

Full Endoscopic Postero-Lateral Lumbar Facet Sparing Interbody Fusion and Targeted Decompression for Foraminal Stenosis and Spondylolisthesis

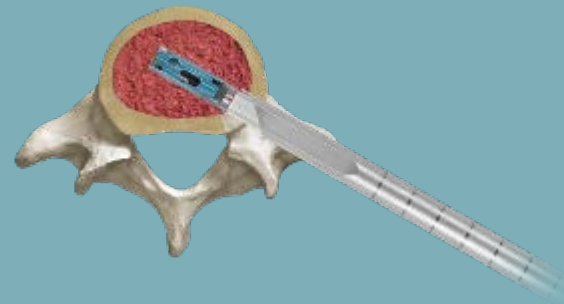
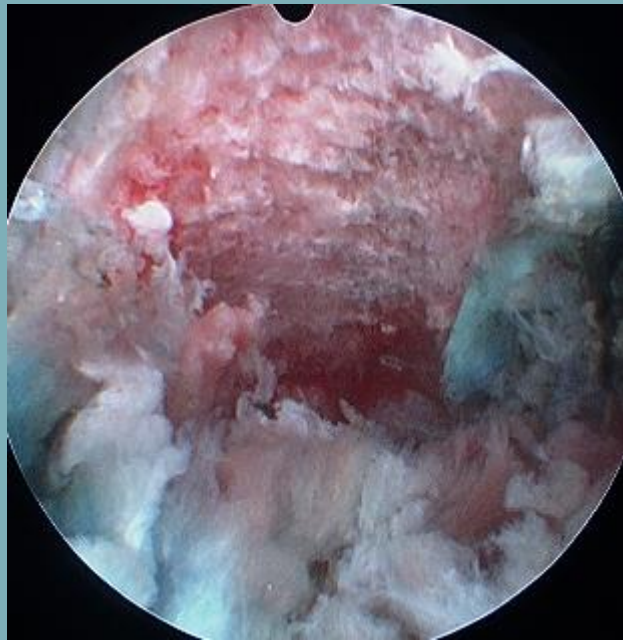
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Frank H. Netter School of Medicine

Quinnipiac University

Department of Orthopaedic Surgery

CT Orthopaedic Specialists



Disclosures

- 1. Elliquence, LLC
- 2. Aesculap Spine
- 3. Globus Spine
- 4. Alphatec Spine

Case

HPI: Patient is a 83 y.o. female who was presented with mild lower back pain and significant and left leg pain

PE: Wt 63.5kg, Ht 5'5", BMI 23.3kg/m²

Spine/Neurologic:

- Normal gait.
- Strength: grossly intact for BLE.
- Sensation: grossly intact for BLE.
- Bilateral ankle clonus (-).
- (



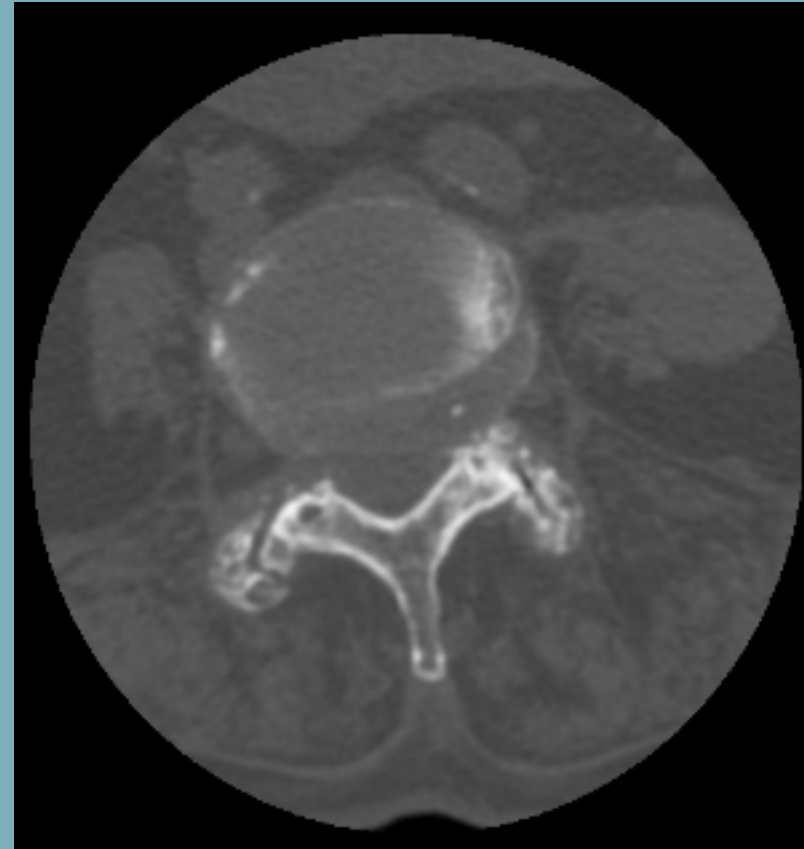
Pre op X ray



Pre-op CT



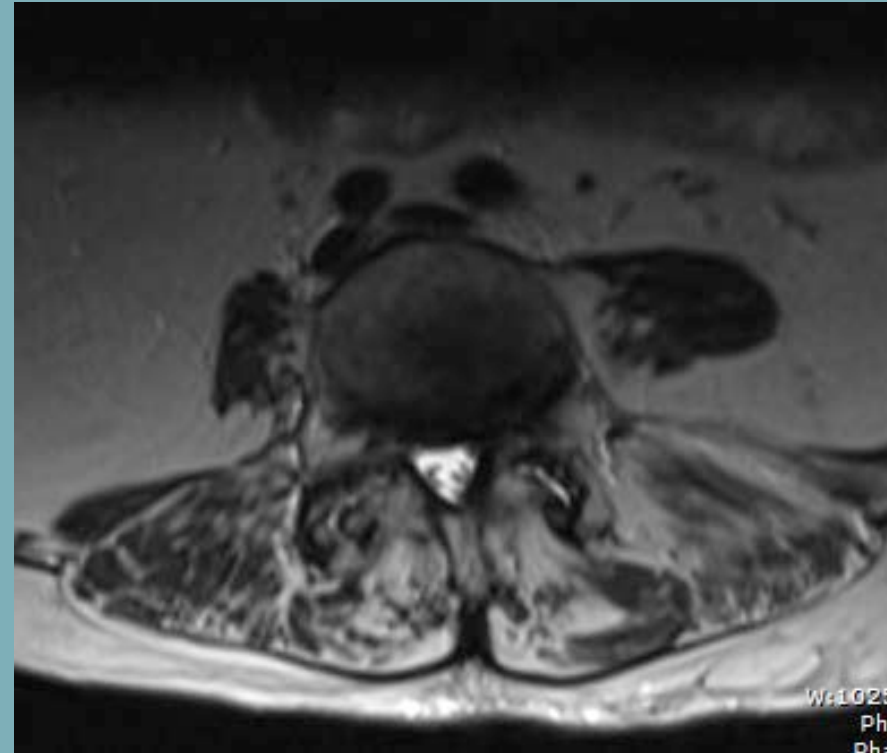
L4-5



Pre-op MRI



L4-5



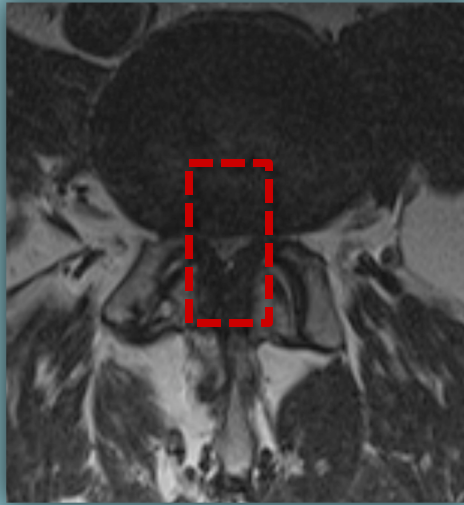
Case 2



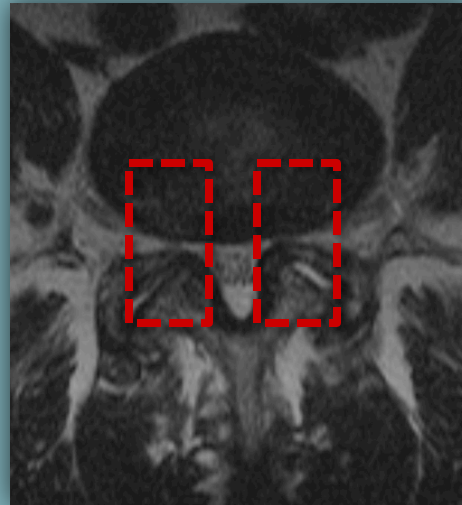
- Prior Open Decompression and fusion
- Adjacent Level Spondylolisthesis
- BMI 42

MIS Indications and Limitations: Degenerative spinal stenosis

Classification



central

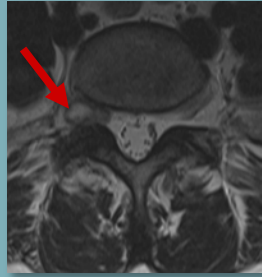


lateral
(recess, foraminal)

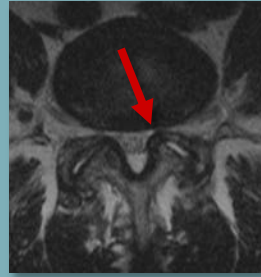
- Symptoms: leg pain, paralysis, back pain
- Bony, capsular ligament structures
- Deficit in movement (walking)

algorithm lumbar stenosis

lateral stenosis

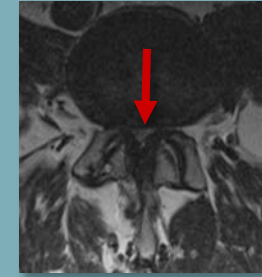


foraminal
• z-joint cyst



recess

central stenosis



transforaminal



interlaminär

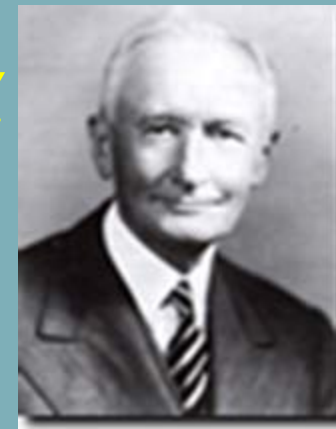
leg symptoms

Advantages of Endo MIS Techniques:

- Same incision for all patients
- Muscle, blood supply preservation facet
- Leverage Indirect and Direct decompression
- Infection rates
- Preserve Facet Joint >>> Less destabilizing
- Access to multi focal areas of stenosis

Introduction: Evolution of Spinal Discectomy

Mixer WJ, Barr JS: Rupture of intervertebral disc with involvement of spinal canal. N Engl J M 1934; 211: 210f..



William J. Mixer

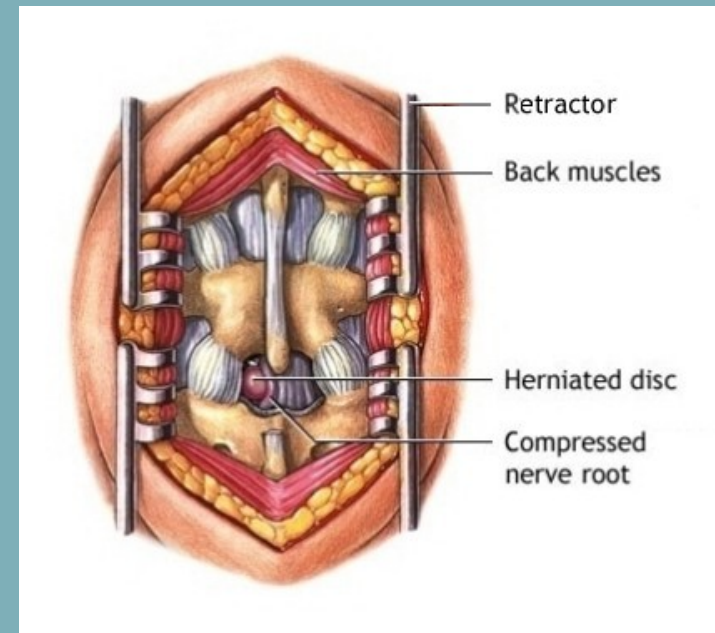
1933



McCullough Micro-discectomy

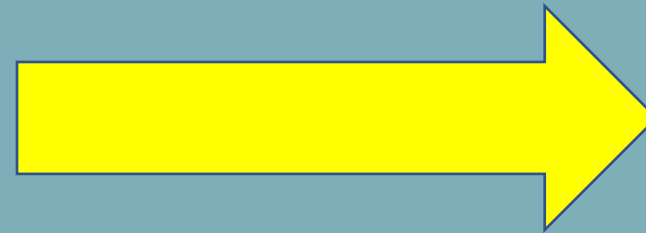
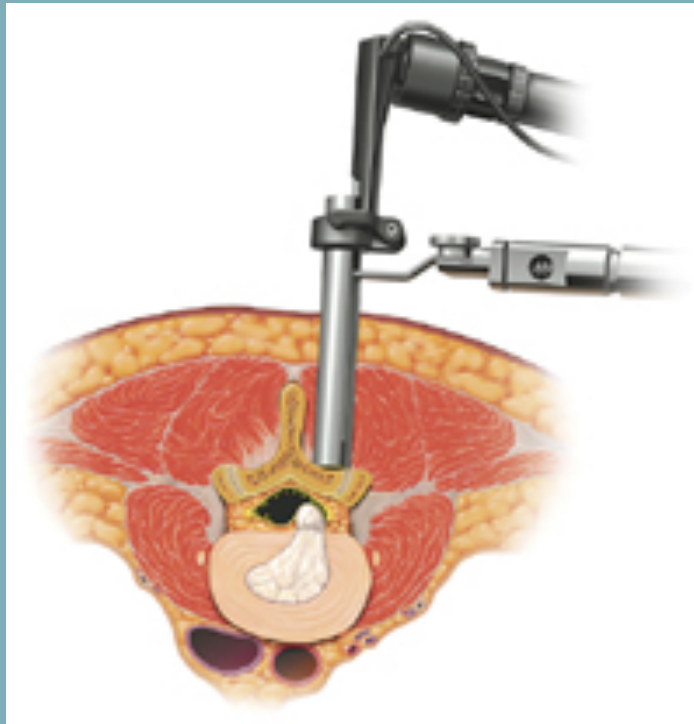


1970s

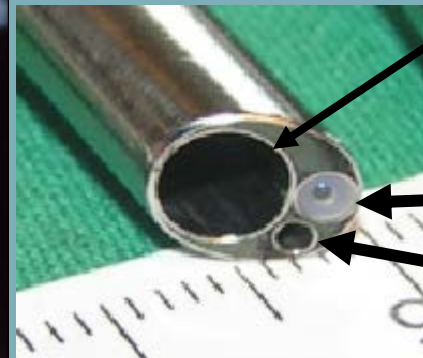
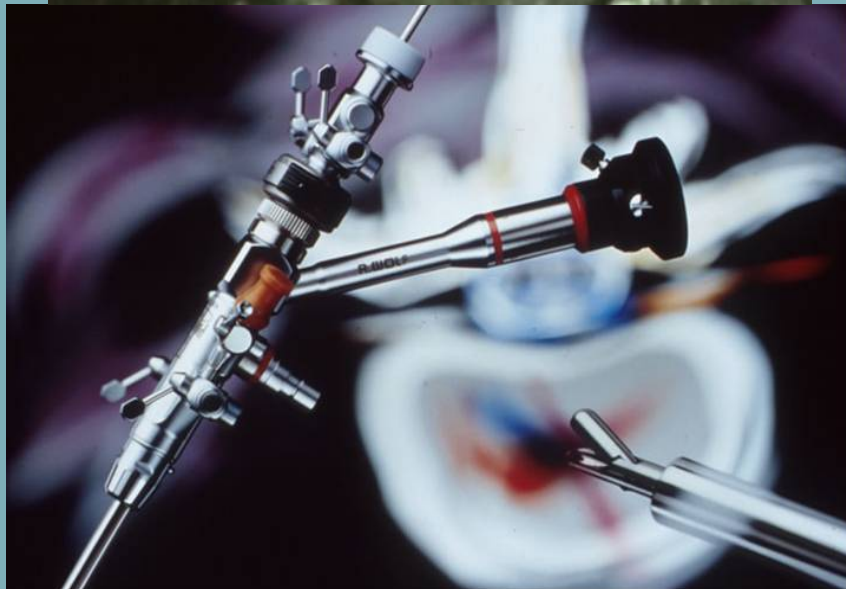
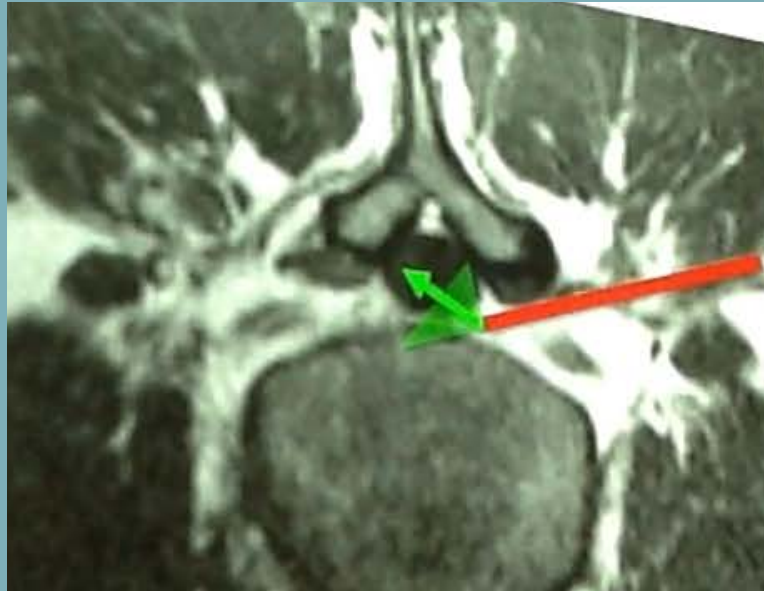


Introduction: Evolution of Spinal Discectomy

MED Metrx



Full Endoscopic Surgery: Vertebri Scope



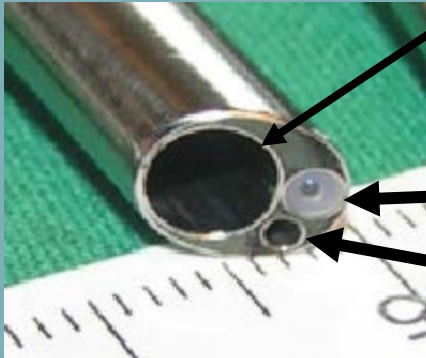
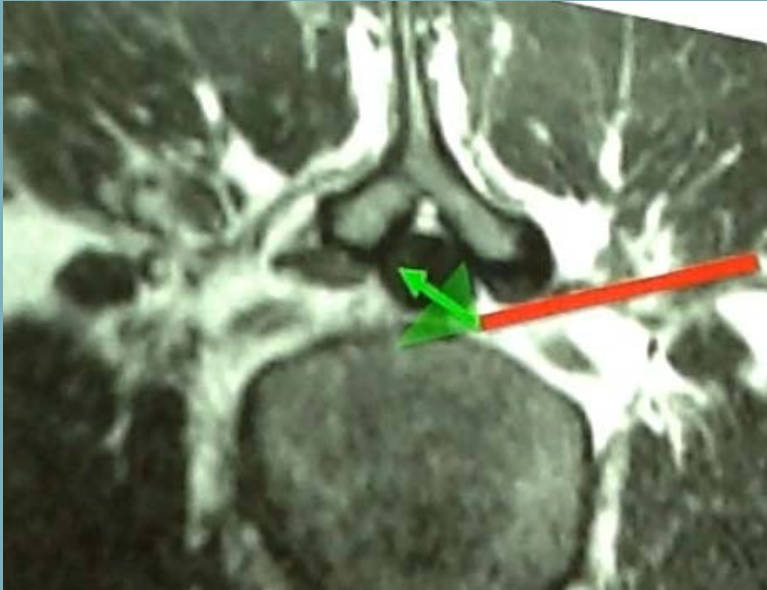
Working Channel

Light Guide

Optics

Irrigation Channel

Current Technology Full Endoscopic Surgery



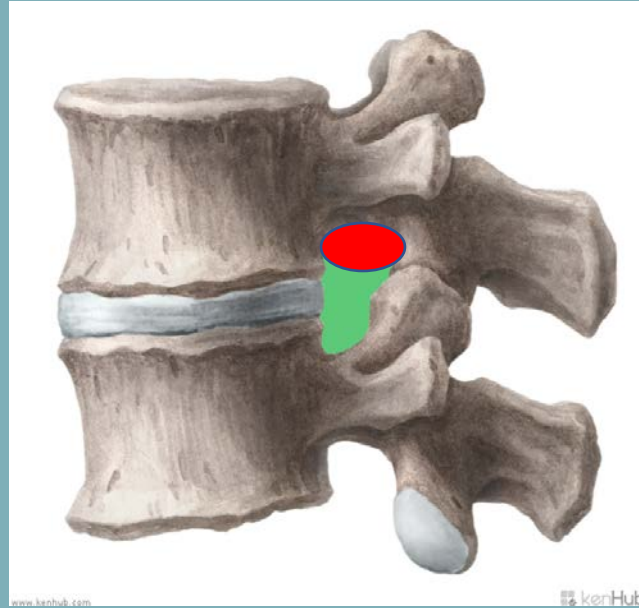
Working Channel

Light Guide

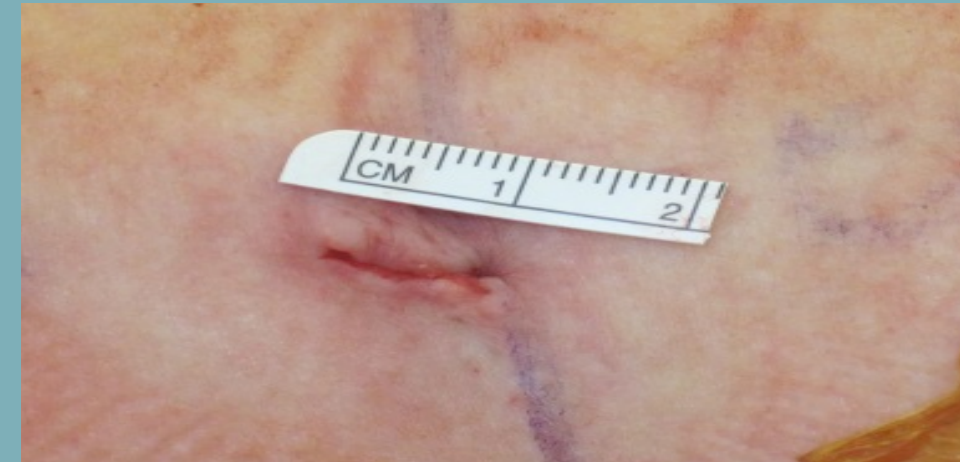
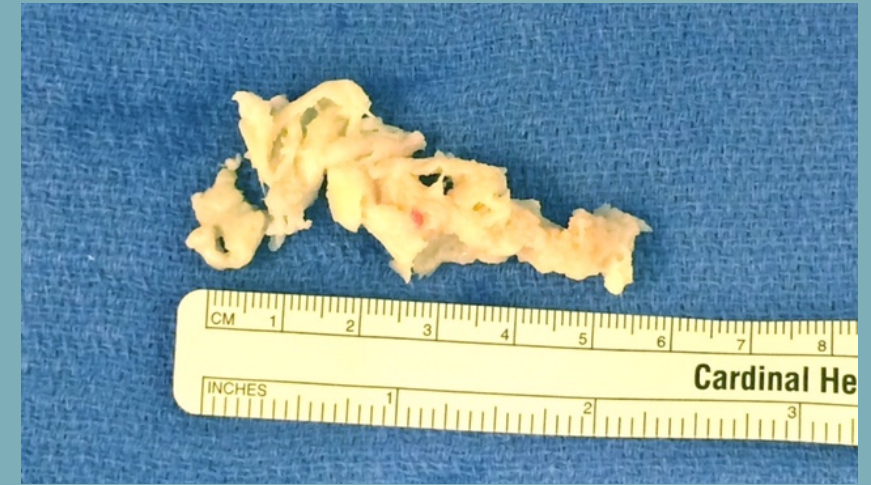
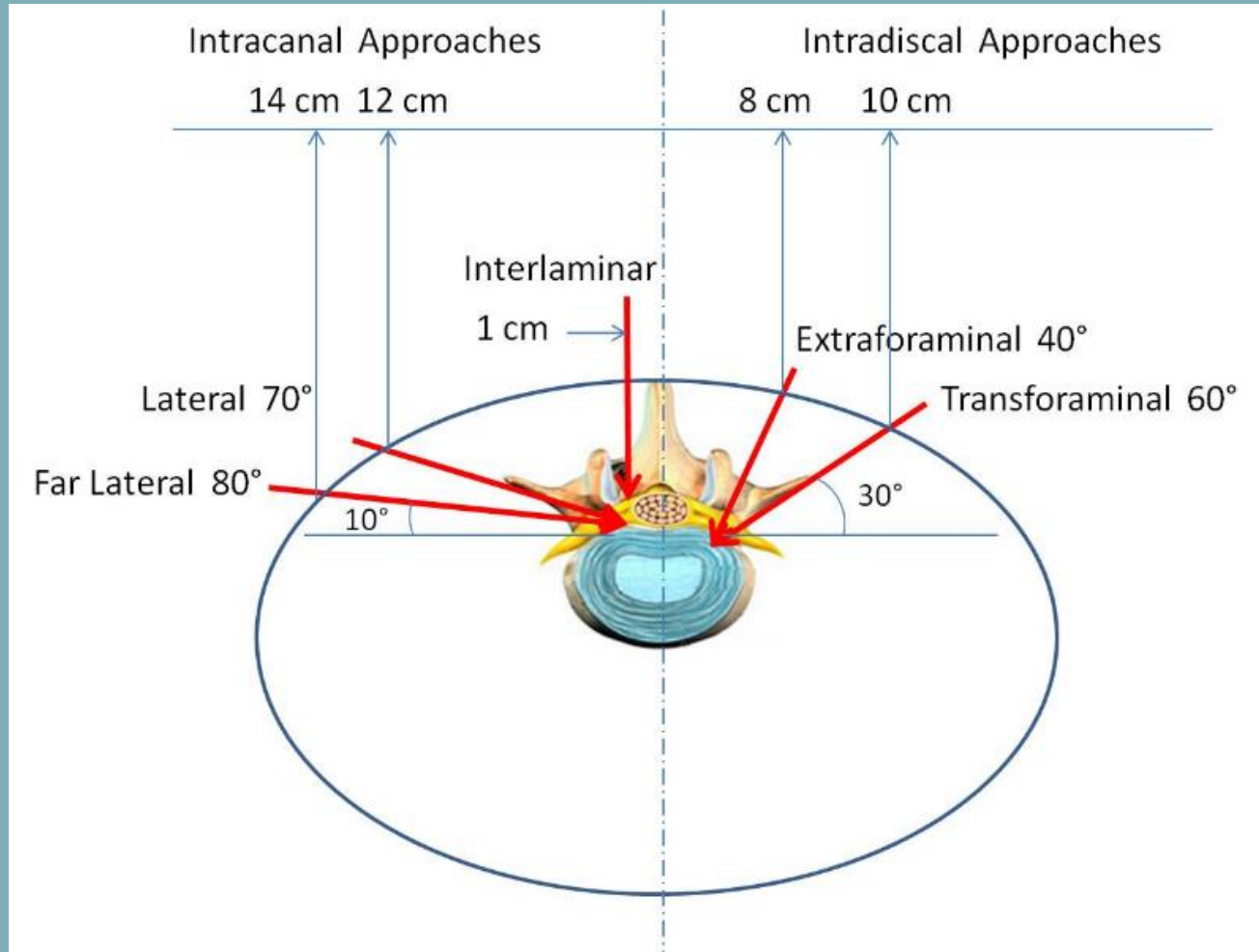
Optics

Irrigation Channel

Understand the Foramen: Upper zone and lower zone



Direct Targeted Discectomy/Decompression



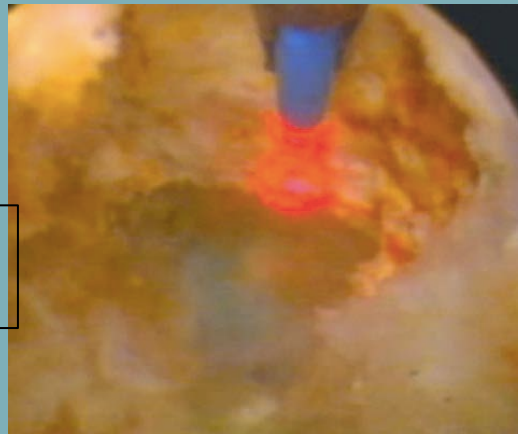
Special Tools for Foraminal Decompression



Articulating Burrs

Fits down the working channel of a 4.0 mm foraminoscope

Laser Straight and Side Firing

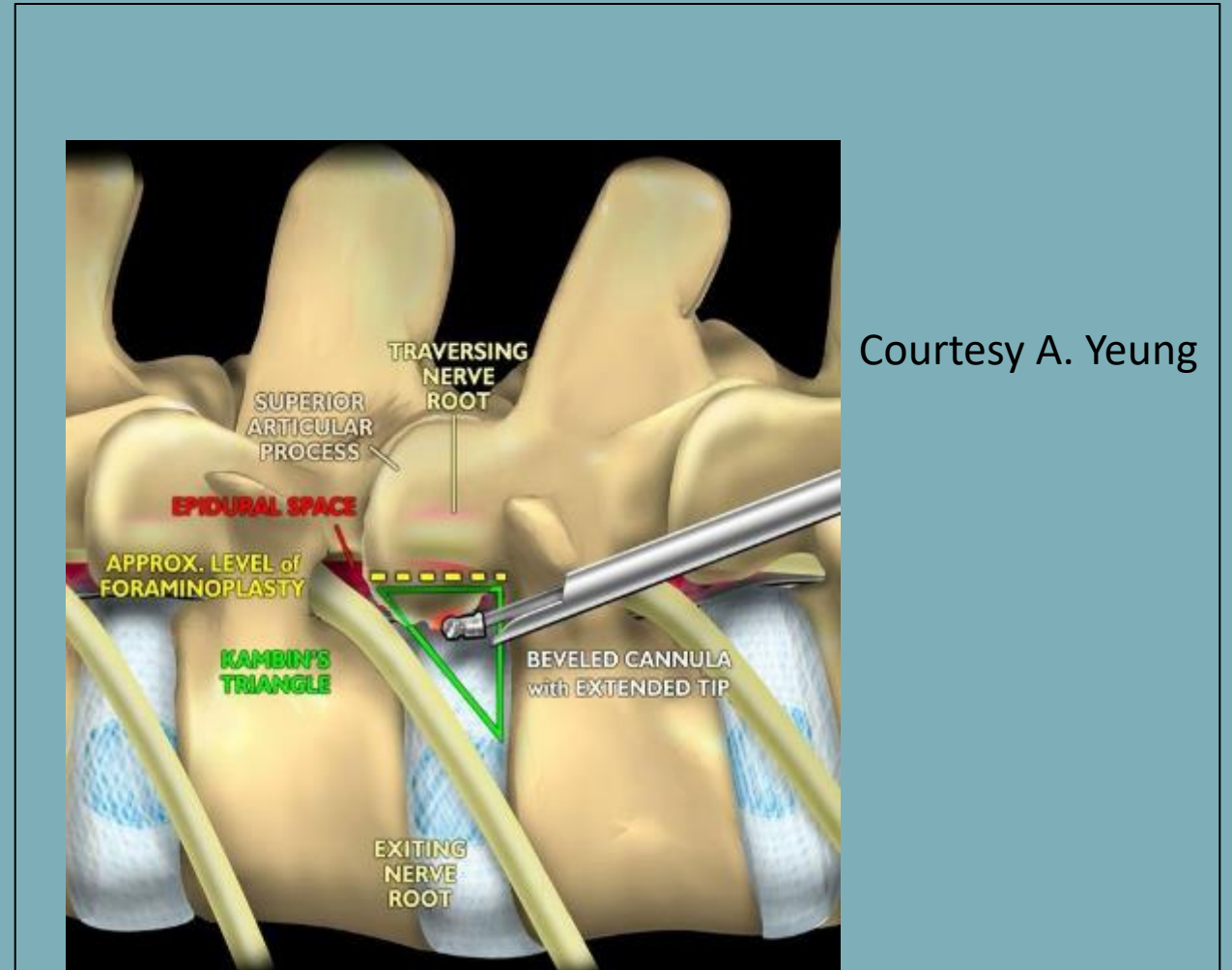
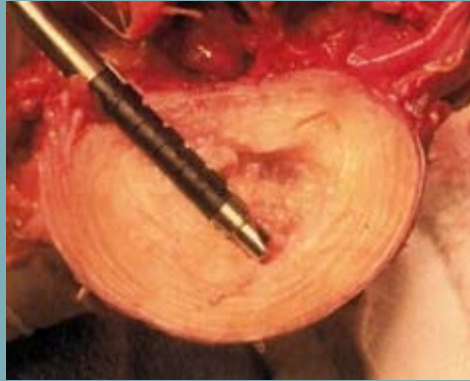


Endo Ultrasonic Bone cutter

Big, Small, Narrow, Wide: Endoscopic Surgery The Neutralizer



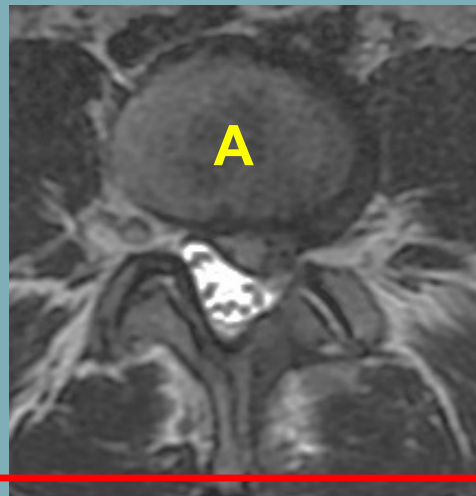
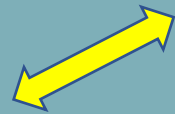
Endoscopic Foraminoplasty, Discectomy, and Endplate Preparation



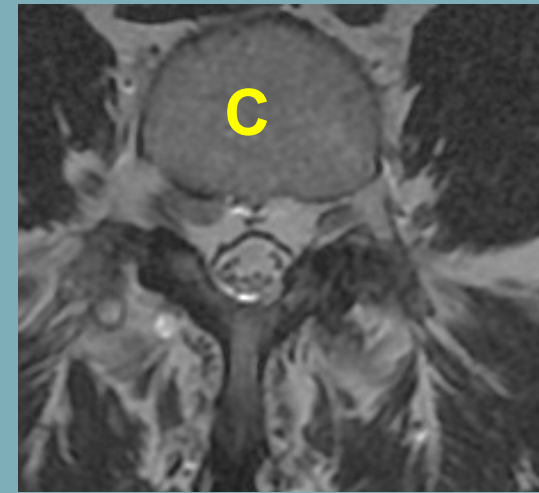
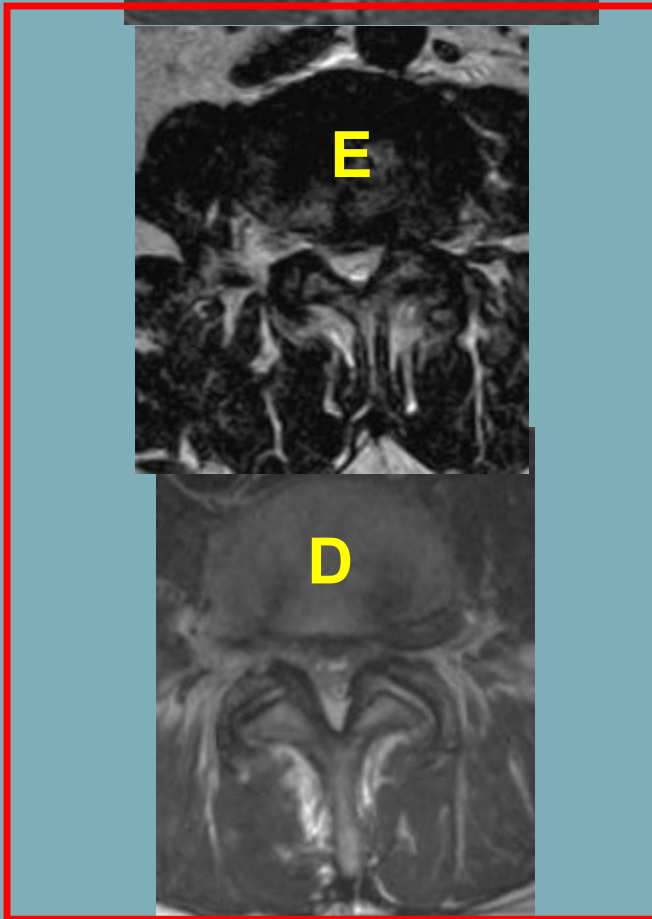
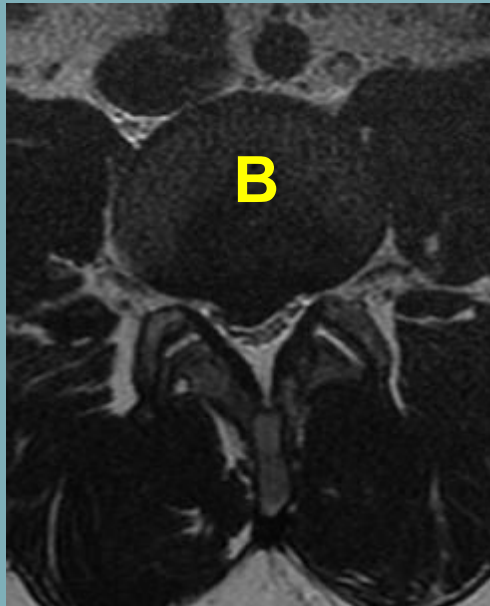
Courtesy A. Yeung

Patterns of Lumbar Disc Prolapse

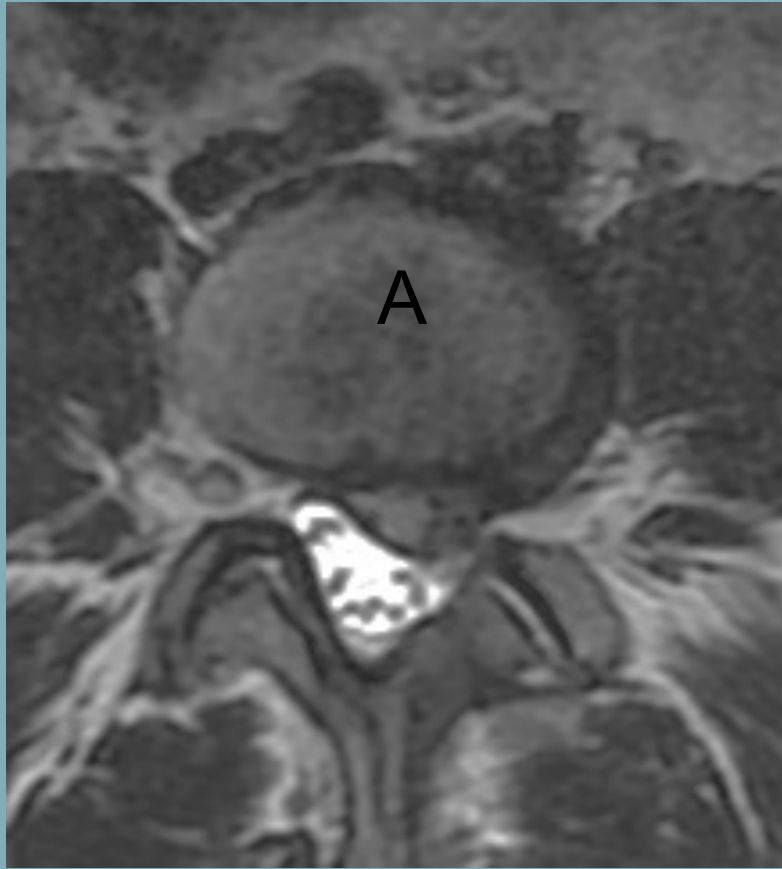
“Uni-Focal HNP”



“Uni-Focal HNP”



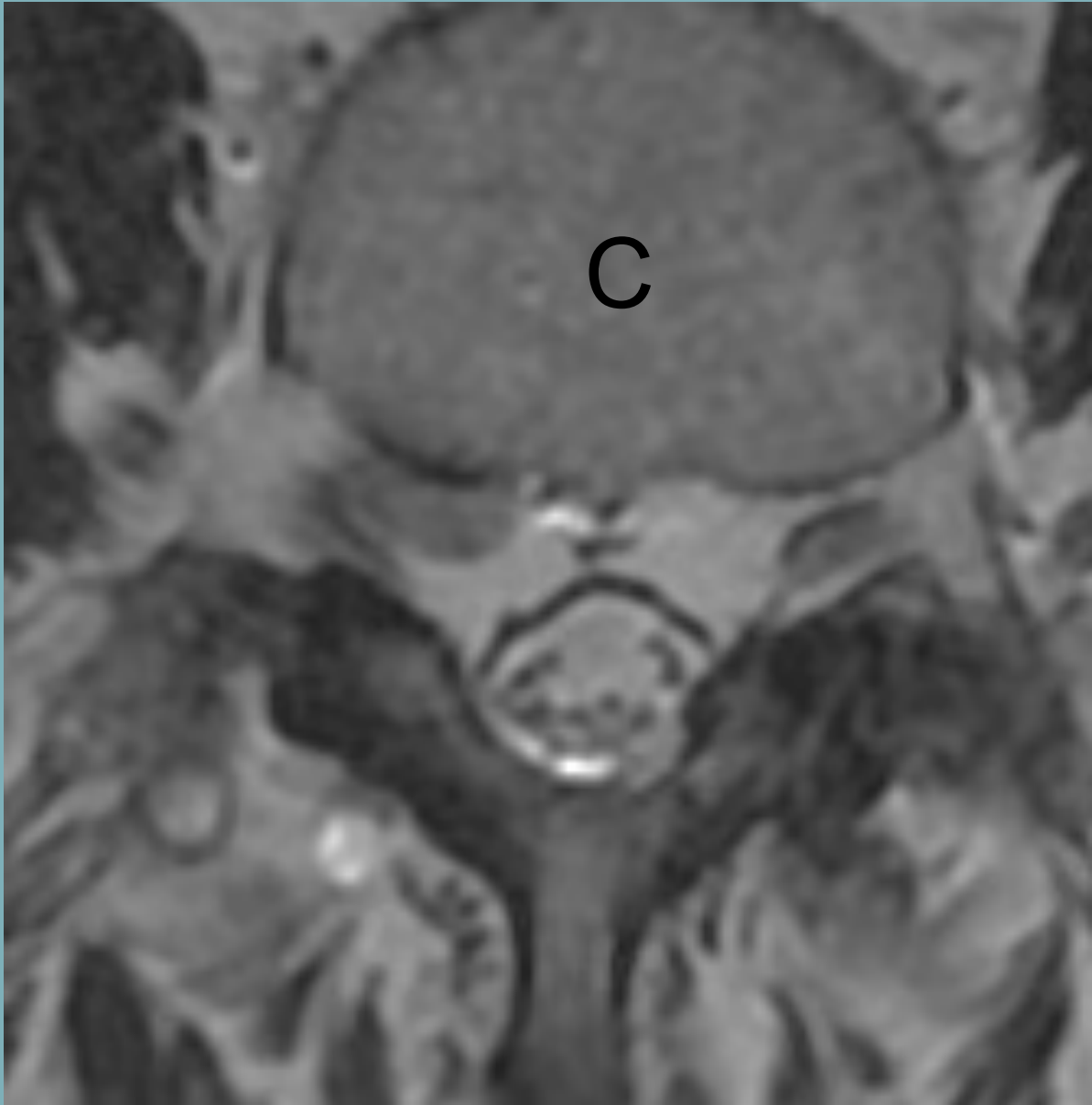
Multi-Focal HNP

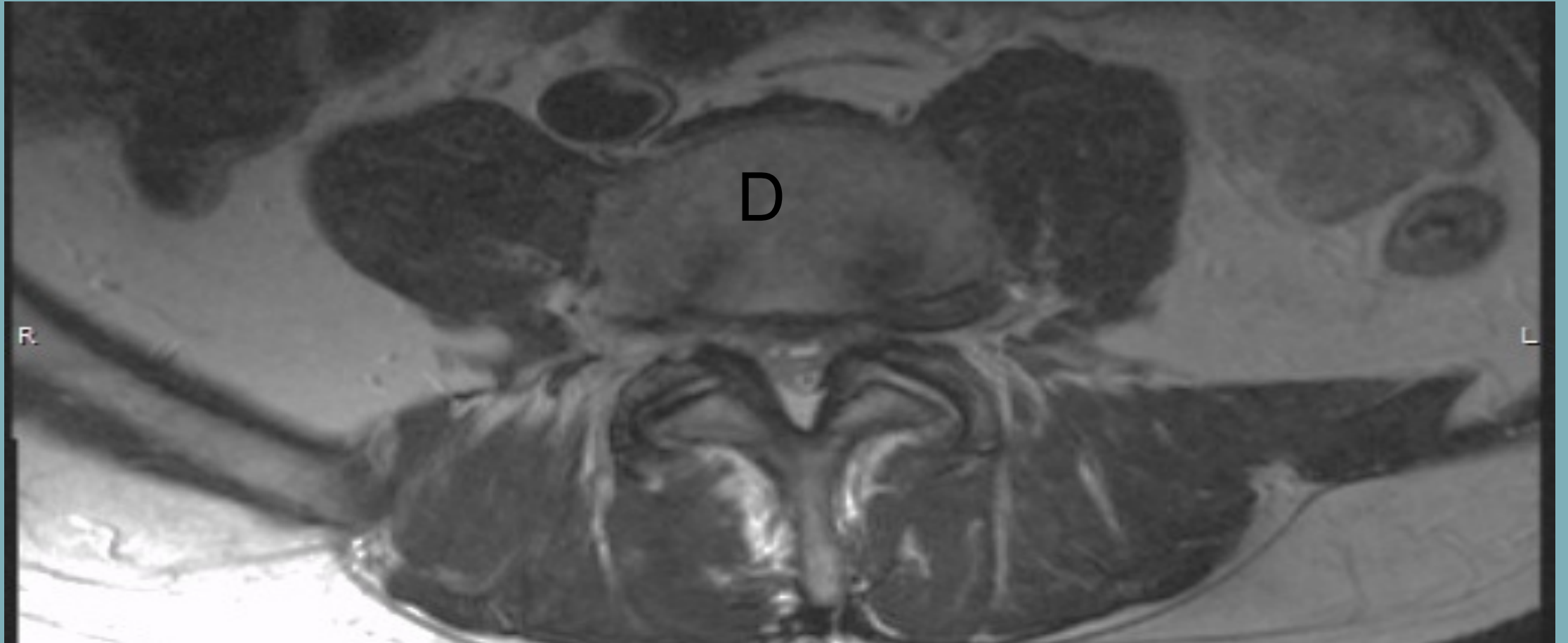


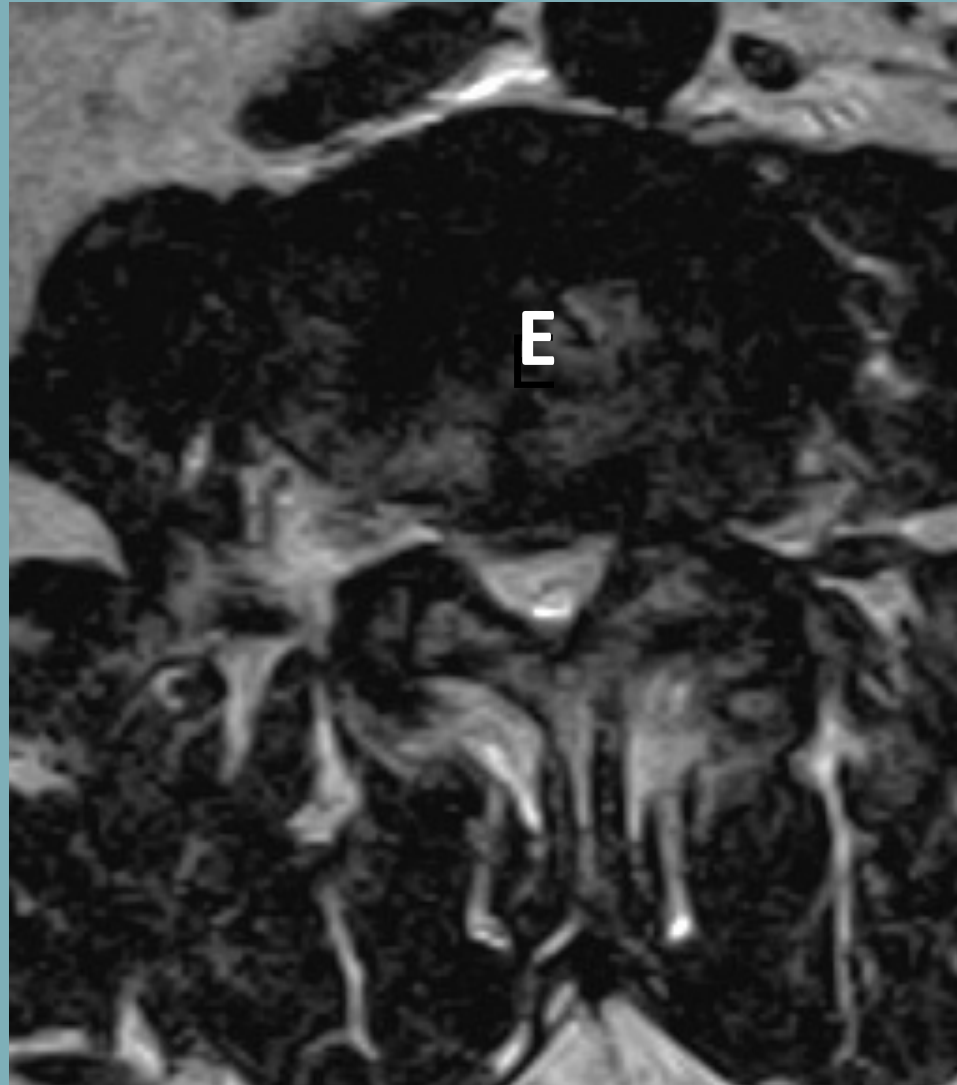
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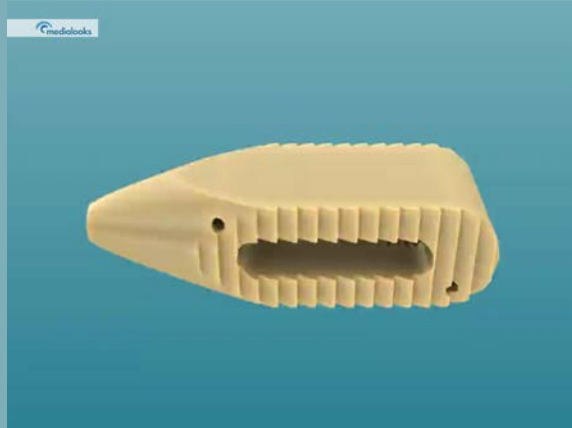
B





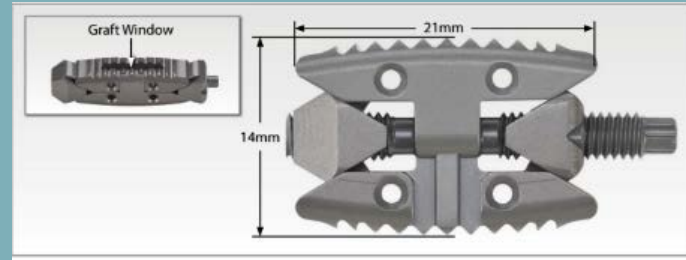


Solid Bullet Implant



INDIRECT DECOMPRESSION

Expandable implants



Opti-Cage, Interventional Spine/Depuy

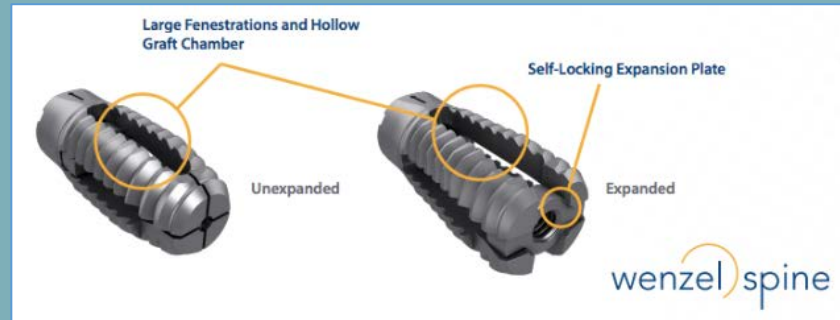


Rise Intra-LIF (Globus)

ZEUS (Amendia OLLIF)



Omega Lift



Vari Lift: Wenzel Spine



Mojave



Flarehawk



Prolift

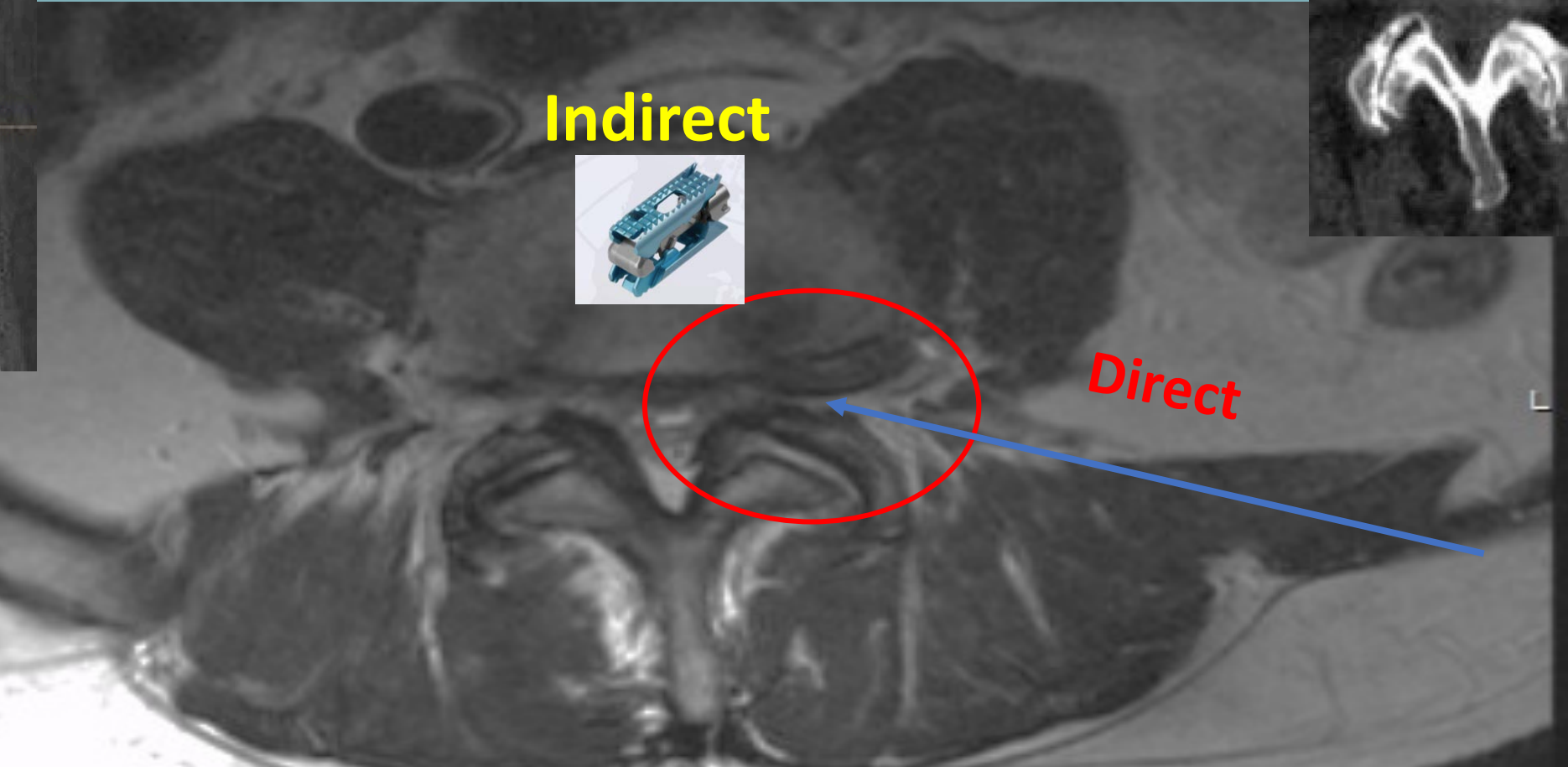
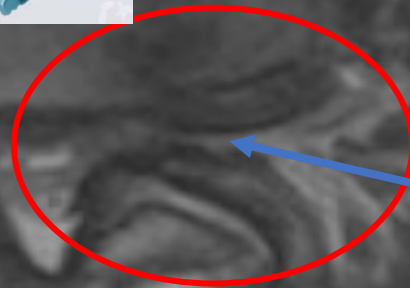
Holy Grail/Ultra MIS Surgery?: Spondylolisthesis/Foraminal Stenosis



Indirect

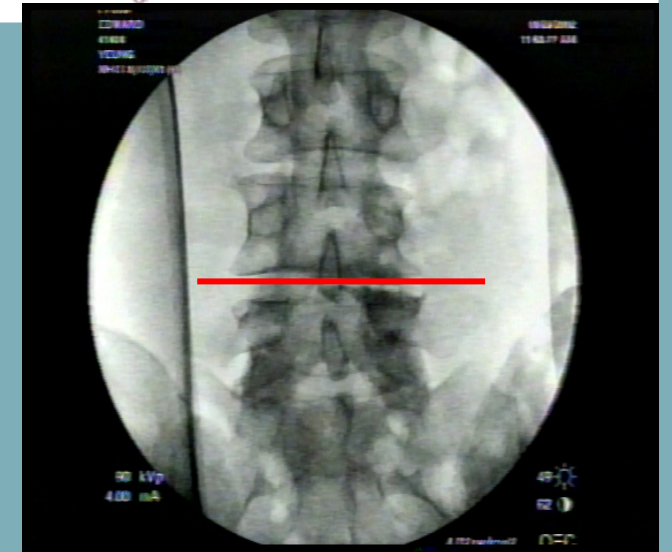
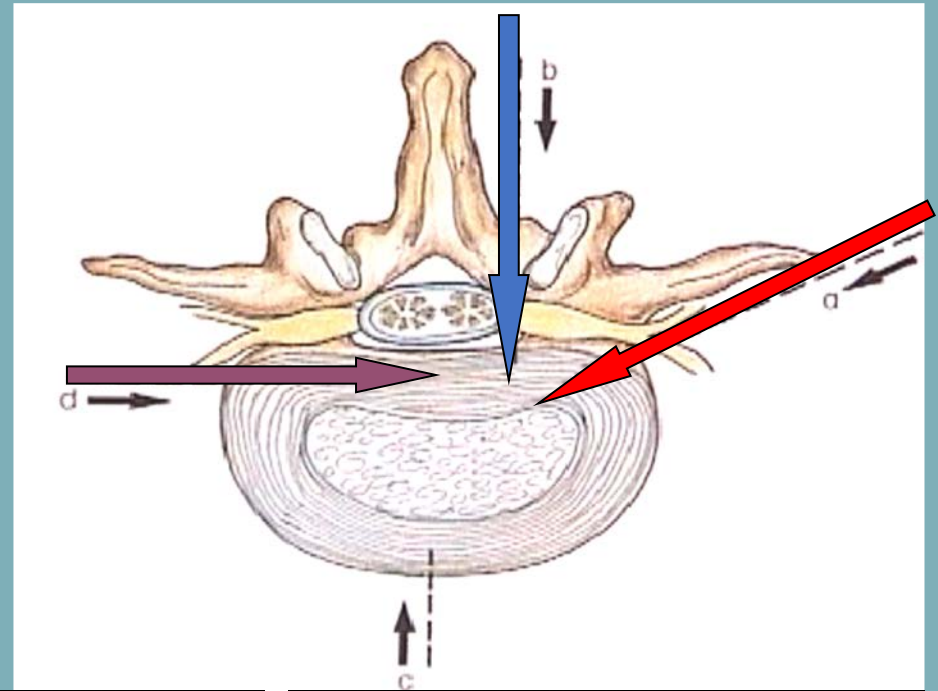


Direct

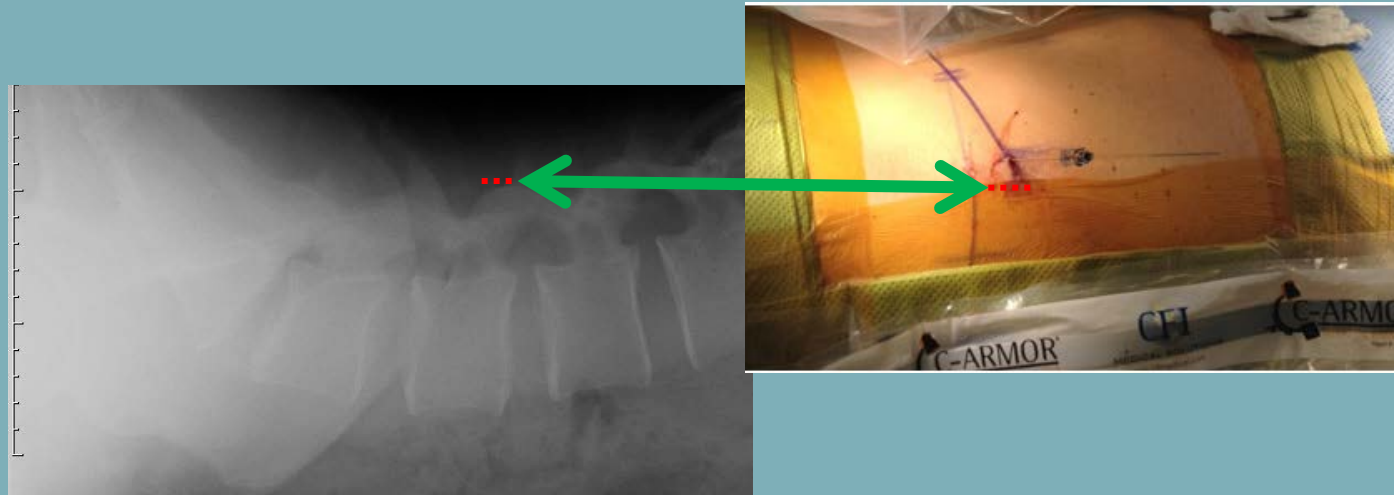


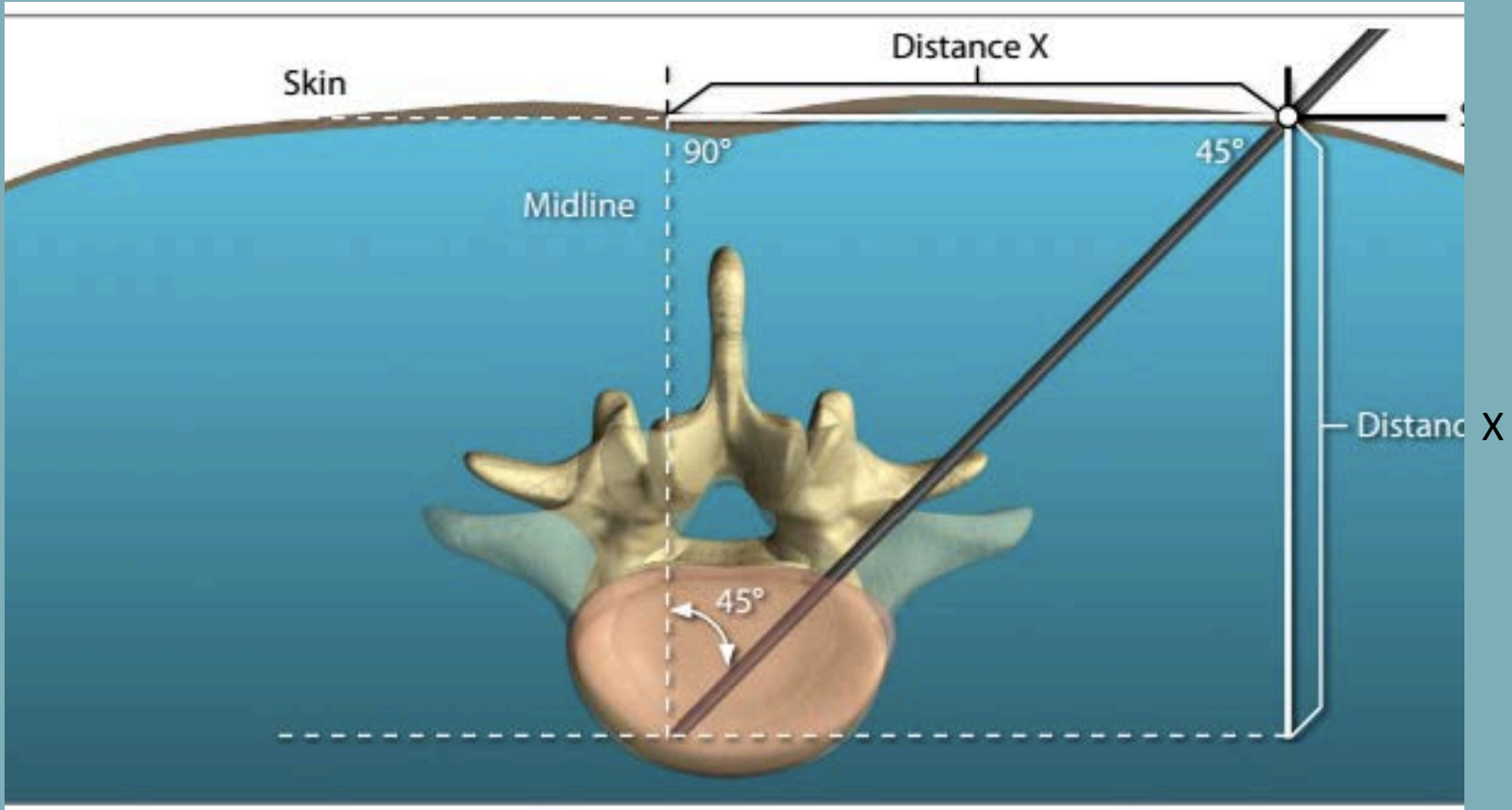
Needle placement

- On AP View parallel disc space
 - Midline mark
 - Iliac crest mark
- Lateral view:
 - Mid disc line
 - Posterior facet line



Posterior Facet Line

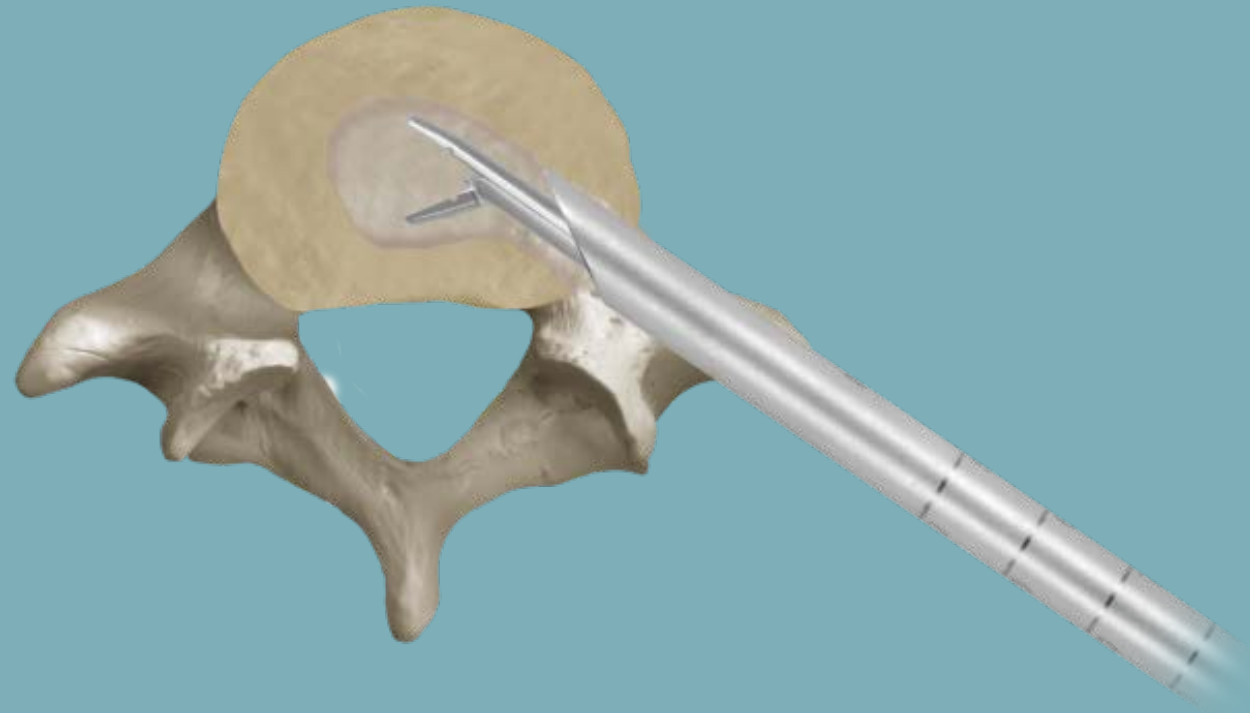


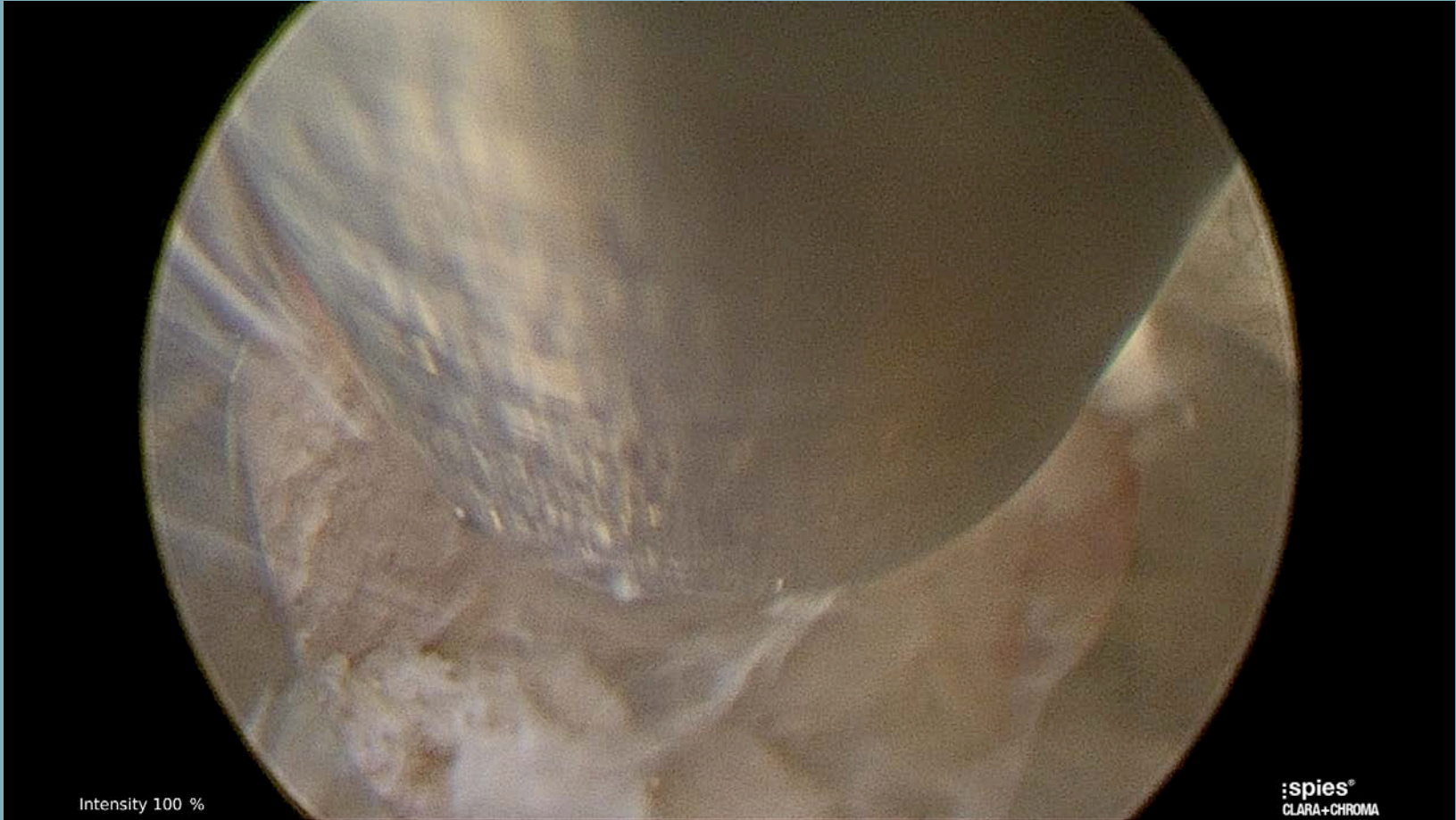




Disc Space Preparation

Disc Cutter expands as a loop curette to deflect left, right, up and down for thorough discectomy.

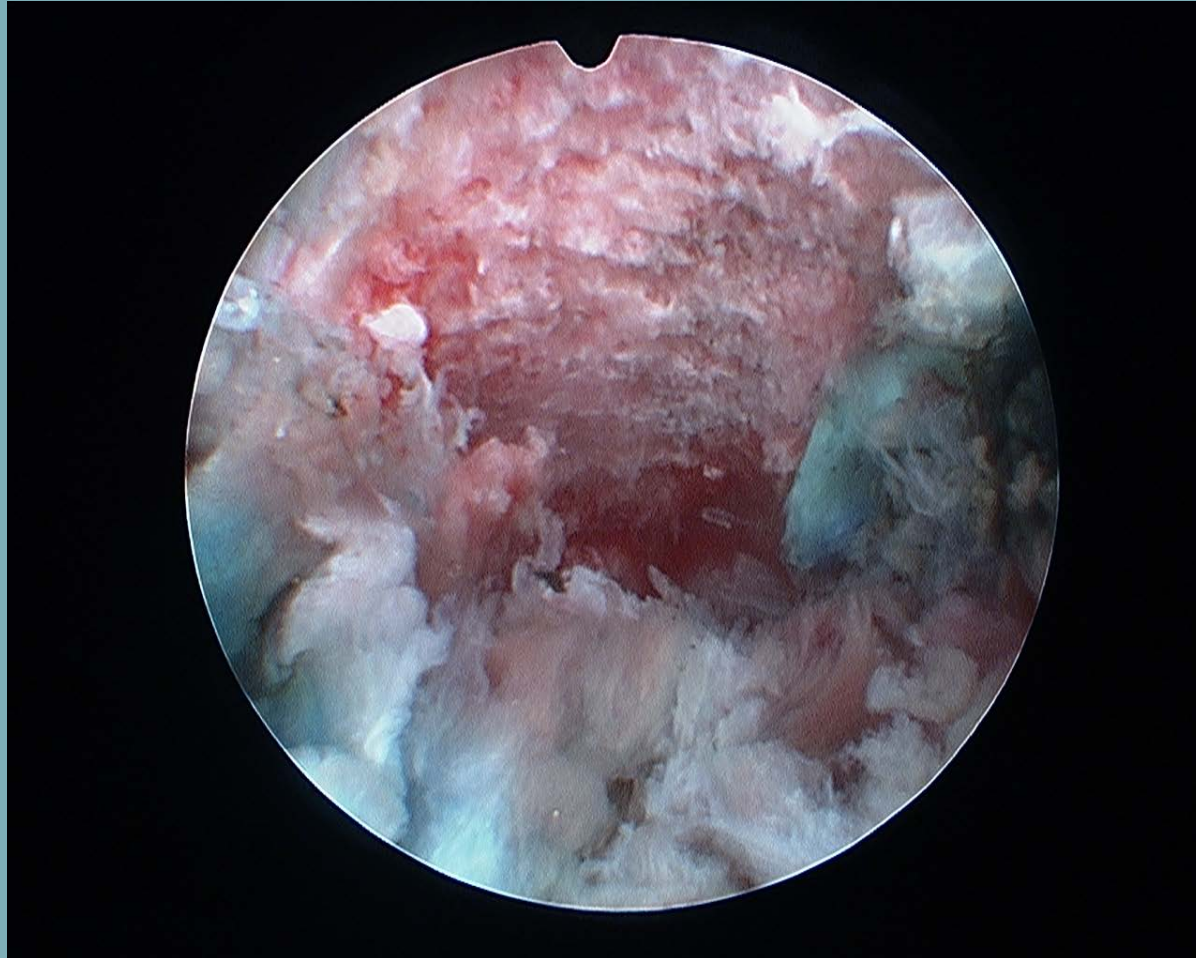




Intensity 100 %

spies®
CLARA+CHROMA

Endplate Preparation with Expanding Instruments



Case

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PE: Wt 63.5kg, Ht 5'5", BMI 23.3kg/m²

Spine/Neurologic:

- Normal gait.
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- (



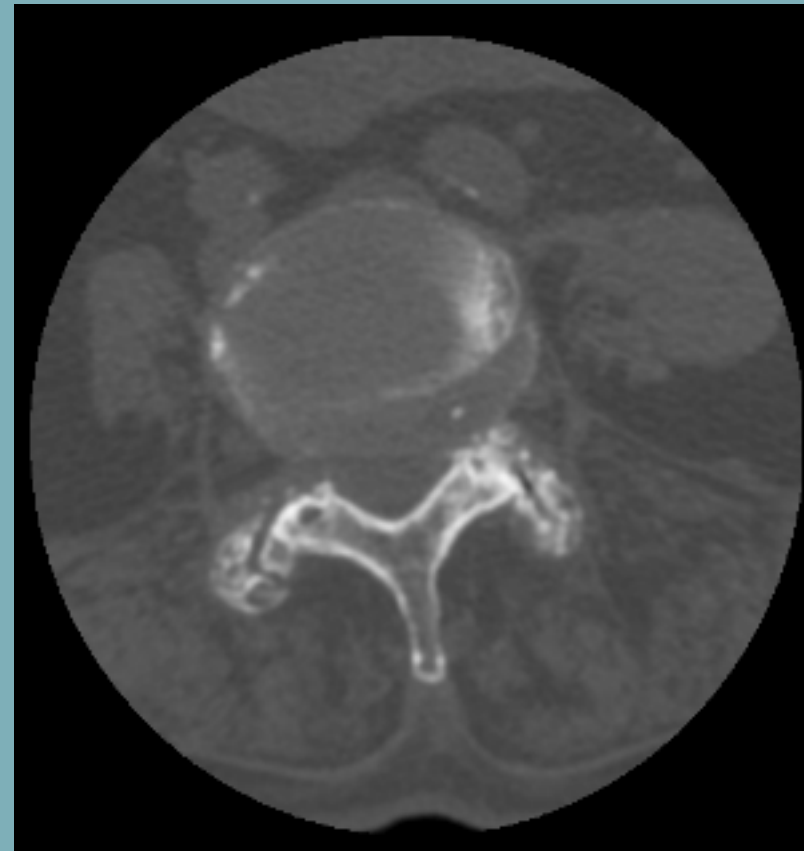
Pre op X ray



Pre-op CT



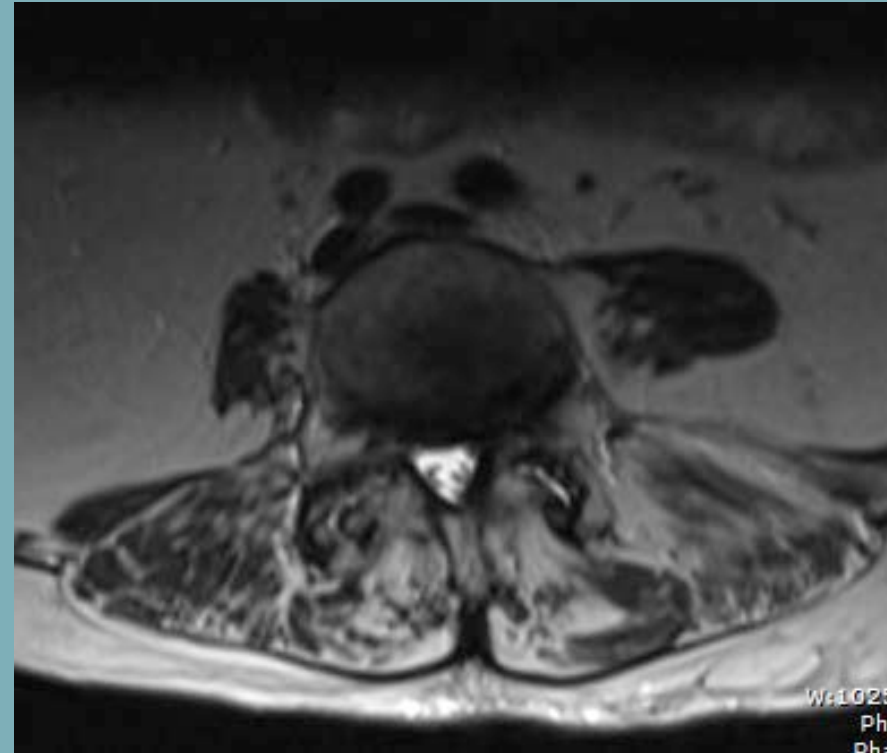
L4-5



Pre-op MRI



L4-5



Post op X ray



X ray

Pre op



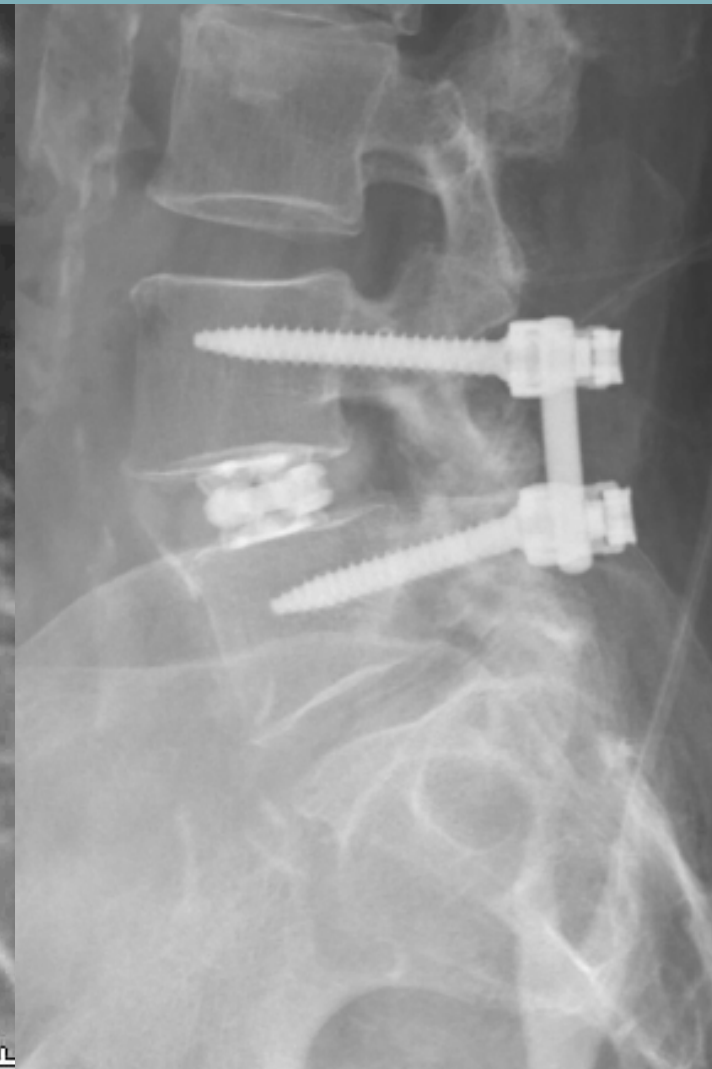
Post op



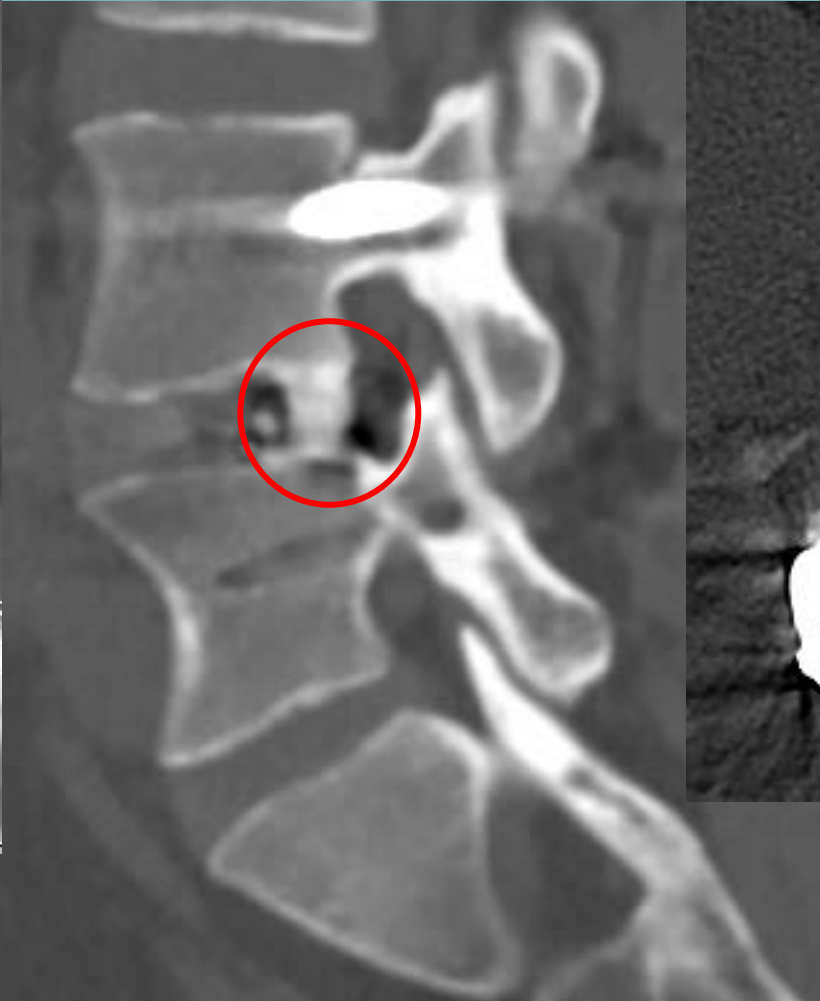
Pre op



Post op



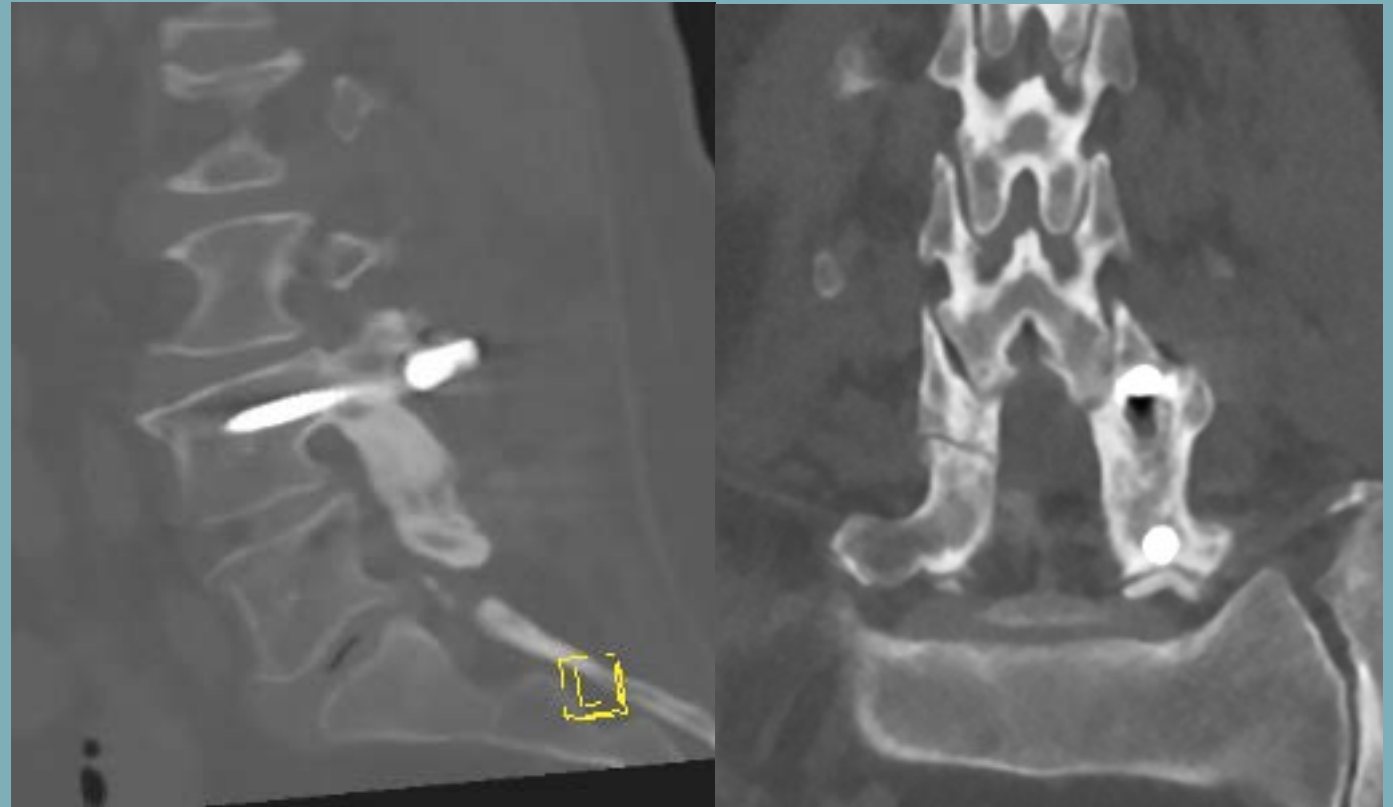
4 month Post OP



1 year post op CT scan



April 2018



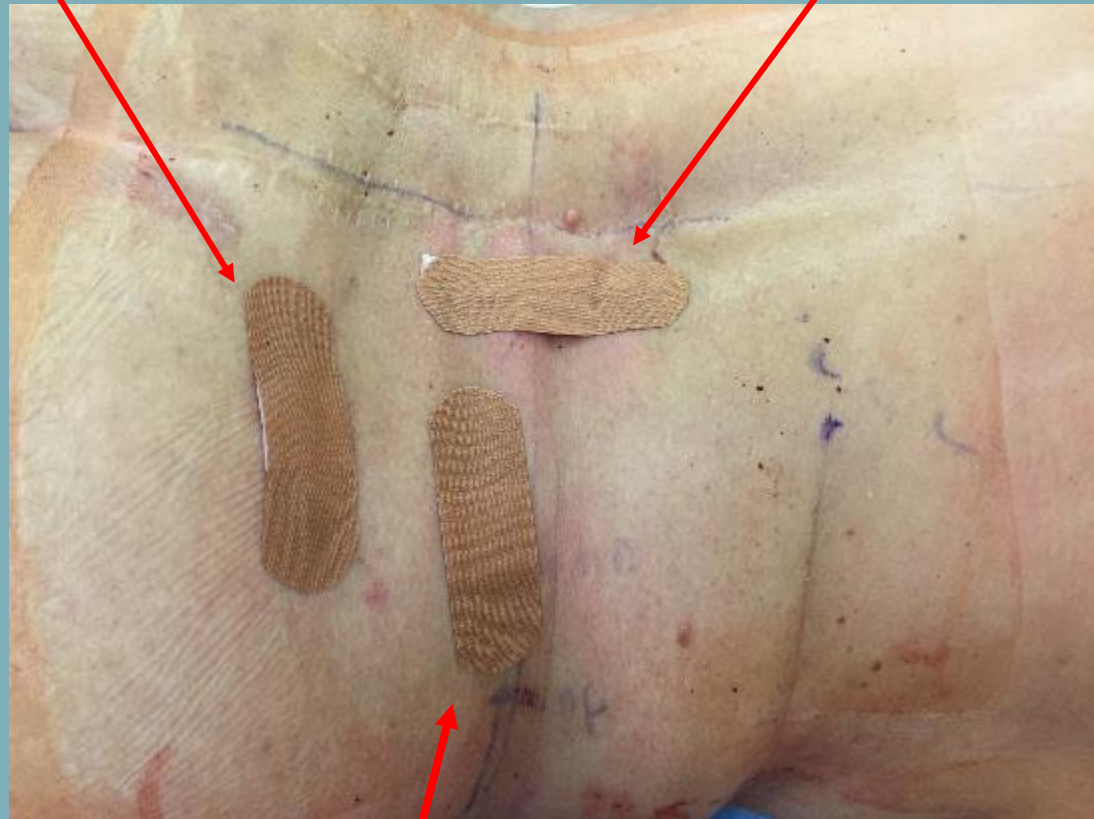
June 2019

Pt had unilateral pars defect on opposite side of screw placement



Bone Graft Incision

Pedicle Screw Incision



Endo Incision

Full-Endoscopic Interlaminar and Transforaminal Lumbar Discectomy *Versus* Conventional Microsurgical Technique

A Prospective, Randomized, Controlled Study

Sebastian Ruetten, MD, PhD,* Martin Komp, MD, PhD,* Harry Merk, MD,†
and Georgios Godolias, MD‡

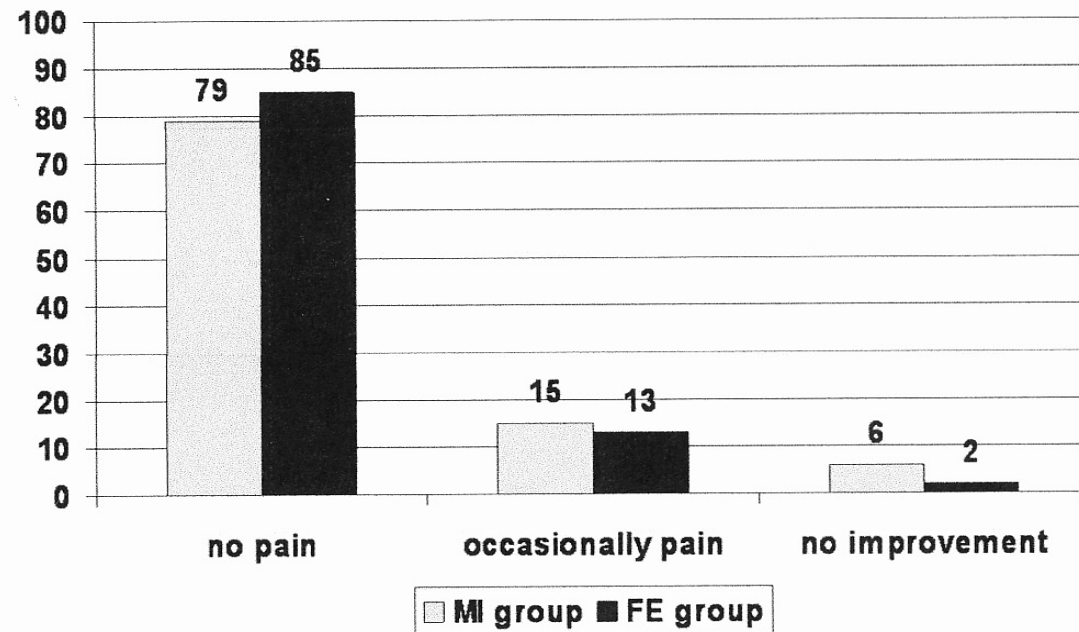


Figure 11. Clinical results in percent in the MI- and FE-group.

Full Percutaneous Transforaminal Lumbar Interbody Fusion Using the Facet-sparing, Trans-Kambin Approach

Christian Morgenstern, MD, PhD, James J. Yue, MD,† and Rudolf Morgenstern, MD, PhD**

Journal Clinical Spine Surgery, IF: 1,98, 2019.

TABLE 1. Demographics and Characteristics of the Operated Patients

	Overall (N = 51) [n (%)]
Age [mean (range)] (y)	59.3 (26.1–82.4)
Female individuals	33 (65)
Preoperative diagnosis*	
Degenerative disk disease	43 (84)
Type of stenosis	
Foraminal stenosis	23 (45)
Central stenosis	4 (8)
Lateral recess stenosis	7 (14)
Spondylolisthesis (Meyerding)	16 (31)
Grade I	13 (25)
Grade II	3 (6)

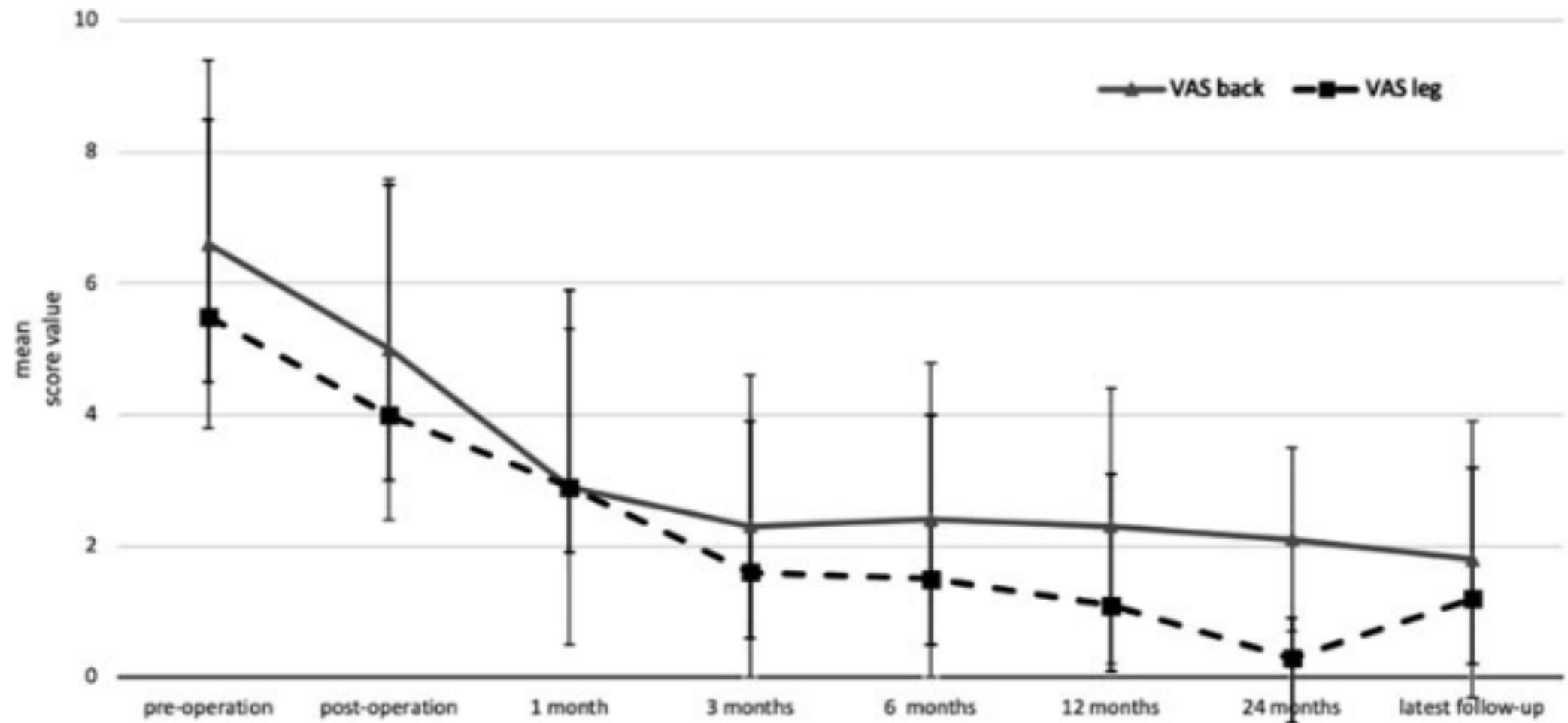
*Multiple diagnoses per case may apply.

TABLE 2. Surgical Characteristics of the Operated Patients

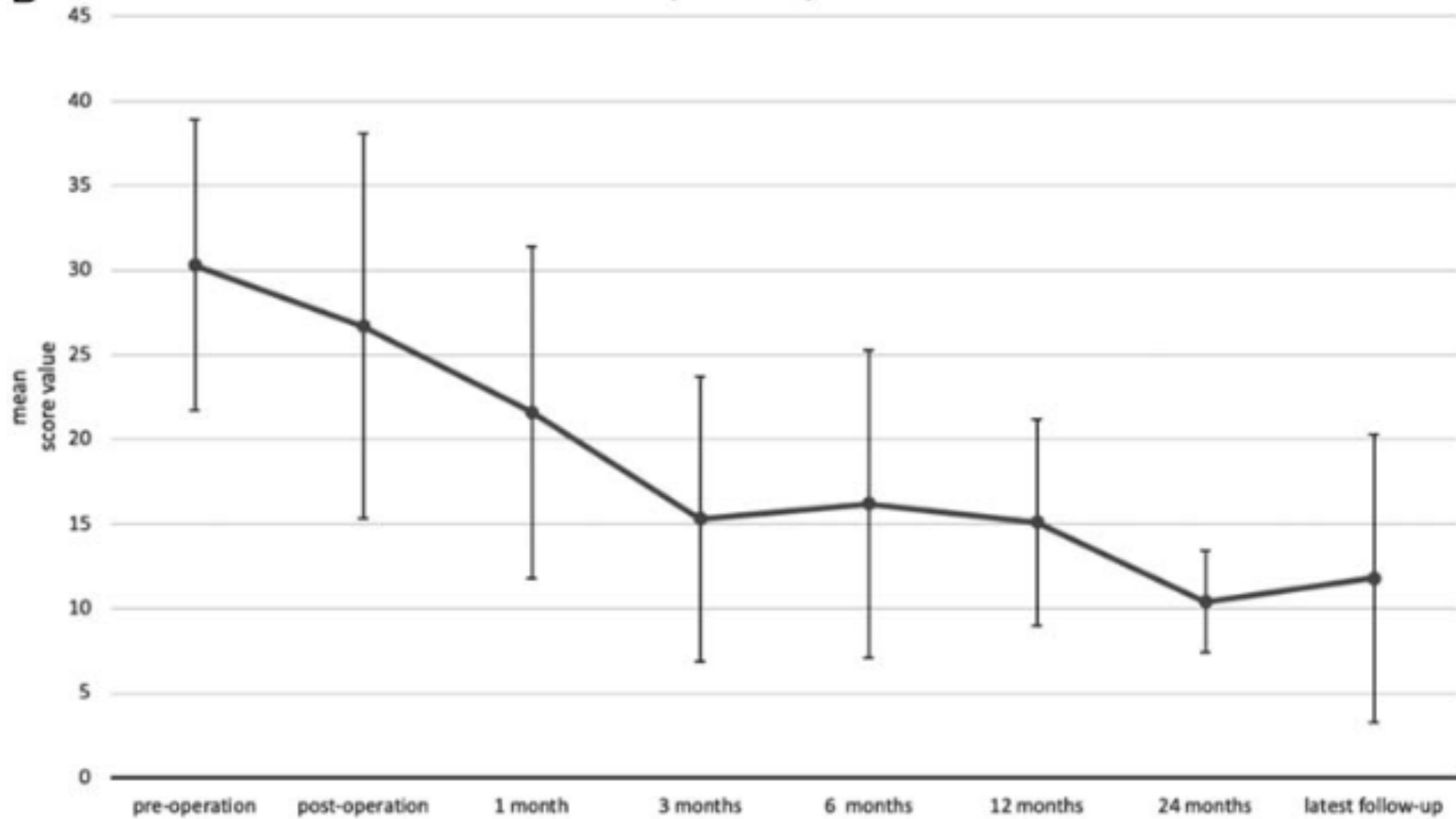
	Overall (N = 51) [n (%)]	P
Operated levels (interbody cages)		
L2/L3	1 (2)	
L3/L4	8 (14)	
L4/L5	34 (62)	
L5/S1	12 (22)	
Total levels	55 (100)	
Number of levels operated with interbody cages (cases)		
One level	47 (92)	
Two levels	4 (8)	
Anesthesia		
General anesthesia with neuromonitoring	49 (96)	
Local anesthesia with sedation	2 (4)	
Median estimated blood loss (mL)	103.6	
Anterior disk height (mm)		
Preoperative (mean)	9.64	
Postoperative (mean)	13.21	0.018
Posterior disk height (mm)		
Preoperative (mean)	6.95	
Postoperative (mean)	10.45	0.007
Postoperative time until first walking [median (range)] (h)	4.7 (3–23)	
Time of hospital stay [median (range)] (h)	33.6 (25–77)	

A

Visual Analogic Scale



B Oswestry Disability Index



Endoscopic transforaminal lumbar interbody fusion without general anesthesia: operative and clinical outcomes in 100 consecutive patients with a minimum 1-year follow-up

John Paul G. Kolcun, BS,¹ G. Damian Brusko, BS,¹ Gregory W. Basil, MD,¹ Richard Epstein, MD,² and Michael Y. Wang, MD¹

Departments of ¹Neurological Surgery and ²Anesthesiology, University of Miami Miller School of Medicine, Miami, Florida

DB 17 Aug 1955
lumbar

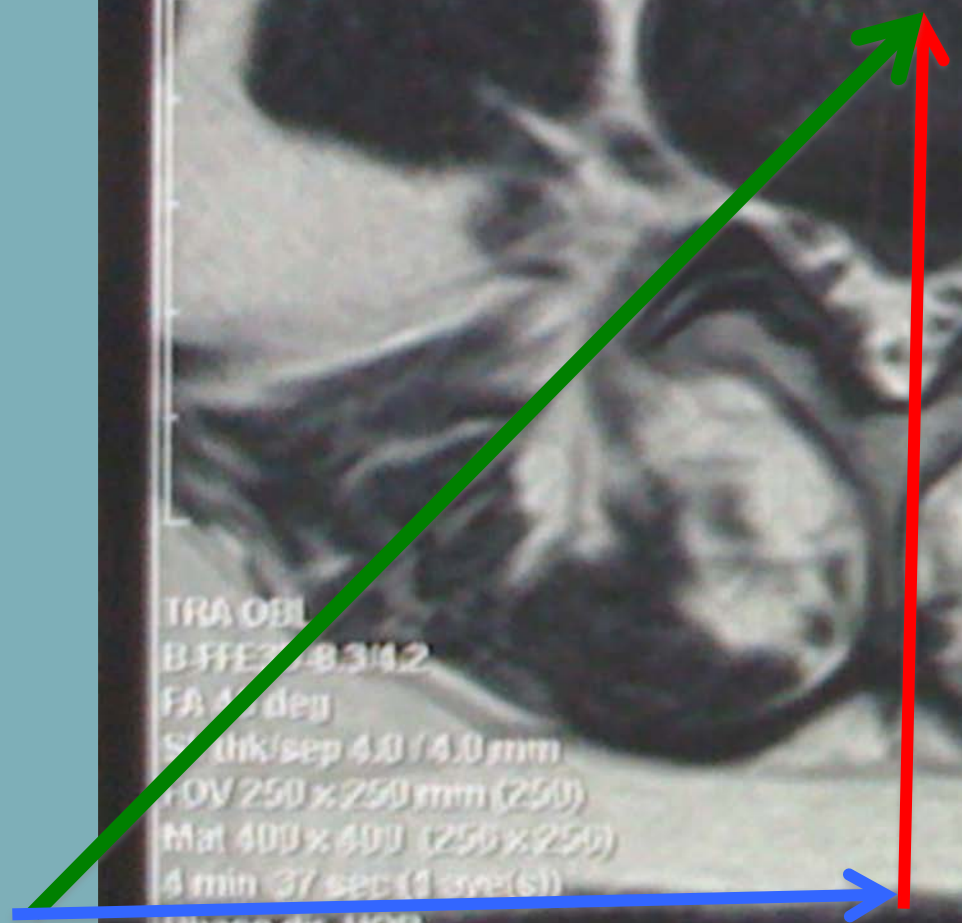
Philips Medical Systems

12 Mar 2009/20:36

NoC

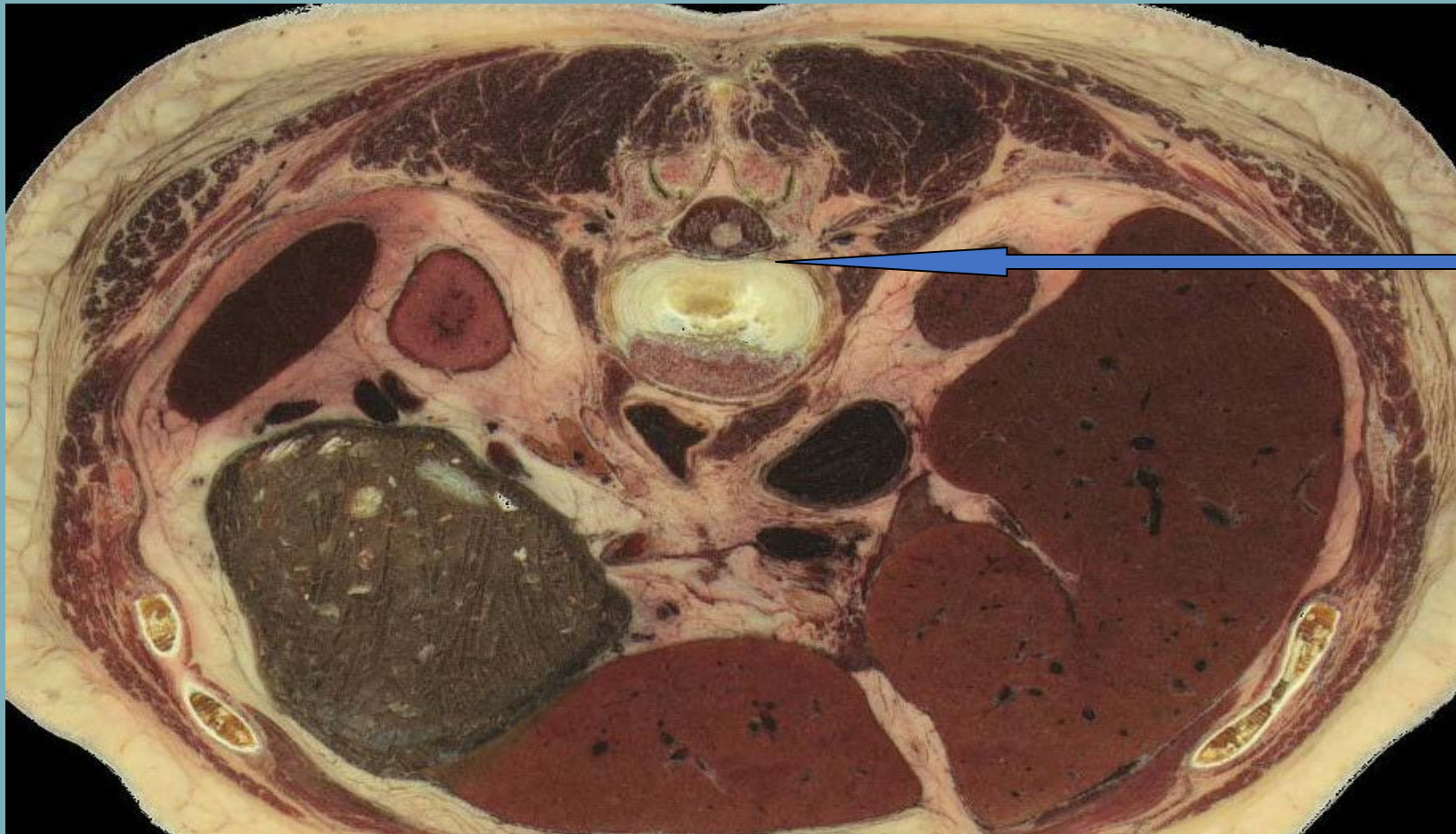
Slice 11 (22)
Pos -27.0 mm

TRA OBI
BFFE7-B.3142
FA 47 deg
S: thk/sep 4.0/4.0 mm
FOV 250 x 250 mm (250)
Mat 400 x 400 (250 x 250)
4 min 37 sec (11:00:00)
Phase dir. HOR



L1-L2 Disc

Most vulnerable for abdominal organ injury using extreme lateral approach



Thank You!

