What is dualPortal Endoscopic Spine Surgery and How Does it Differ from Uniportal Endoscopic Spine Surgery?

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Disclosure

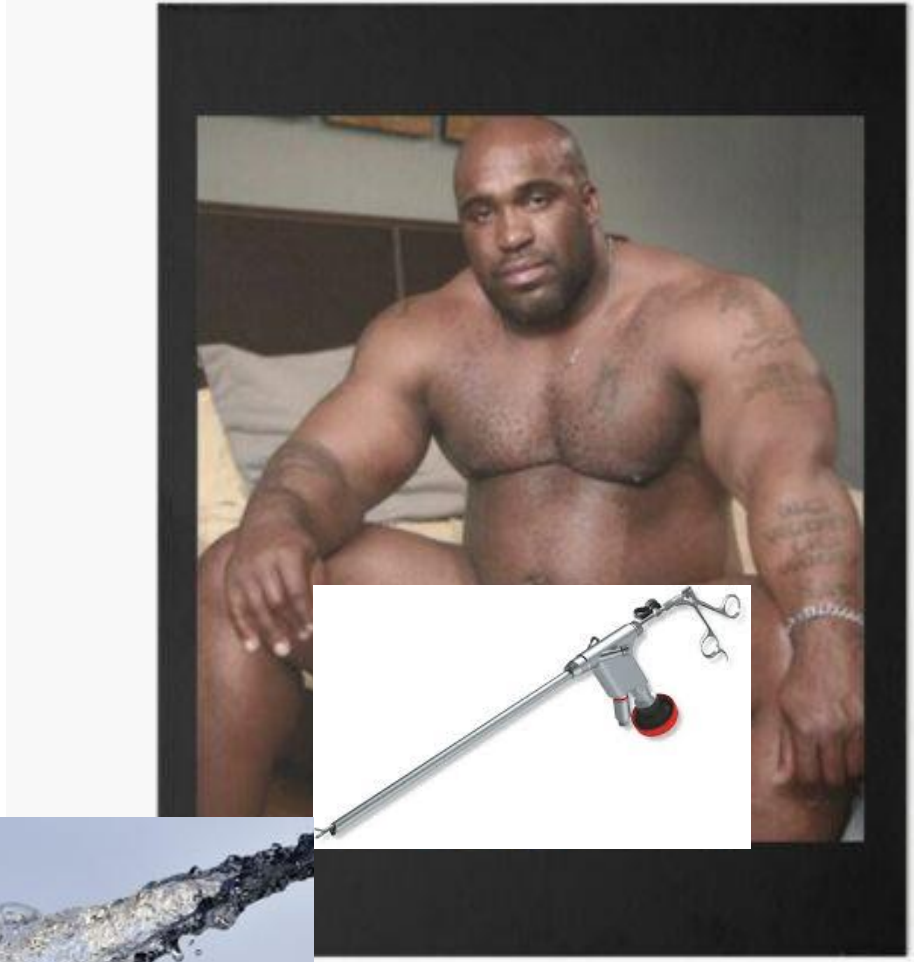
- J&J – Consultant, Research Grant
- Amplify – Consultant
- Medyssey – Consultant
- TrackX – Consultant
- RIWOSpine – Consultant
- Arthrex – Consultant
- Kinesiometrics, INC – Co-founder, IP owner
- MedCyclops, LLC – Co-founder, IP owner

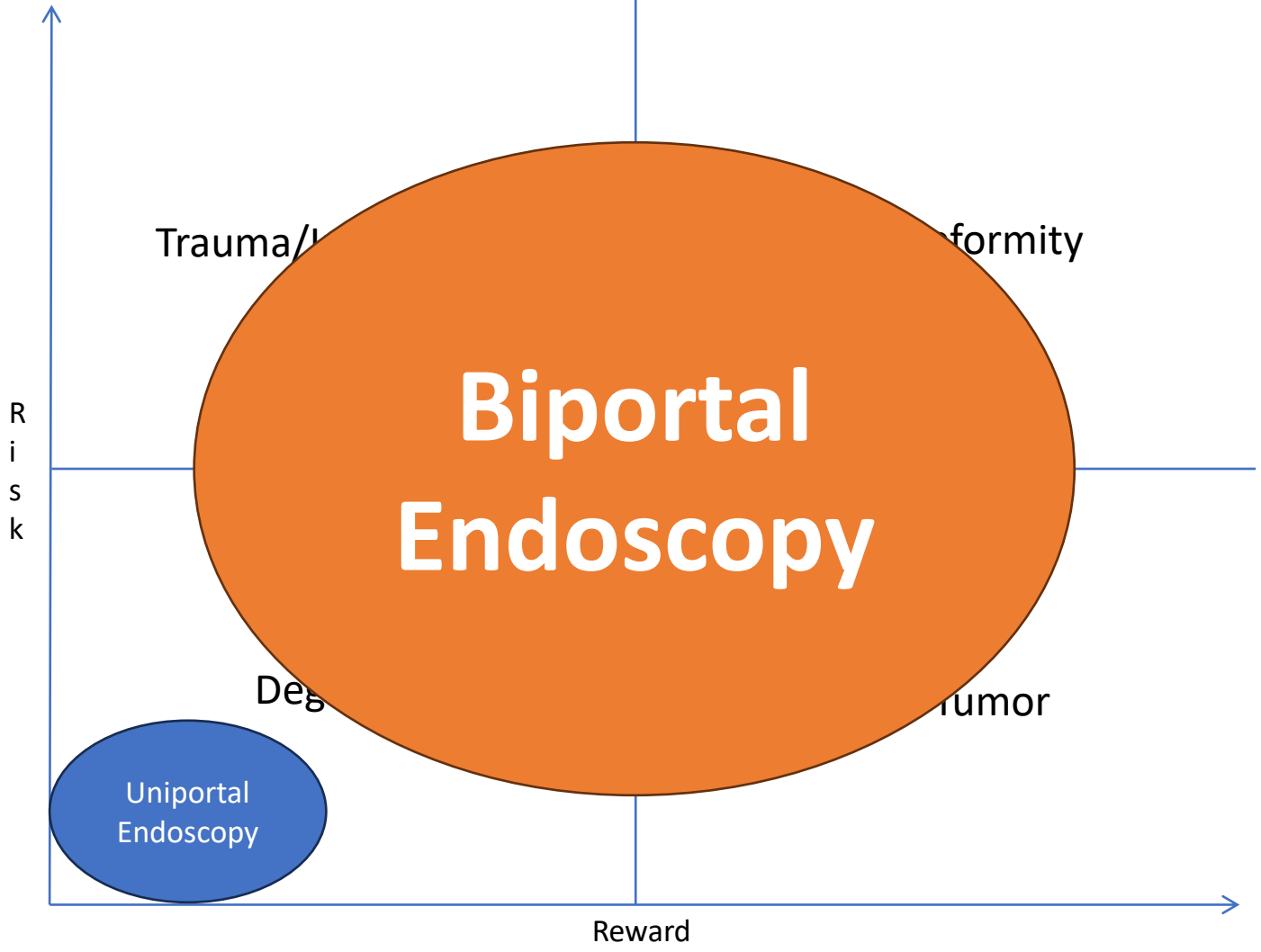
Why Endoscopy?

https://www.riwospine.com/fileadmin/_processed_/a/2/csm_VERTEBRIS_transforaminal_0add4c75c5.jpg
https://upload.wikimedia.org/wikipedia/commons/7/71/Delta_force_GIs_disguised_as_Afghan_civilians%2C_November_2001_C.jpg


CHROMOPHARE F 628
DEERE
740B

LET IT HANG




Trauma/
formity
Biportal
Endoscopy
Deg
umor
Uniportal
Endoscopy
Risk
Reward

Uniportal vs. Biportal

- Uniportal still has a role
  - L5-S1 interlaminar for soft paracentral disc herniation
  - L1-2, L2-3, L3-4 transforaminal discectomy for foraminal pathology
- Biportal is much more efficient when…
  - Bilateral stenosis
  - A lot of drilling is required
  - Multilevel stenosis
  - Instrumentation

$350,000 Start-up Cost[1]

https://d35cnulyv0pa6p.cloudfront.net/products/images/2019/388501/vertebris_lumbar_riwospine.jpg?jDAwKkle71fvLmA1gzxLhGeSEwn9SNKk=

1. Hussain I, Yeung AT, Wang MY. Challenges in Spinal Endoscopy. World Neurosurg. 2022 Apr;160:132-7.

$550 - $2000

https://5.imimg.com/data5/SELLER/Default/2021/4/TQ/WV/EL/4304334/stryker-arthroscopic-set-500x500.jpeg

Necessary Things

0 degree vs. 30-degree scope

$0.65 ~~$0.82~~ 21% off

Tax excluded, add at checkout if applicable. Extra 2% off with coins

0.5-12mm Spherical Head Diamond Grinding Bit Coated Mounted Points Round Ball Burs Coarse For Stone Drill Metal 2.35/3mm Shank

7 sold

Color: 5pcs

5pcs | 10pcs

Size: 1mm (Shank 2.35mm)

0.5mm (Shank 2.35mm) | 0.6mm (Shank 2.35mm) | 0.8mm (Shank 2.35mm) | 1mm (Shank 2.35mm)

‹ Arthroscopy

Stryker 375-951-000 Barrel Bur 5.5mm

$20.00

Stryker 375-951-000 Disposable Arthroscopic Blade, 5.5mm Formula Aggressive Barrel Bur, 6 Flutes (Tan/Tan)

QUANTITY:

1

ADD TO CART

Share

30° probe

for Extremities and Small Joint Procedures

50° probe

for Knee Procedures

90° probe

for Shoulder Procedures


Scope cannula - H2
Scope cannula - H1
Working Cannula Single 40mm
Working Cannula Single 30mm
Fioseal Dispenser
Root Retractor Bayonet


Double Ended Dissector #3
Double Ended Dissector #4
Double Ended Dissector #5
Double Ended Dissector #6
Punch STR 2.0mm•180mm (Shaft and Handle)
Root Retractor Bayonet
Floseal Dispenser

Double Ended Dissector #3

indian knife

Pituitory 2.0mm/18cm/STR

Curette (3.0)Up

Micro Pituitory 2.0mm/18cm/UP

Serial Dilator 5

Micro Pituitory 2.0mm/18cm/STR

Muscle Detacher MD20-30

T-bar(Muscle Detacher)

성시경 - 거리에서

떠오르는 그 대 모습

내 살아나는 설레임 한번에

참 잊기 힘든 순간이란 걸

또 한번 느껴지는 하루

아직 나를 생각할지 또 그녀도 나를 찾을지

걷다 보면 누가 말해줄 것 같아

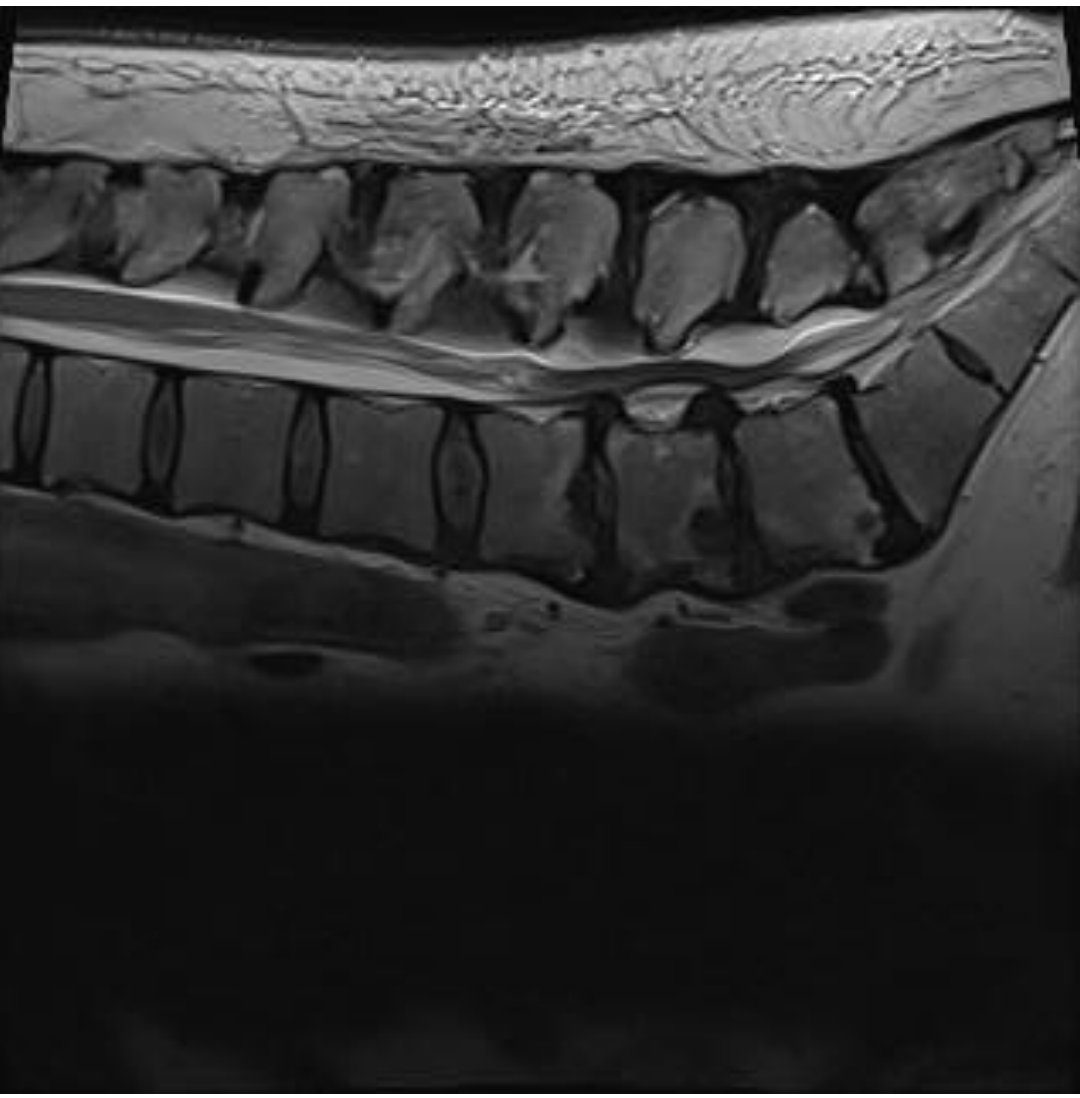
Case #1 – Uniportal transforaminal discectomy and foraminotomy

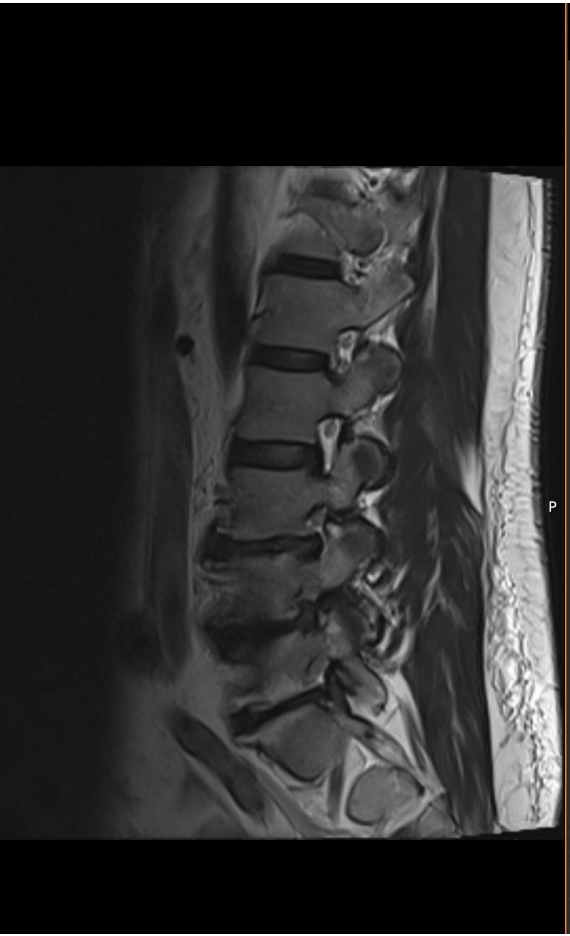
History

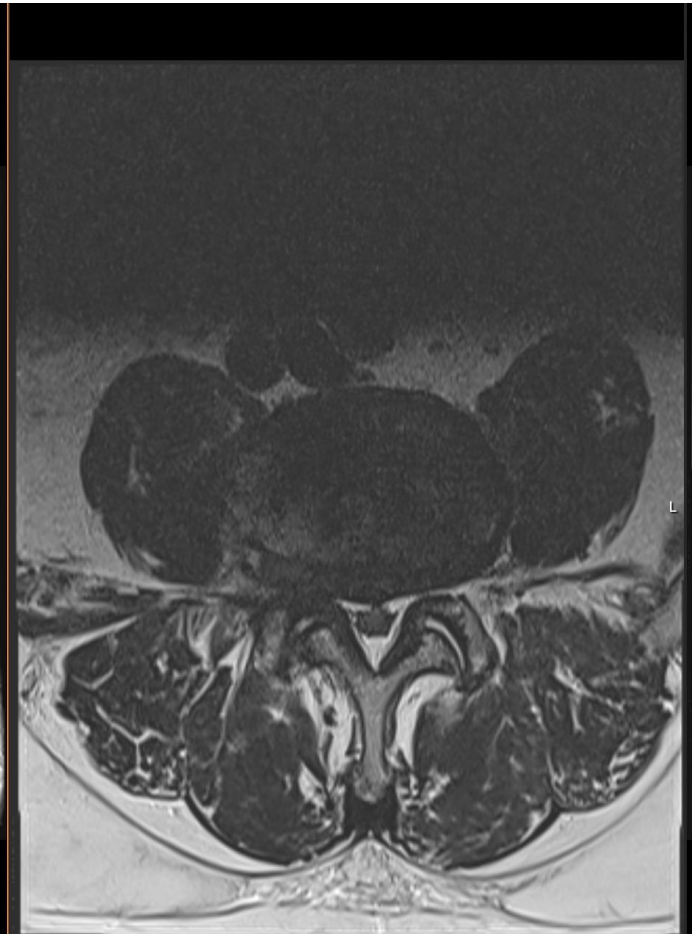
- 66 y.o. male presenting with chronic low back pain and sharp radiating pain into anteromedial and lateral right thigh and inner part of leg
- Present for a year and progressively worsened
- Leg pain > back pain
- VAS 10/10, EQ-5D 70, PROMIS Pain-62 (mod), Phy-41 (mild), Depression -34 (normal)
- Pain worse with walking, relieved bending forward
- He cannot walk more than 1/2 block
- PMH significant for HTN, COPD, recent PE (on Eliquis)

Physical Examination

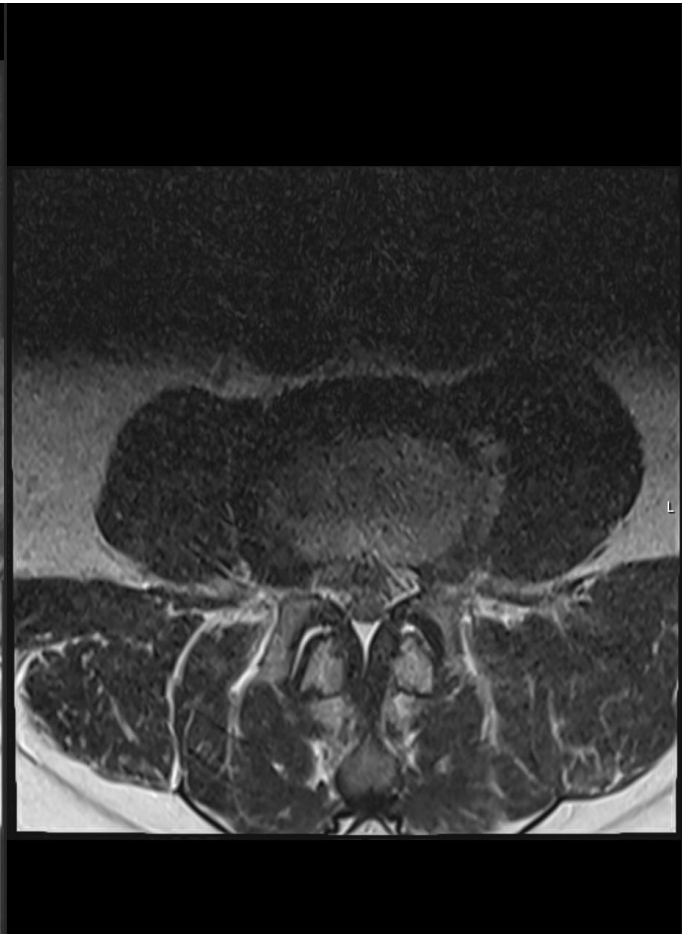
- BP 177/107 , Pulse 90 , Ht 6' 1" (1.854 m) , Wt 269 lb (122 kg) , BMI 35.49 kg/m2 , SpO2 98%
- Intact strength
- Decreased light touch sensation in medial and lateral thigh
- Positive straight leg raise
- Unable to tandem walk secondary to pain



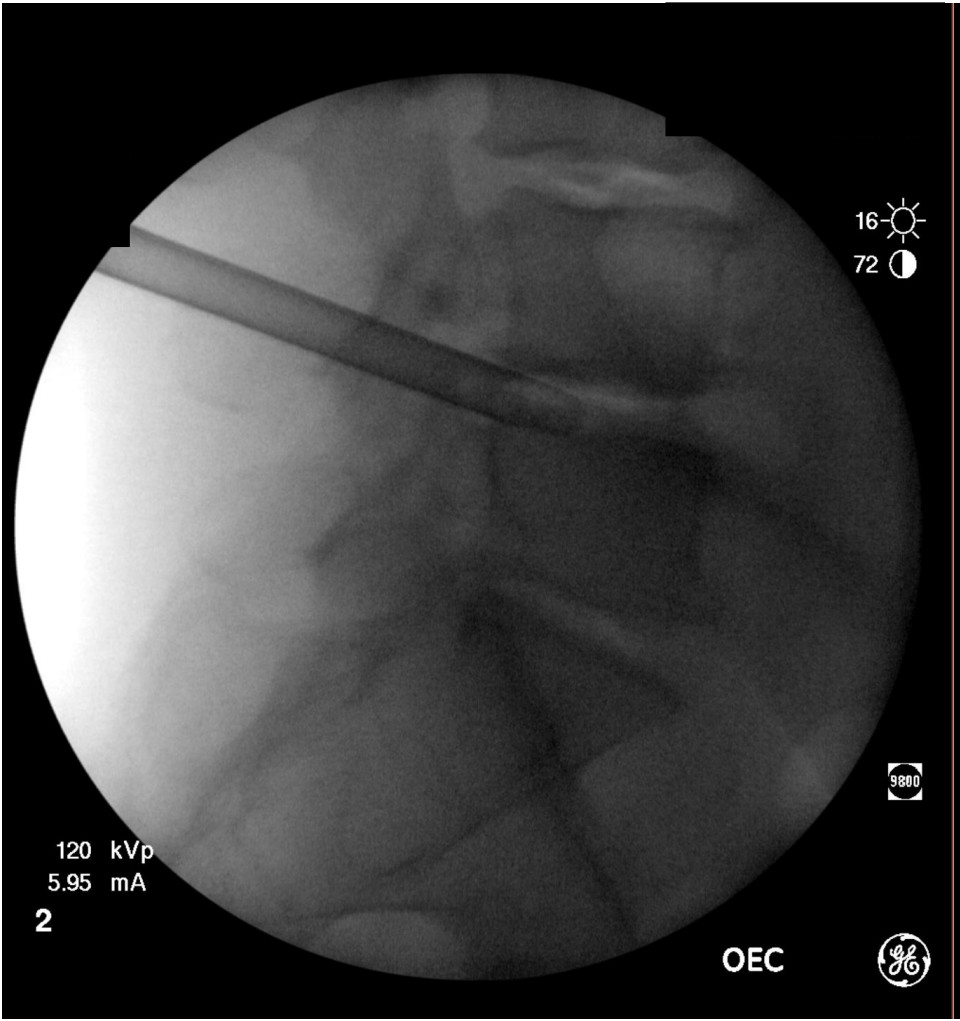




L4-5



L3-4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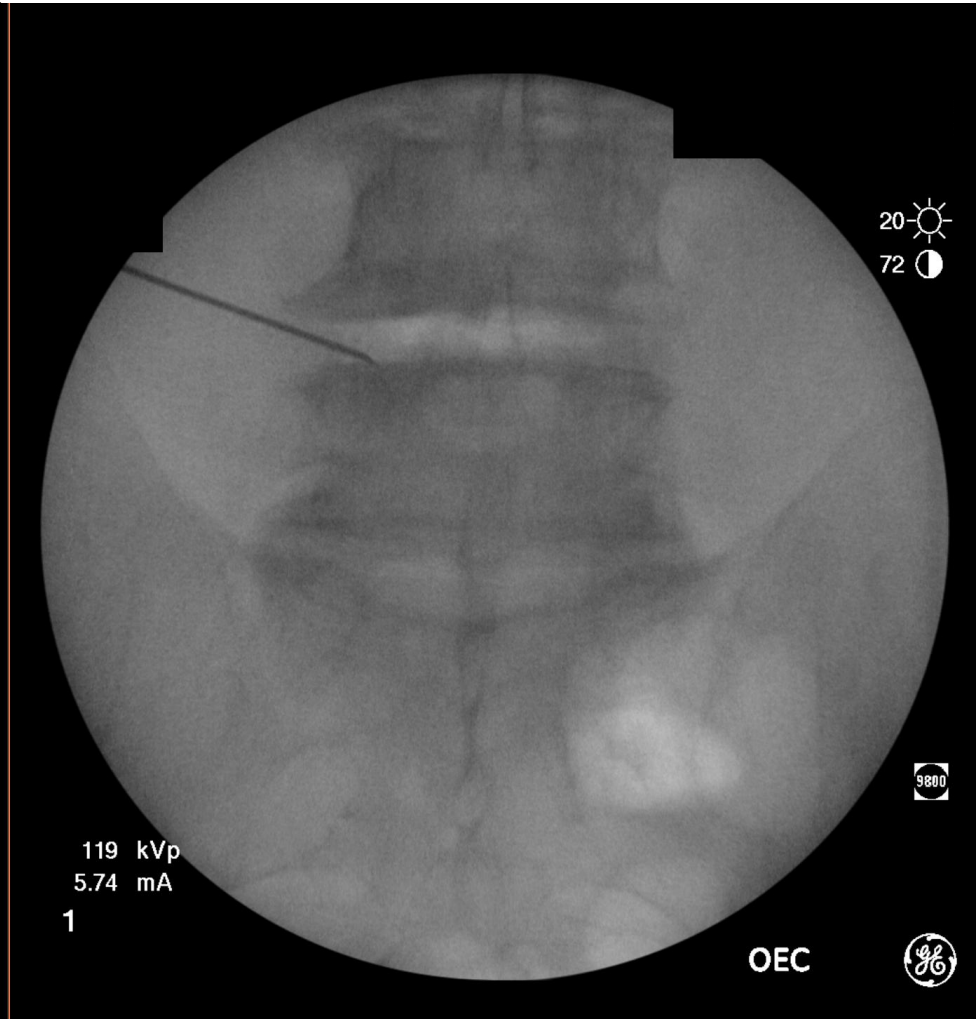
5.95 mA
2
OEC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5.74 mA
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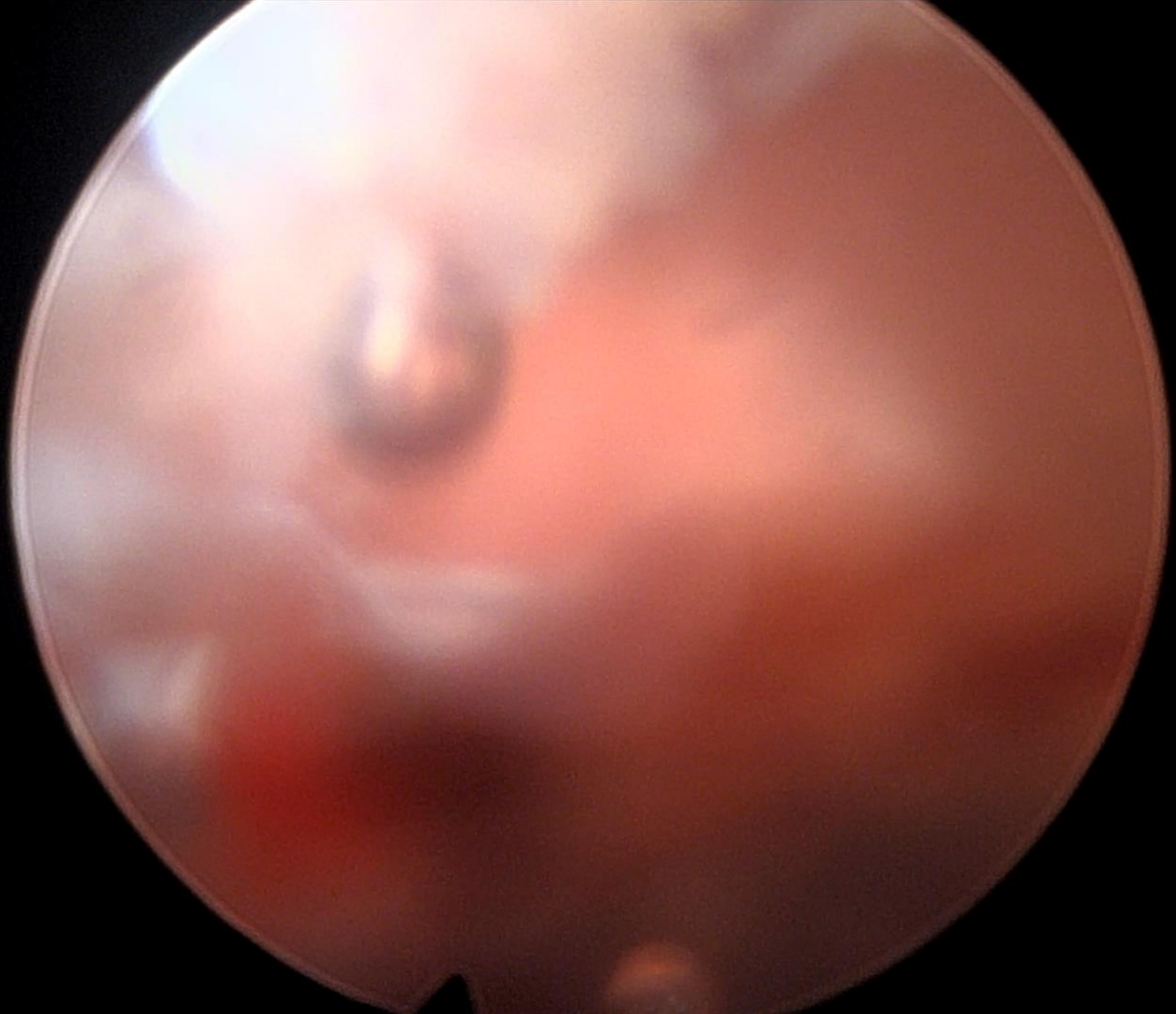

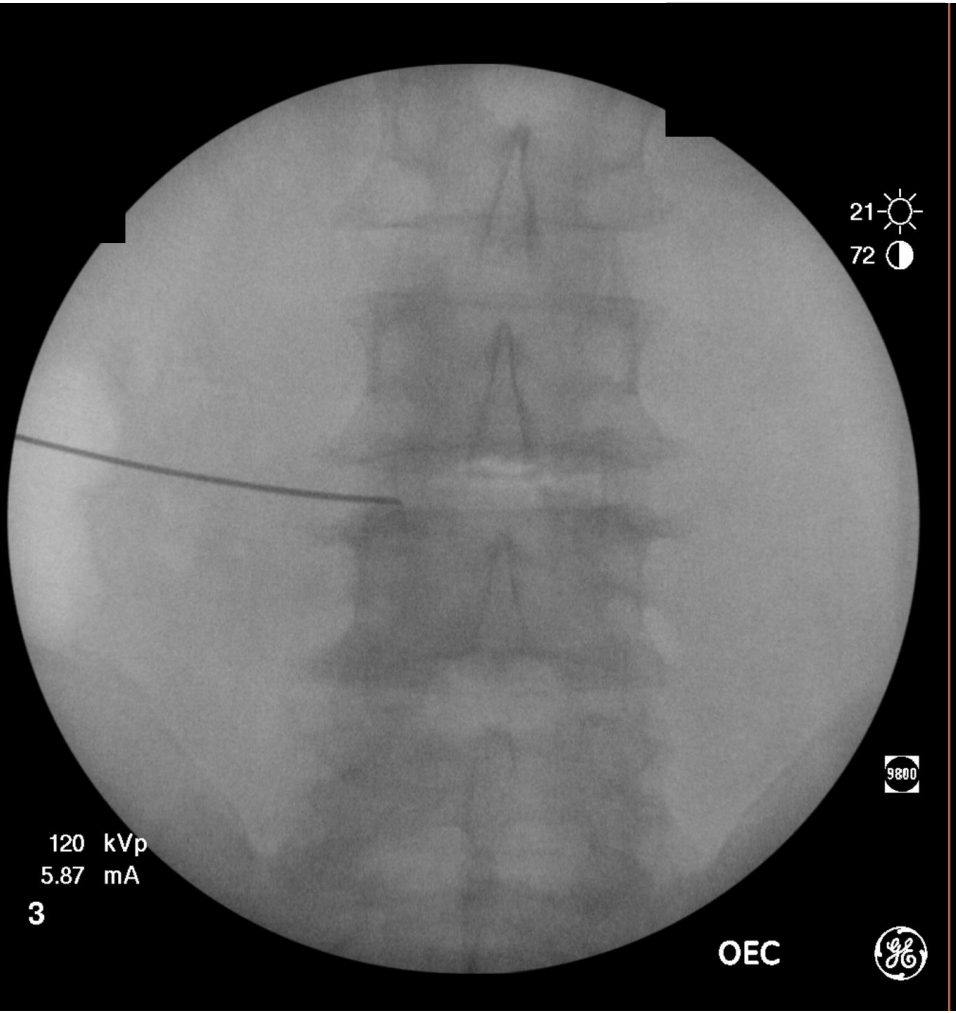
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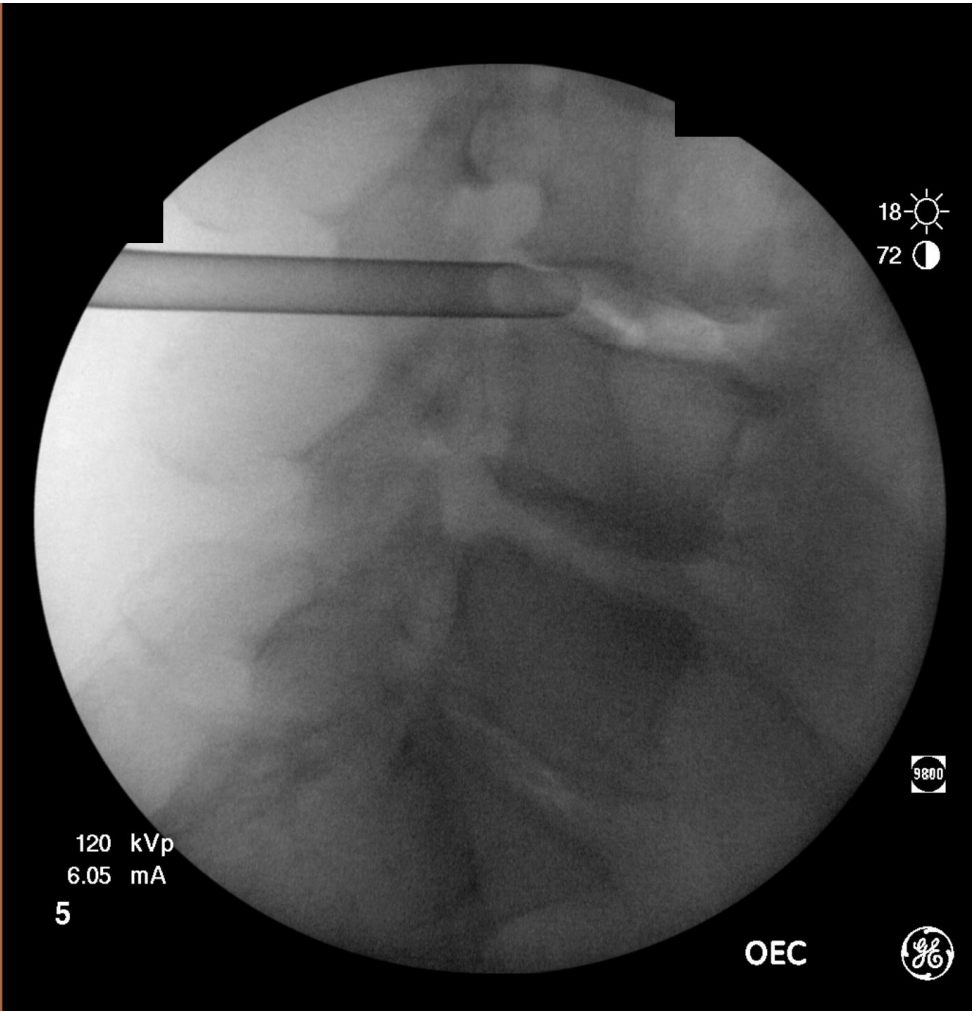
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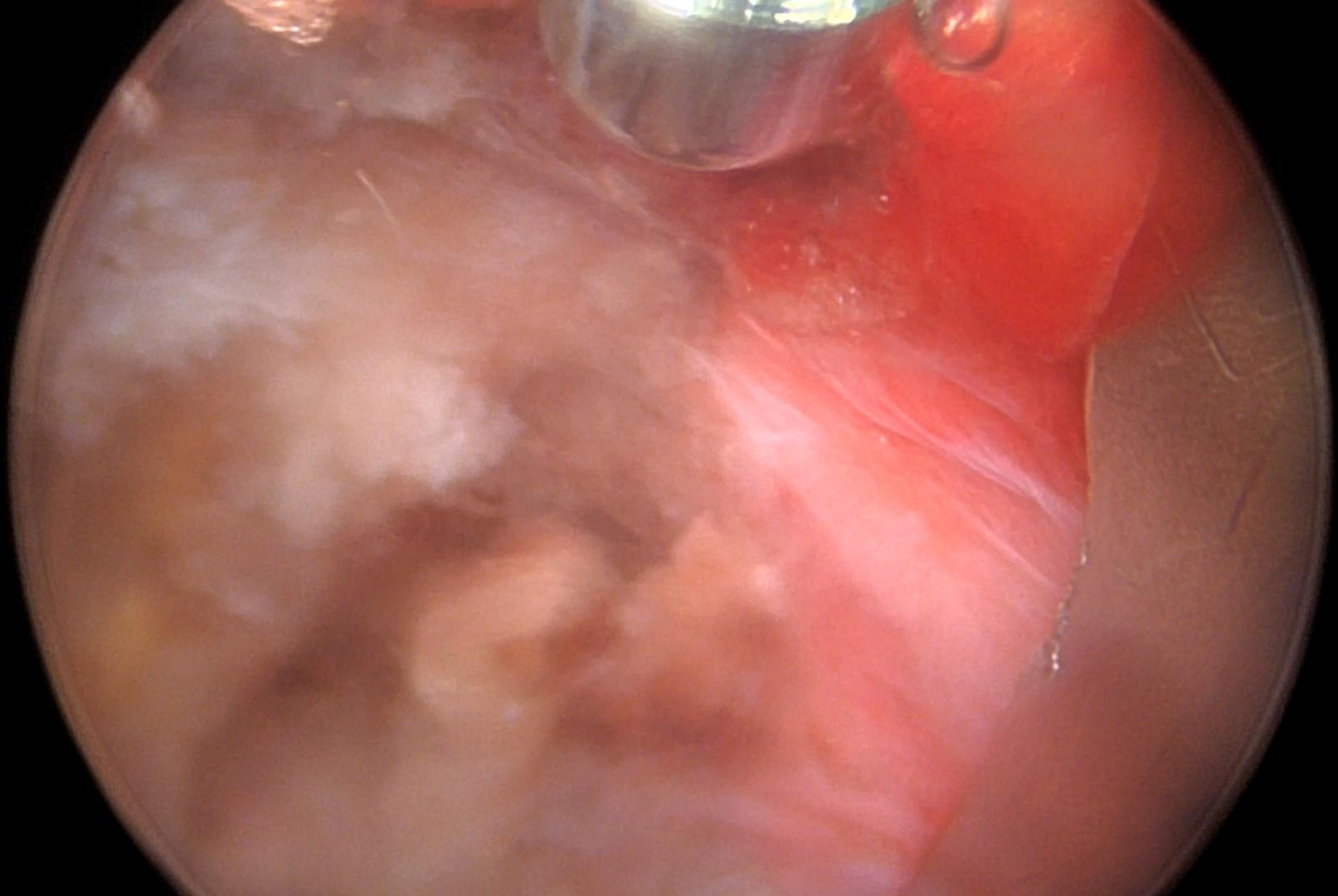
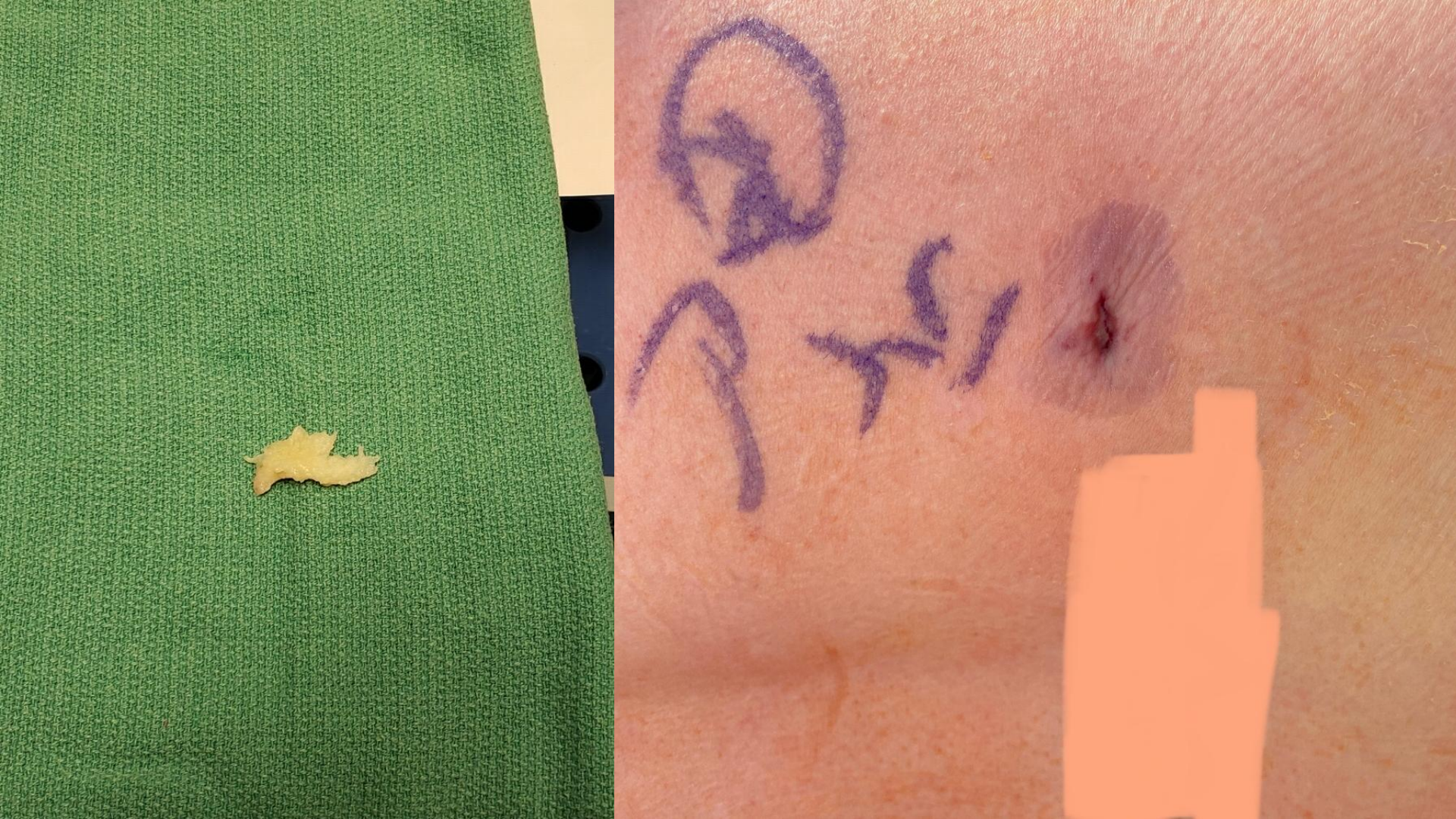
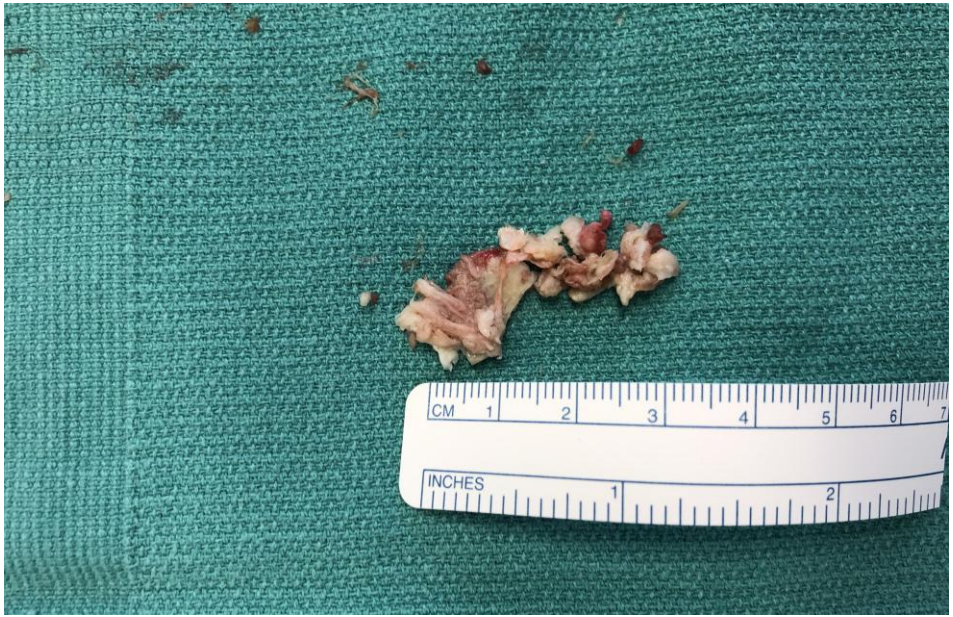
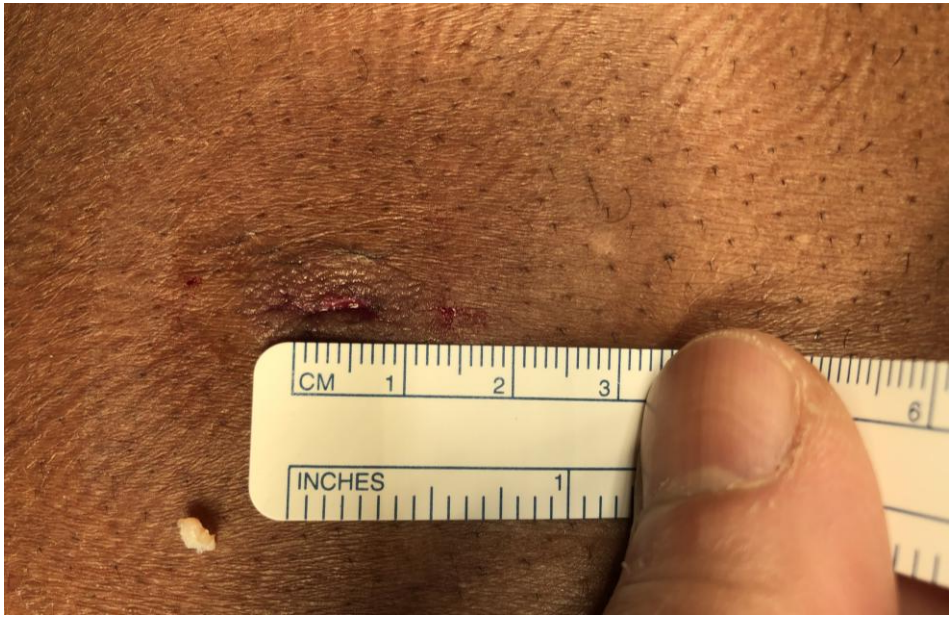


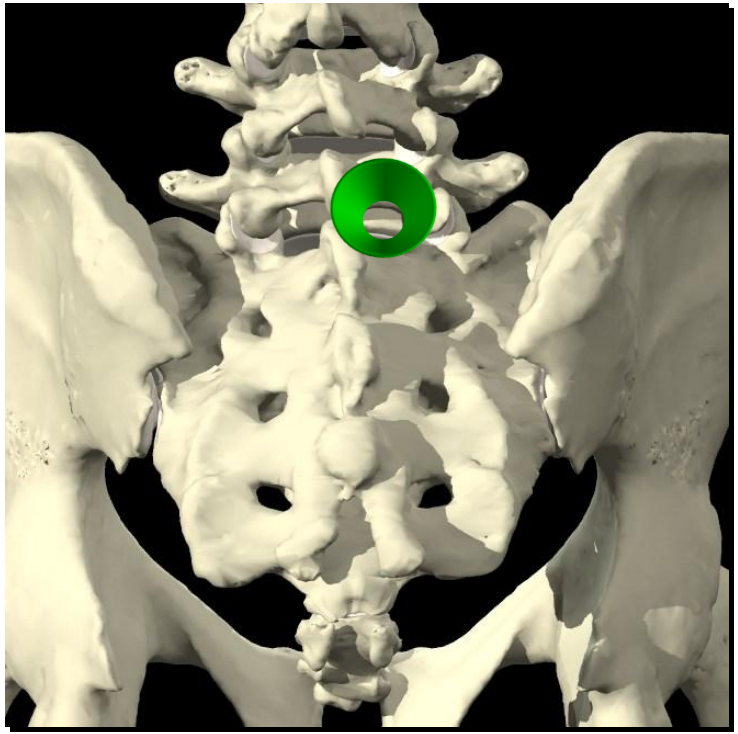


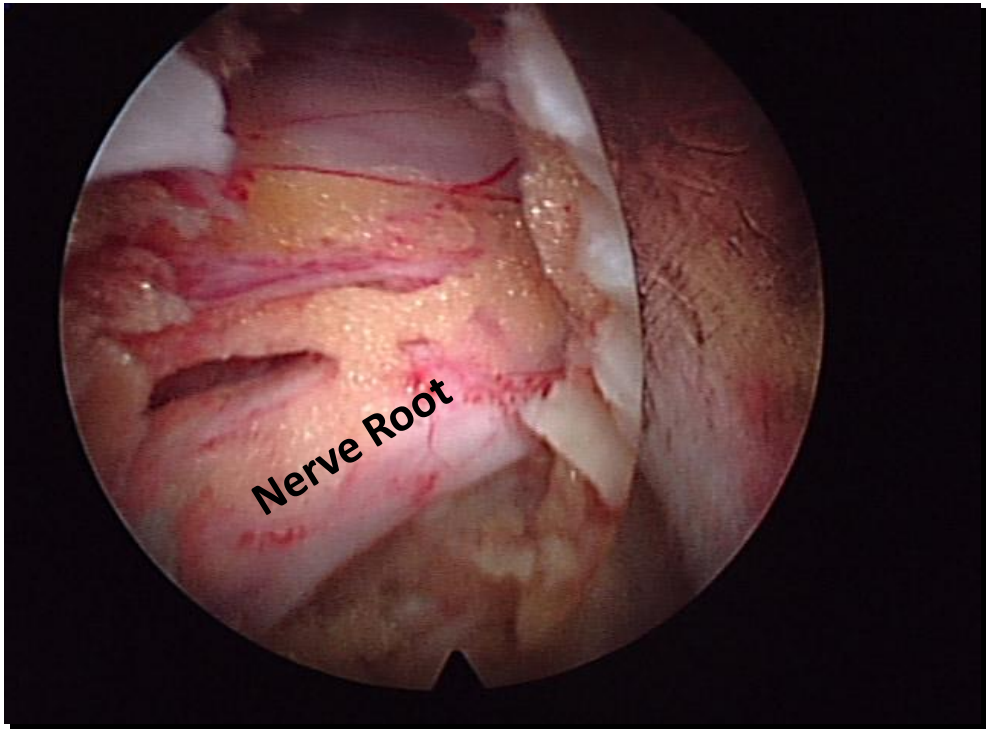

CM 1 2 3 4 5 6
INCHES 1 2


CM 1 2 3
INCHES 1

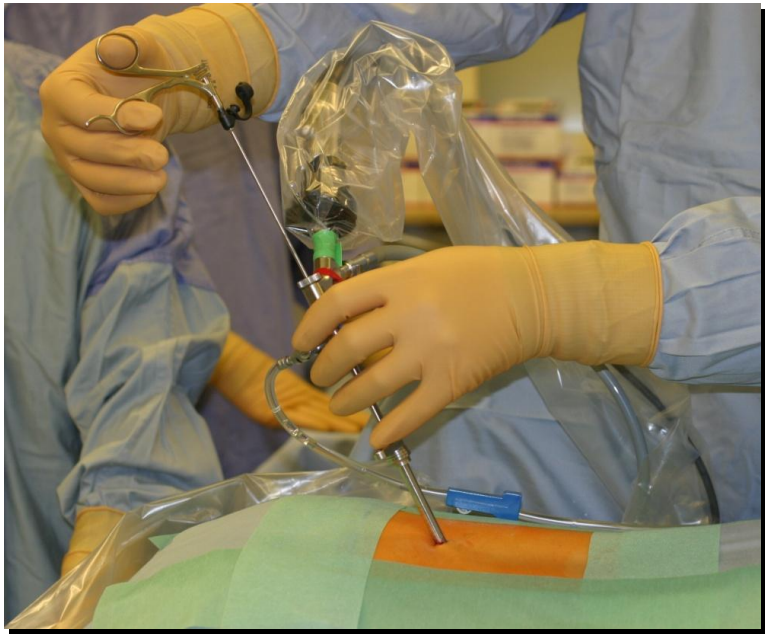
Interlaminar Endoscopic Approach

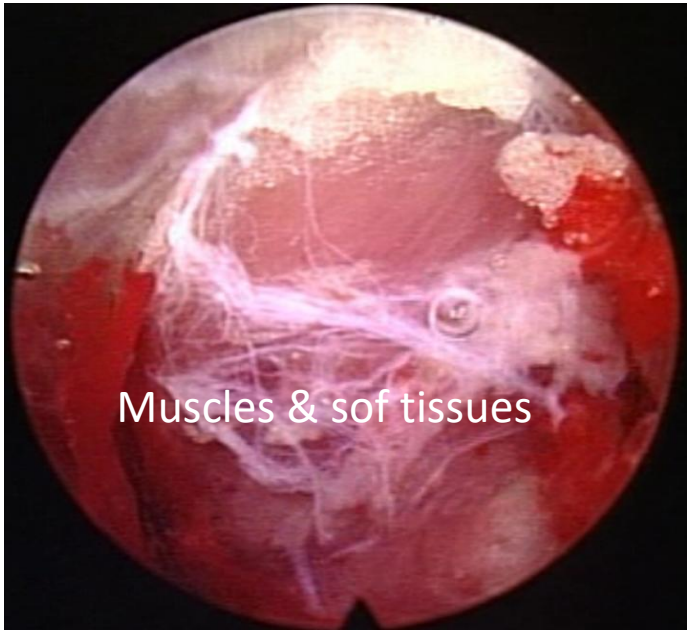
- Interlaminar Window – paracentral discs





Interlaminar

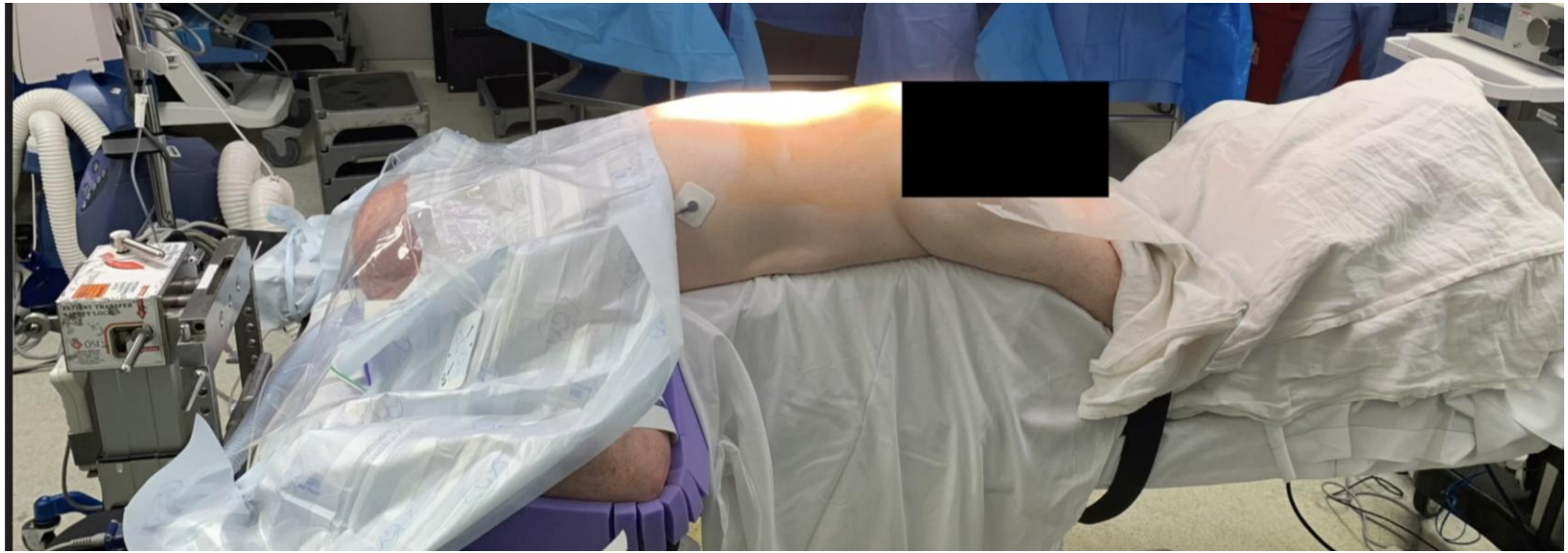




Comment:

- **Keep the direction straight to the disk level**
- **C-arm position in lateral view during the operation**

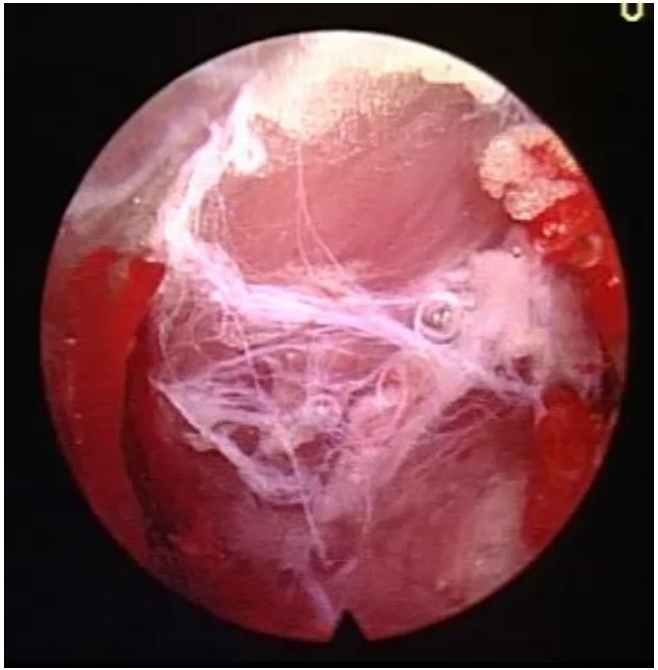
Positioning is the key



Comment:

- **Flat Jackson with Wilson Frame**
- **Flex the spine to open up the interlaminar space**

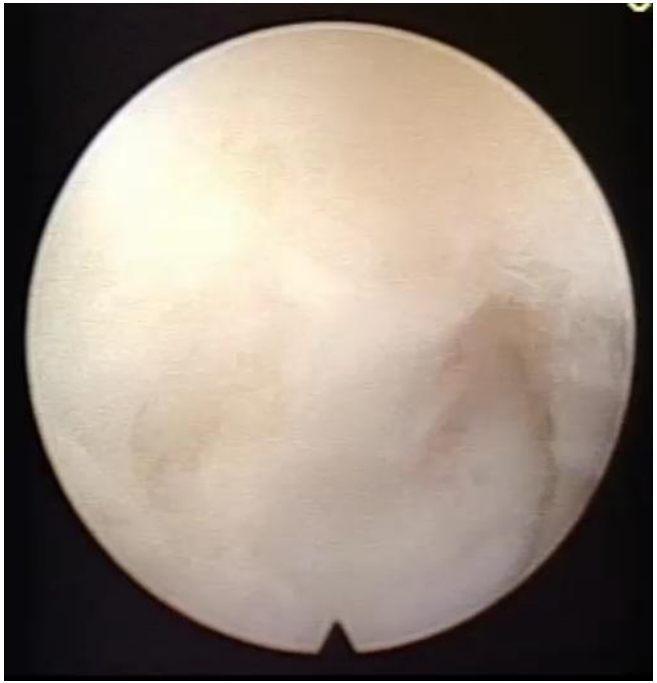
Identification of ligamentum flavum



Comment:

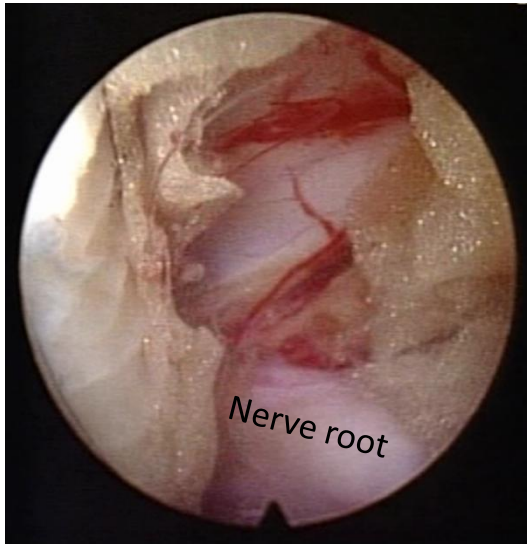
- **Cleaning from soft tissues**
- **Keep tension on the ligament by pushing the sleeve**

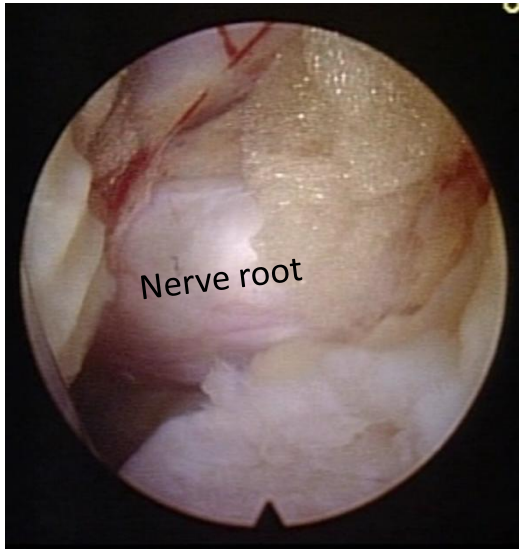
Opening of flavum ligament



Comment: Starting from medial to lateral by using the same incision

Identification of neural structures

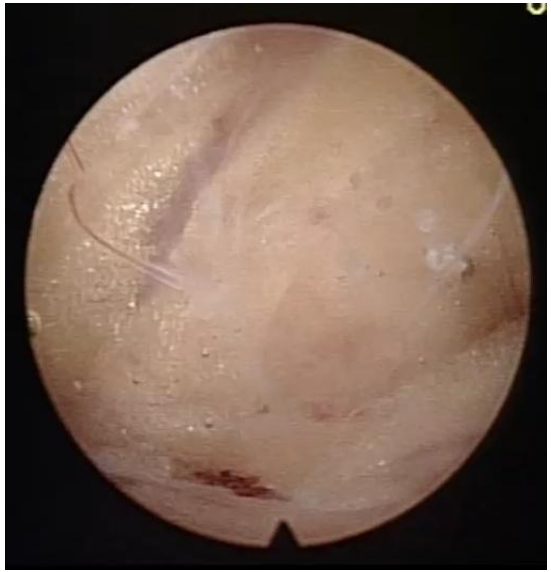




Comment:

- **Removal of soft structures surrounding neural structures**
- **Identification of lateral border of the nerve root**

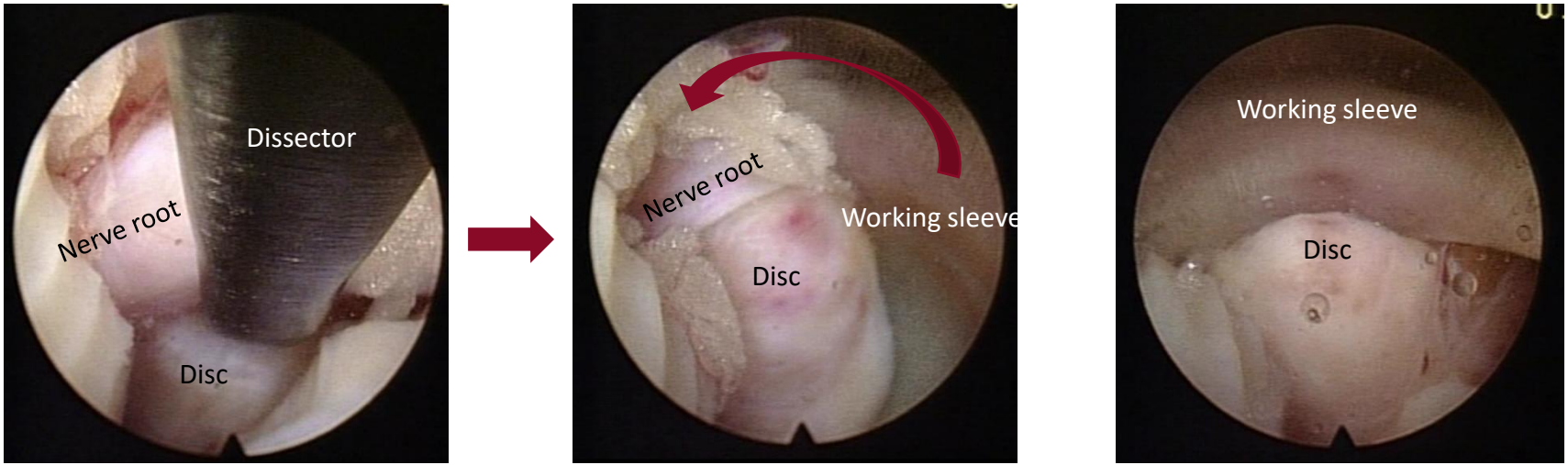
Identification of neural structures



Comment:

- **Removal of epidural fat and scar surrounding neural structures**
- **Identification of lateral border of the nerve root**

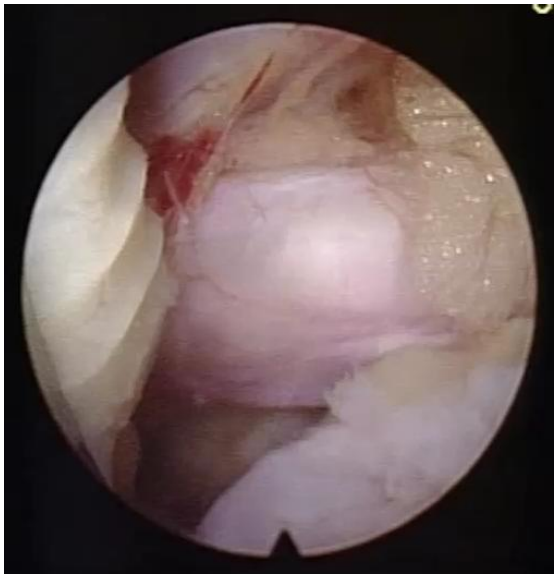
Protection of neural structures with the working sleeve



Comment:

- **Pushing the working sleeve to the level of the disc, medial to the facet joint**
- **Rotating the working sleeve clockwise or counter-clockwise as you see fit**

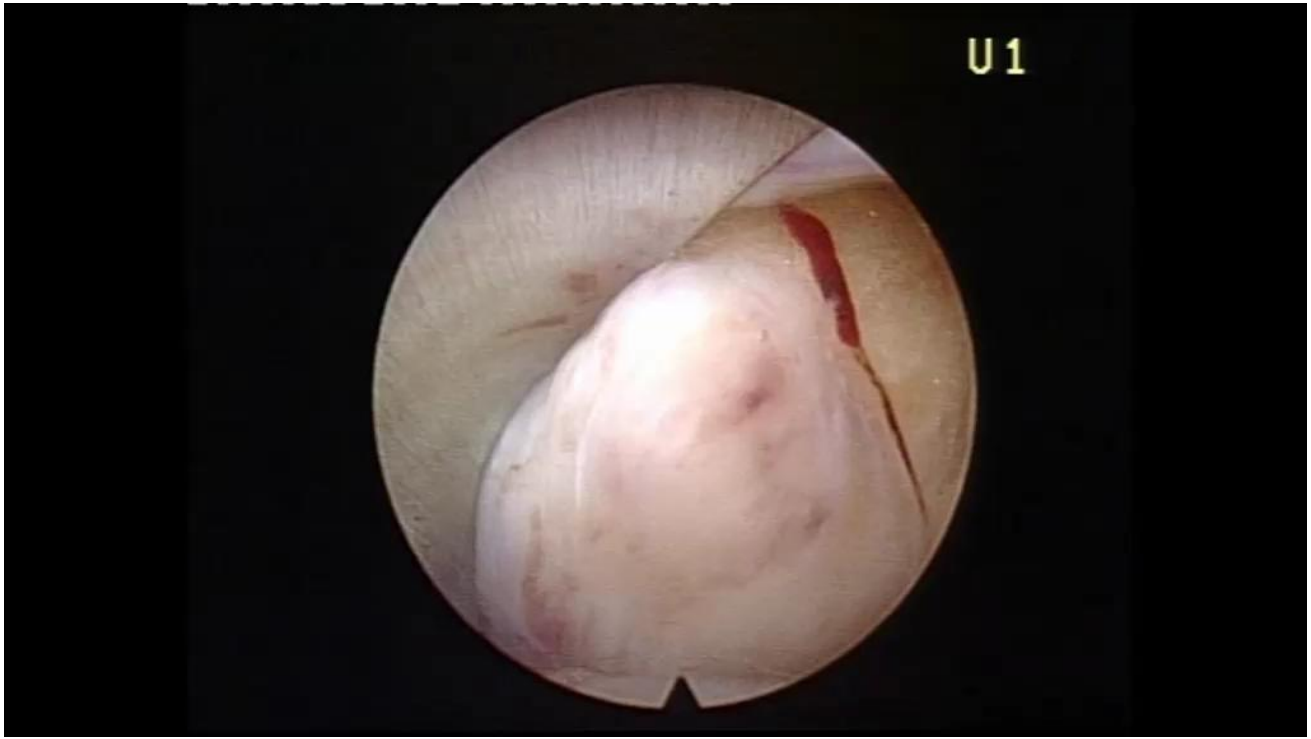
Protection of neural structures with the working sleeve



Comment:

- **Pushing the working sleeve to the level of the disc**
- **Rotating the working sleeve clockwise or anti-clockwise as possible**

Discectomy

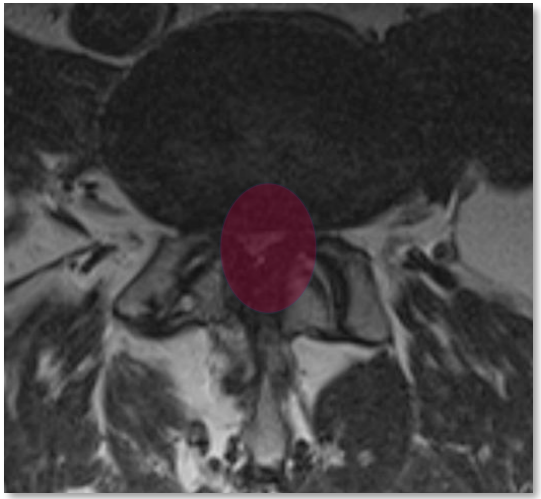


Now the big boy stuff…

Degenerative spinal stenosis

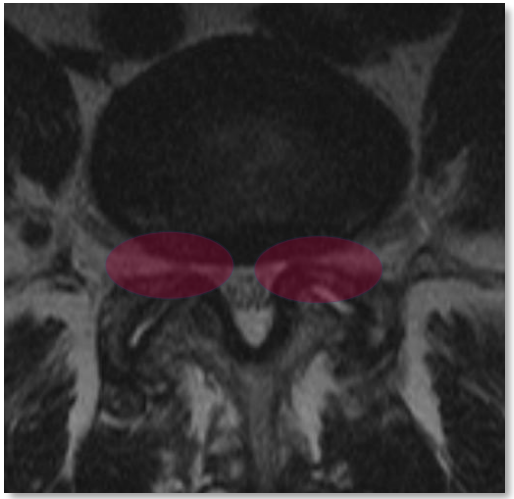
Classification:

Central



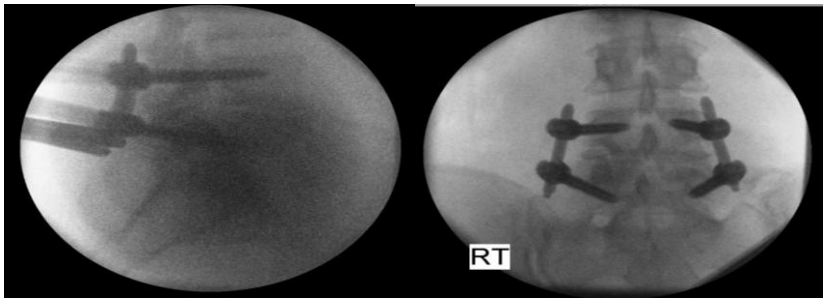
Lateral

(recess, foraminal)



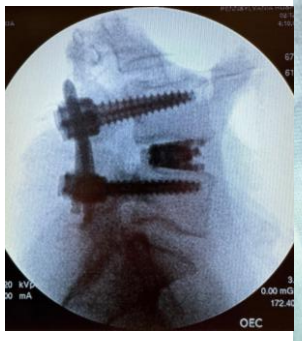
Endoscopic Assisted Lumbar Interbody Fusion

Transforaminal

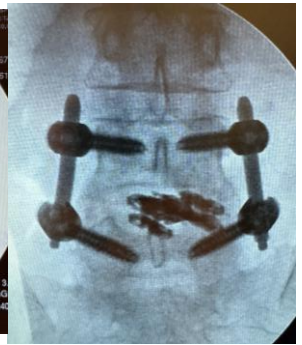


Interlaminar

Uniportal



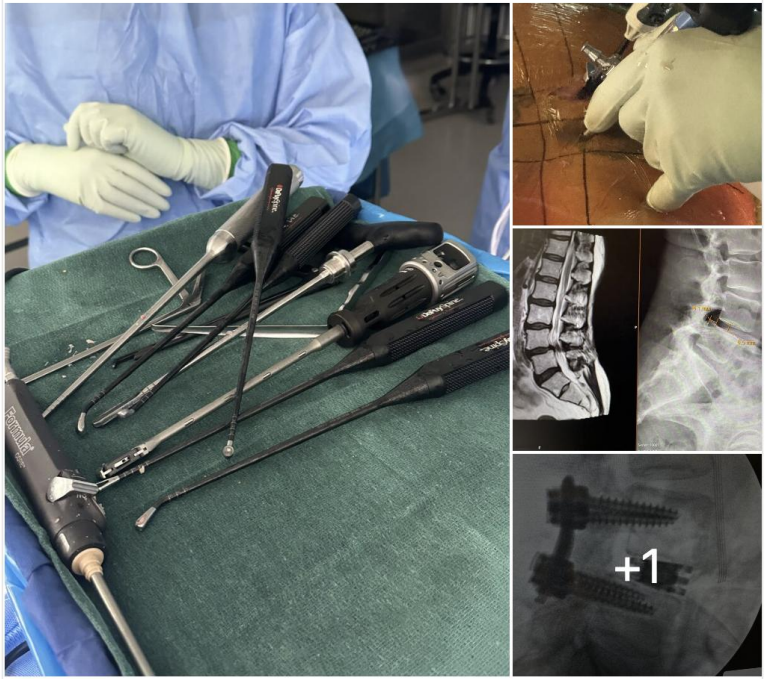
Biportal



Jang Yoon, MD, MSc, FAANS, FCNS · You
Director of Minimally Invasive Spine Surgery Co-director of Com...
9mo · Edited ·

Unilateral biportal endoscopy (UBE) has become my preferred method for performing lumbar interbody fusion, and one of the main reasons is the ability to use the same tools I use in open TLIF procedures. With UBE, I can use familiar instruments like Kerrison Rongeurs, osteotomes (I love removing the IAP from the start), disc dilators, shavers, and a 5.5 mm aggressive flute drill bit (thanks to my ortho colleagues). Diamond and matchstick bur tips are also possible.

This method maintains the size and efficiency of the tools typically used in open surgery, making #dualPortal TLIF highly efficient. Performing the procedure endoscopically doesn't mean compromising on speed or efficiency!



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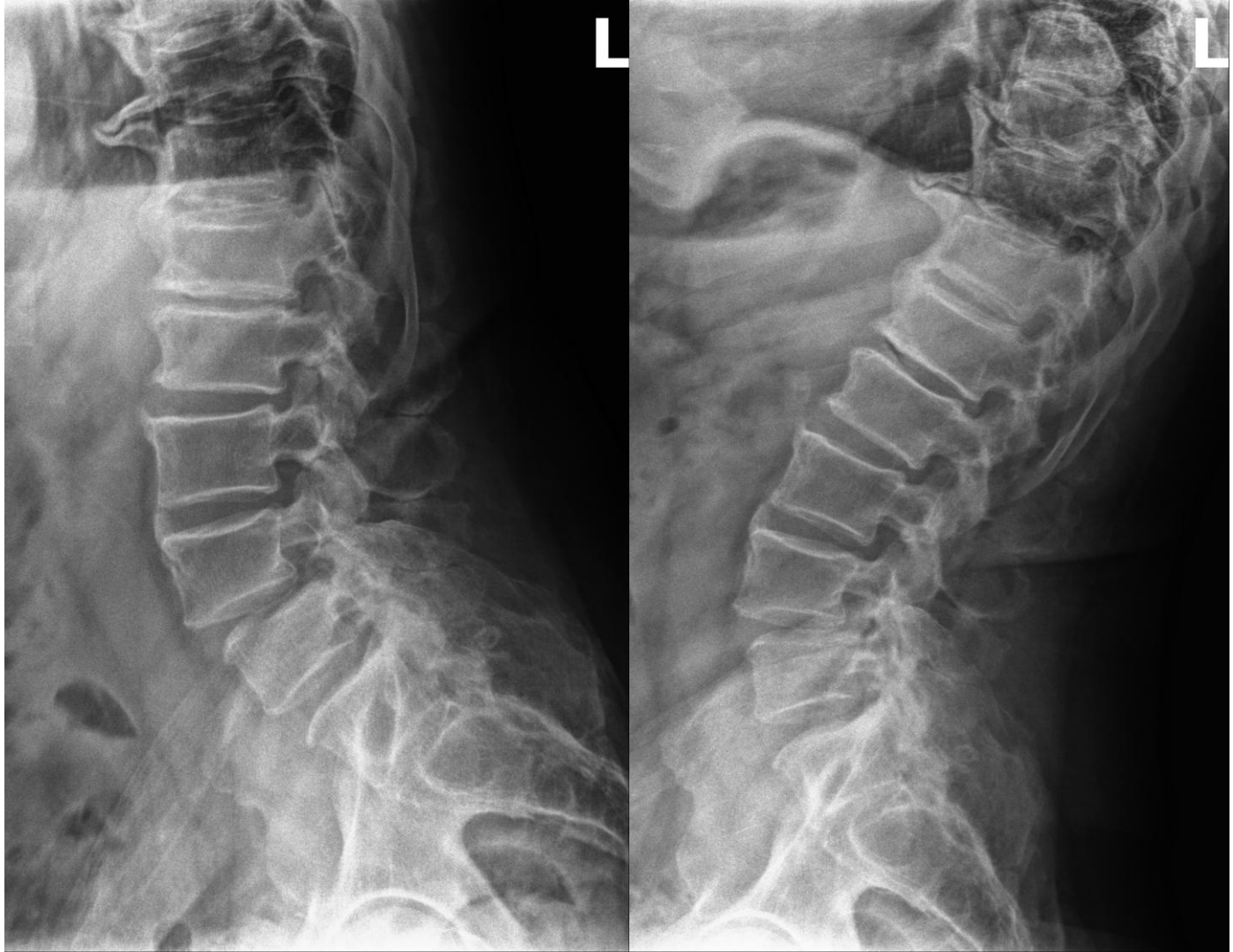
Case #2 – Two level TLIF using endoscopic technique

History and Physical Examination

- 74-year-old male
- 7/10 low back pain
- Used to walk 3 miles a day enjoyed walking, but now unable to ambulate a city block
- Low back pain with radiation of pain down both legs
- Ht 5' 8" (1.727 m) , Wt 235 lb (106.6 kg) , BMI 35.73 kg/m2
- 5/5 strength in BLE, decreased sensation to light touch in his calves bilaterally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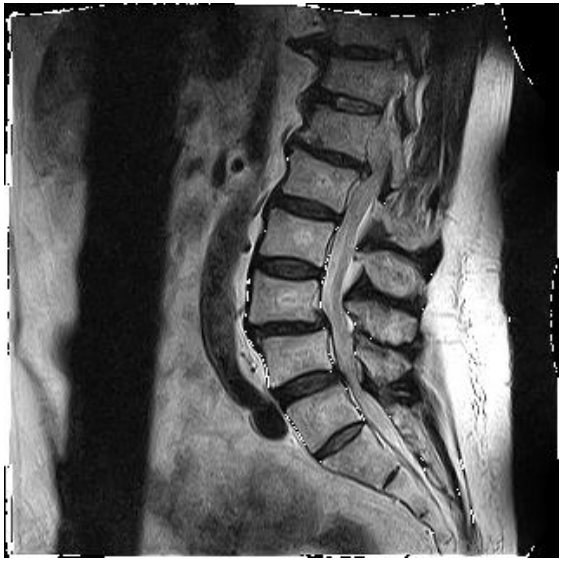
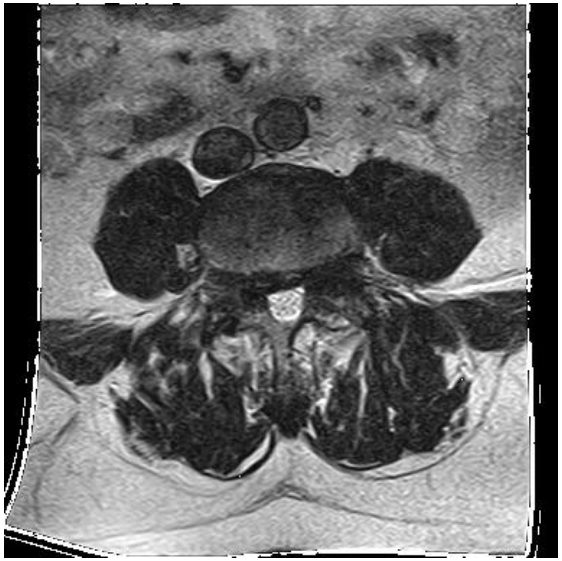
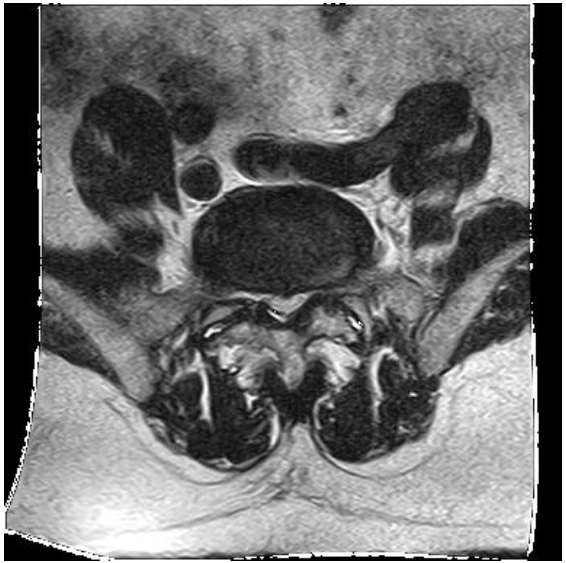
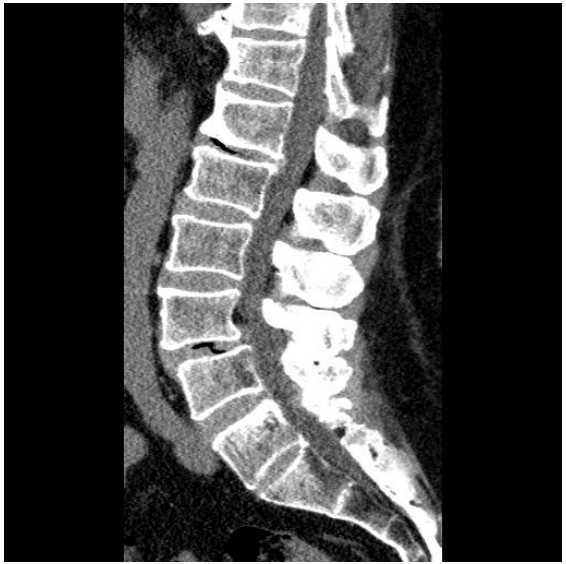


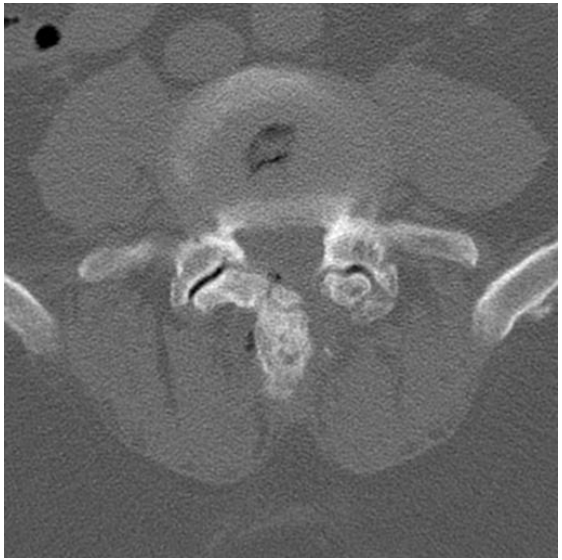


L4-5

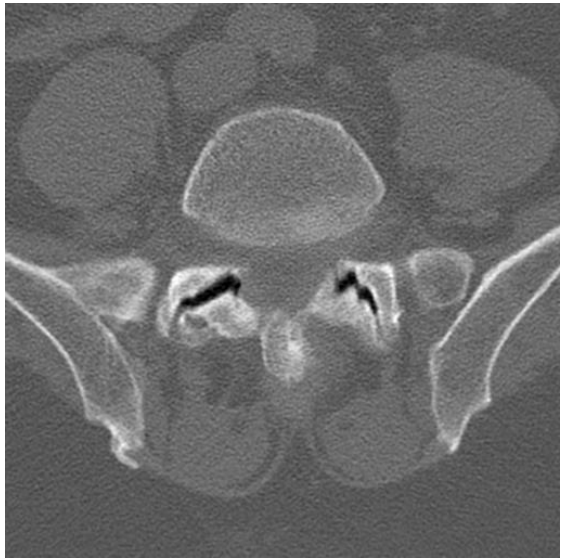


L5-S1

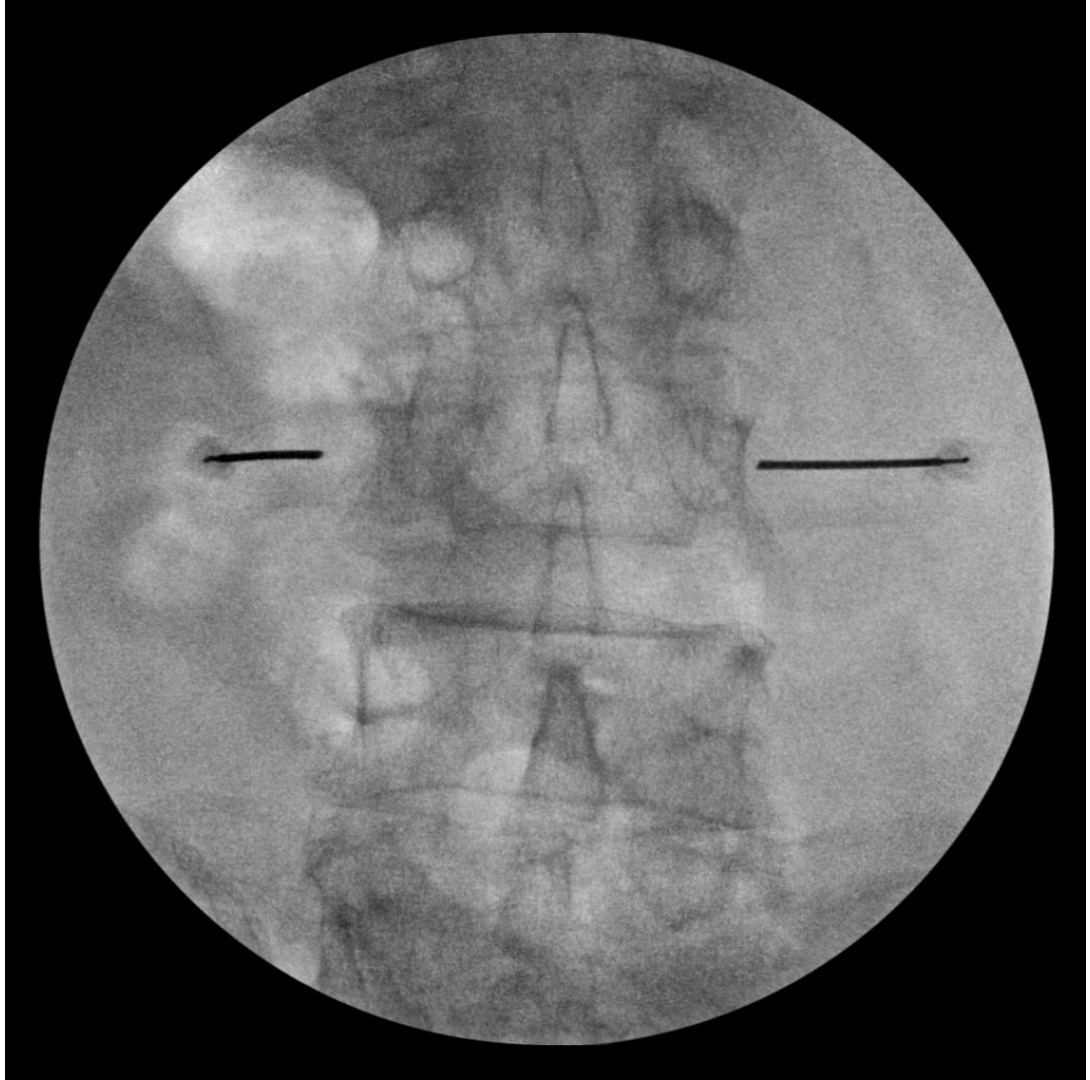




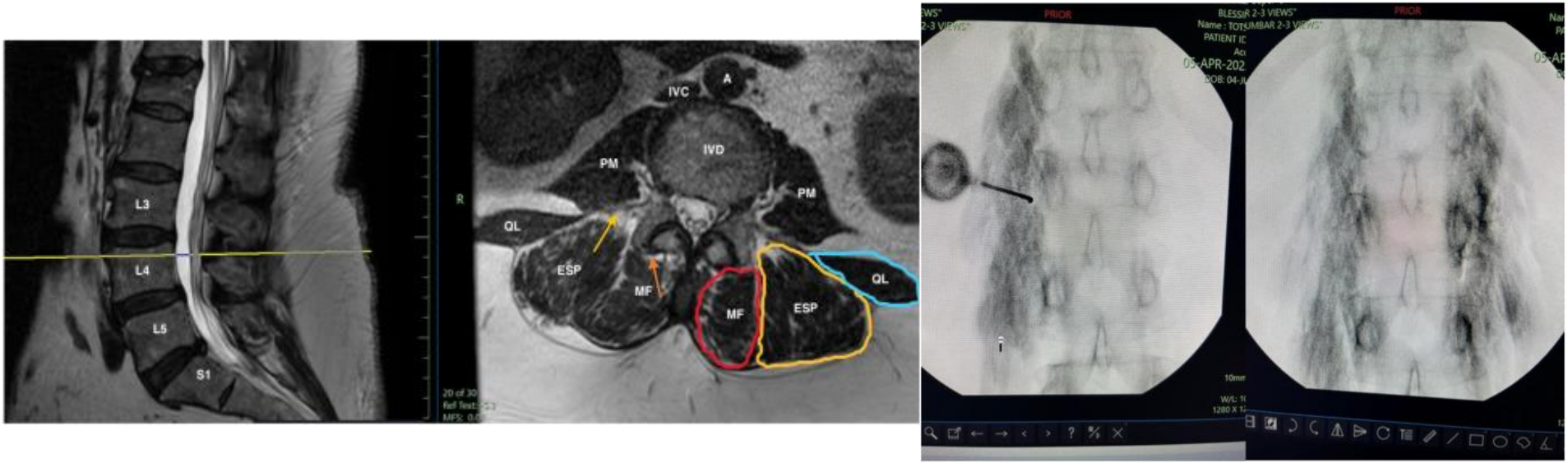
L4-5



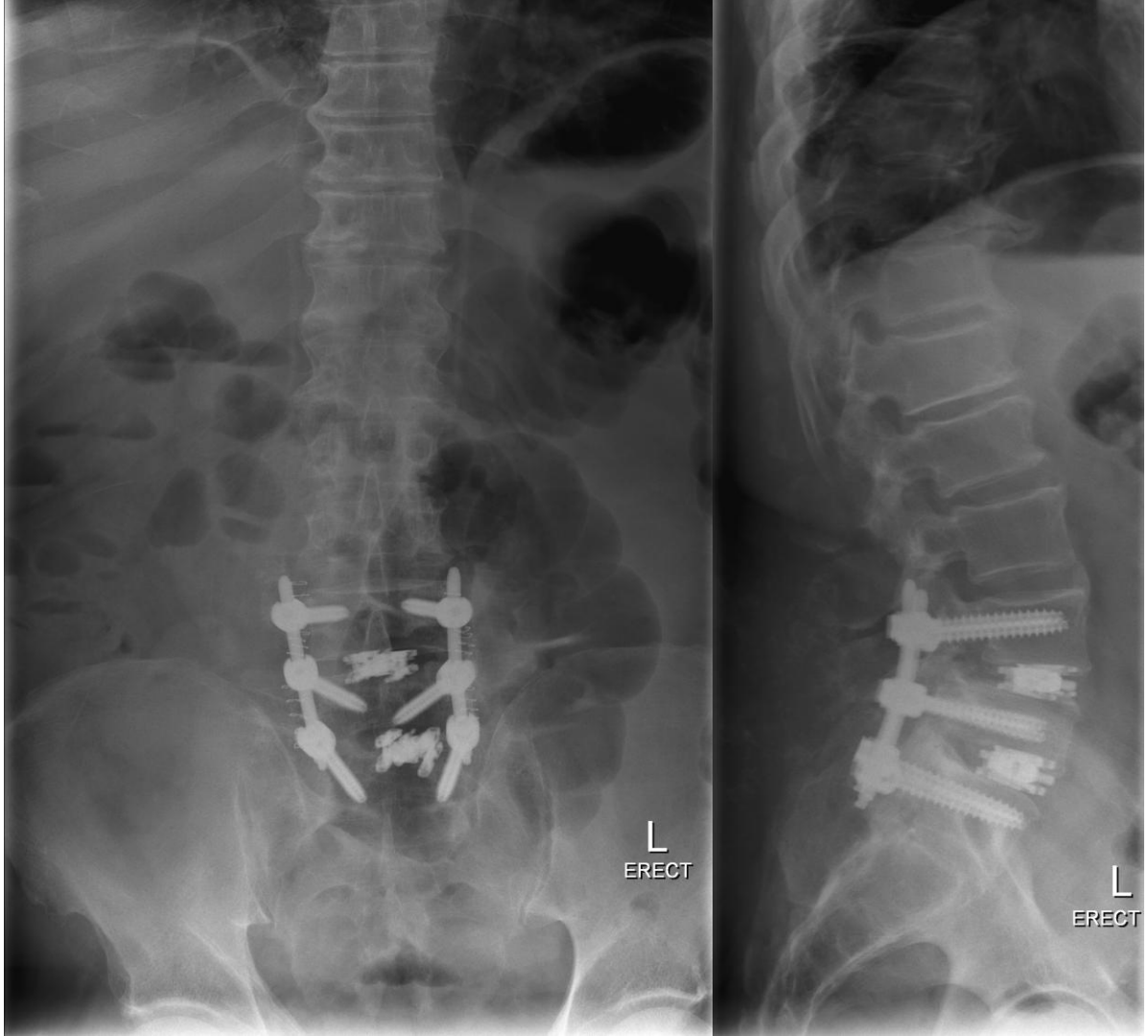
L5-S1



Bilateral Erector Spinae block at L3



Robertson SC, Kamm C, Ashley M. Fluoroscopic Guided Lumbar Erector Spinae (ESP) Field Blocks: A New Technique and Radiographic Analysis. World Neurosurg. 2024 May;185:e1287-e1293. doi: 10.1016/j.wneu.2024.03.072. Epub 2024 Mar 21. PMID: 38521215.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Outcome

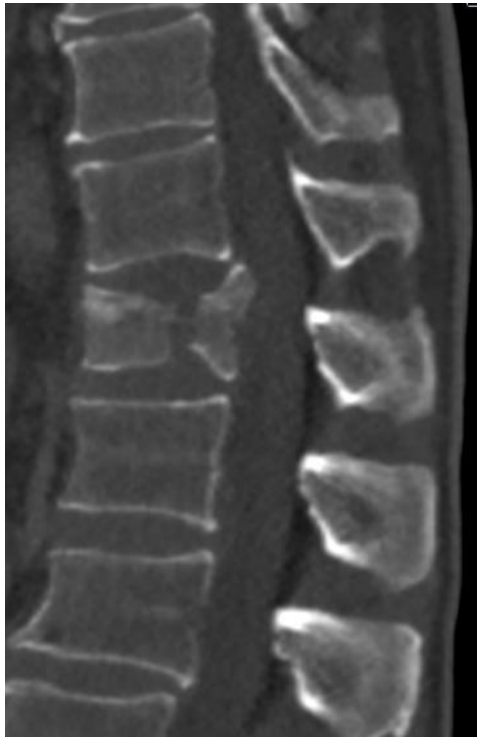
- Overnight stay in the hospital
- < 23-hour overnight stay
- Ambulated on the day of the surgery
- D/C home

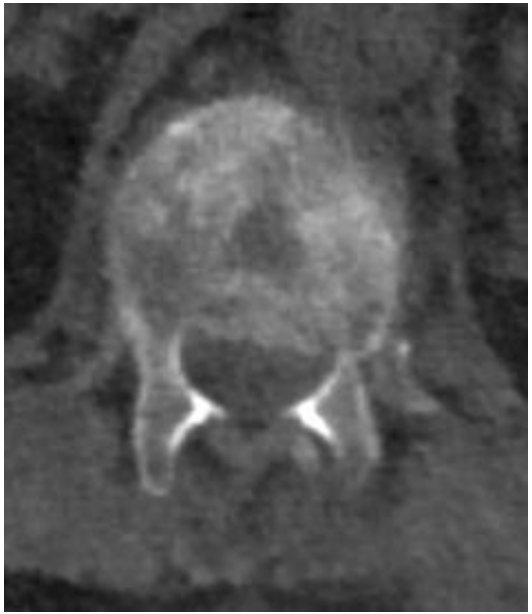
Case #3 – Partial corpectomy and separation surgery in thoracic spine using endoscopic technique

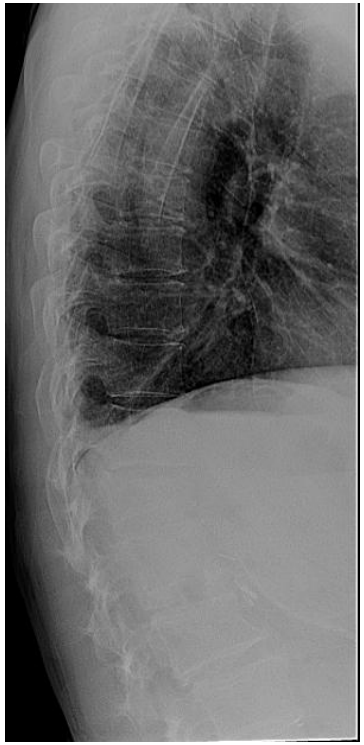
History and Neurological Exam

- History: 71M with recent diagnosis of renal cell carcinoma. Presented to ER with increased mechanical back pain and myelopathy in setting of a known T12 pathologic compression fracture
- Recent surgical history: nephrectomy 2 months prior to presentation
- Chief complaint: mechanical back pain, unsteady gait, subjective lower extremity weakness
- Neurologic exam: full strength, normal sensation, no hyperreflexia

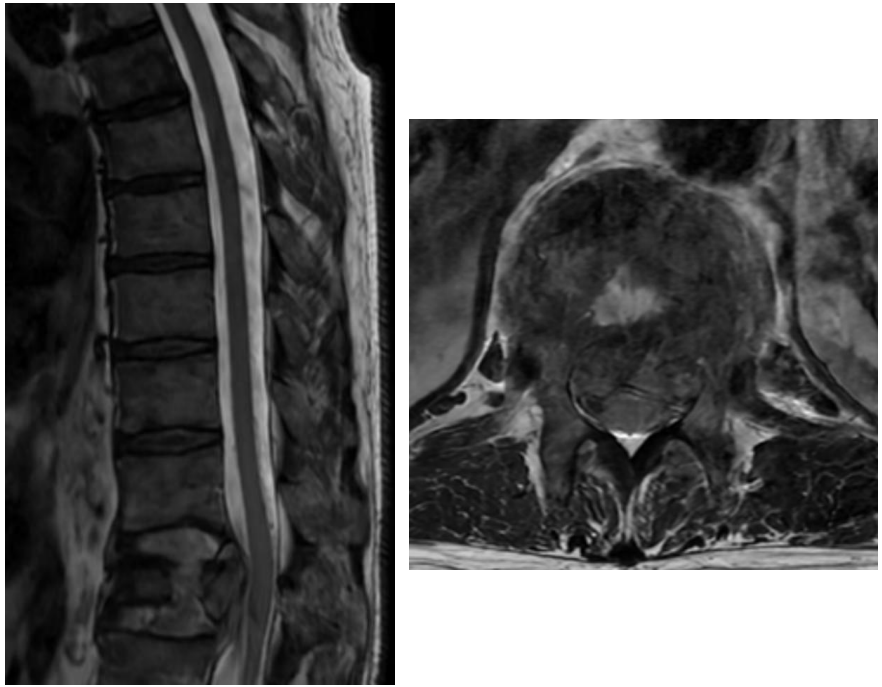
Neuro-Imaging Findings – CT scan



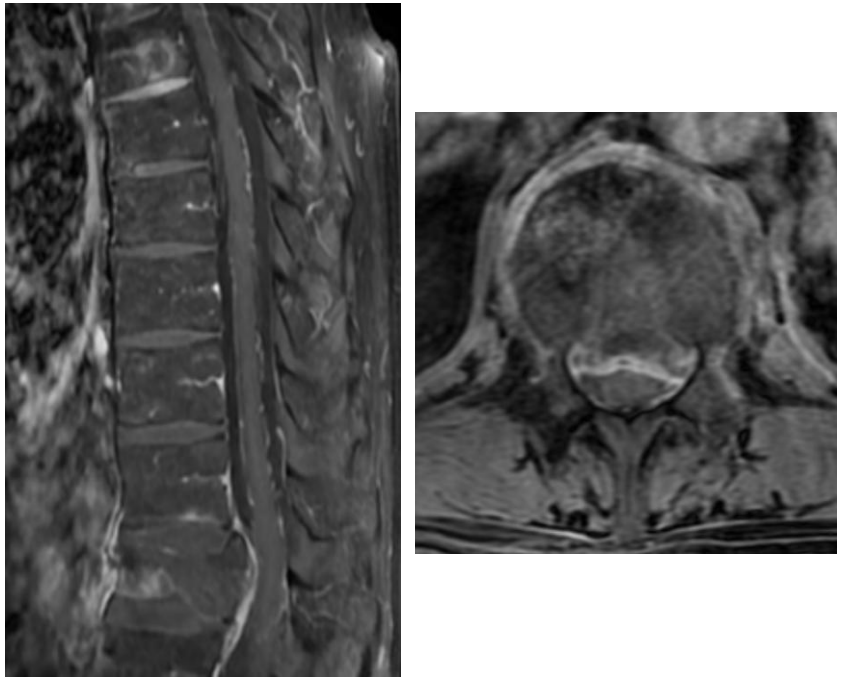




Neuro-imaging Findings – Preoperative MRI



T2 sequence

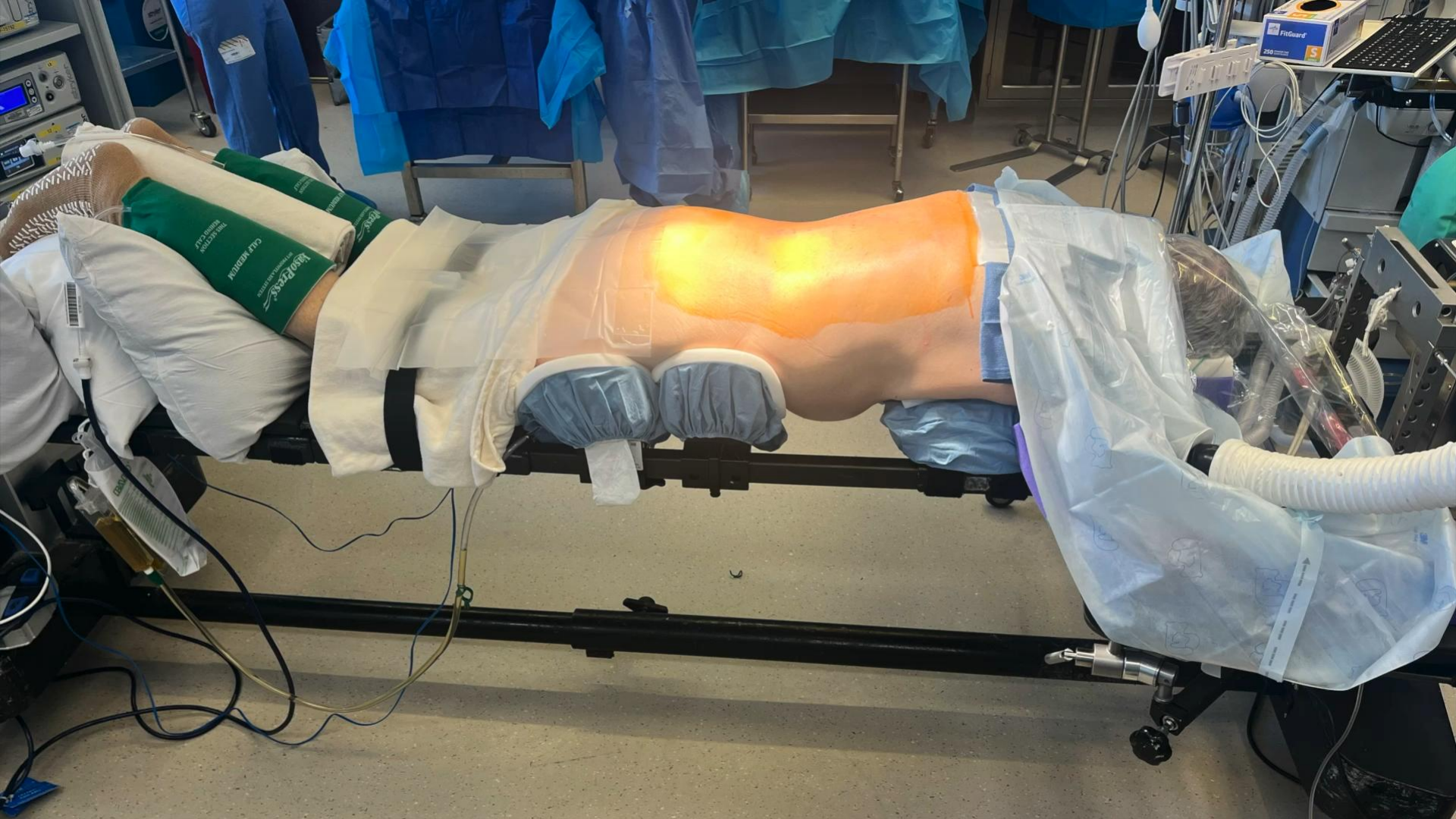


T1 post-contrast sequence

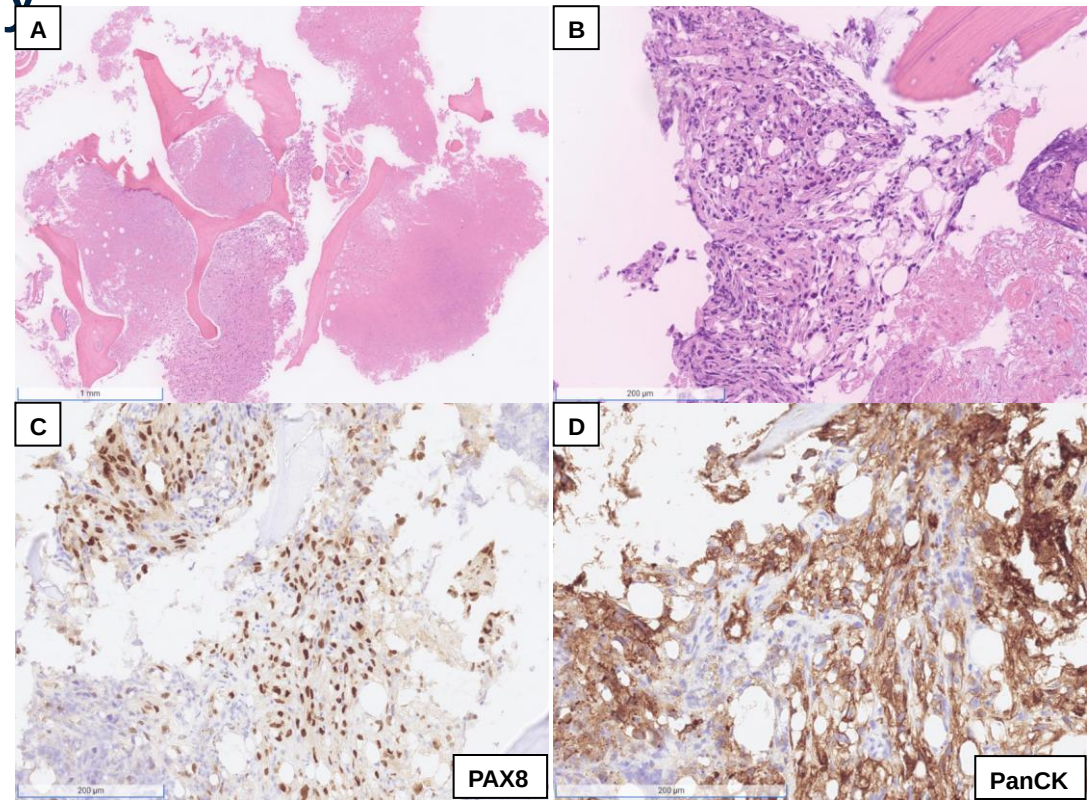
Rationale for Procedure and Alternatives

- Spinal Instability Neoplastic Score (SINS) – 14
  - Semirigid (1)
  - Mechanical back pain (3)
  - Lytic lesion (2)
  - Kyphosis (2)
  - >50% vertebral height loss (3)
  - Posterior spinal element involvement (3)

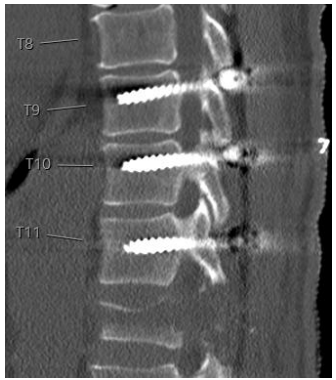
- Diagnosis
  - Bilsky 3 spinal cord compression
  - Spinal column instability from thoracic spinal metastatic disease

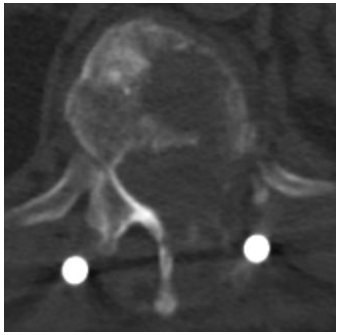

FitGuard

Pathology

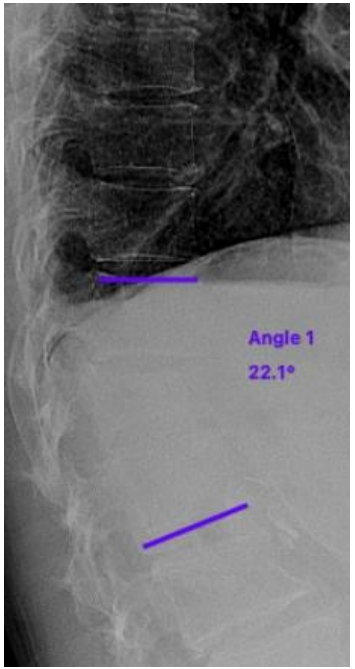


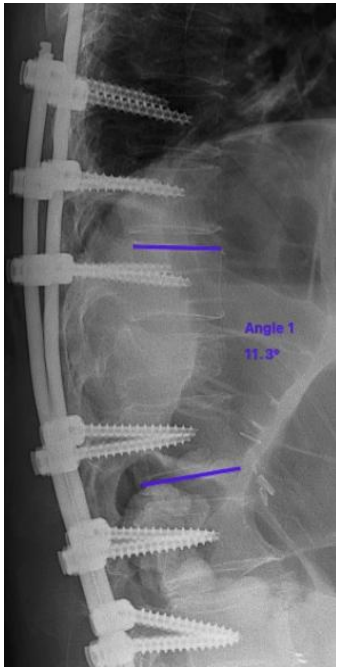
Post operative imaging



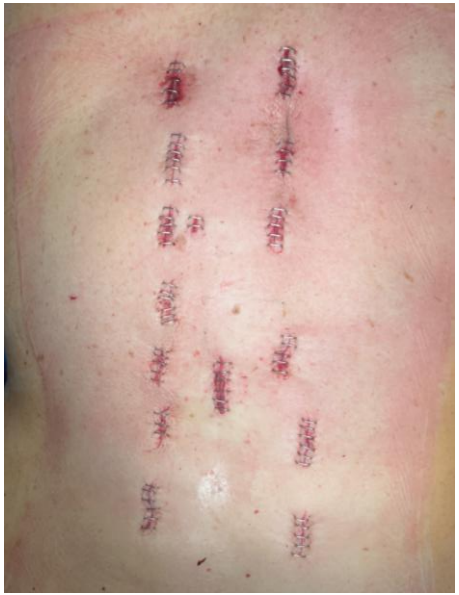


Post-operative CT





Post operative upright XR

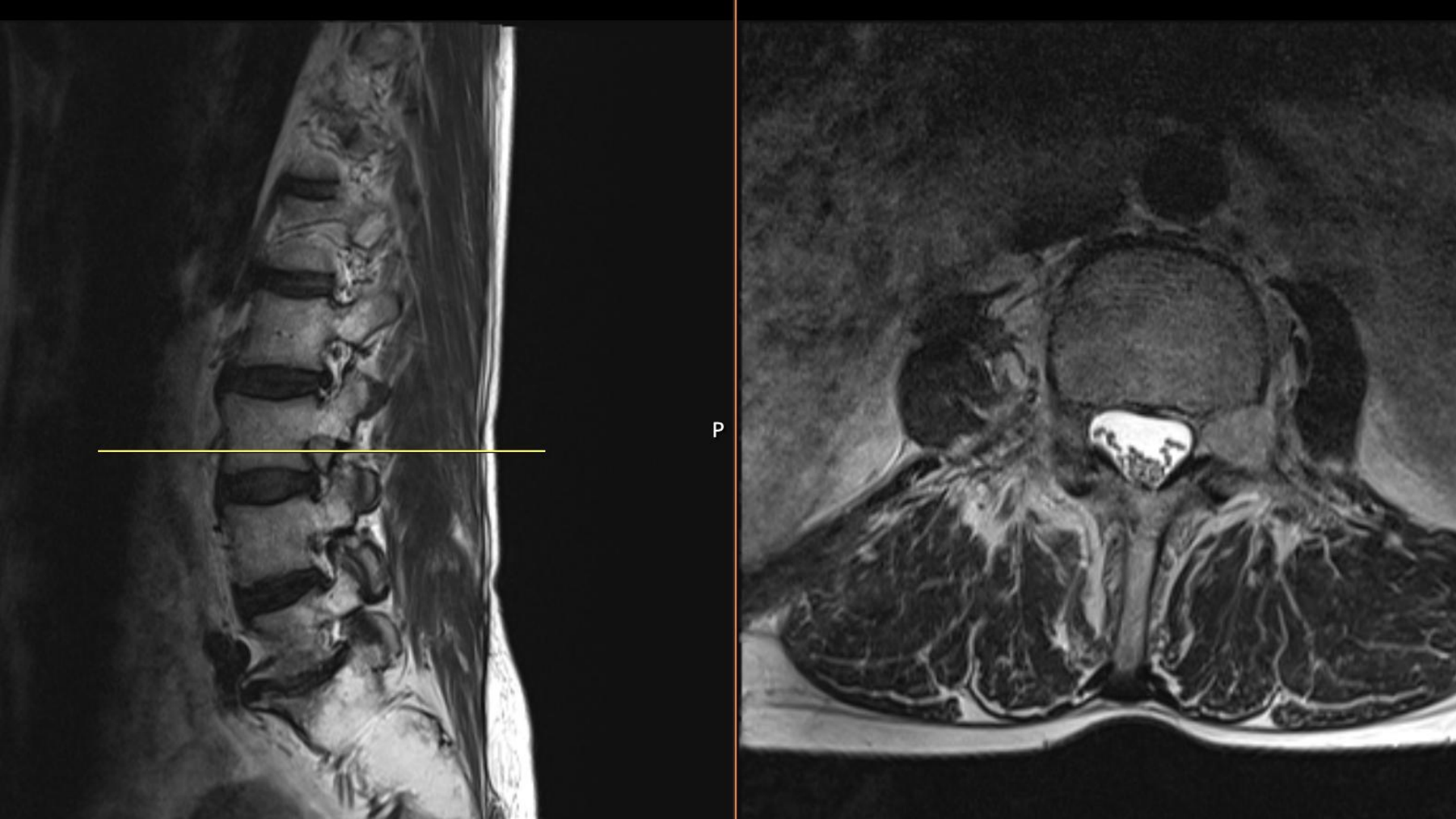


Incision

Case #4 - Triportal Nerve Sheath Tumor Resection

History & Physical Examination

- A healthy 57-year-old female
- Intractable pain down her anterolateral thigh on the left side
- Did not respond to PT and medications
- No weakness on examination. Numbness to light touch and tingling on the anterolateral thigh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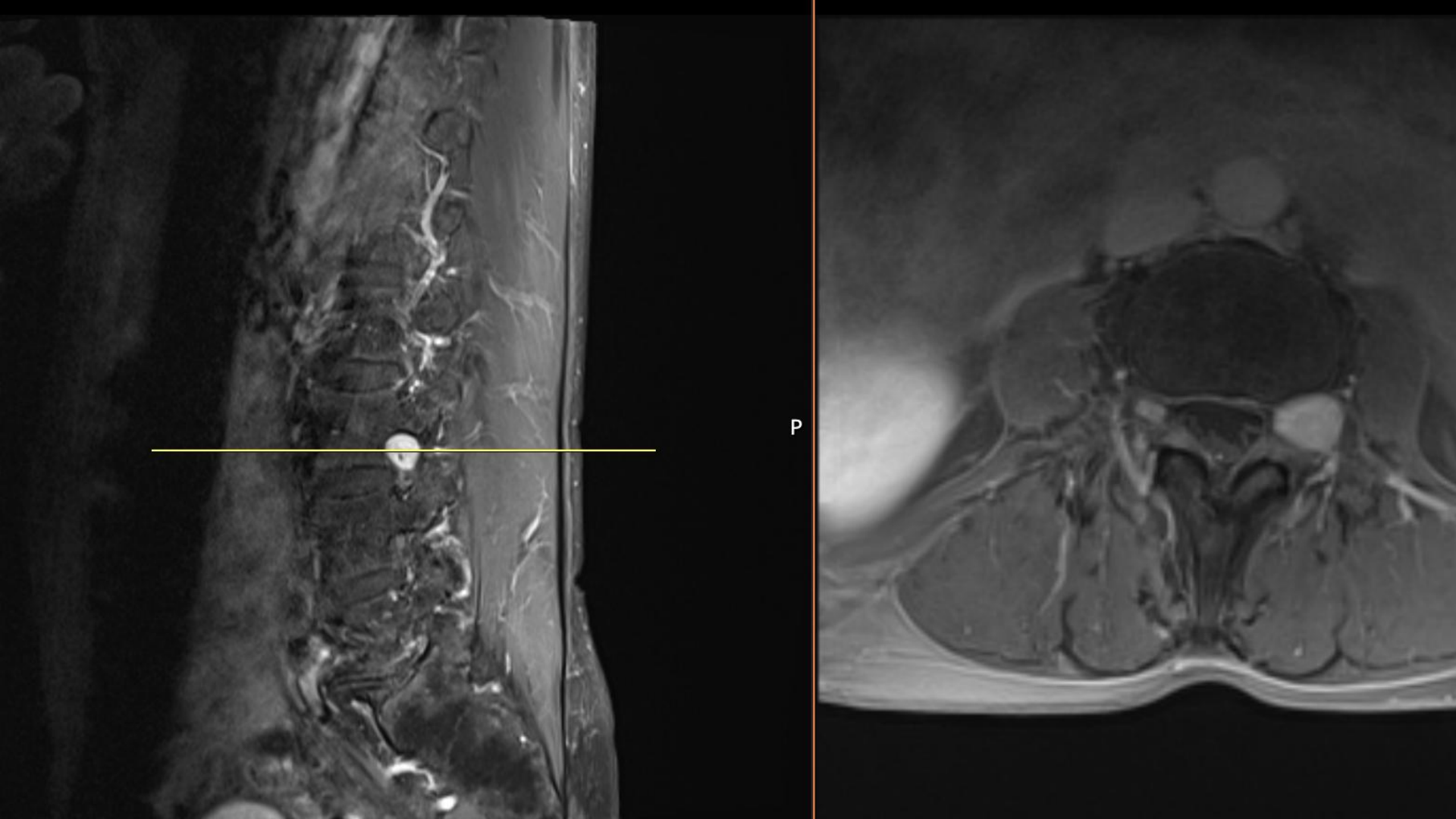
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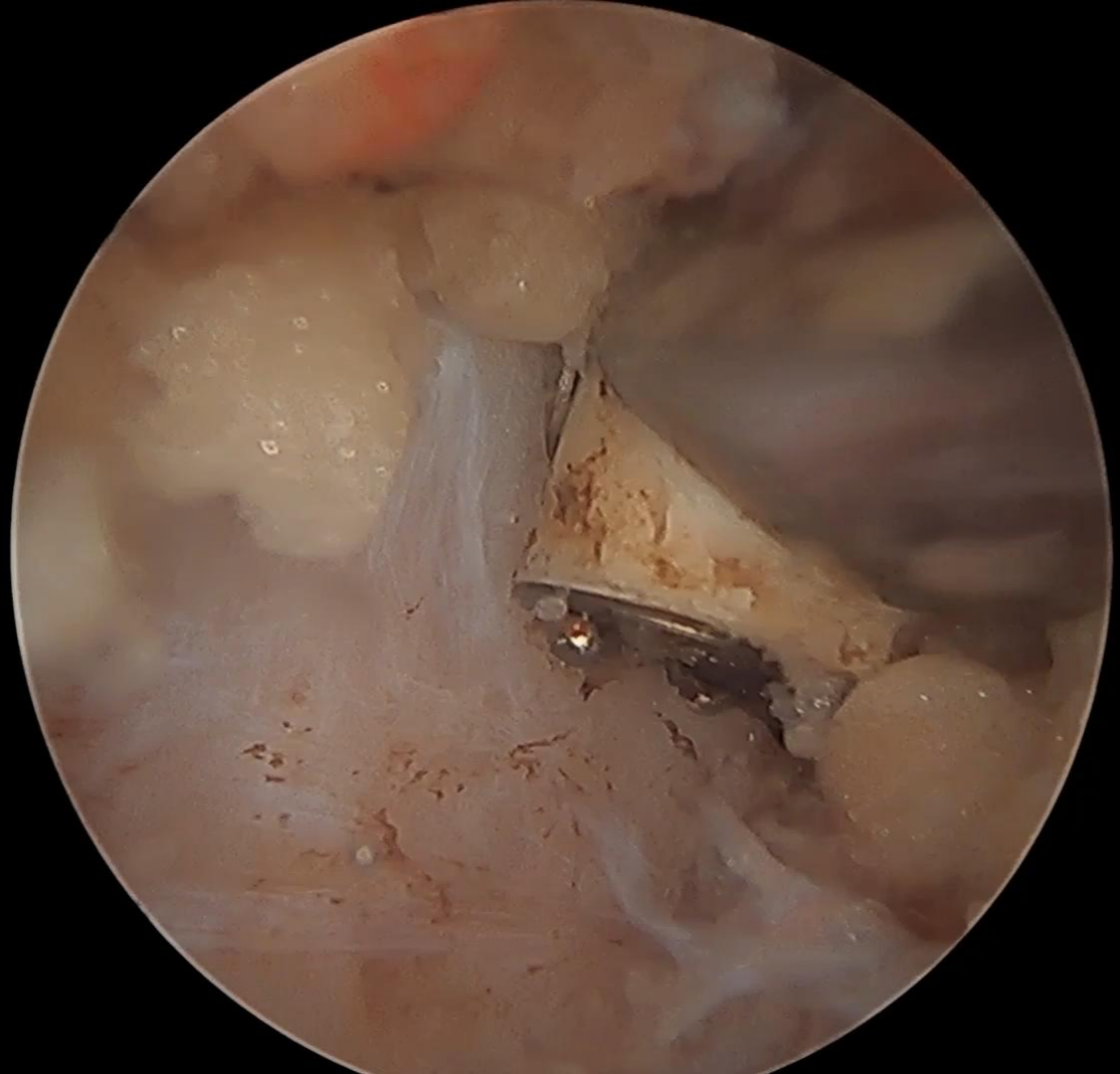

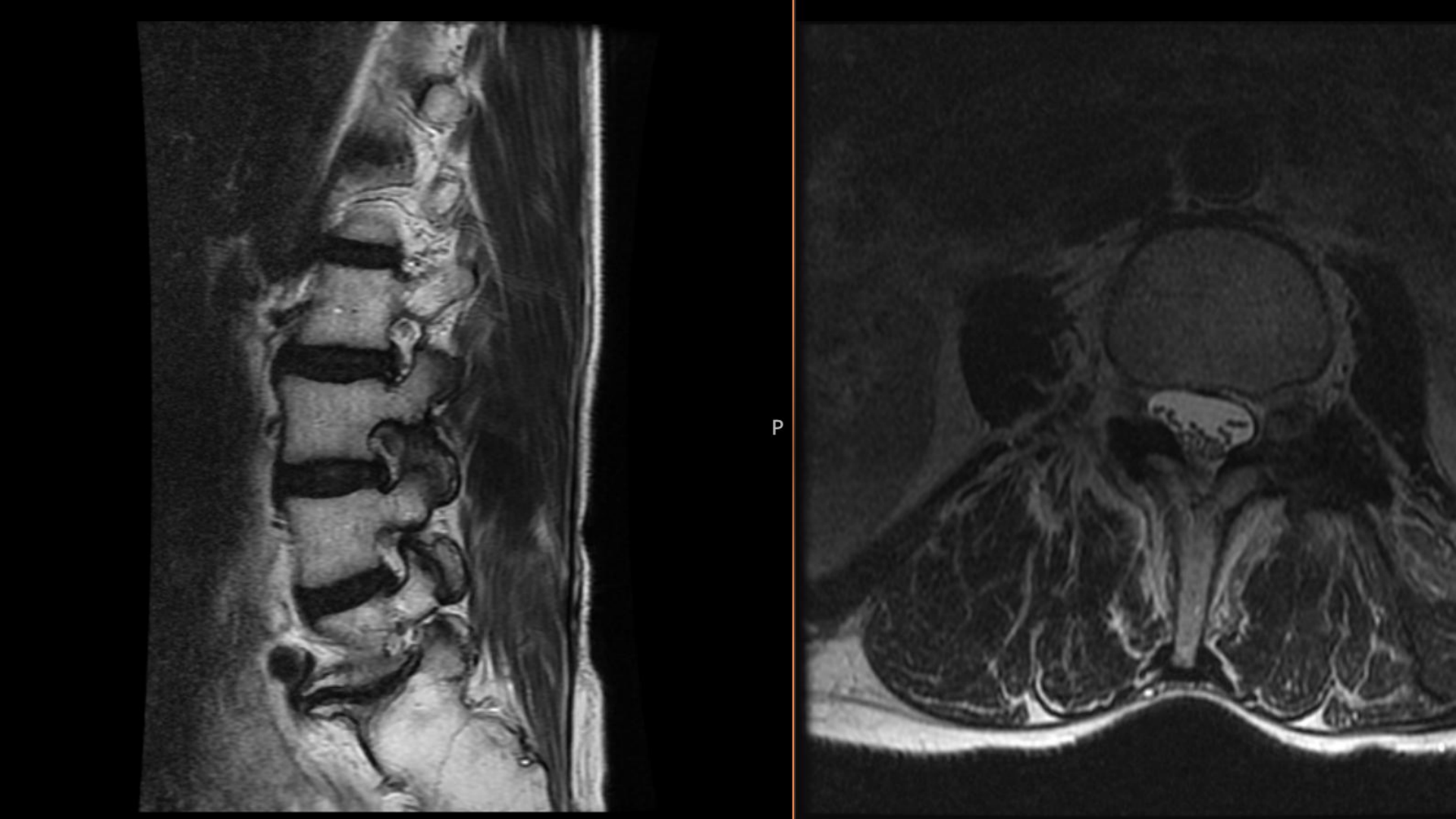
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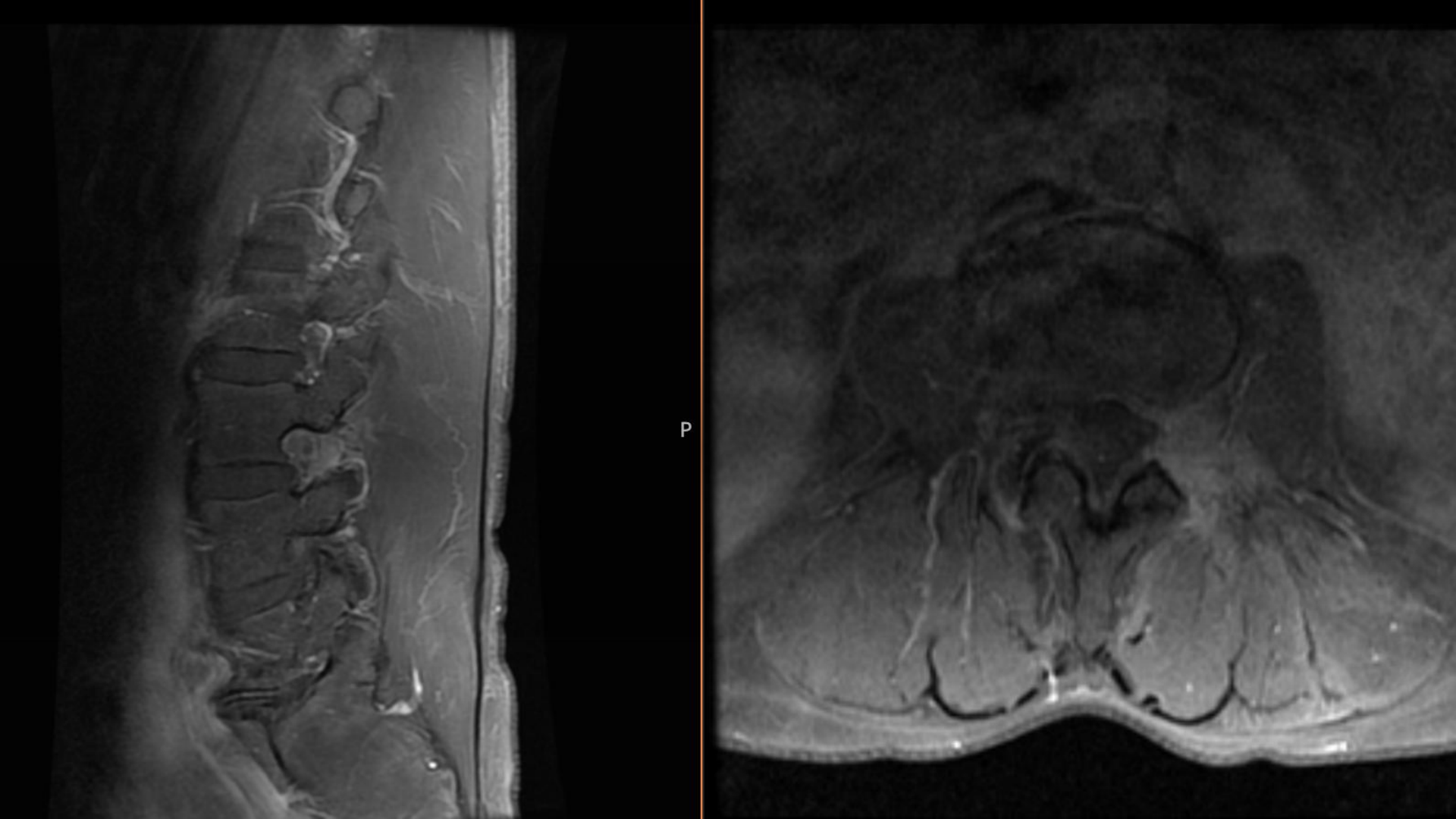
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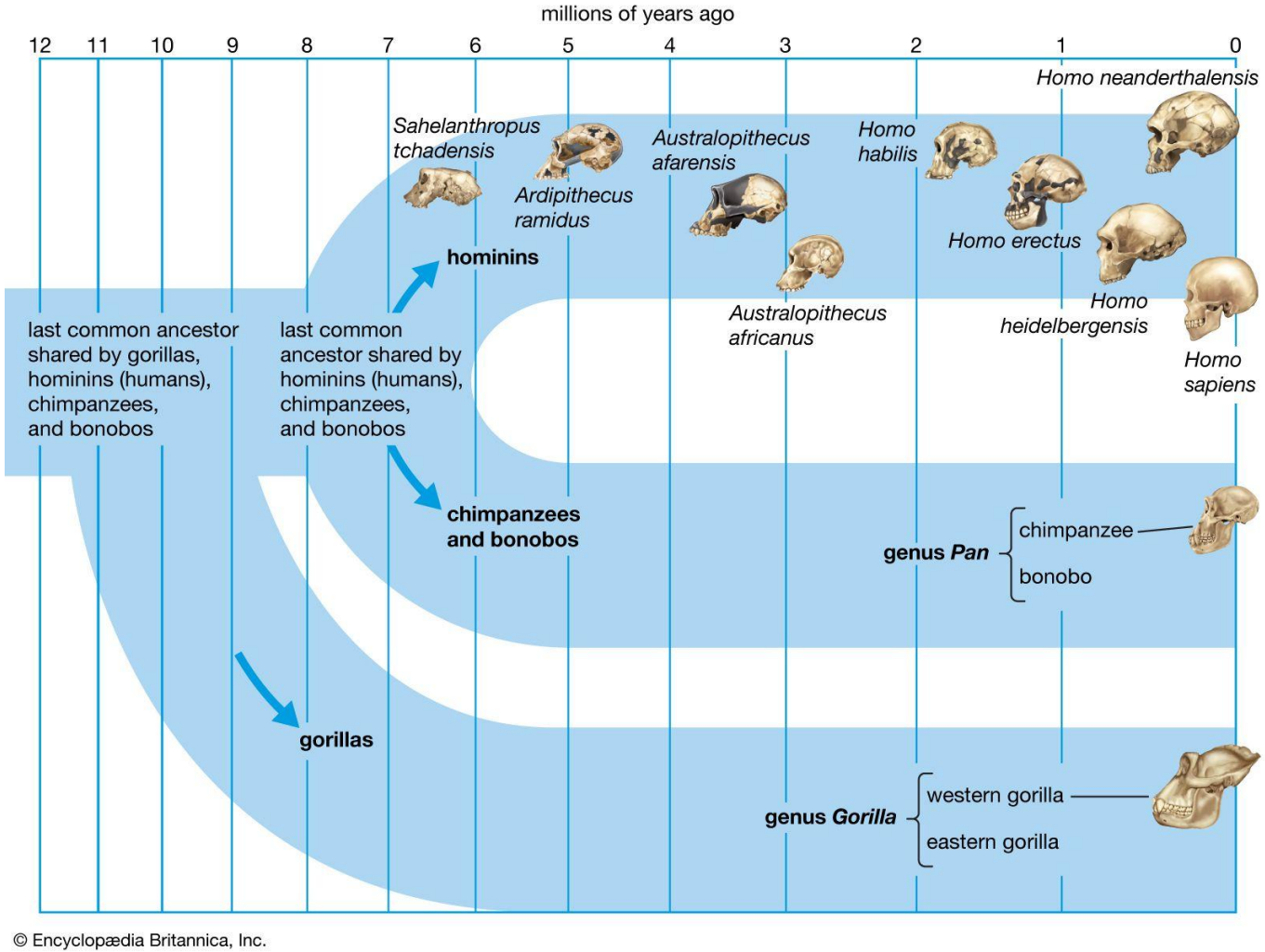
Pushing the limits

- Bi-manual technique
  - A retractor attached to the endoscope
  - Switching between endoscope and tool incision
    - Left hand for drills and Kerrison’s
  - Tri-, Quad-portal surgery with robotic assistance
- Intradural tumor
  - Dural closure can be challenging, but not impossible
- Multi-level decompression and fusion/Deformity

Human history has been a story of extinct or evolve



Thank you!

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