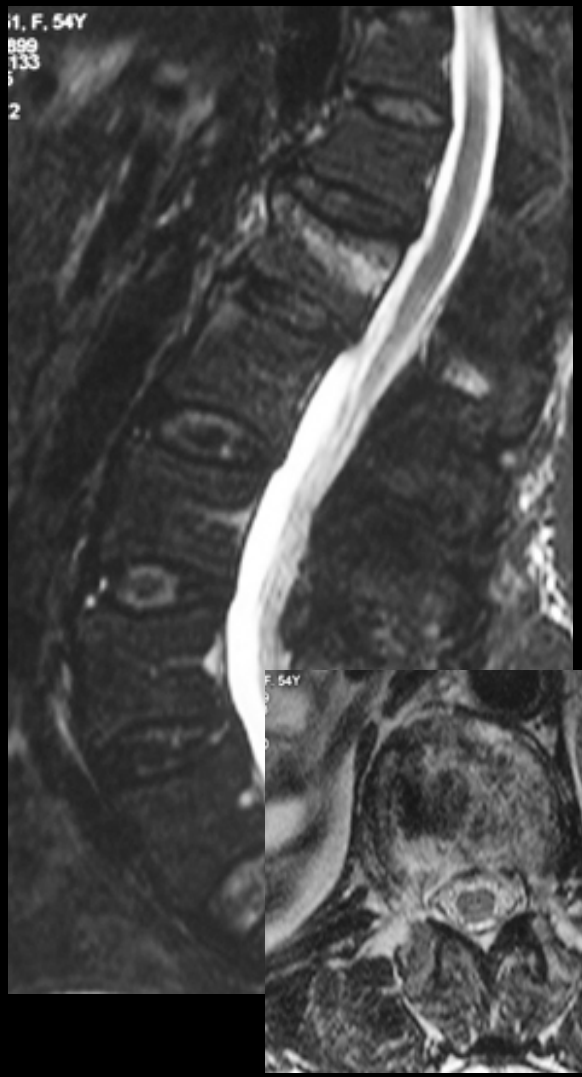


Crisco JJ, Panjabi MM, Clin Biomech 1992
Bozkuş H ve ark., Turkish Neurosurg 2003

L1 Vertebra Kırığı







Kırığın Doğal Seyri



Travma günü





Travma sonrası 9.ay

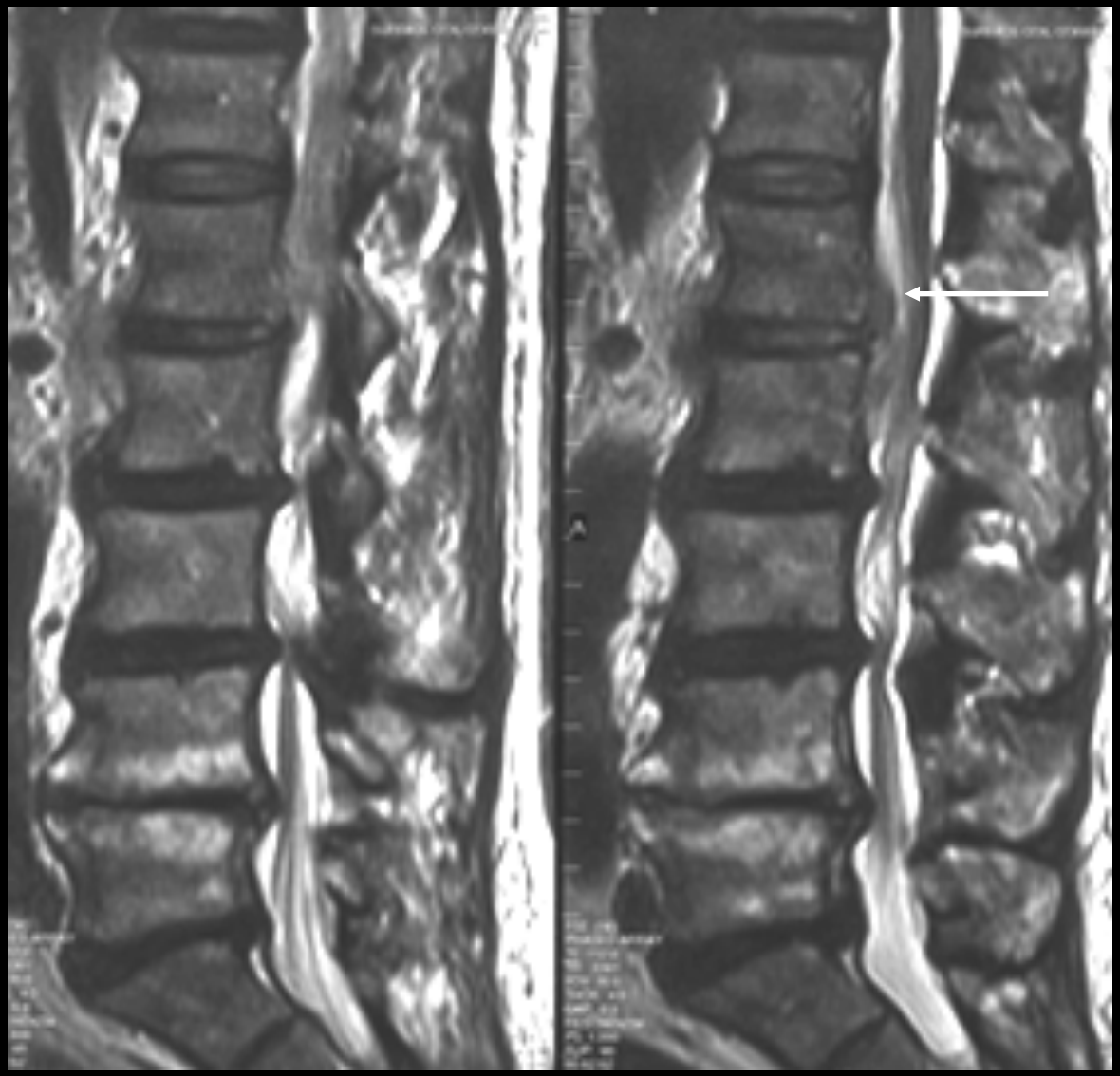
Tedavi



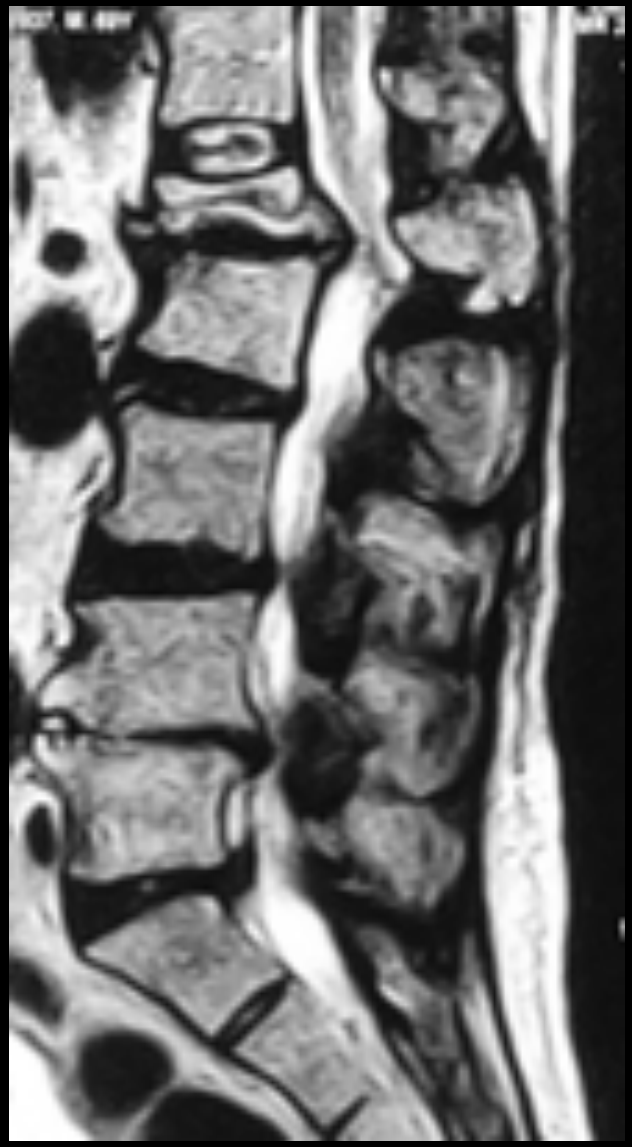


İnfeksiyon

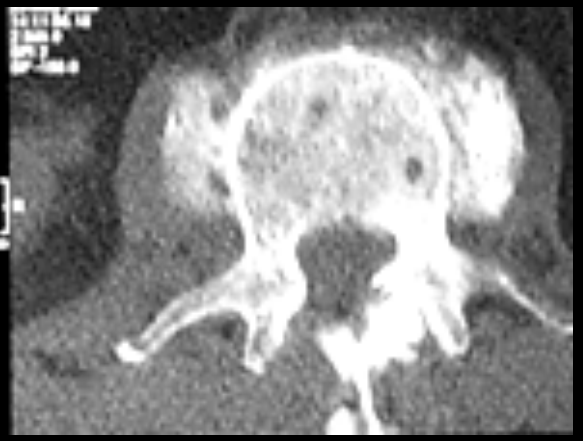
L1-2 epidural abse

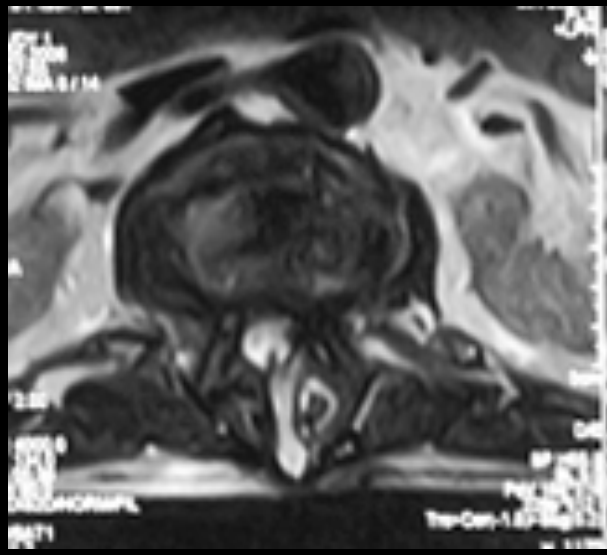


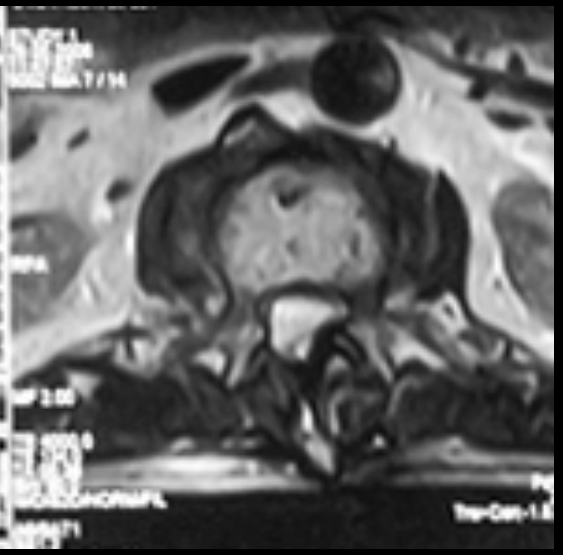
1 yıl sonra









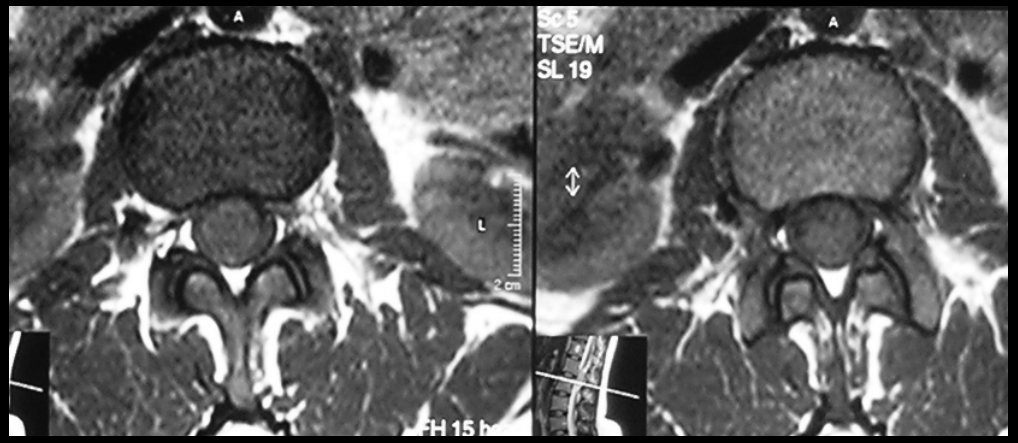


Spinal tümör

L1-2 epandimom



!!!!!!



T10 nörinom

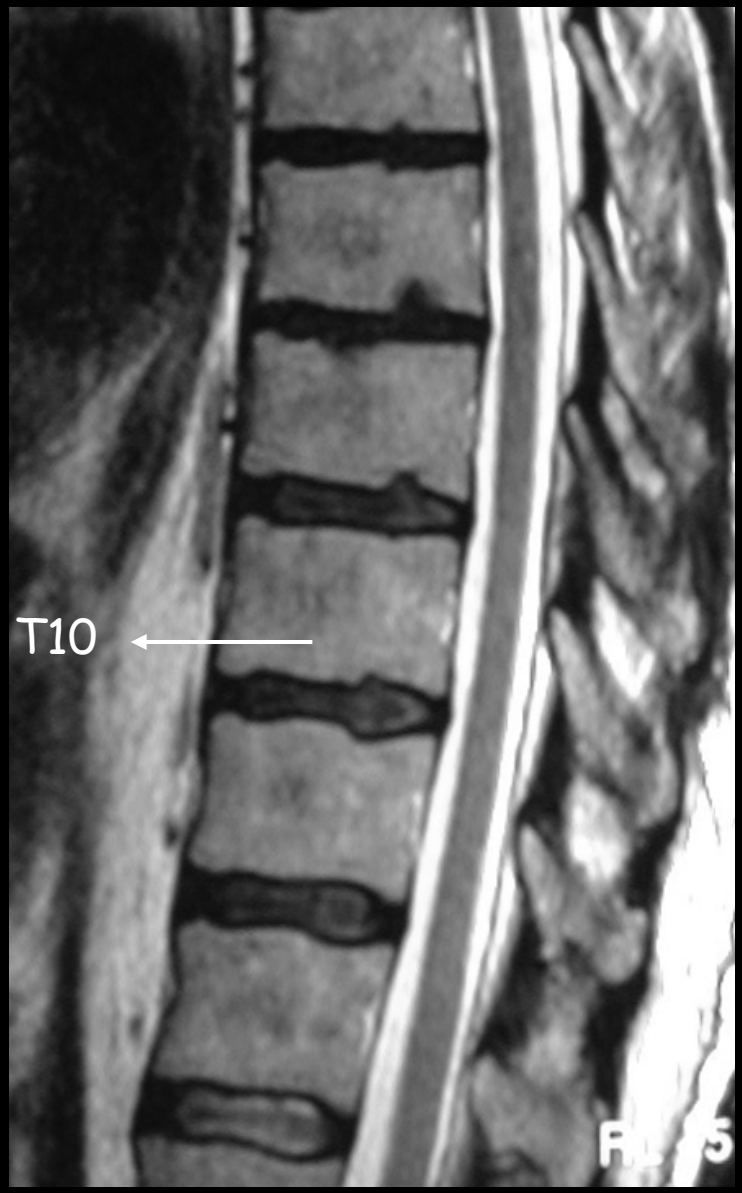








Postop. 3.ay





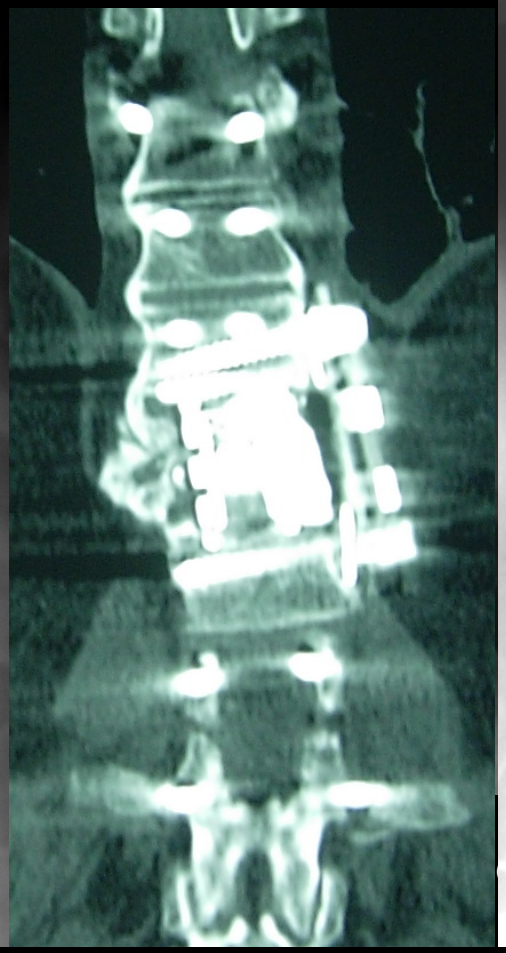


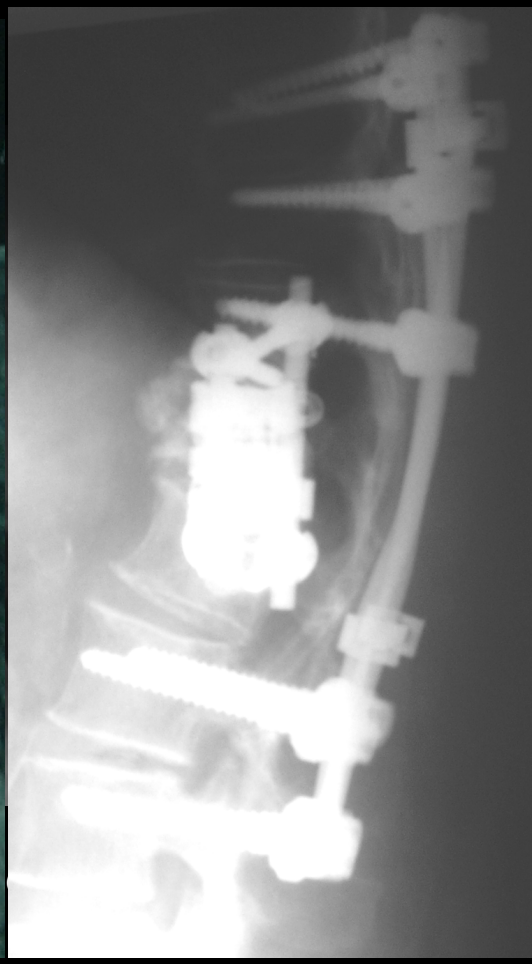
Primer vertebra tümörü

Primer vertebra tümörü/ osteoporoza bağlı anterior kafes çökmesi !





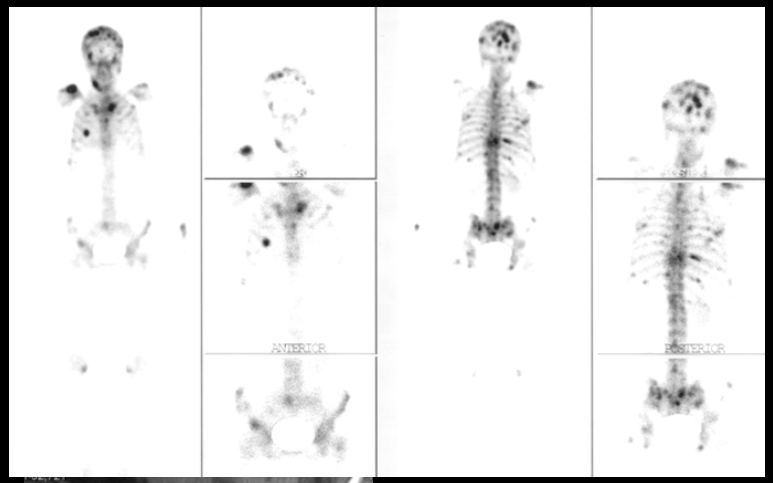




Vertebra tümörü

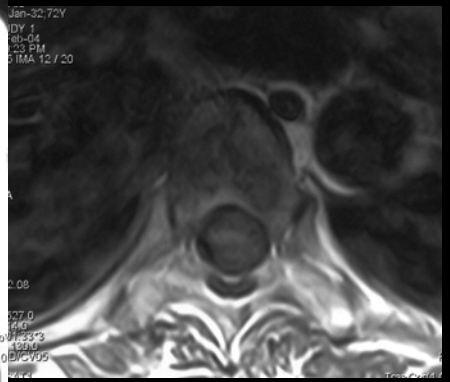
Metastaz

T8 metastatik kırık

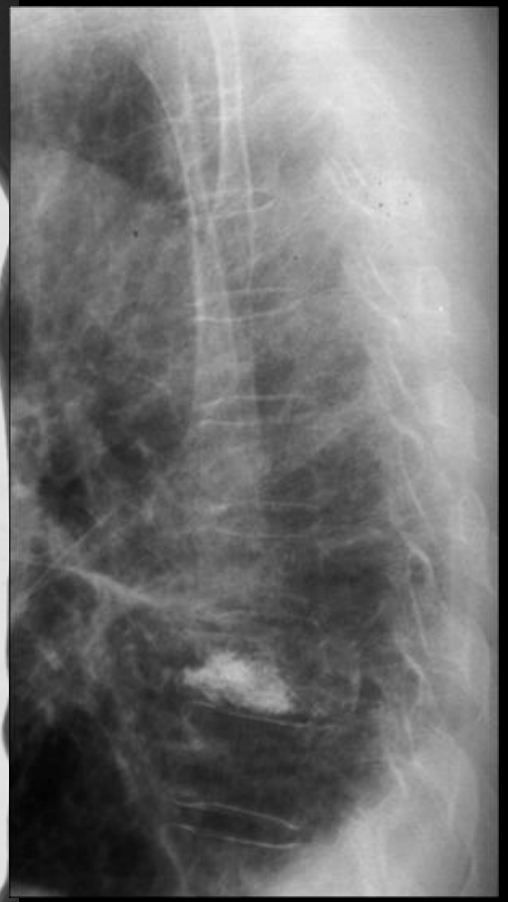


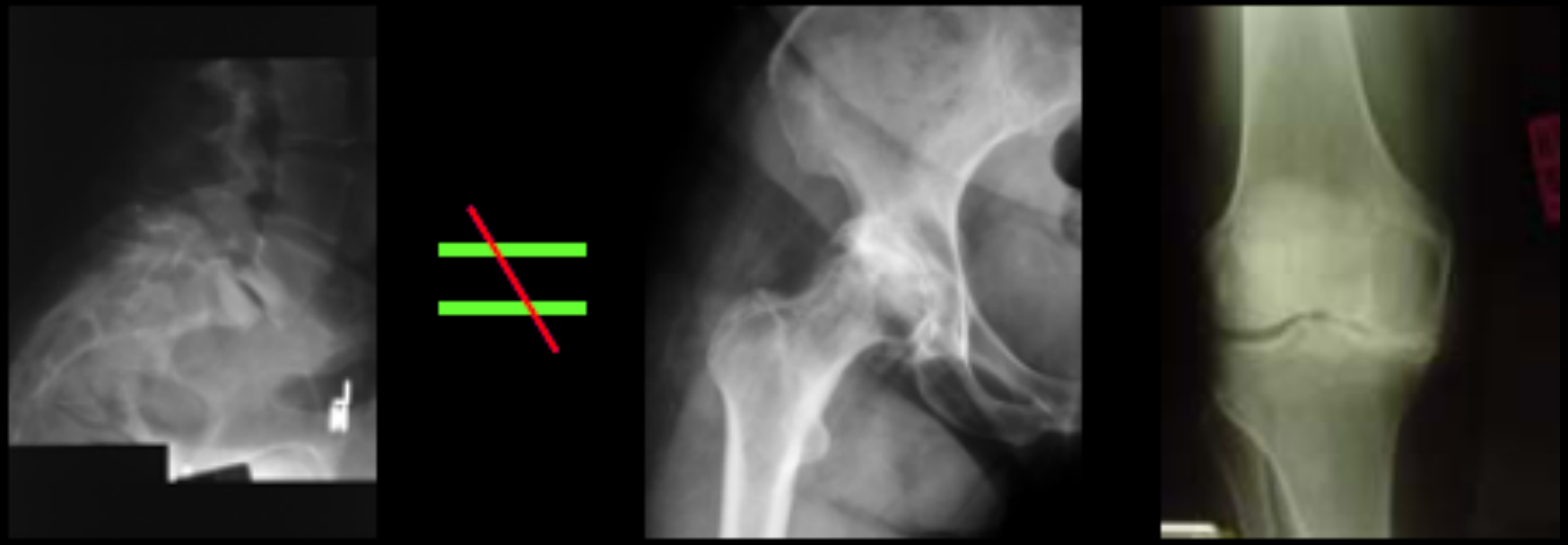


Akciğer yaygın metastazı !









Teşekkür Ederim