

# Indications of Epidural Steroid Injections

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# Epidural Steroid Injections

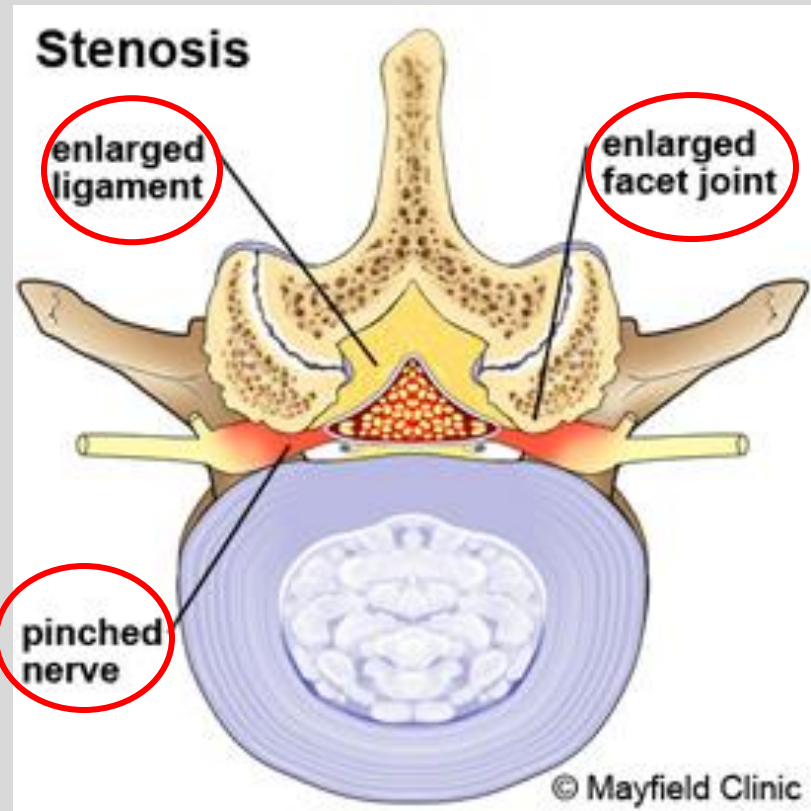
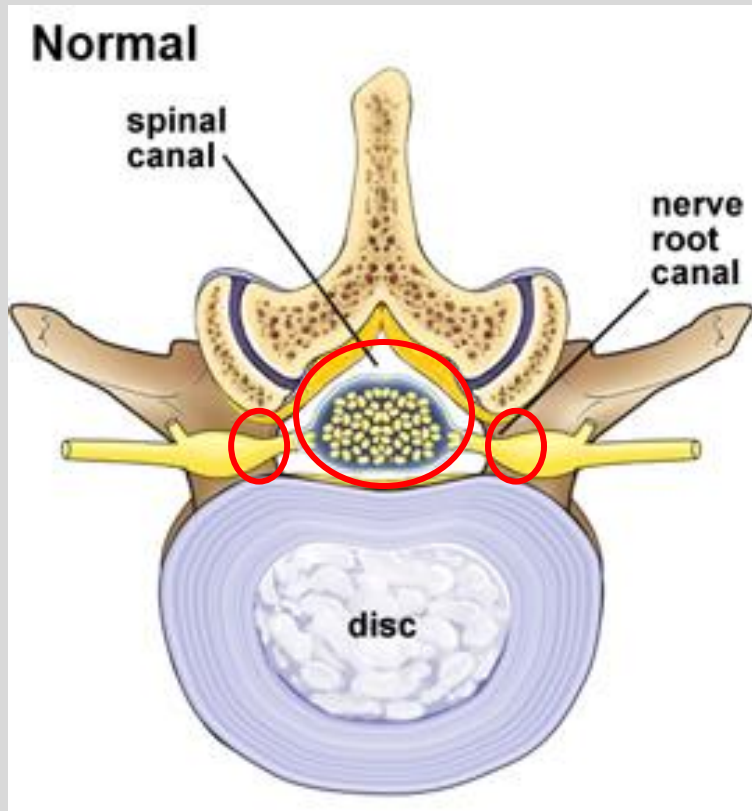
1. Indications
2. Pre-injection Imaging
3. Mechanism of Action
4. Types and Techniques
5. Outcomes

# Indications

Cervical, thoracic, or lumbar radiculopathy caused by:

1. Herniated Disc
2. Spinal Stenosis (central vs. neuroforaminal)

# Stenosis



<http://www.mayfieldclinic.com/PE-STEN.htm>

# Pre-injection Imaging

- MRI without contrast of clinical symptoms
- Prior spine surgery---MRI with contrast

# Pre-injection Imaging

Cohen SP, Gupta A, Strassels SA, Christo PJ, Erdek MA, Griffith SR, Kurihara C, Buckenmaier CC 3rd, Cornblath D, Vu TN. Effect of MRI on treatment results or decision making in patients with lumbosacral radiculopathy referred for epidural steroid injections: a multicenter, randomized controlled trial. Arch Intern Med. 2012 Jan 23;172(2):134-42.

1. MRI results did not affect clinical outcomes
2. MRI results only had a small bearing on decision making

# Guidelines for Imaging

Chou R, Qaseem A, Snow V, et al; Clinical Efficacy Assessment Subcommittee of the American College of Physicians; American College of Physicians; American Pain Society Low Back Pain Guidelines Panel. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the **American College of Physicians** and the American Pain Society. *Ann Intern Med.* 2007;147(7):478-491.

- serious or progressive and neurological deficits
- Pre-epidural or surgery evaluation

Glass LS, Harris JS, Blais BR, Genovese E. *Occupational Medicine Practice Guidelines: Evaluation and Management of Common Health Problems and Functional Recovery in Workers*. 2nd ed. Elk Grove Village, IL: **American College of Occupational and Environmental Medicine (ACOEM)**; 2007.

- neurologic symptoms that persist for at least 6 weeks and not receding

# Mechanism of Action

## Steroid

1. Inhibit Phospholipase A2
2. Reduction in Arachidonic Acid
3. Suppress impulses from damaged nerves
4. Depress impulses from unmyelinated C-fibers



# Mechanism of Action

## Local Anesthetics only

1. Increase blood flow to damaged nerves
2. Washout of inflammatory cytokines (volume makes a difference)

# Techniques

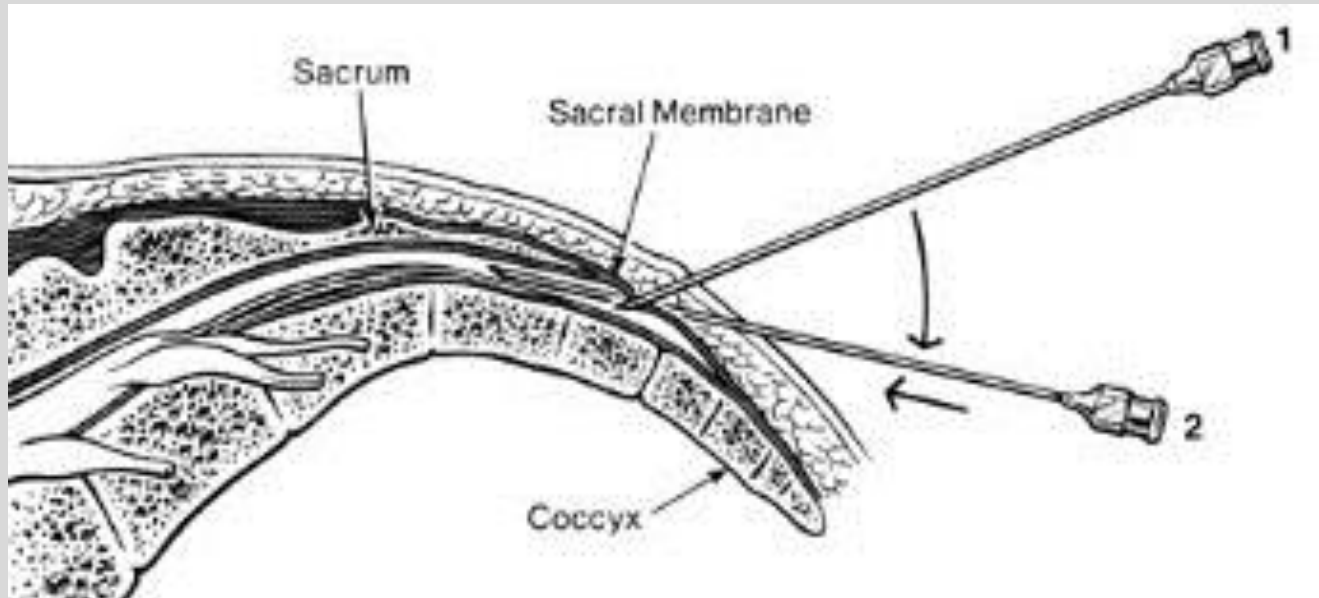
## Cervical

1. Interlaminar Epidural Steroid (CESI)

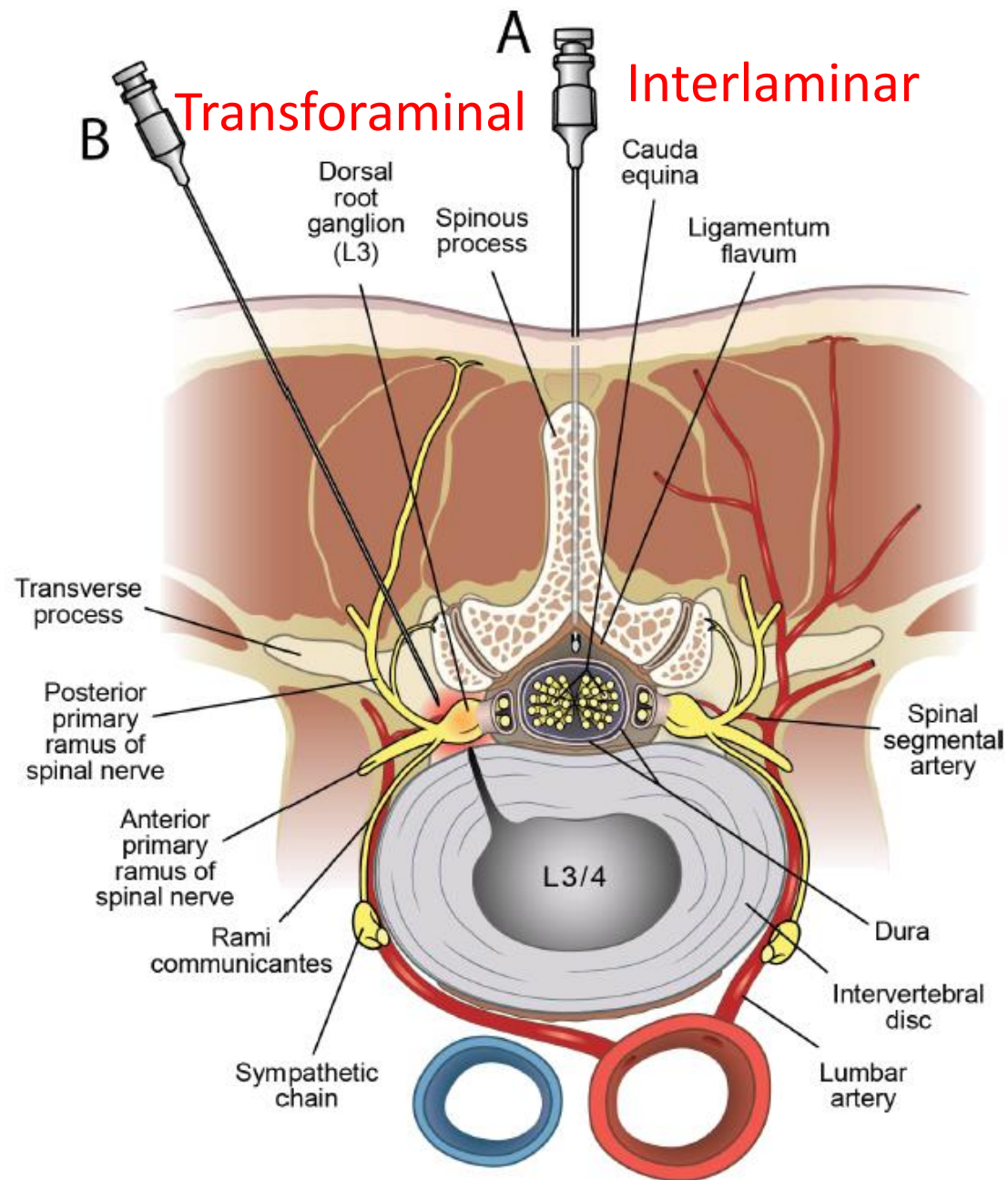
## Lumbar

1. Caudal Epidural Steroid (Caudal ESI)
2. Interlaminar Epidural Steroid (LESI)
3. Transforaminal Epidural Steroid (TFESI)

# Caudal ESI



[www.painprevent.com](http://www.painprevent.com)



# Outcomes

Cohen SP, Bicket MC, Jamison D, Wilkinson I, Rathmell JP. Epidural steroids: a comprehensive, evidence-based review. Reg Anesth Pain Med. 2013 May-Jun;38(3):175-200.

- 70% of patients with radicular symptoms will be better by 6 months
- Conflicting reports of the various technique

# Safety

Jacob M. McGrath, BA, Michael P. Schaefer, MD, and Daniel M. Malkamaki, MD. Incidence and Characteristics of Complications from Epidural Steroid Injections. *Pain Medicine* 2011; 12: 726–731

- 4,265 injections on 1,857 patients over 7 years
- No major complications were identified
- 103 minor complications (2.4%)
  - Pain at injection at site
  - Persistent numbness

# Complications of TFESI

Increased Pain

Pain at injection site

Persistent numbness

Intravascular Injection

1. George C. Chang Chien, DO, Kenneth D. Candido, MD, Nebojsa Nick Knezevic, MD, PhD. Digital Subtraction Angiography Does Not Reliably Prevent Paraplegia Associated with Lumbar Transforaminal Epidural Steroid Injection. *Pain Physician*. 2012; 15:515-523.
2. Scott E. Glaser, MD, and Frank Falco, MD. Paraplegia Following a Thoracolumbar Transforaminal Epidural Steroid Injection. *Pain Physician*. 2005;8:309-314

# LESI vs. TFESI

Ivan Rados, MD, Katarina Sakic, MD, PhD, Mira Fingler, MD, and Leonardo Kapural, MD, PhD.  
Efficacy of Interlaminar vs transforaminal Epidural Steroid Injection for the Treatment of  
Chronic Unilateral Radicular Pain: Prospective, Randomized Study.

Unilateral Radiculopathy demonstrated no  
difference between LESI vs. TFESI



# LESI vs. TFESI

Chang-Chien GC, Knezevic NN, McCormick Z, Chu SK, Trescot AM, Candido KD. Transforaminal versus interlaminar approaches to epidural steroid injections: a systematic review of comparative studies for lumbosacral radicular pain. Pain Physician. 2014 Jul-Aug;17(4)

No clinical significant difference in pain relief or functional outcomes

# Cost-Effectiveness

- Relative low cost procedure
- Might expedite a return to work status in sooner than 3 months

# Cost-Effectiveness

Fox, John MD; Haig, Andrew J. MD; Todey, Brian BS; Challa, Sastish MS.  
The effect of required physiatrist consultation on surgery rates for back pain. **Spine** (Phila Pa 1976). 2013 Feb 1;38(3):E178-84.

- University of Michigan and Priority Health (Grand Rapids, MI)
- Mandatory physiatry consults decreased surgery rates by 25%
- 74% were satisfied with physiatry consults

**TABLE 5. Financial Impact to the Insurer Related to the Spine Centers of Excellence Program**

	November 2006 to October 2007	November 2007 to October 2008	Change	Percent Change
Surgical per member per month costs	\$9.75	\$7.29	\$2.46	−25.1
Total spine-related per member per month costs	\$19.77	17.37	\$2.40	−12.1
Average reimbursement per surgery	\$21,250	\$22,853	\$1603	+8

# Alternatives

## 1. Surgery

- Costly
- Equivocal data

## 2. Medication Management

# My Recommendations

- Early evaluation (<3 months from injury)
- Imaging
- NSAIDS and muscle relaxants for 1-2 weeks
- Physical Therapy
- Seek consultation with pain medicine immediately
- Injection and return to work

# Example 1

- 62yo male complaining of low back and left leg pain

DPI OF NORTH BROWARD  
6808State Rd 7, Coconut Creek , Med-Lab, 33073, US  
ID: T100455772  
Name: [REDACTED]  
DOB: 03/09/1958  
SEX: M  
DE: 01/14/2019  
TimeE: 21:55:02  
SerT: 22:02:18  
STATION: MRC22701  
Man: SIEMENS  
TR: 4620.00  
TE: 121.00  
NrCnt: 0  
TEL: 17  
ROWS: 448  
COLUMNS: 448

LSPINE T2 SAG H-F

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Loc: 12.87  
Thk: 4.00  
Spacing: 5.00  
PhStps: 510  
BW: 130.00  
Matrix: 448/0/0/31  
AcqTime: 21:59:53  
1.5000  
Symphony

FOV: 29.00 x 29.09cm  
MAG: 2.05 (1.00)  
W/L: 1169.00/549.00

DPI OF NORTH BROWARD  
6808State Rd 7, Coconut Creek , Med-Lab, 33073, US  
ID: T100455772  
Name: [REDACTED]  
DOB: [REDACTED]  
SEX: M  
DE: 01/14/2019  
TimeE: 21:55:02  
SerT: 22:07:27  
STATION: MRC22701  
Man: SIEMENS  
TR: 7400.00  
TE: 115.00  
NrCnt: 0  
TEL: 13  
ROWS: 256  
COLUMNS: 256

LSPINE T2 AX

Copy

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AcqTime: 22:04:04  
1.5000  
Symphony

FOV: 17.00 x 17.06cm  
MAG: 3.59 (1.00)  
W/L: 1199.00/572.00

KAMERLINK  
LESI

01/18/2019  
10:37:14 AM

53-☀  
57-🌑

104 kVp  
1.70 mA

2

OEC



[REDACTED]

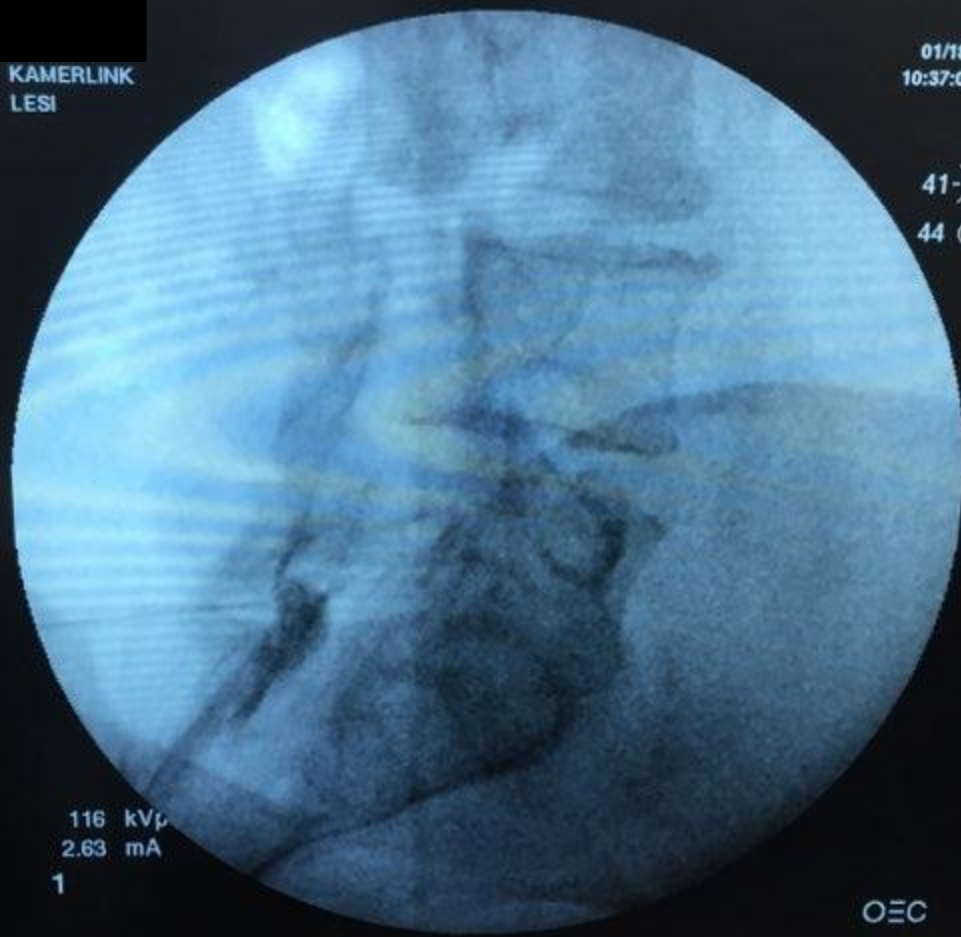
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44 🌙

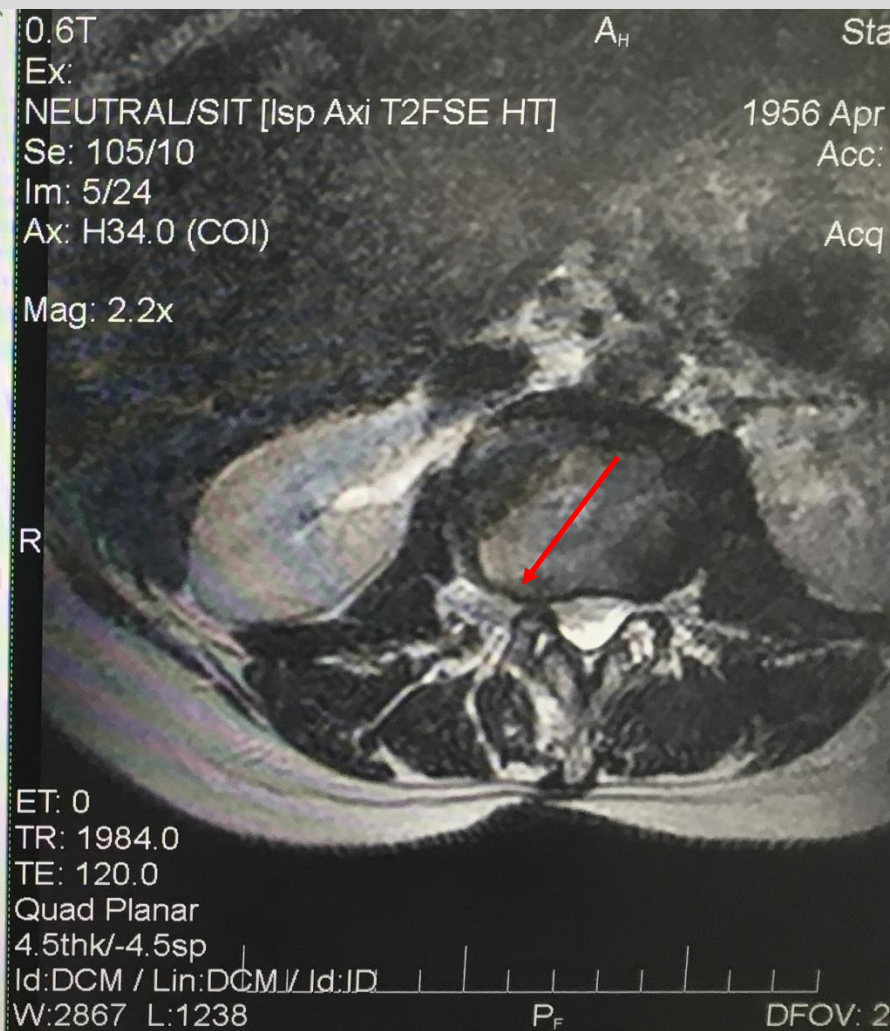
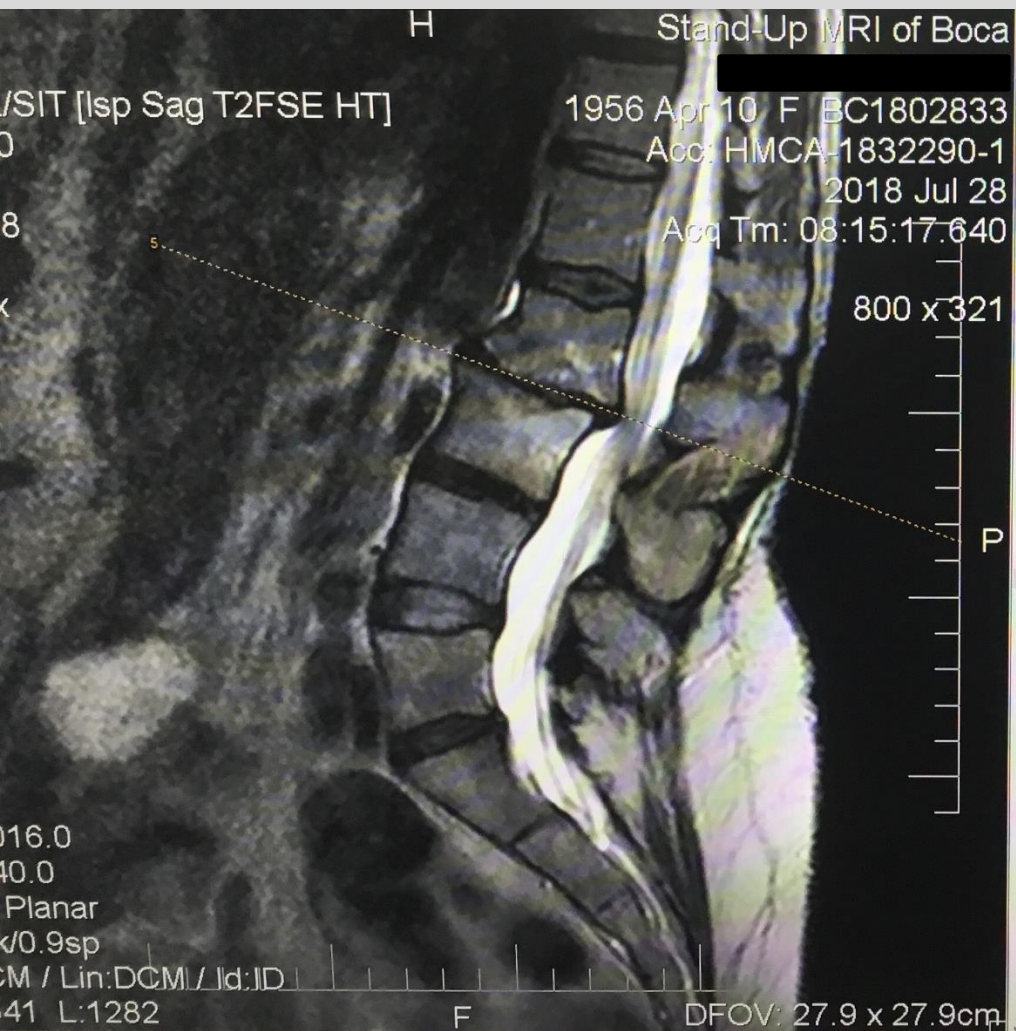
116 kVp  
2.63 mA  
1

OEC



# Example 2

- 62 yo female complaining of low back and right thigh pain



# Example 3

- 40 yo female presenting with low back and left hip pain after uterine artery ablation





02/07/2018  
3:32:05 PM

32   
60 

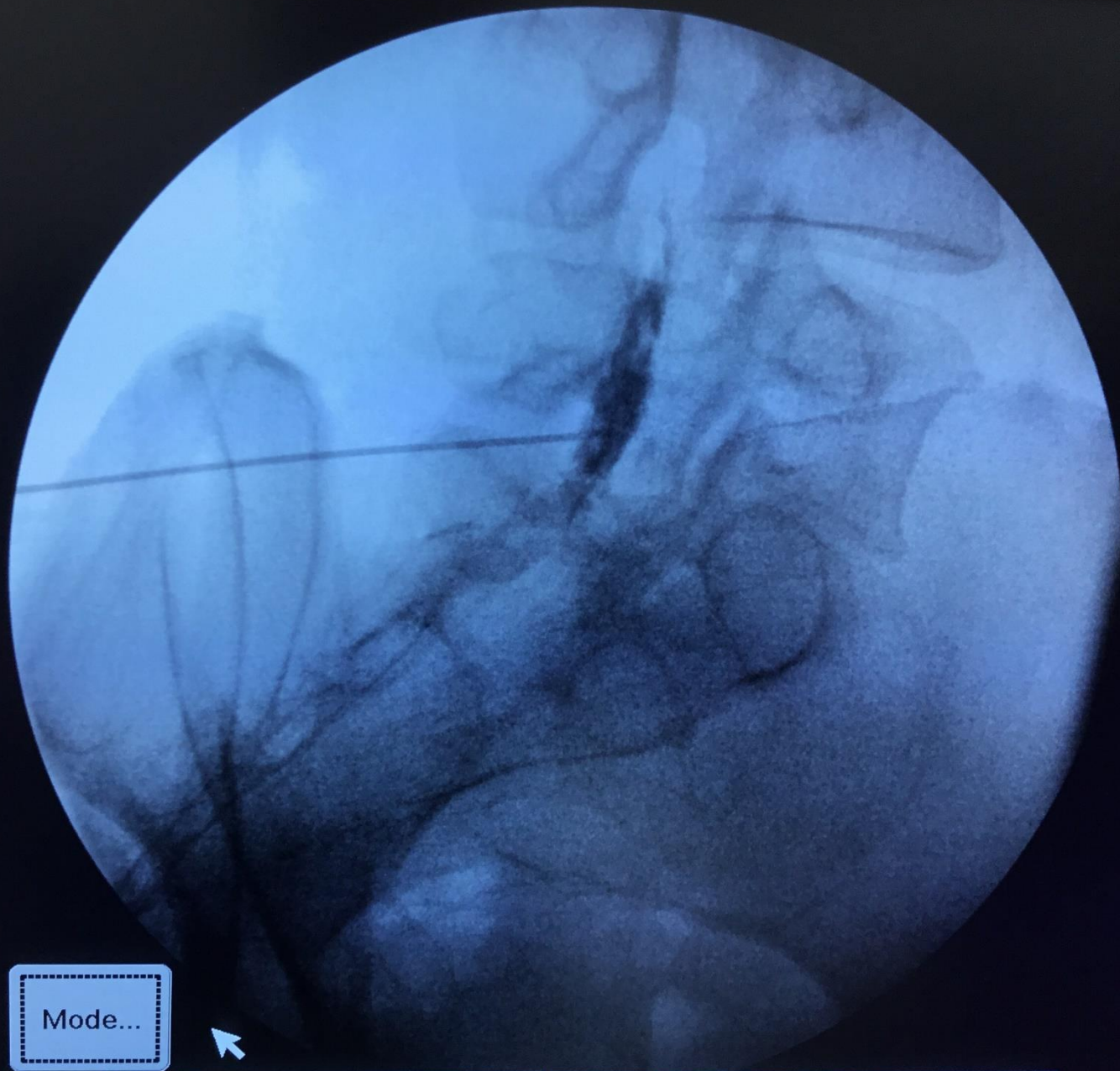
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0.1 min

0.00304 mGym2

OEC





Mode...



Fluoro



HLF

# The End