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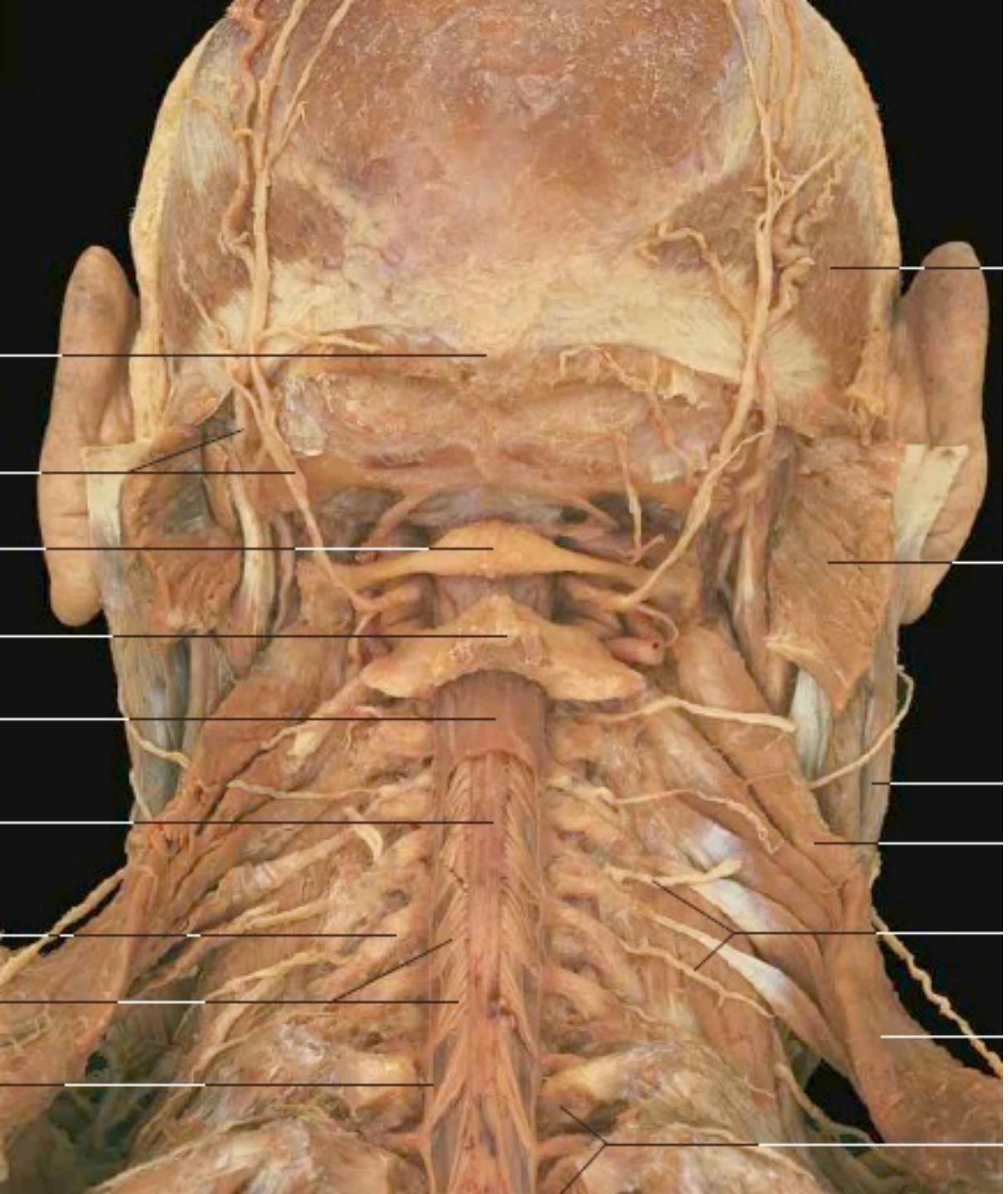
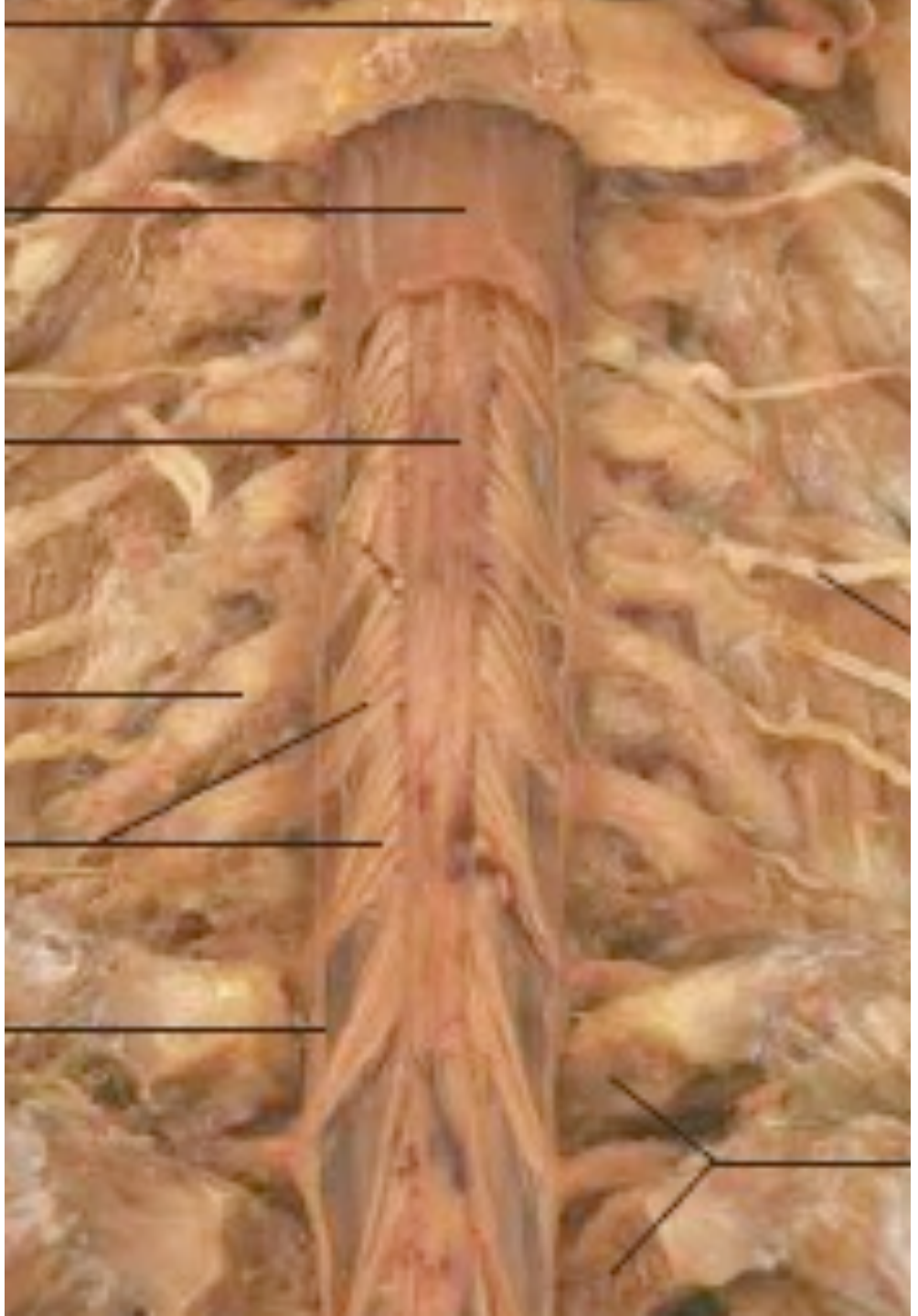
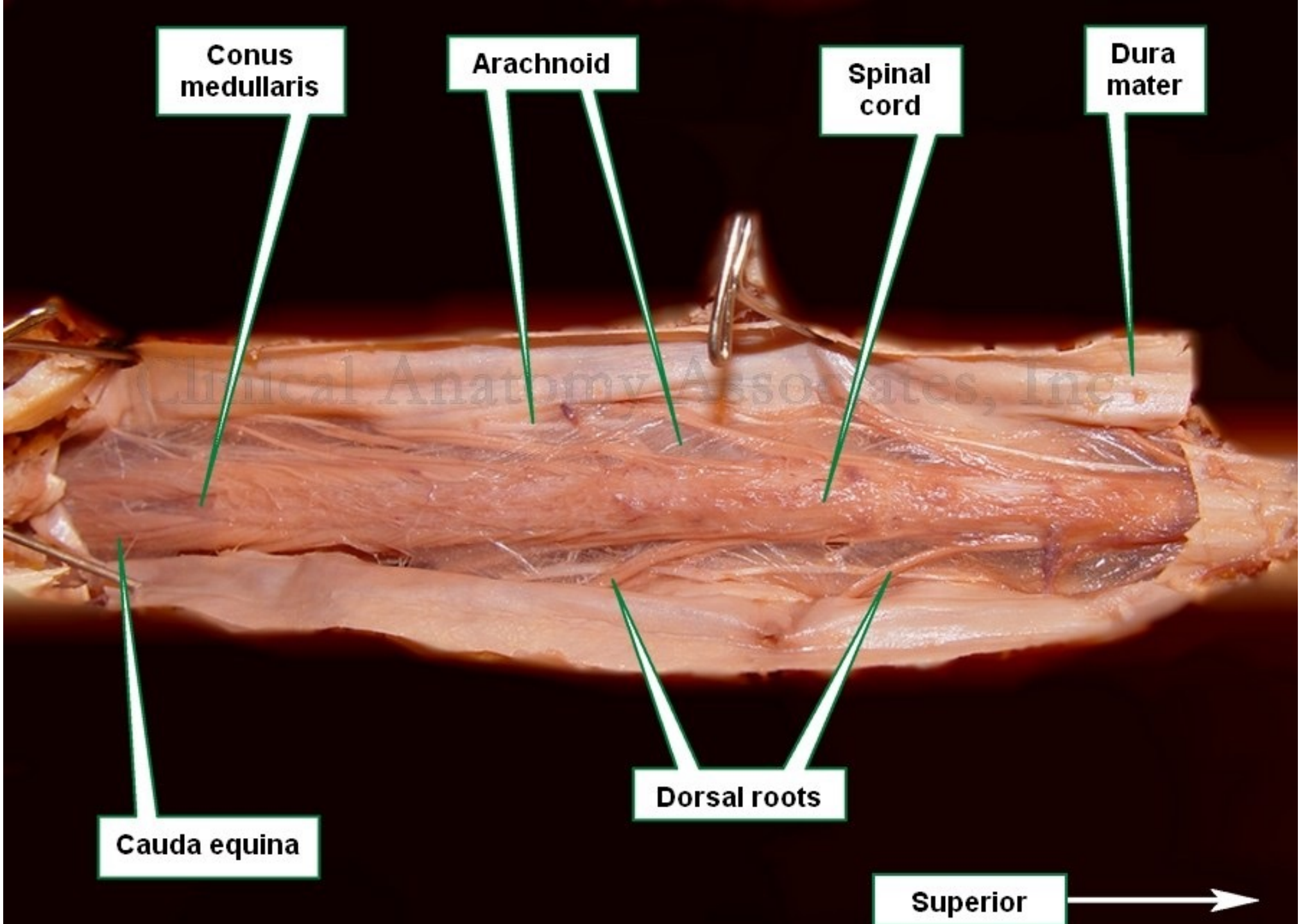
Epidural Patch Basics: What they are and why they fail.

Resources for Patients and Physicians Watching

- Papers discussed in this talk
- 48 hour- flat test
- Contact information compiled by Stanford, Duke, and others on physicians interested in helping patients with CSF Leak.
- More to come….






Conus medullaris
Arachnoid
Spinal cord
Dura mater
Cauda equina
Dorsal roots
Superior

Epidural Blood Patch

Cavilon
No Sting Barrier


STOP!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5
1
4
3
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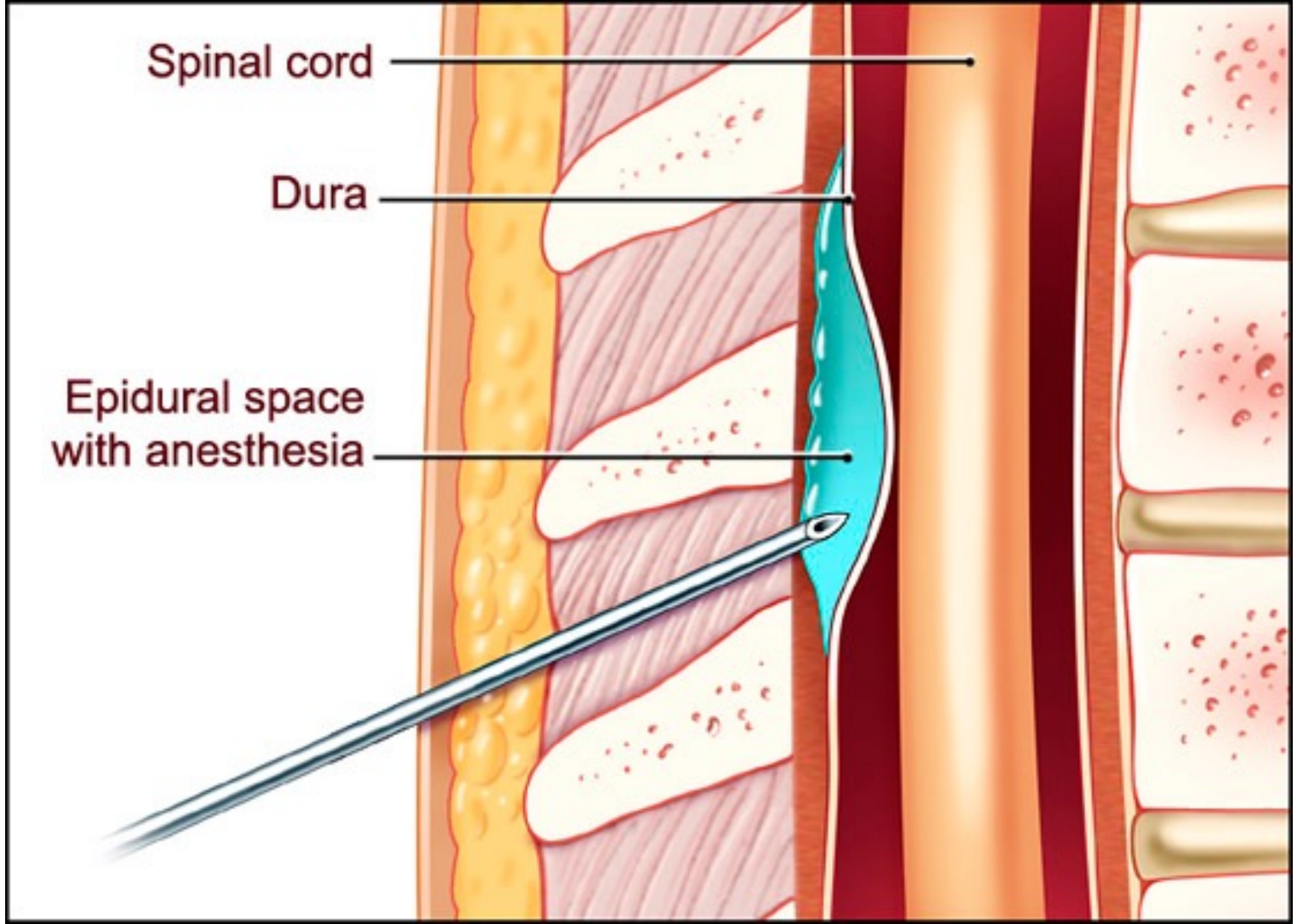
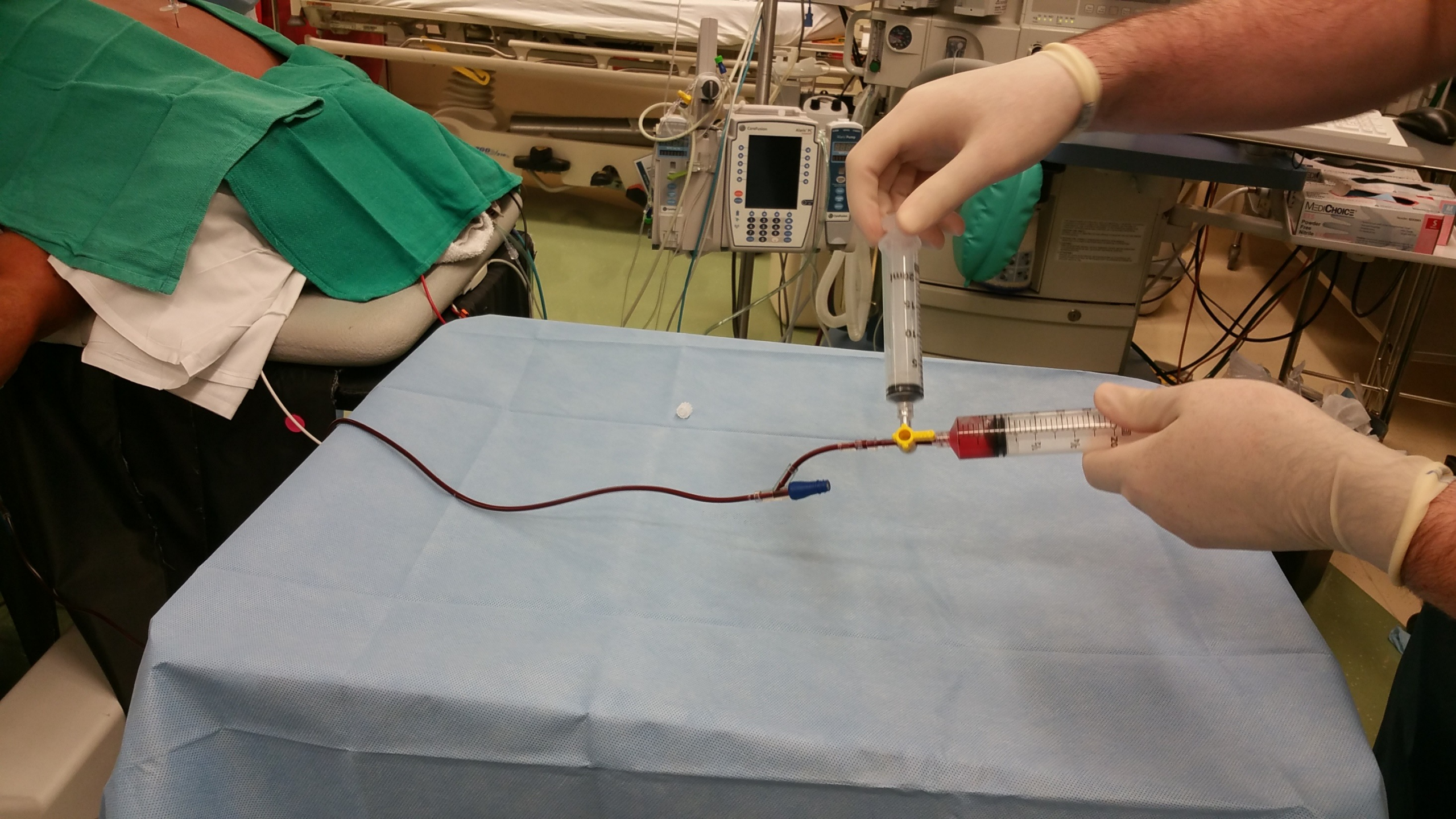

Spinal cord
Dura
Epidural space
with anesthesia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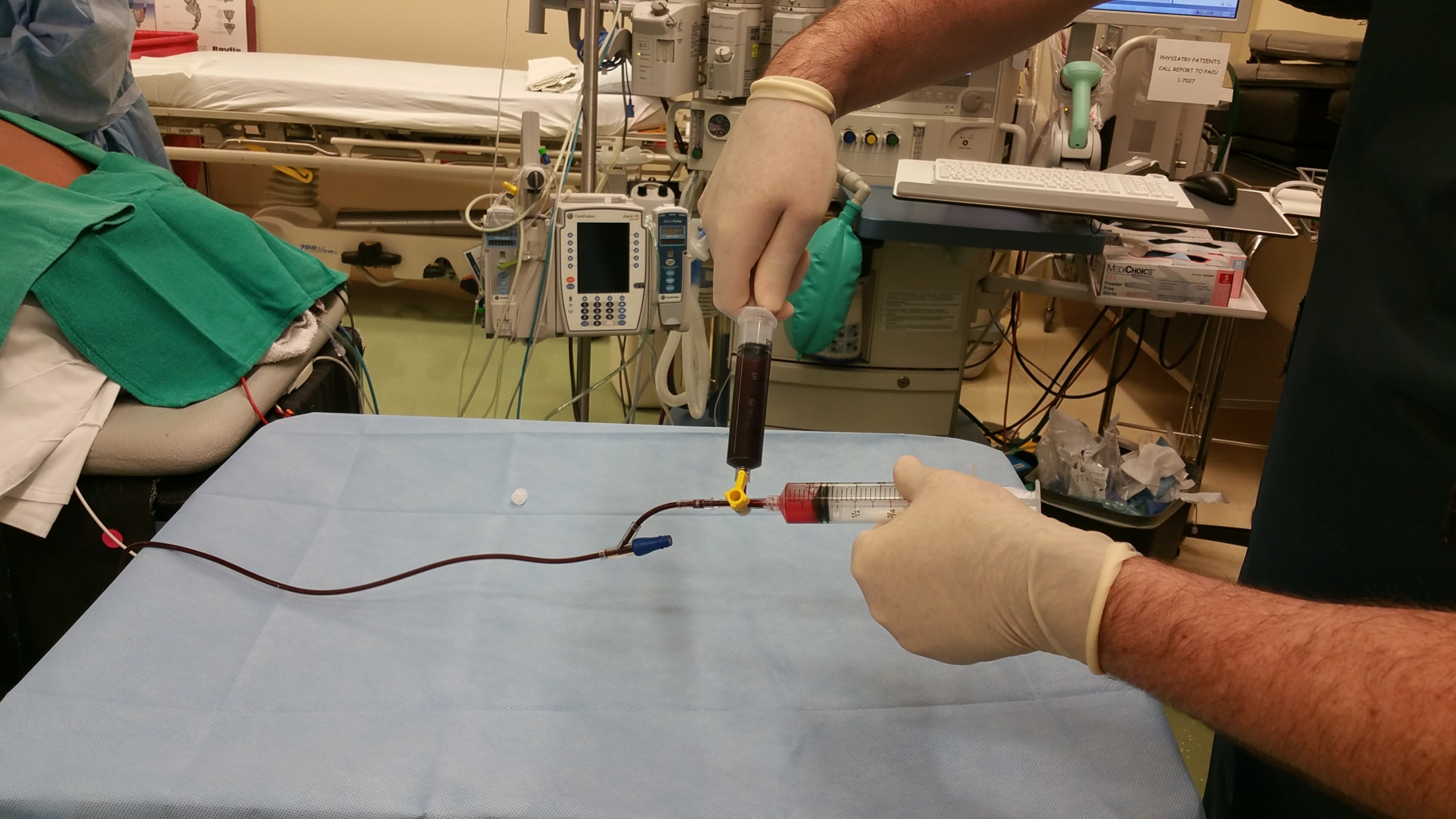
PHYSIATRY PATIENTS
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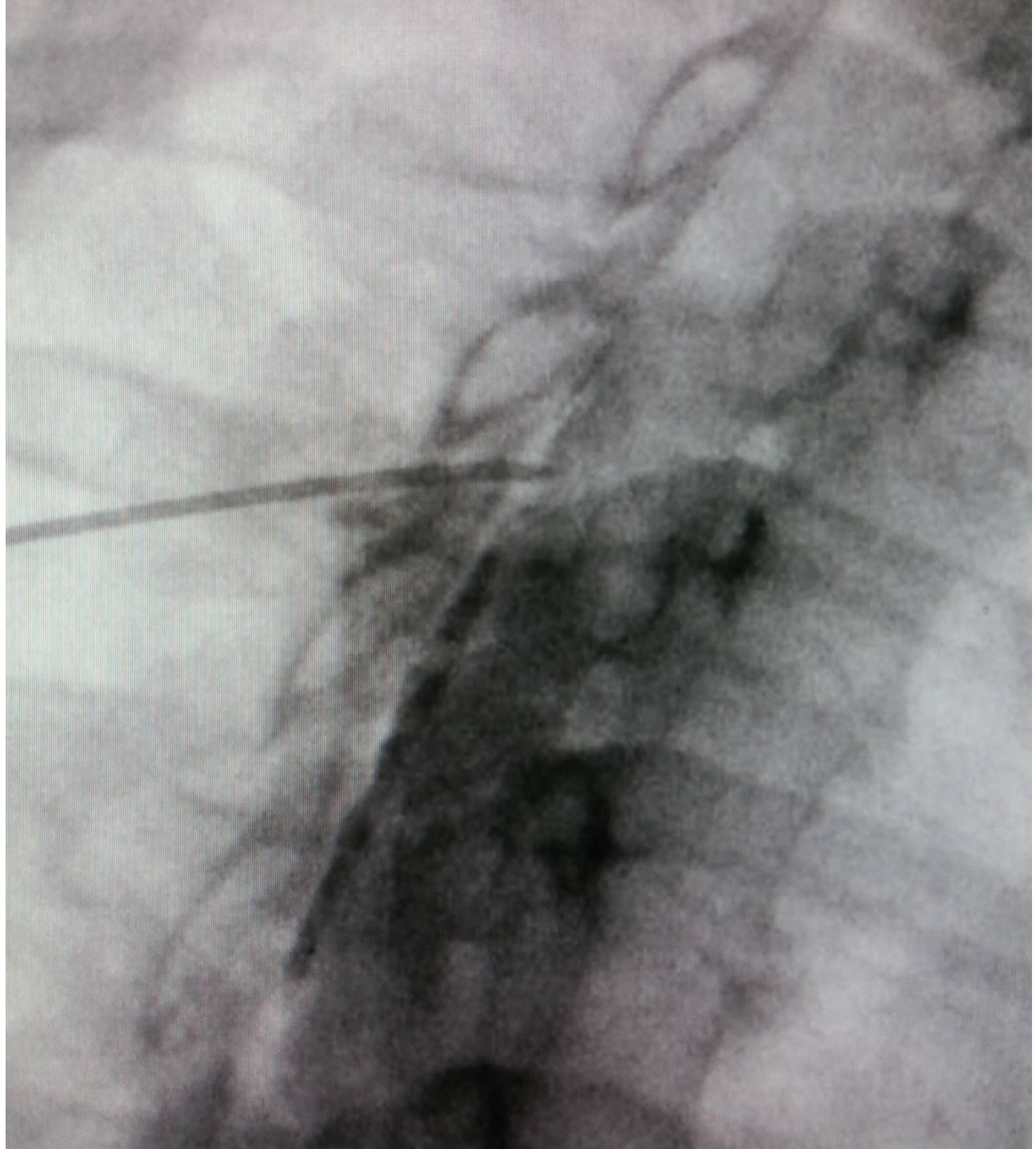
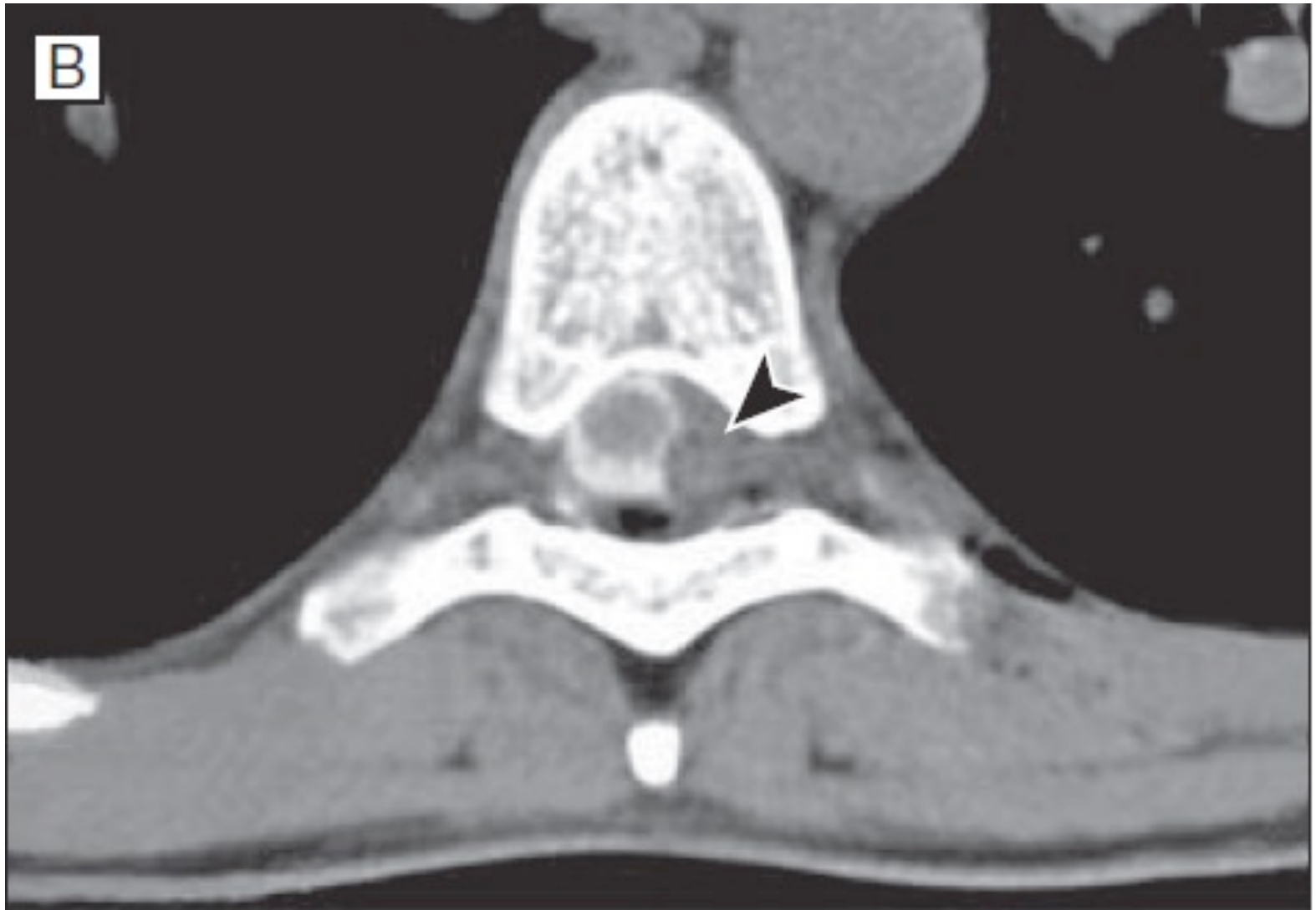


Epidural Blood Patch

Lateral placement of Fibrin Sealant



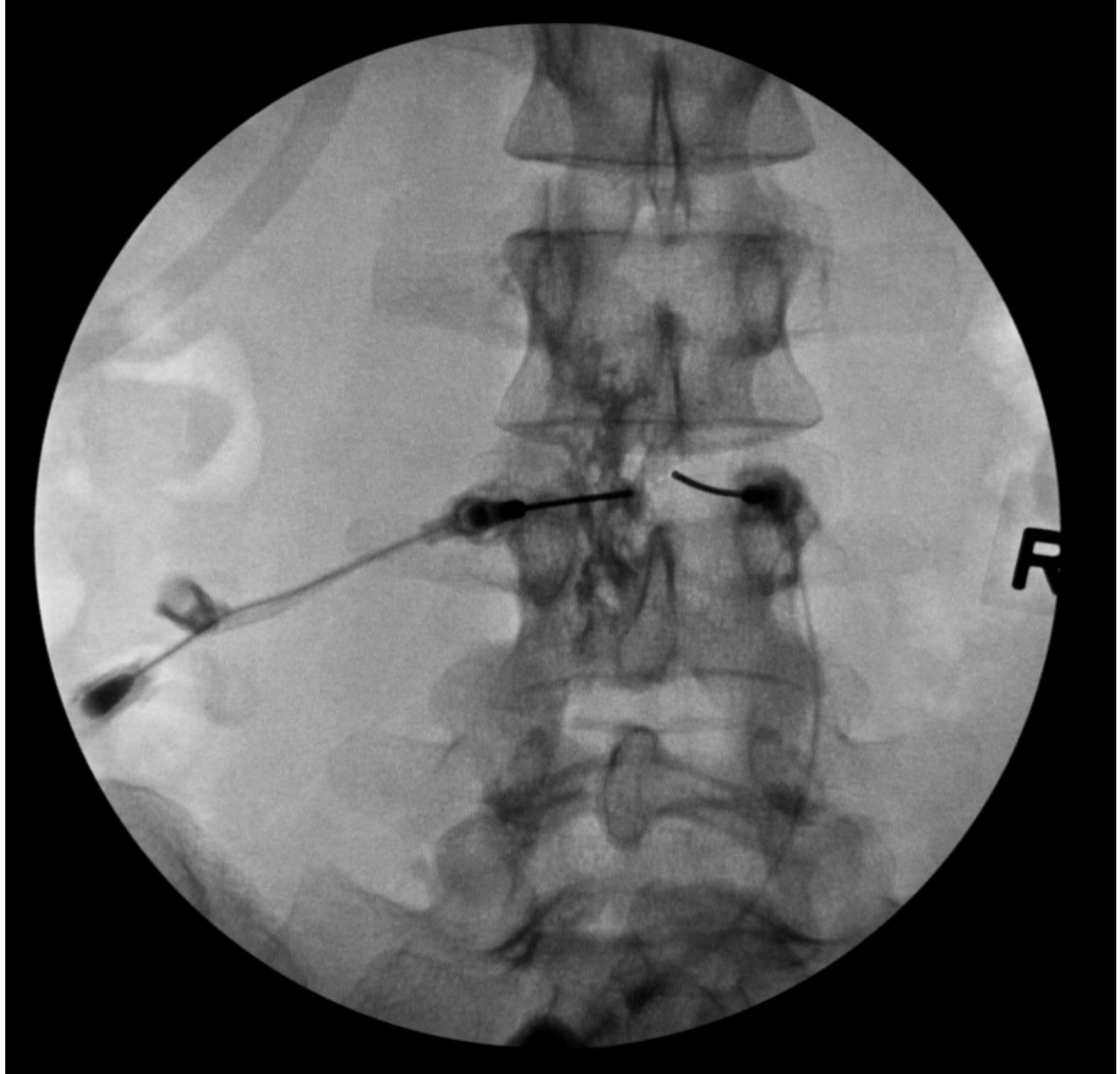
Six Causes of Persistent CSF Leak Despite a Properly Done Epidural Patch

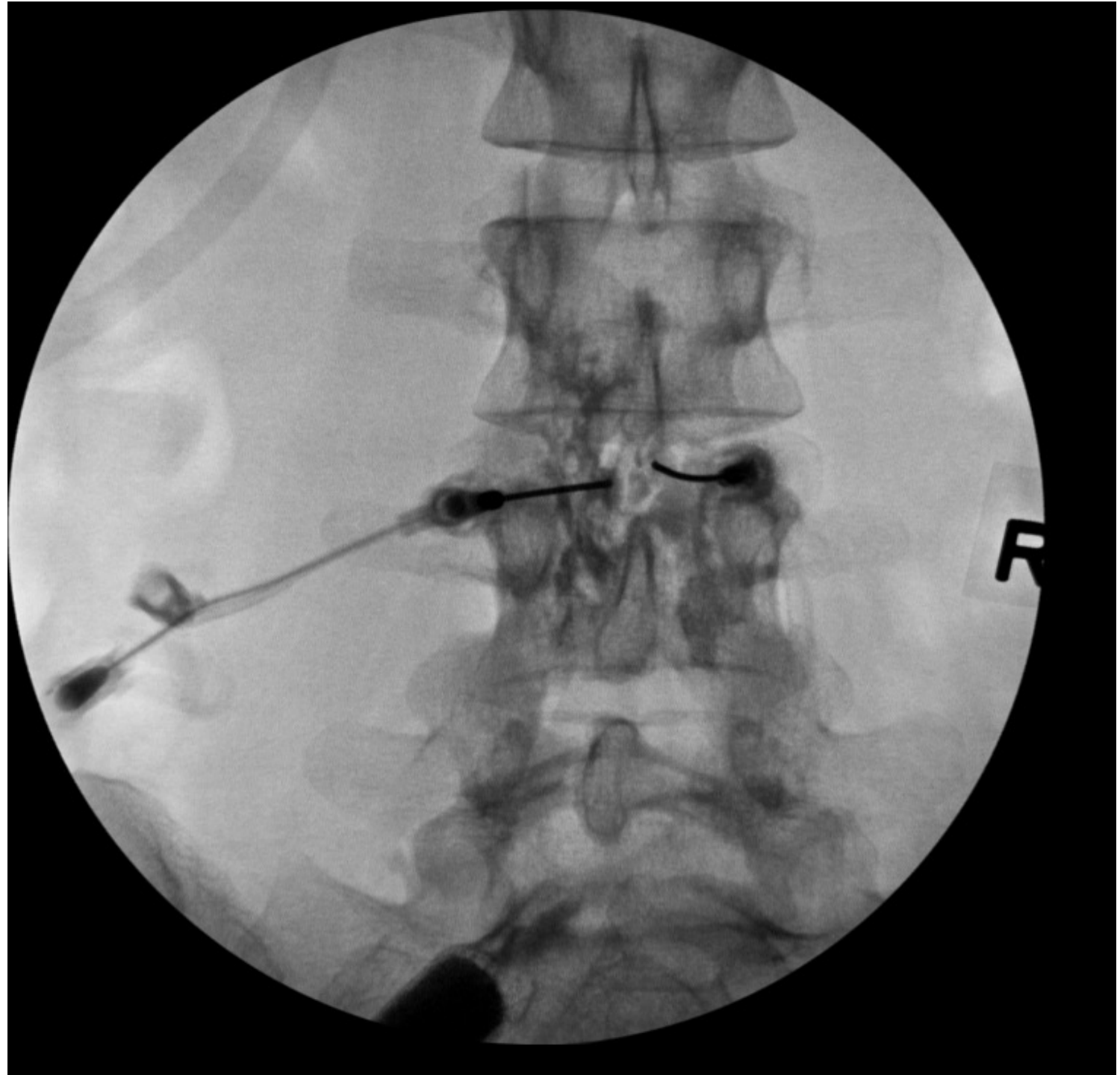
- Intact Plica Mediana Dorsalis
- Ventral Dural Puncture
- Dural Fistula Formation
- Dural Bleb Formation
- CSF-Venous Fistula
- Neo-membrane/pseudo-dura

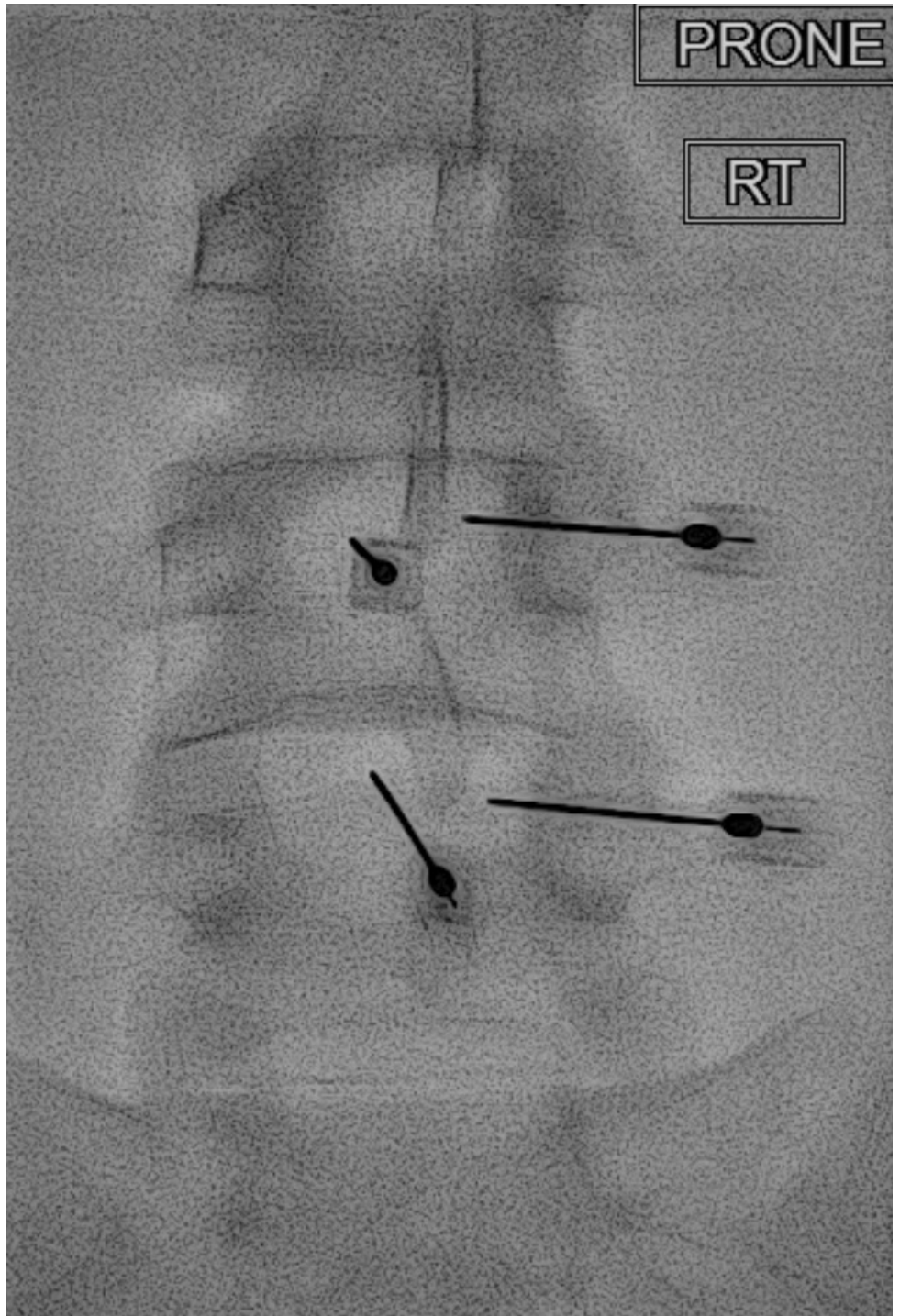
Failure Point 1:
Functional Intact Plica Mediana Dorsalis

Case 1:

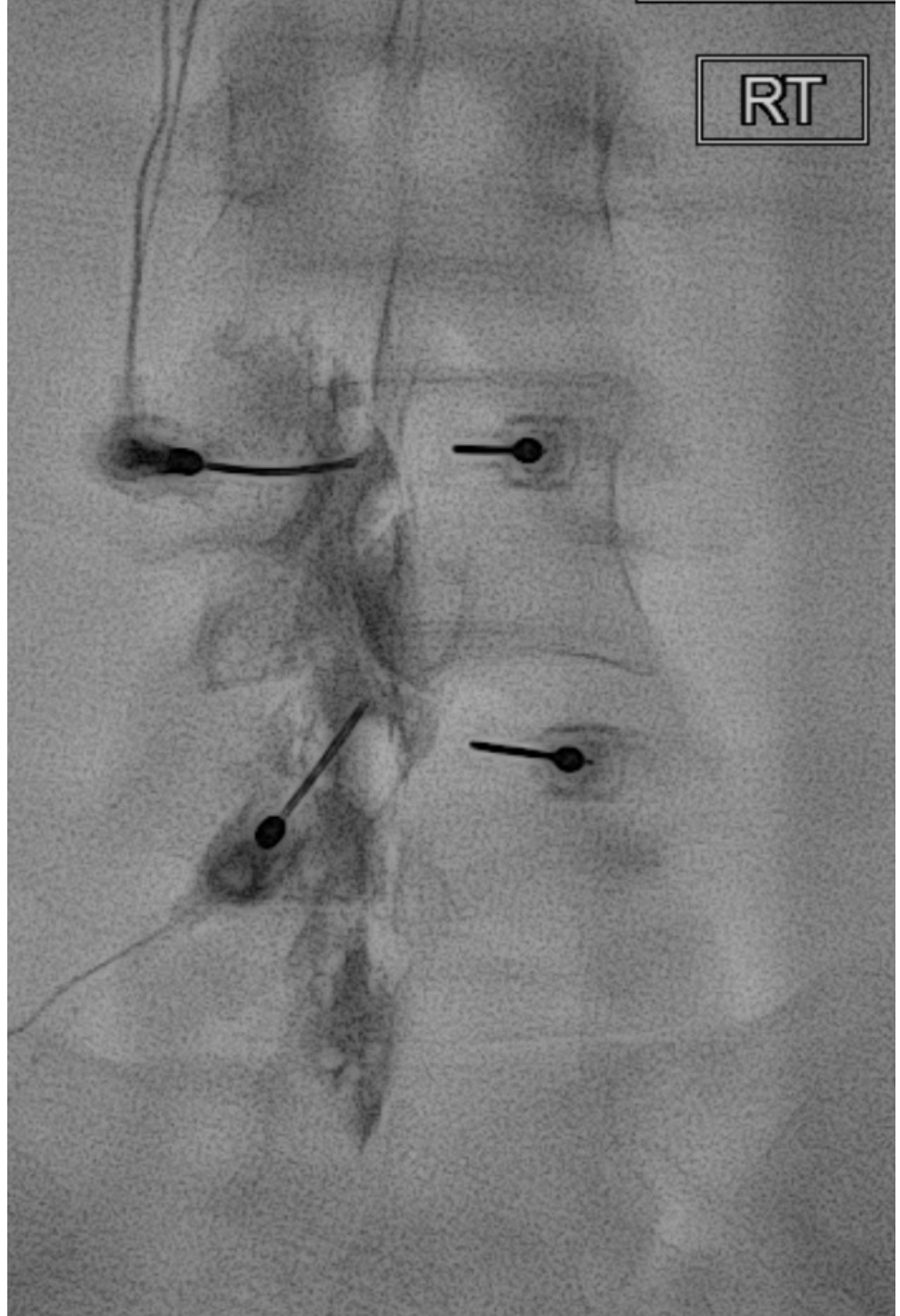
- 35 year old woman with an spinal tap
  - After spinal tap had a spinal headache 10/10
  - Had at least 1 failed blood patch







Doesn’t This Seem Excessive?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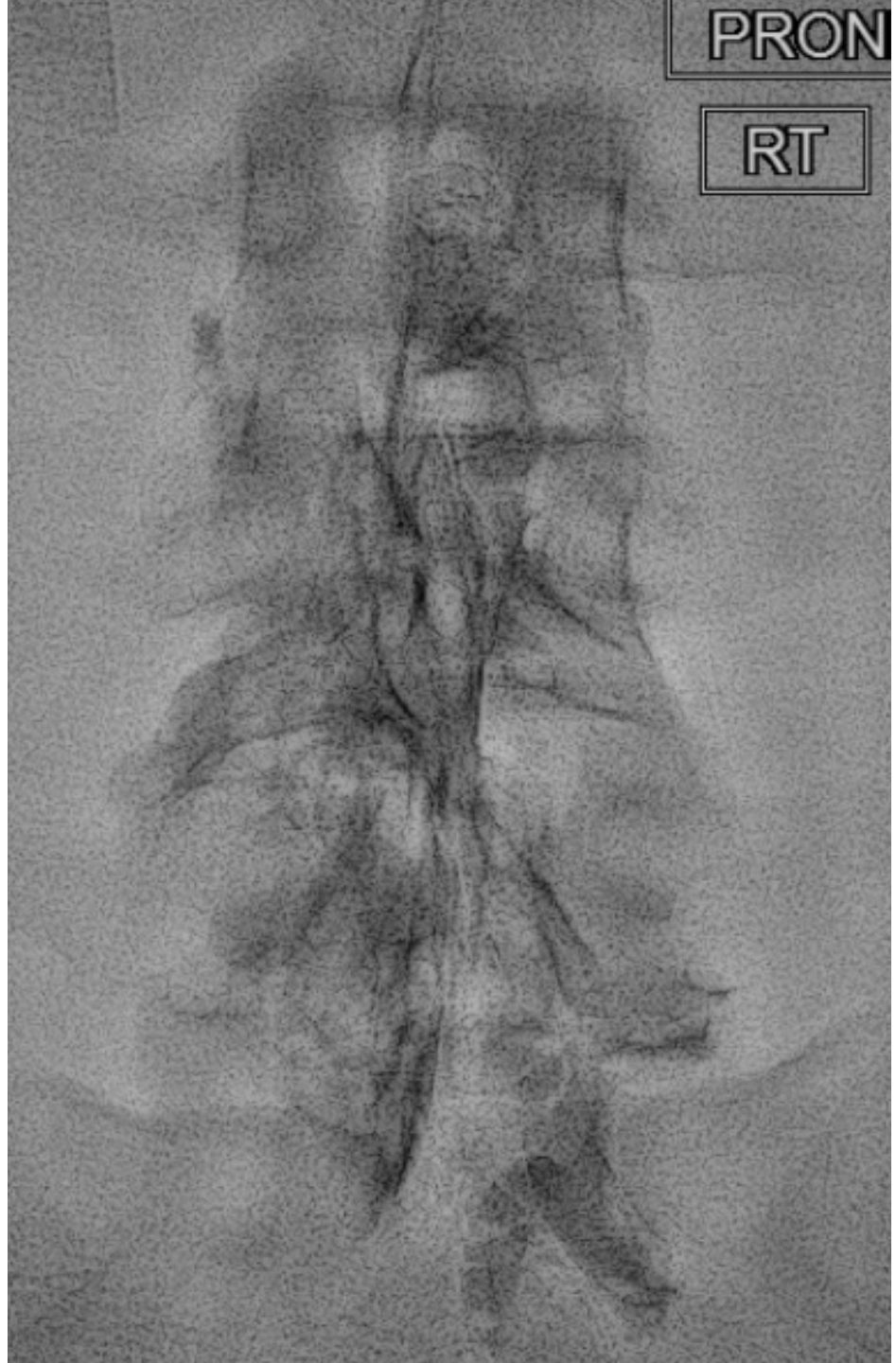
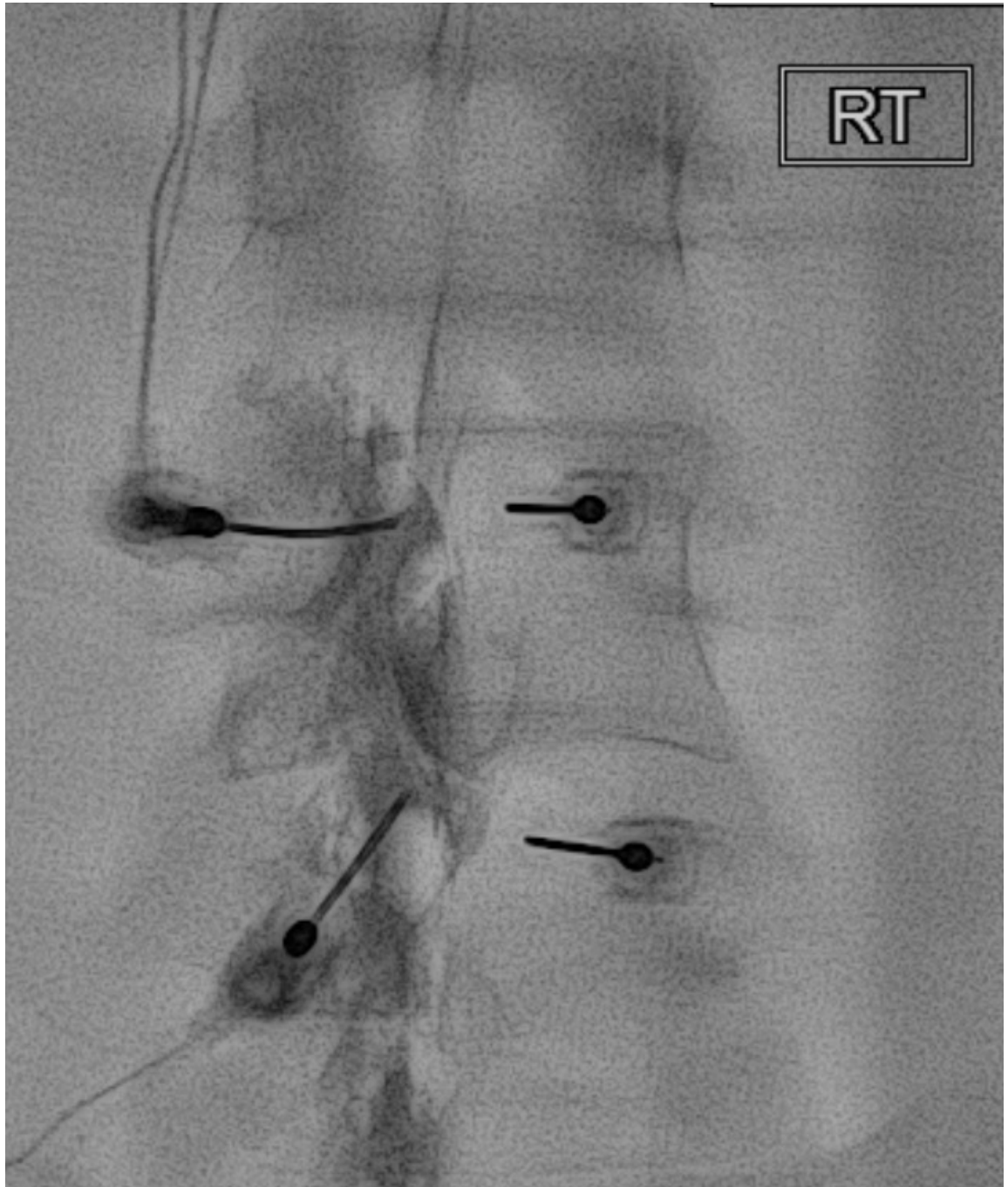
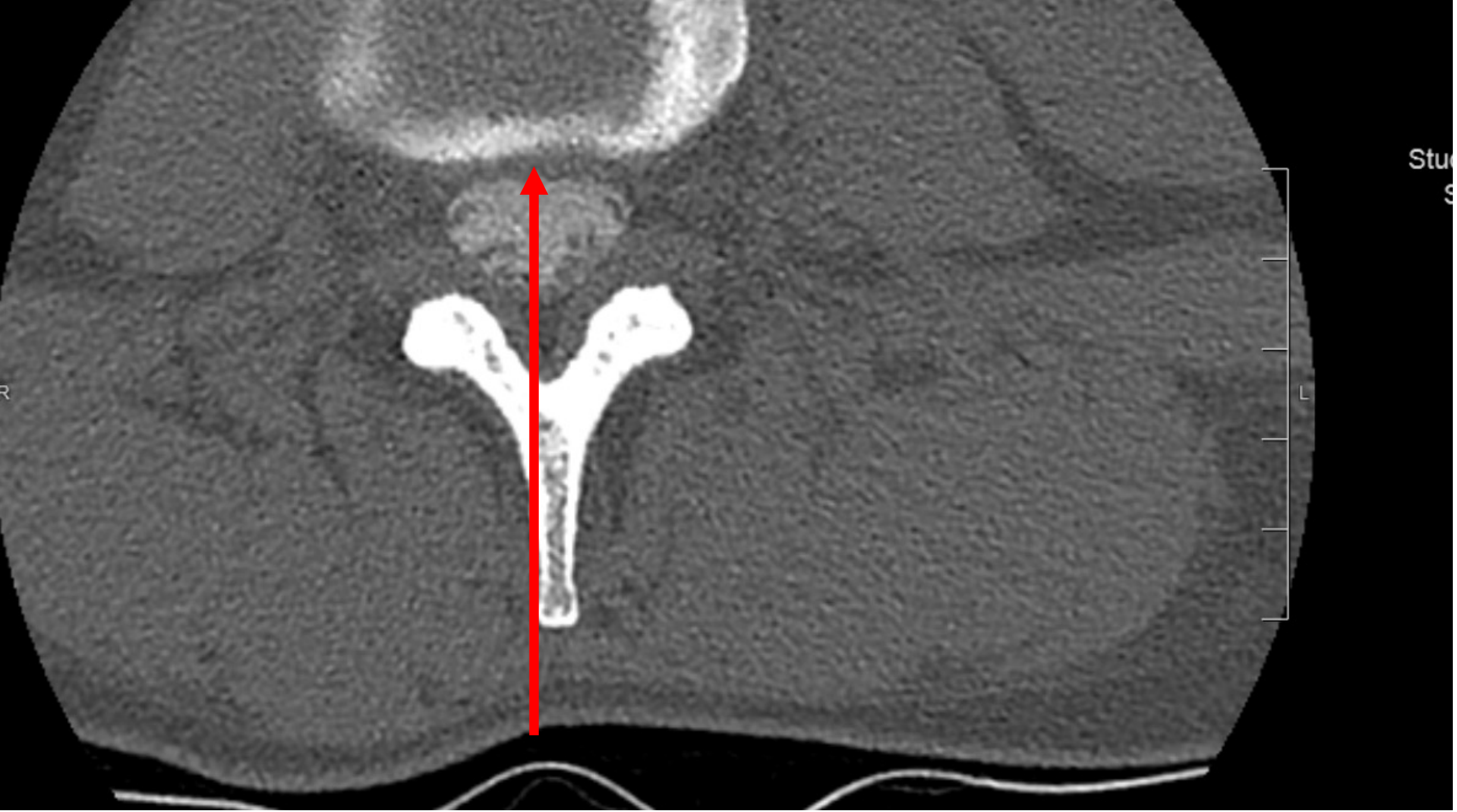
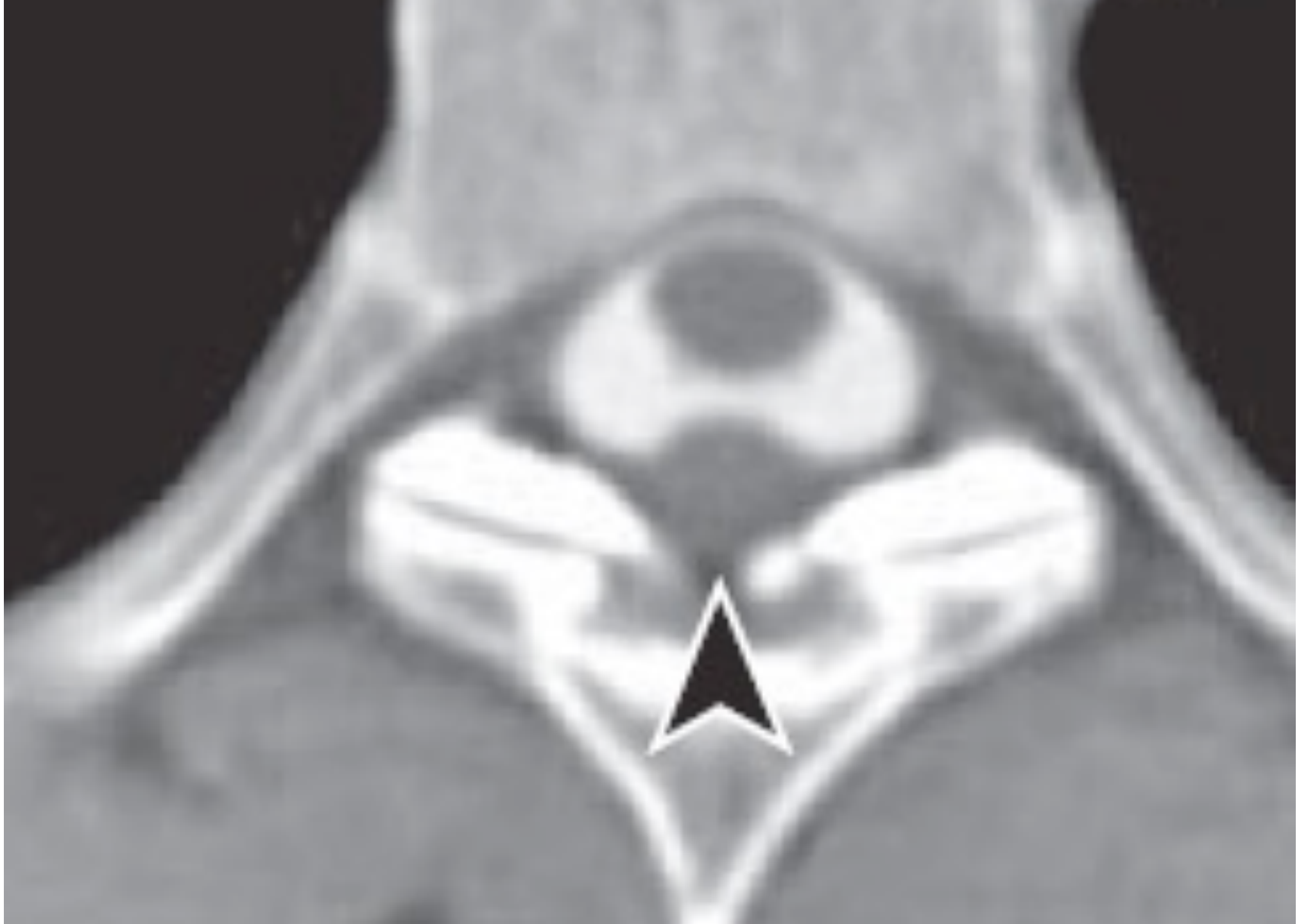

PRON
RT

- A properly done bedside epidural blood patch may do nothing to cover/seal the defect.
- The patient will feel better initially then recur.
- This will lead to a lower patch long term success rates and artificially inflated estimates of early success.
- Simply repeating the procedure gives you a 50% chance of getting the other side.
- Or use a bilateral paramedian approach under imaging guidance.

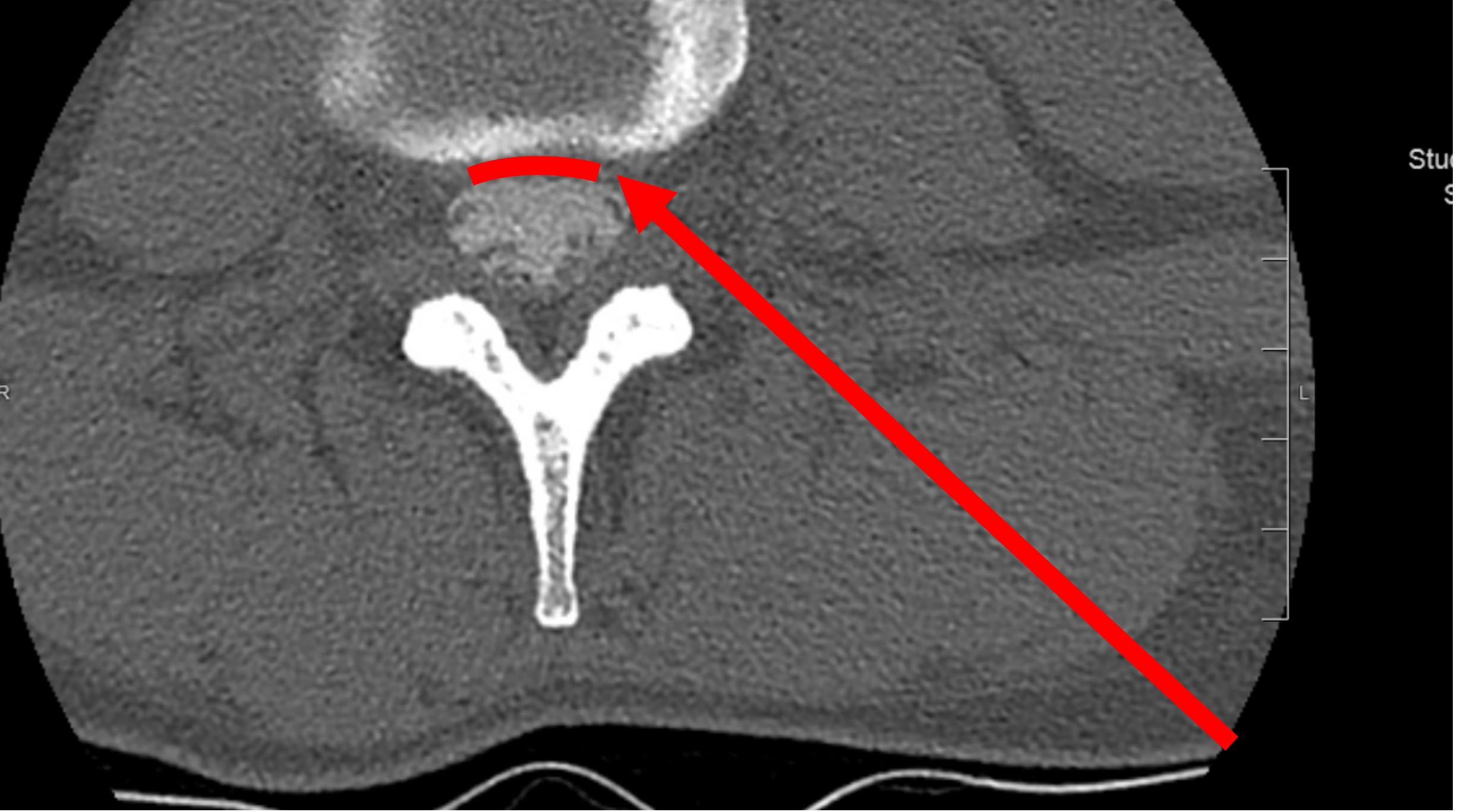


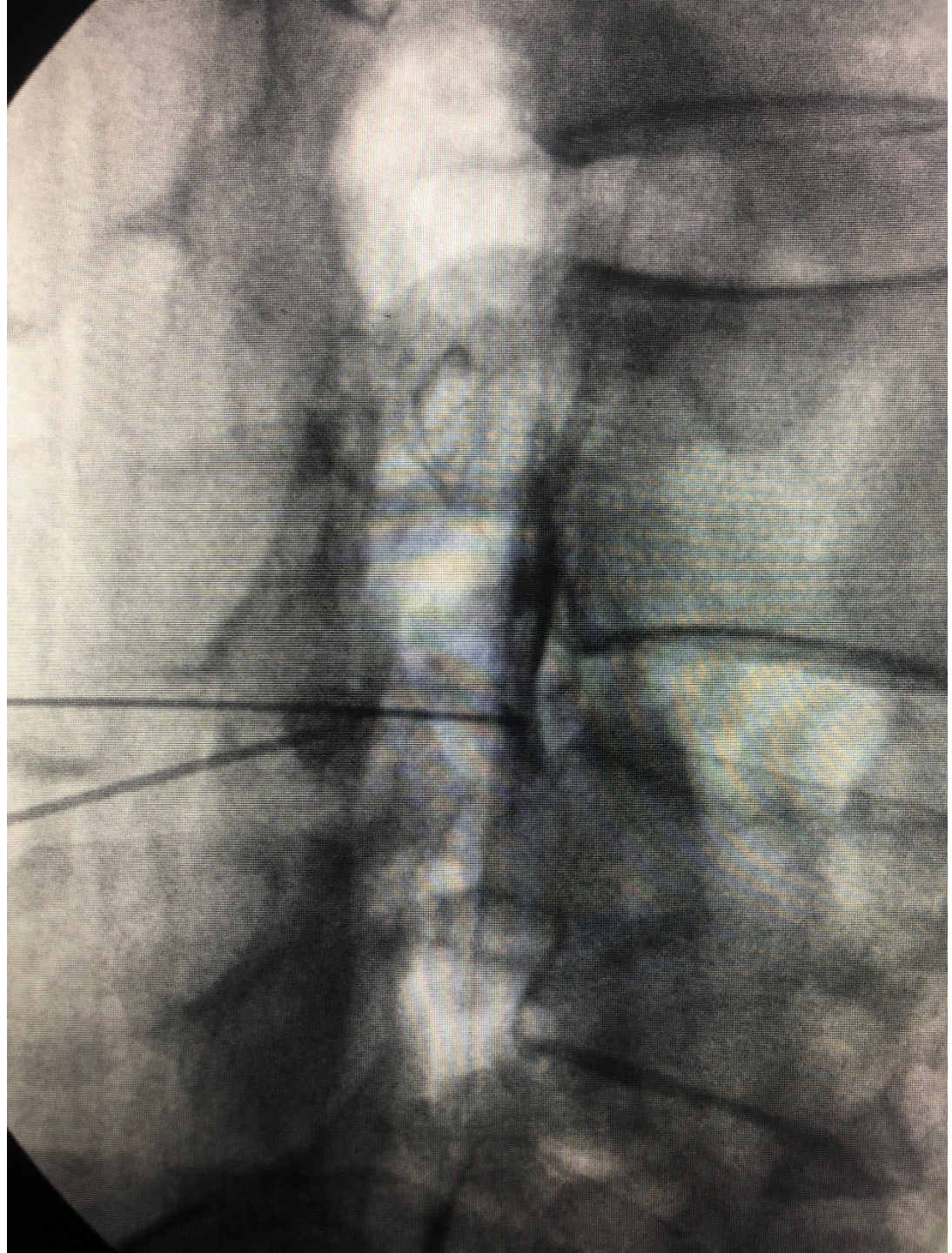
Failure Point 2:
Ventral Dural Puncture



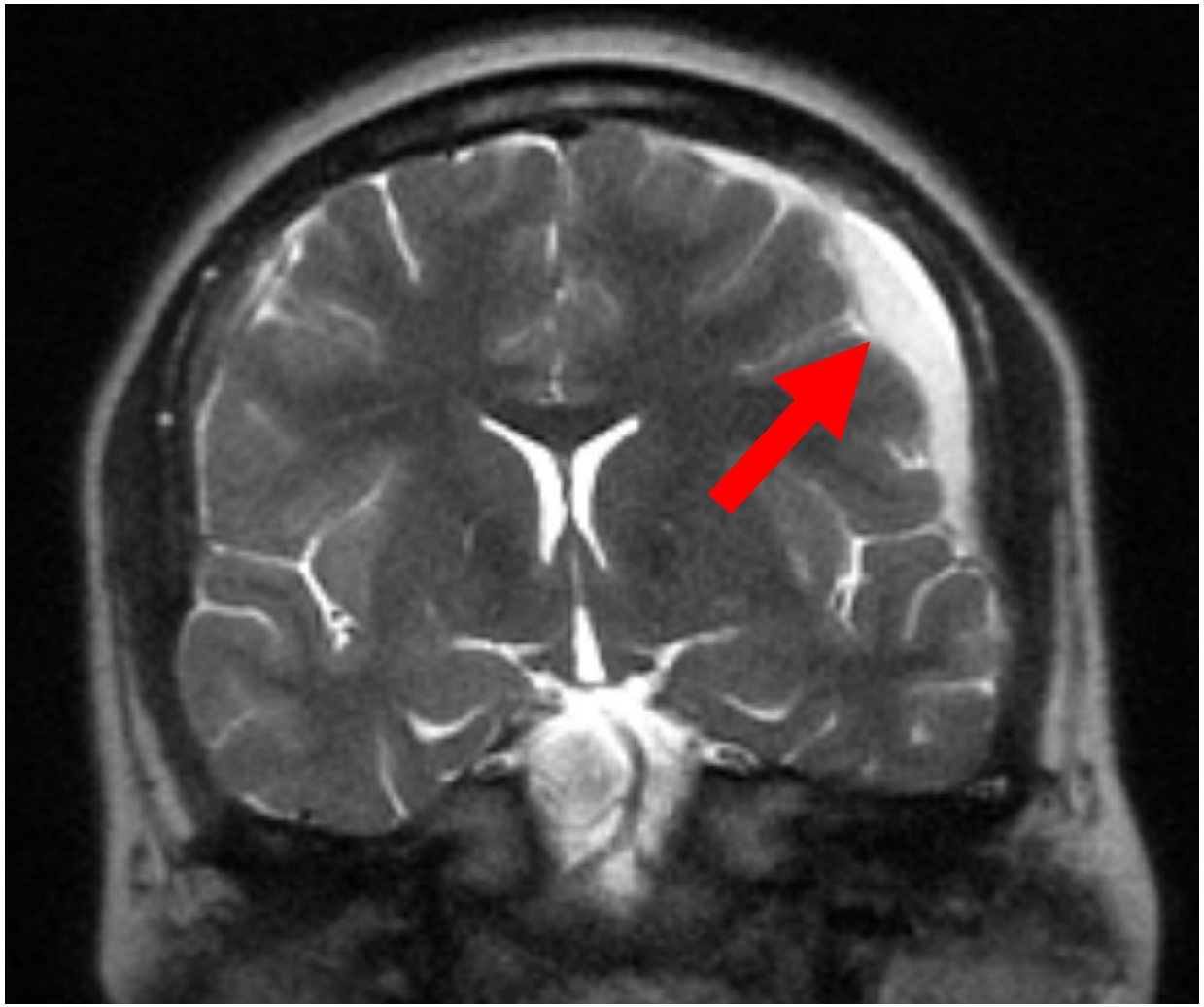



Wouter I. Schievink, MD
Neurosurgery





18 year old transferred to LPCH 1 month after recognized UDP during labor epidural. S/P failed blood patch X2



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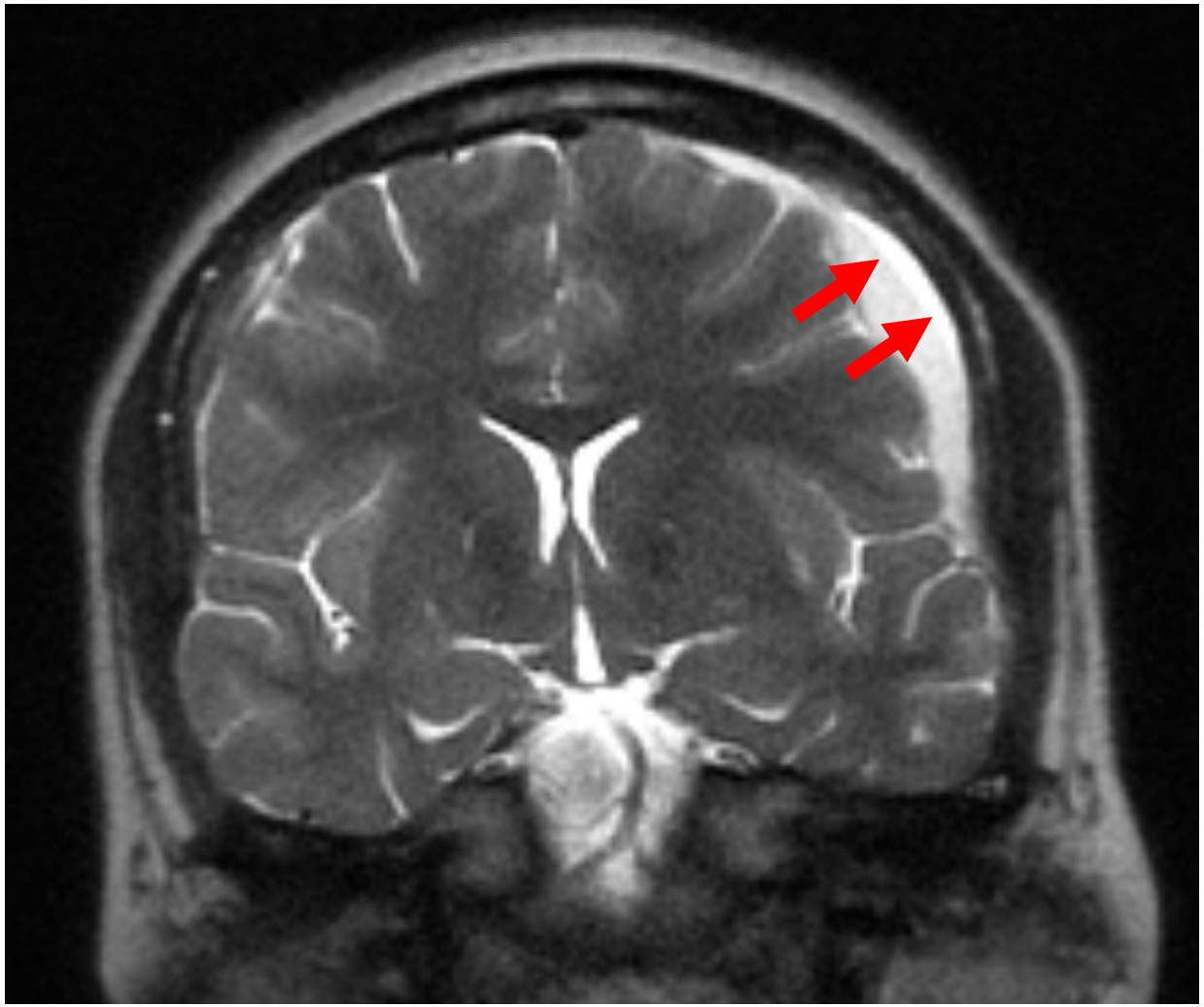

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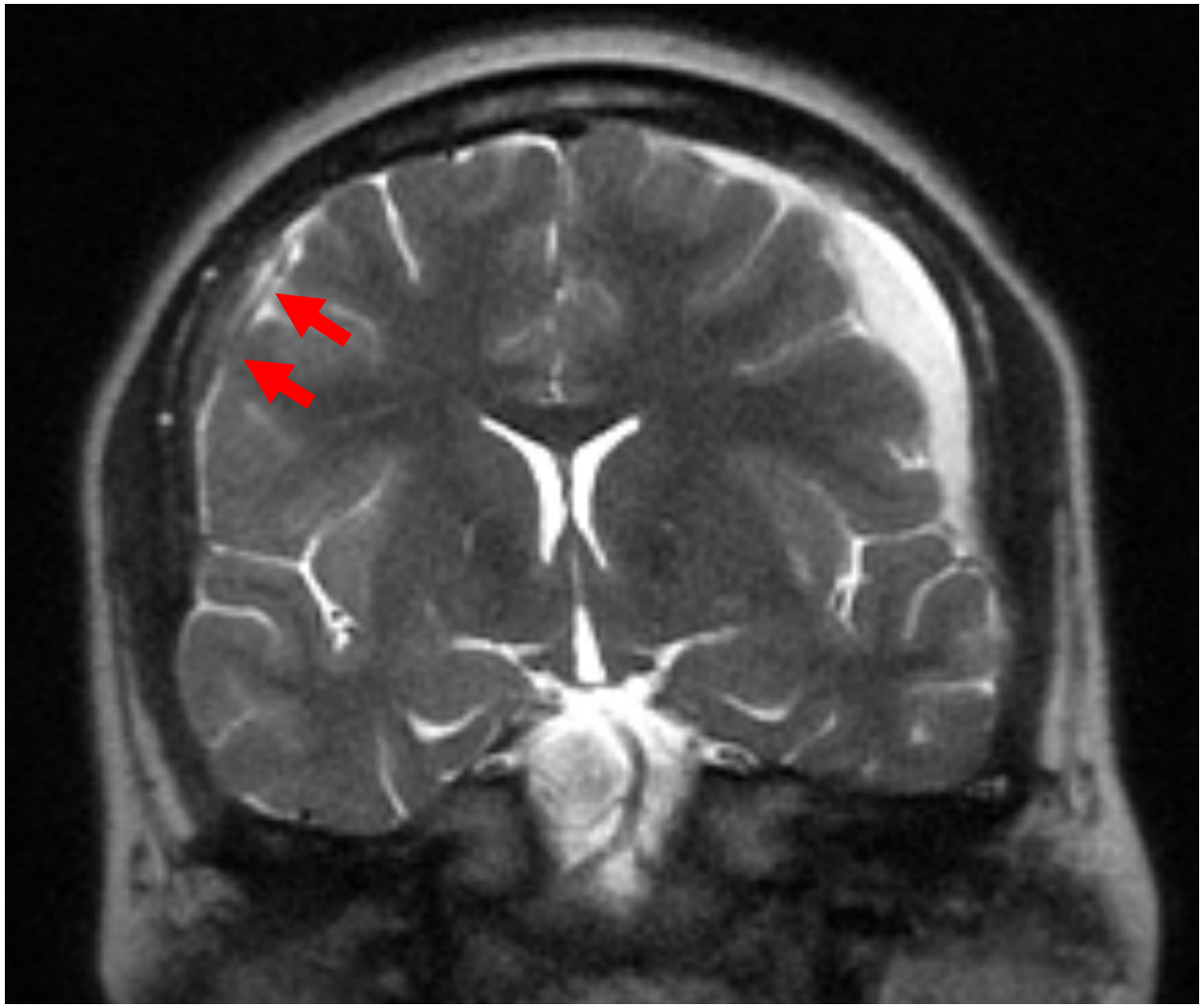

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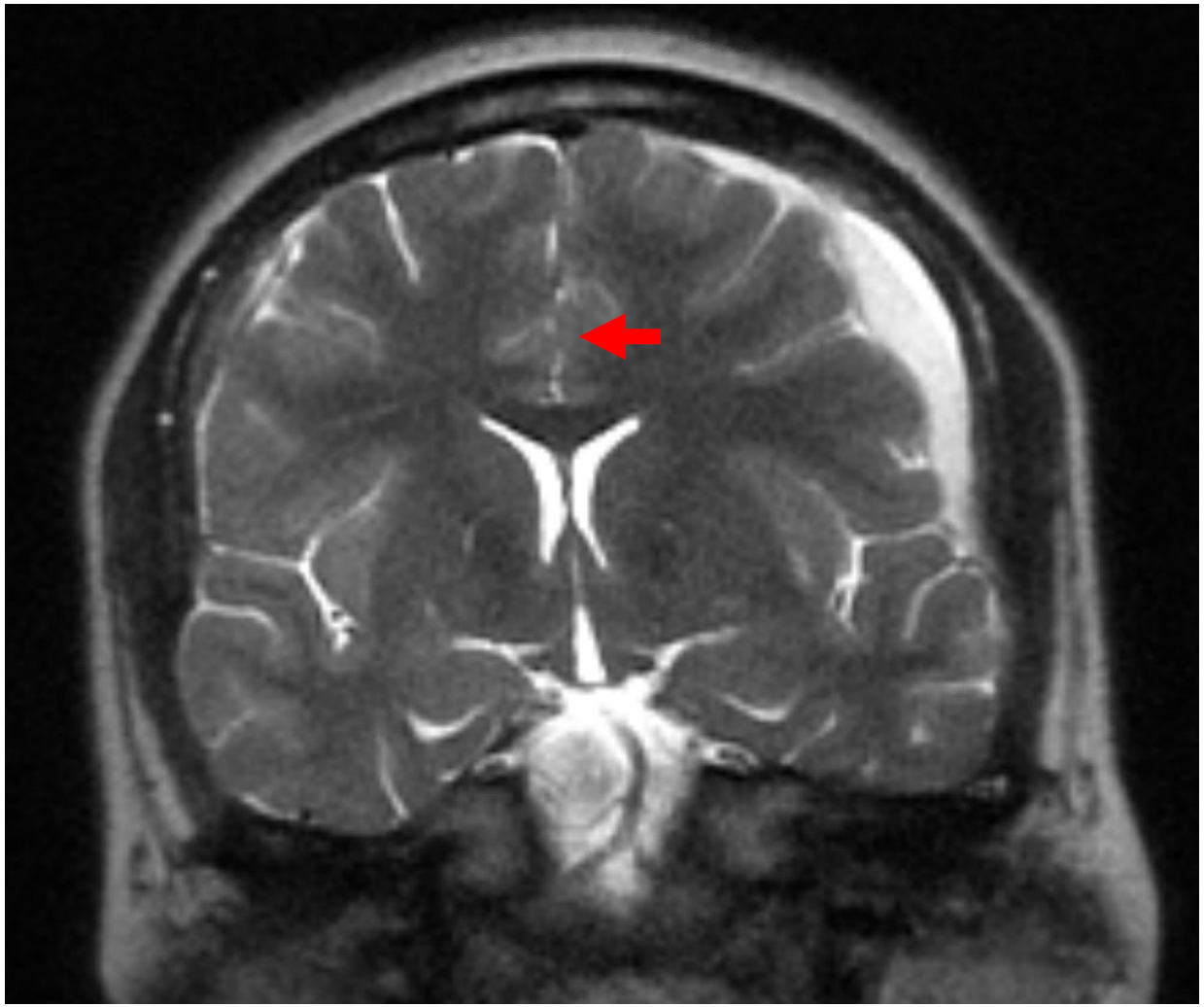

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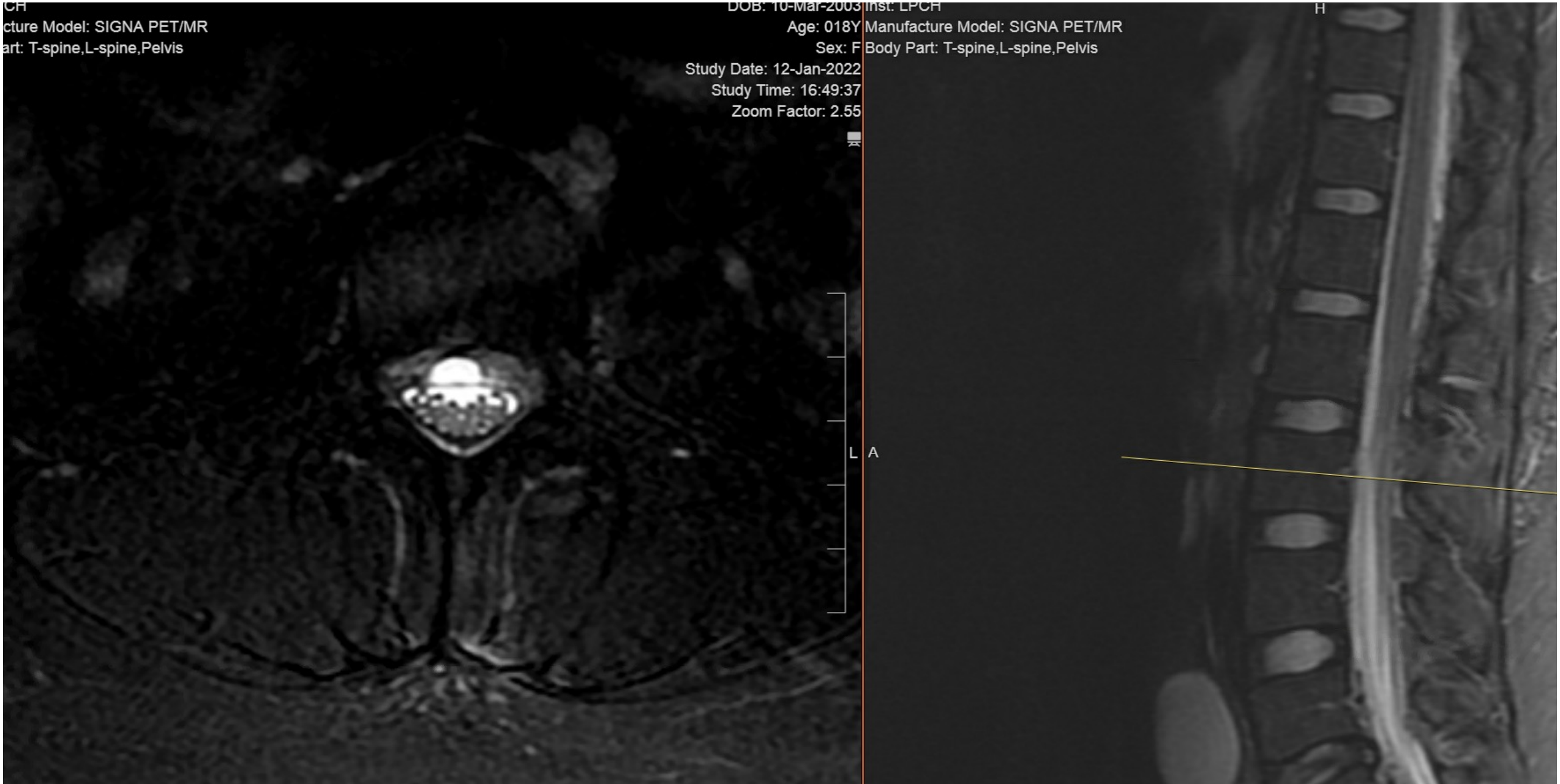
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Body Part: T-spine,L-spine,Pelvis
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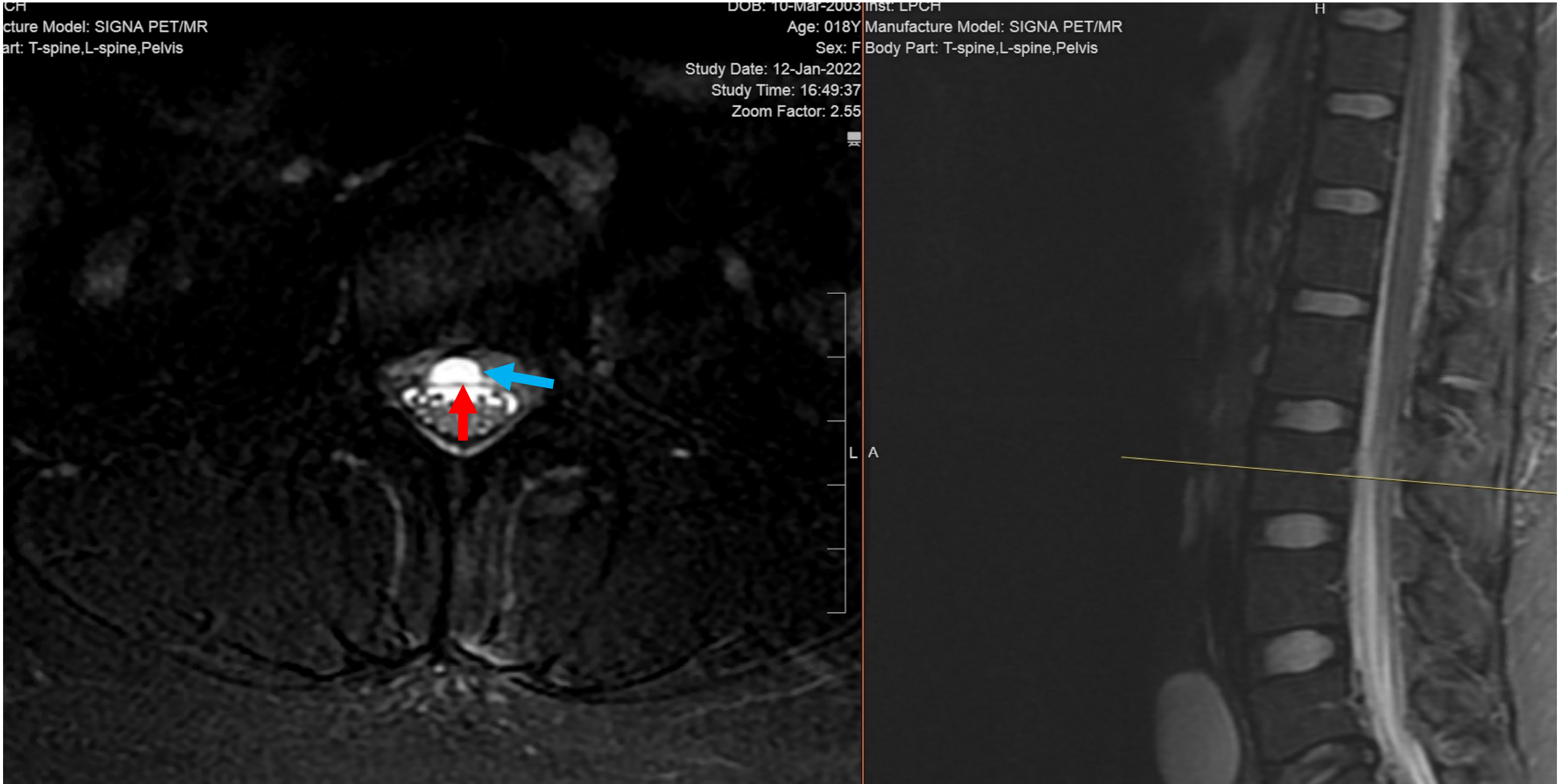
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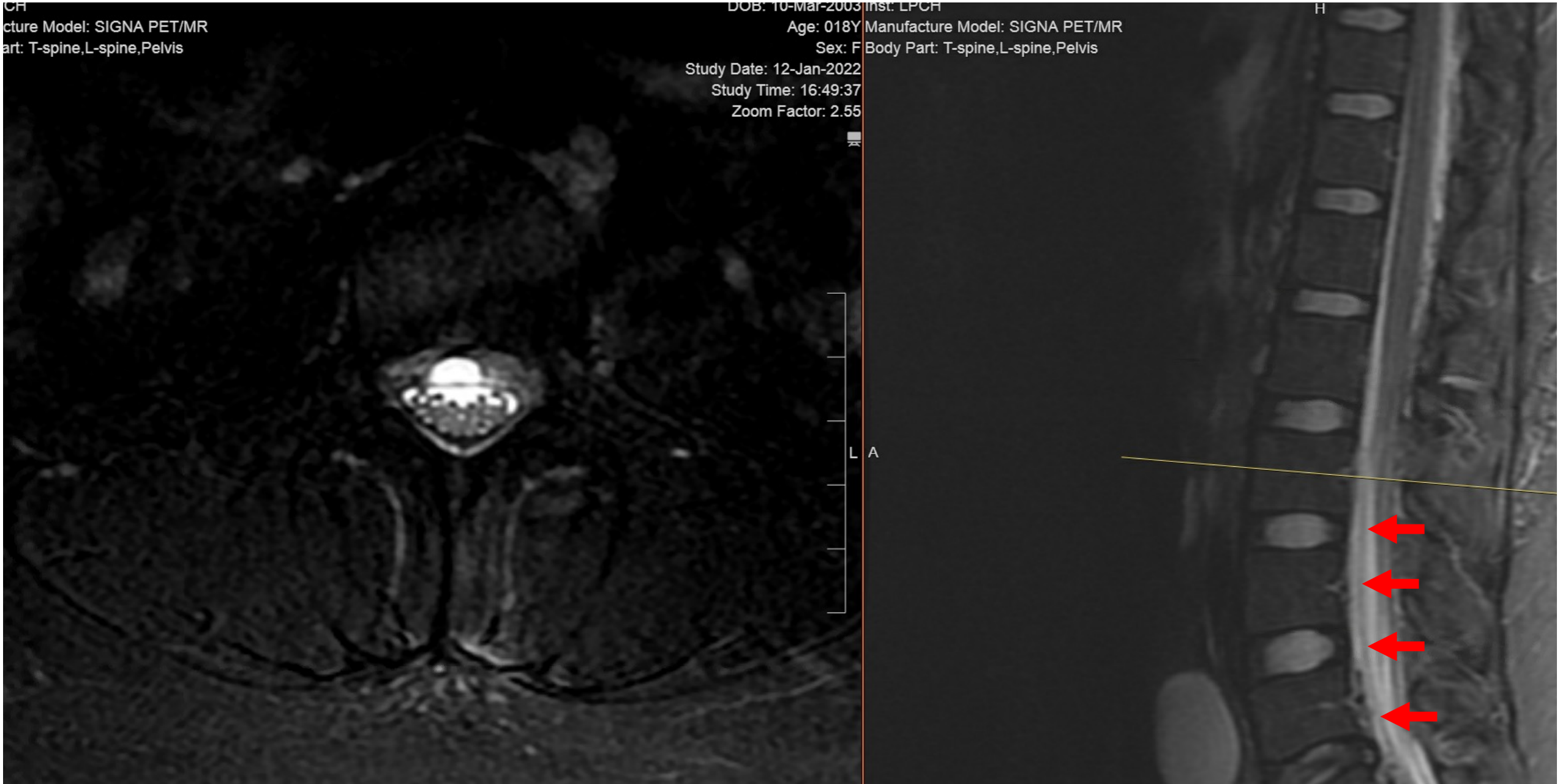
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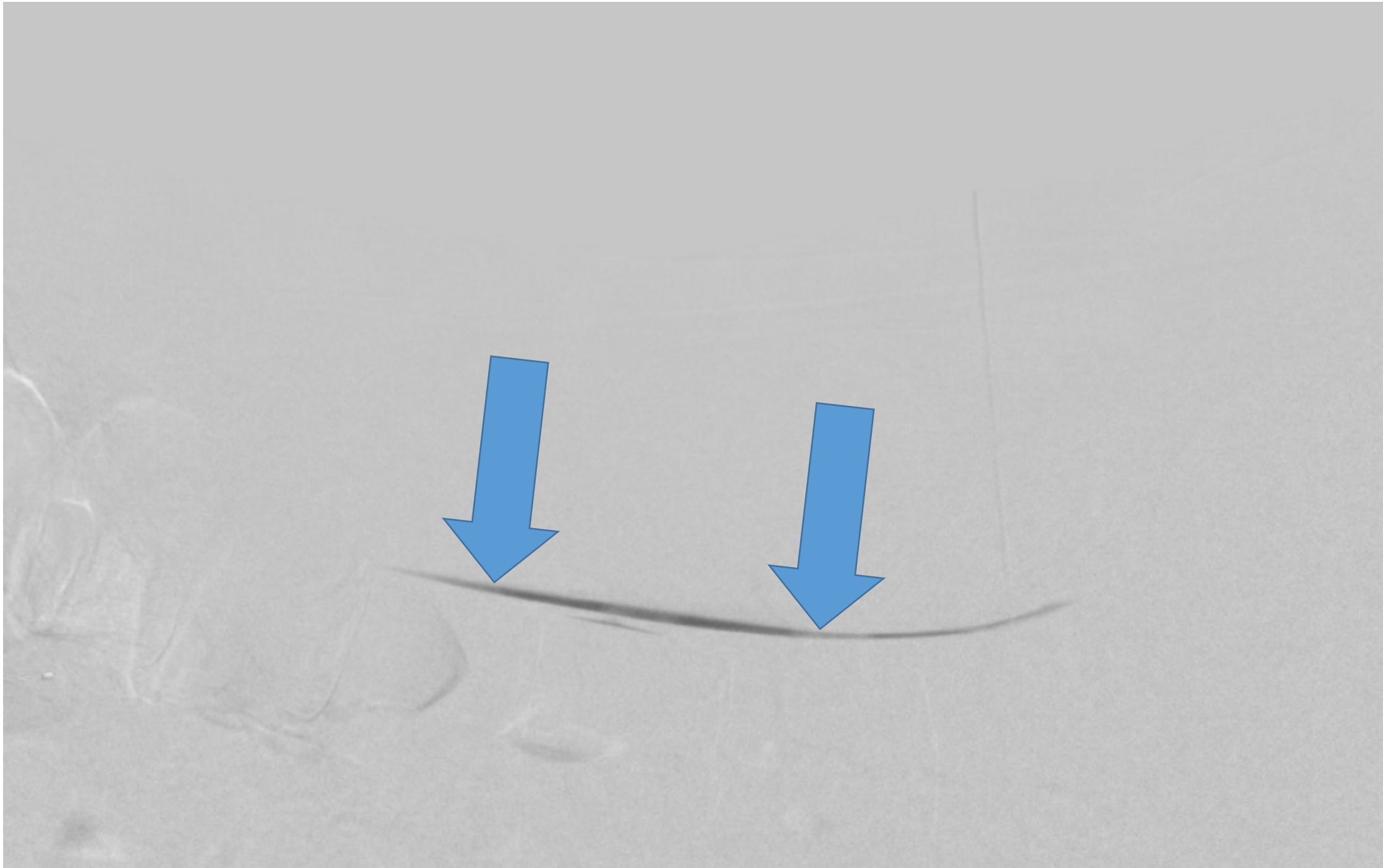
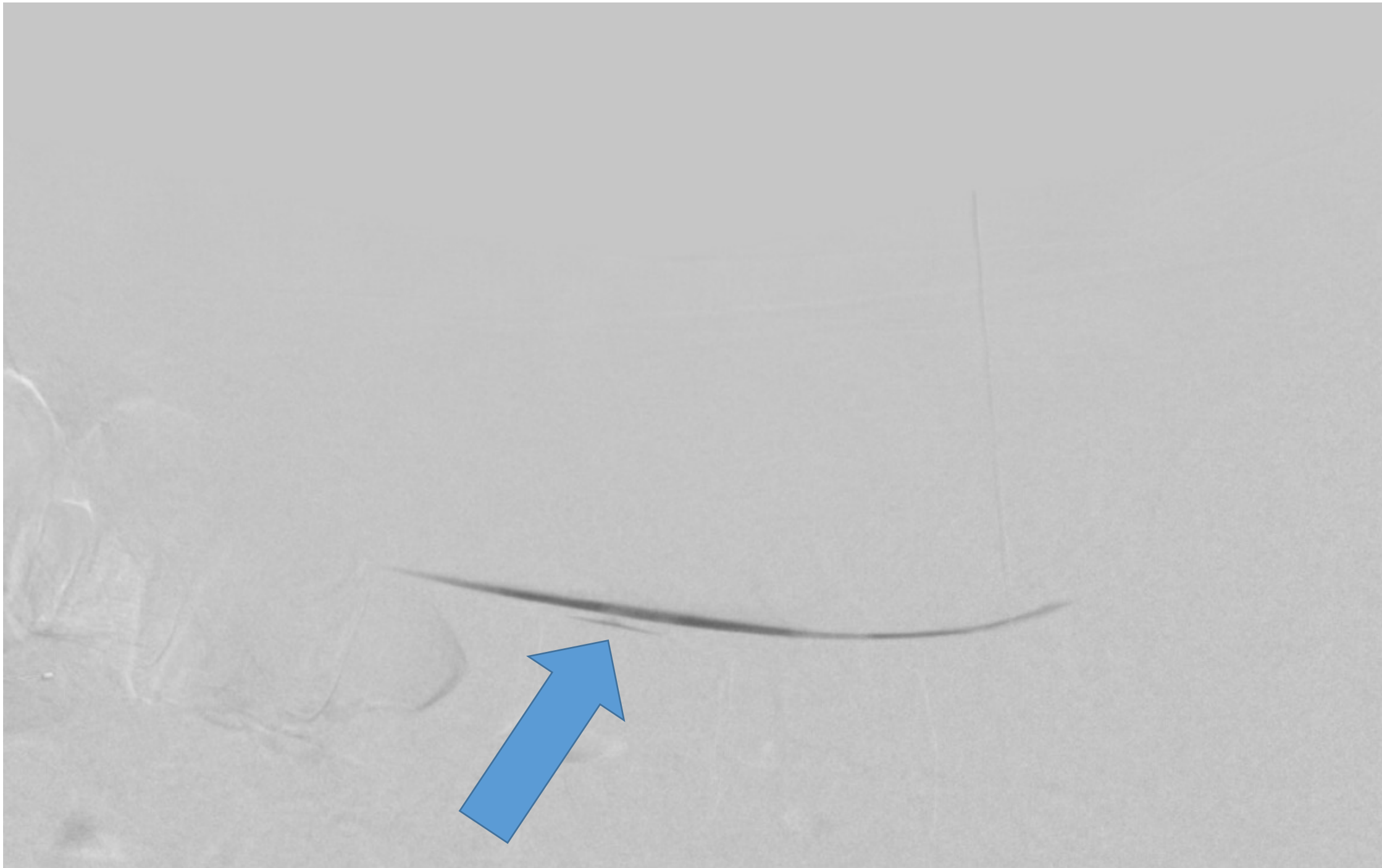
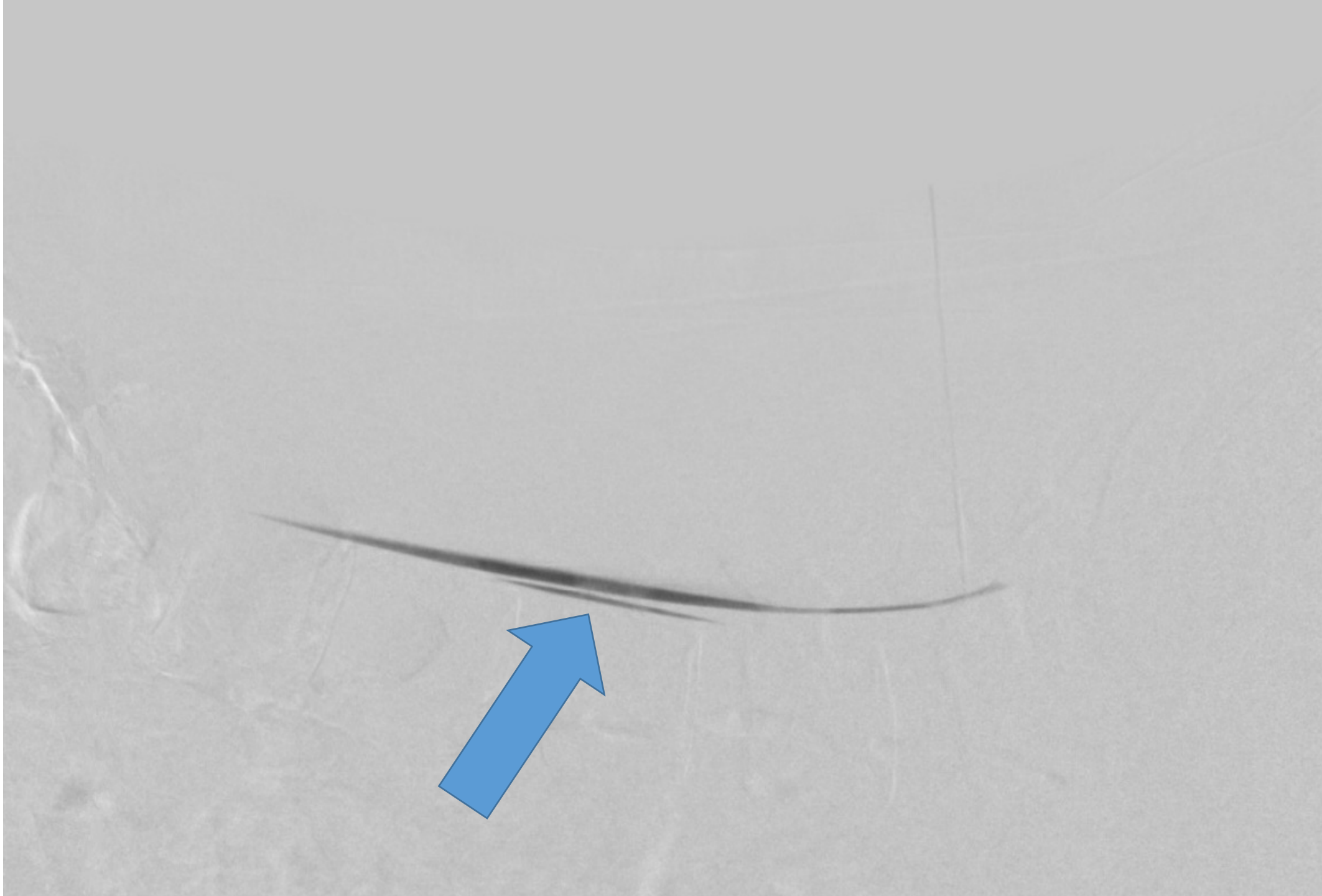
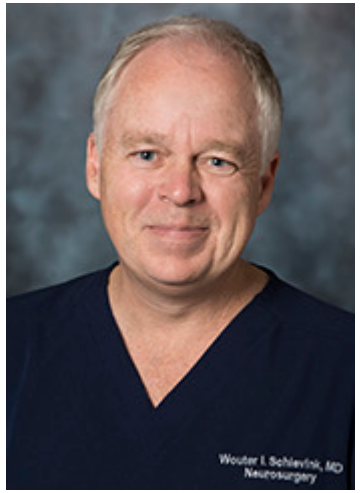


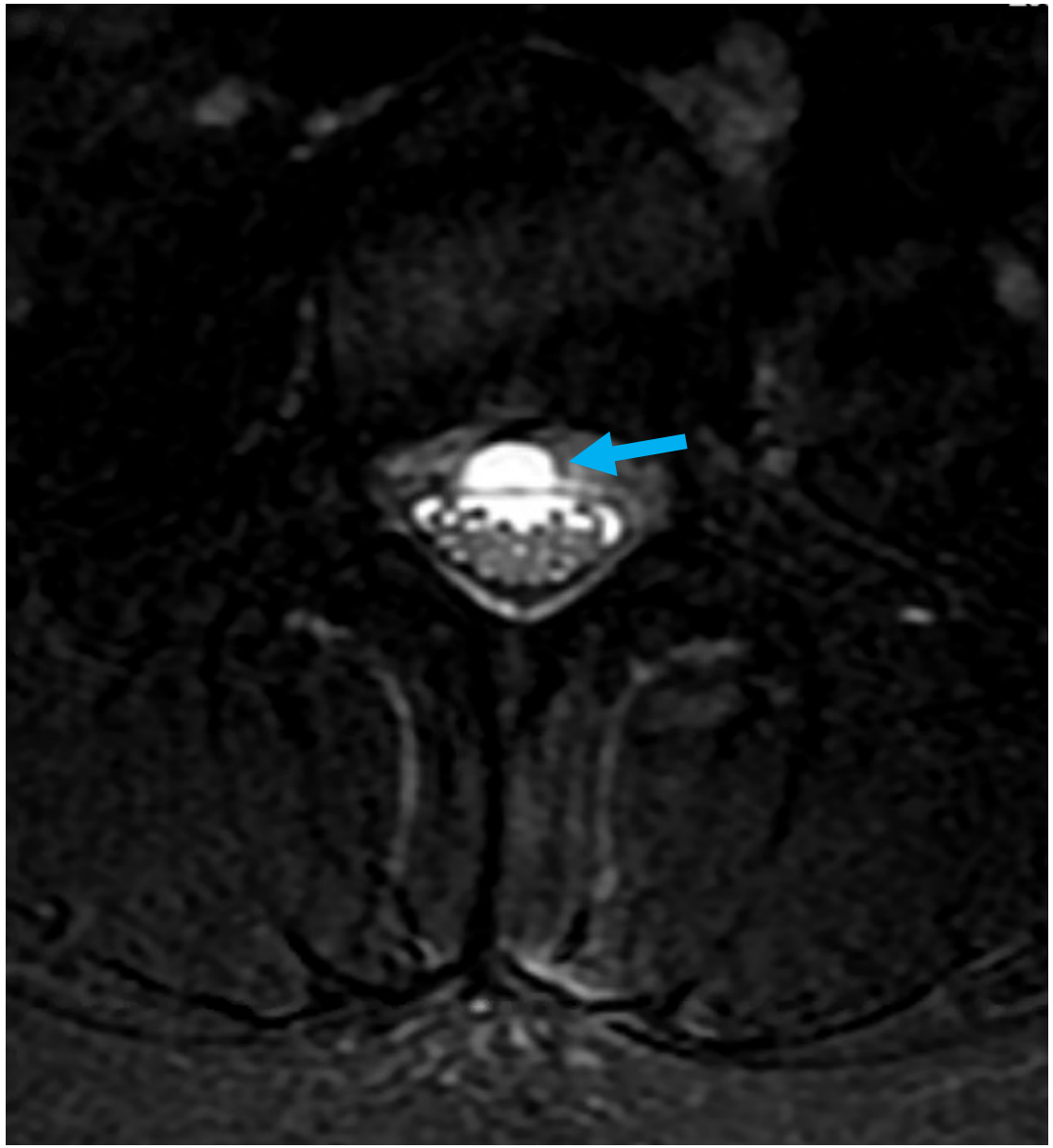





Marcel Mat, M.D.
Neurosurgery


Wouter I. Schievink, MD
Neurosurgery

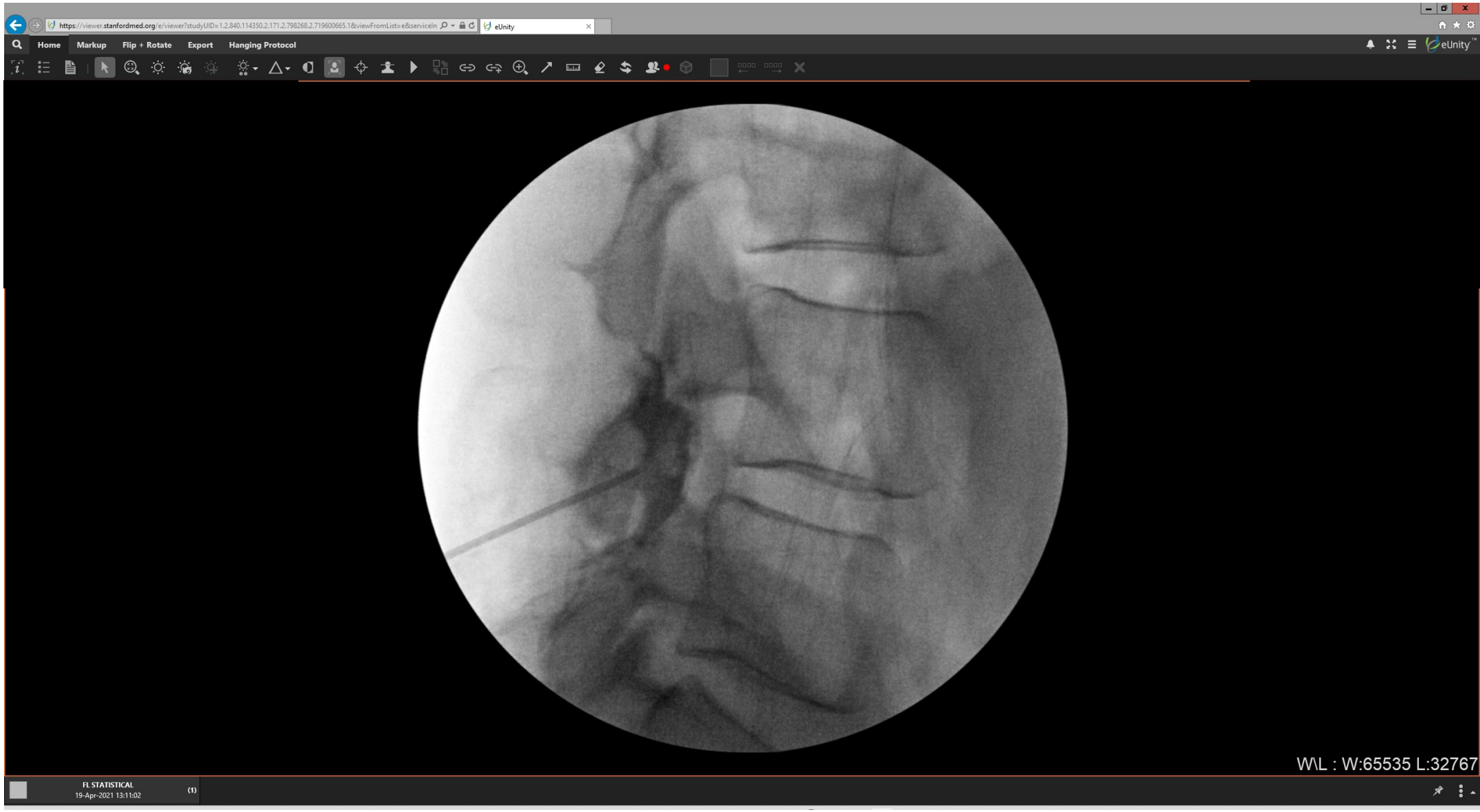
- A properly done bedside epidural blood patch may do nothing to cover/seal the defect.
- The patient will feel better initially then recur.
- This will lead to a lower patch long term success rates and artificially inflated estimates of early success.
- Simply repeating is unlikely to help.
- What to do:
  - 1. Use a transforaminal approach under imaging guidance.
  - 2. Do the imaging that will give a surgeon confidence to open the dorsal dura.
  - 3. Surgeons should carefully evaluate direct visualization/ scoping of ventral dura.



Failure Point 3:
Dural Fistula Formation

- 8/19/18 Venous sinus thrombosis and venous infarct with hemorrhagic conversion.
- 8/22/18 she underwent a right frontal craniotomy and evacuation of a lobar intracerebral hematoma on 8/22/18 **along with a lumbar drain placement**.
- 7/19/19- After a year of orthostatic headache following recovery has a radionuclide cisternogram to look for a CSF Leak: **“No evidence of CSF leak.”**
- 11/1/19- bilateral **digital subtraction myelogram** at mayo clinic. - no evidence of CSF leak or CSF venous fistulas
- 11/19- Multilevel thoracic epidural blood patches at Mayo- no relief
- 4/19/21- right paramedian L4-5 with catheter to L3-4 epidural fibrin patch at Stanford- Contrast seen to pass through L3-4 defect

L3-4 defect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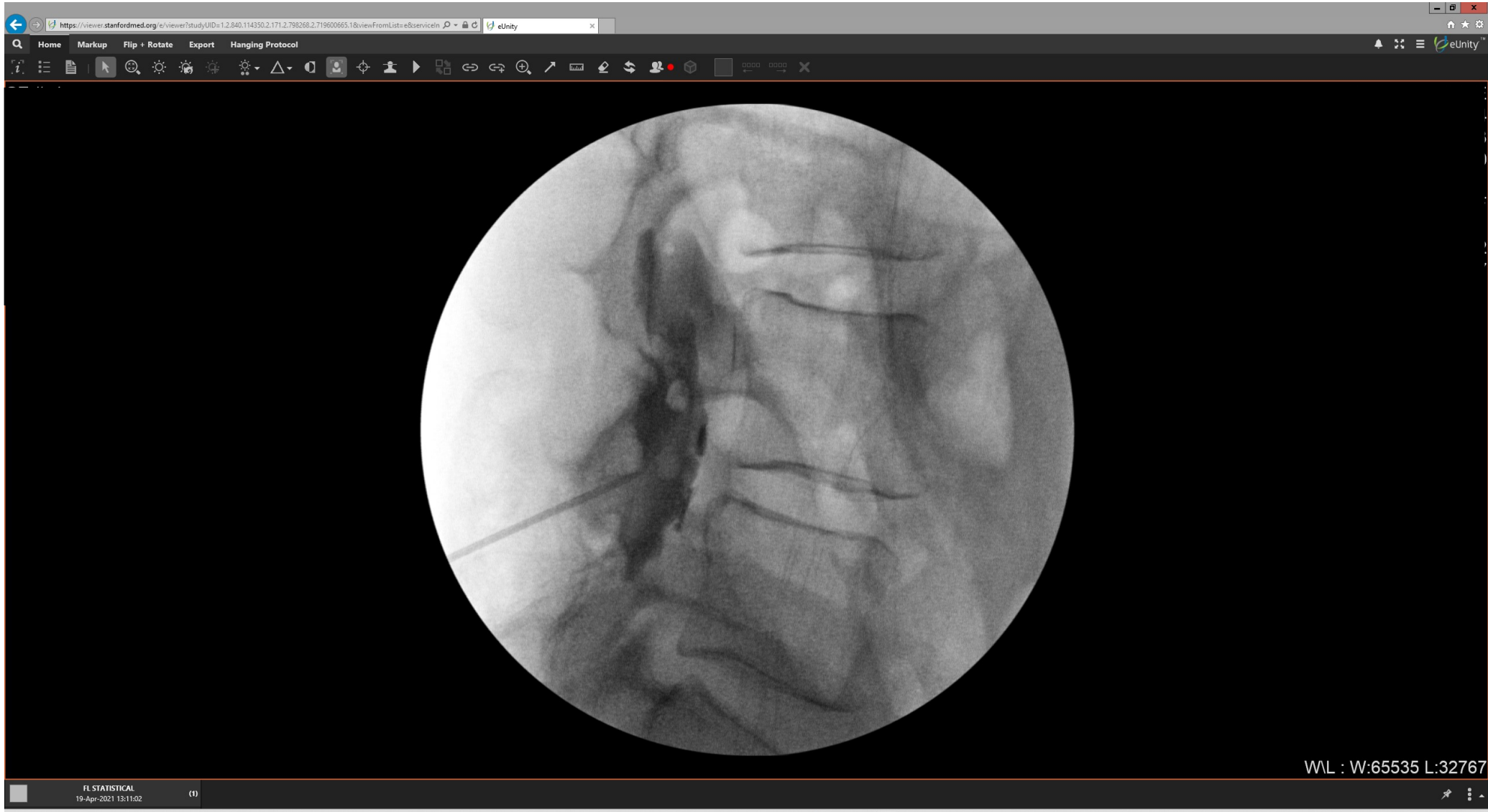
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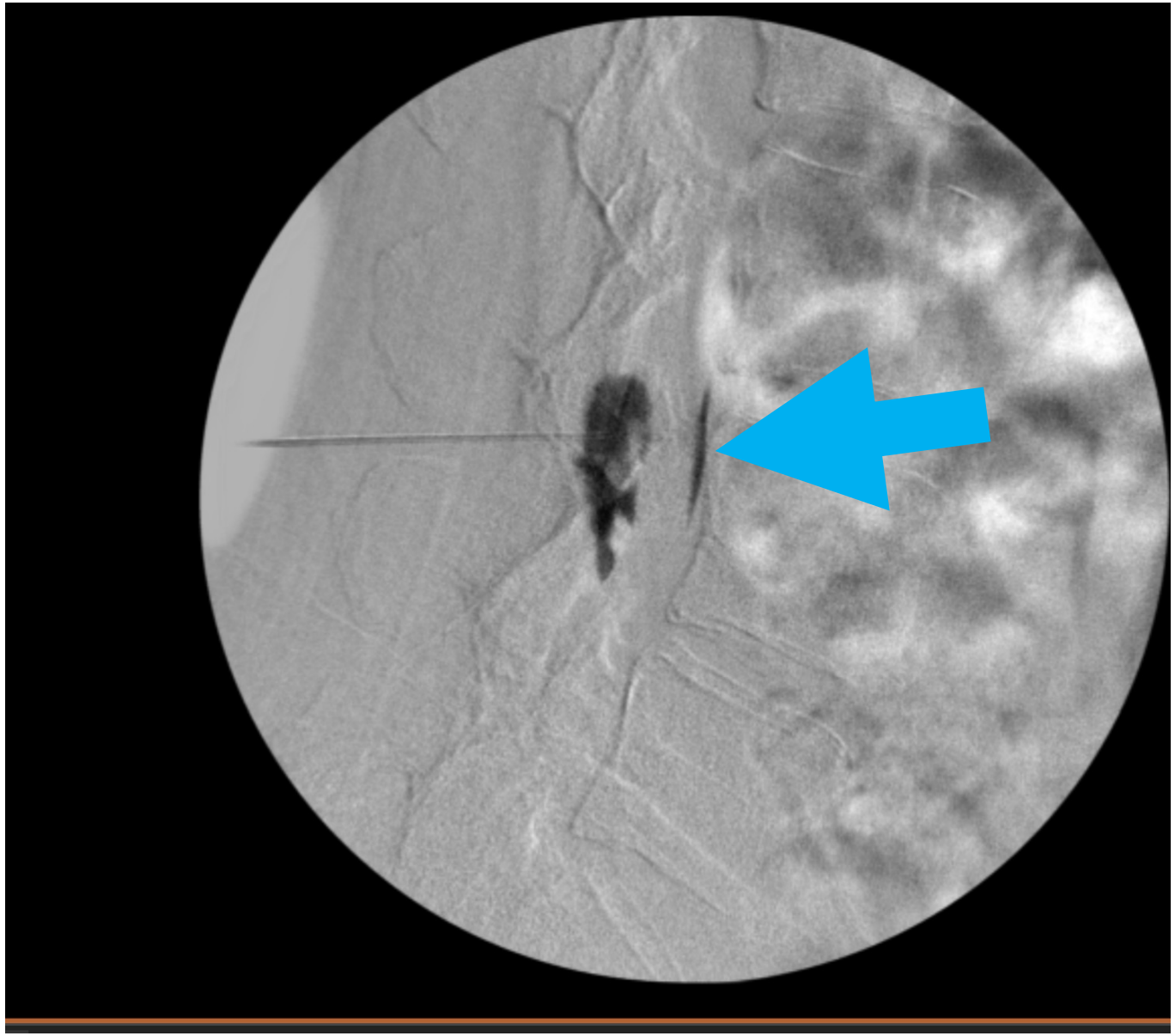
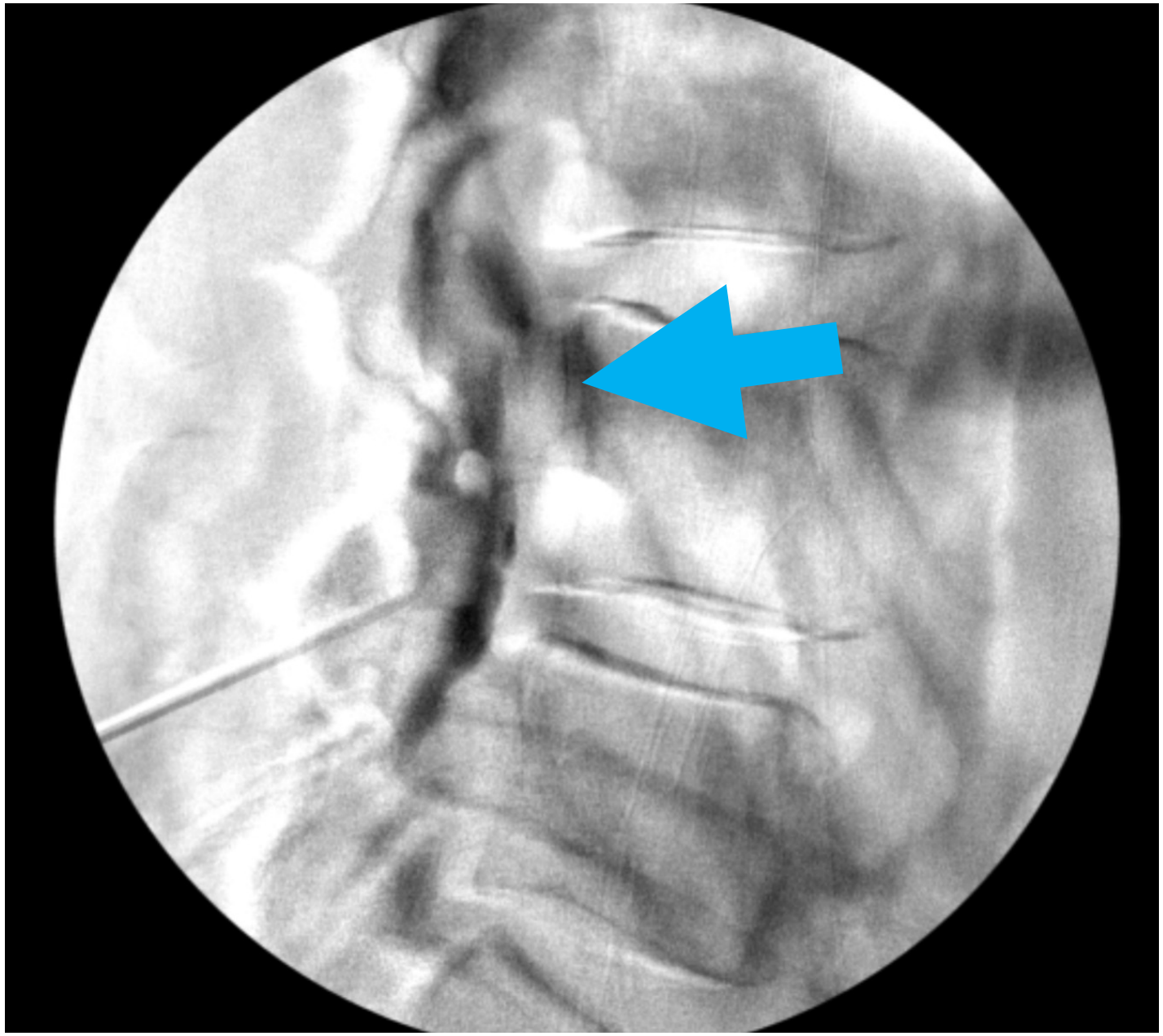
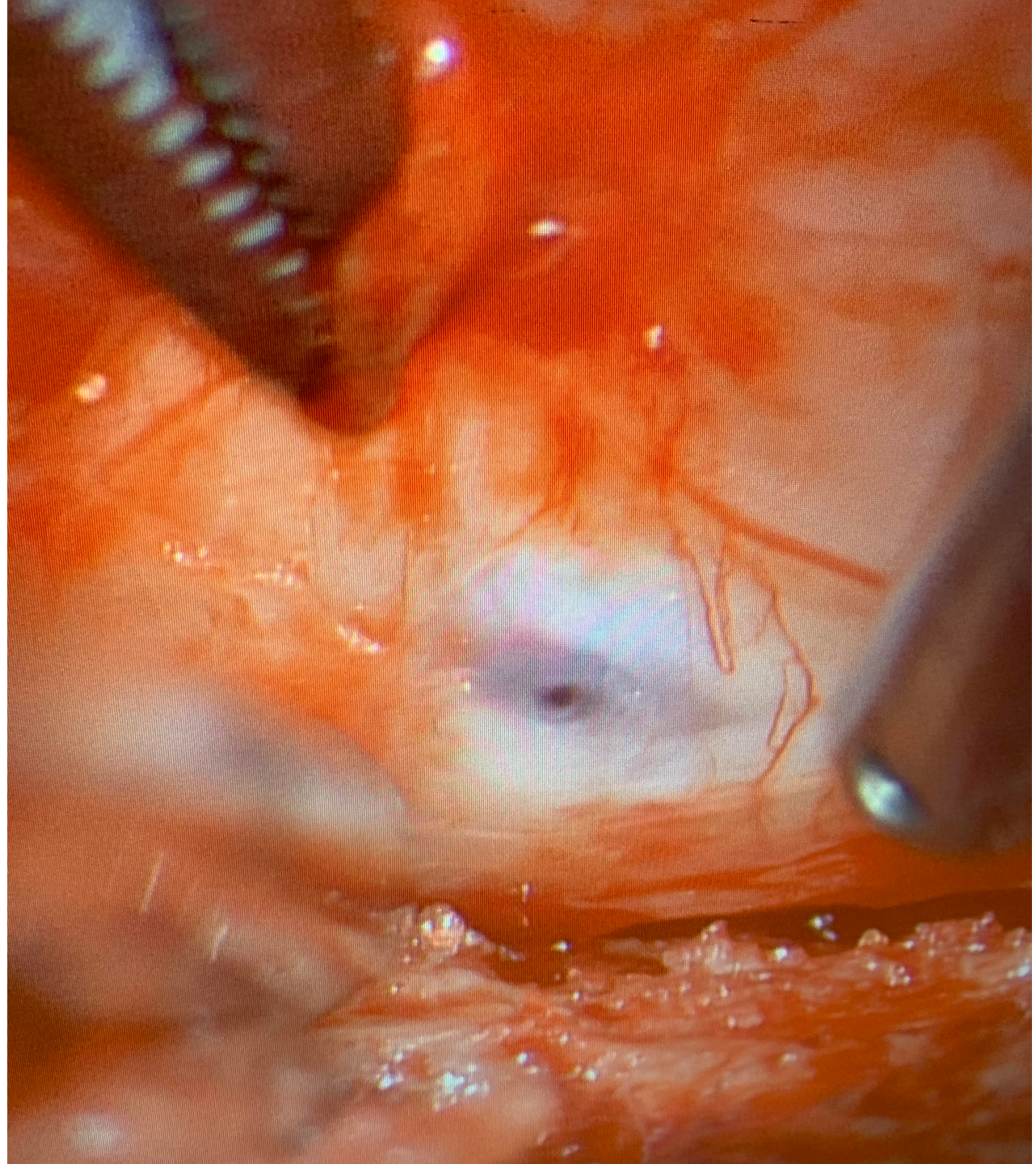
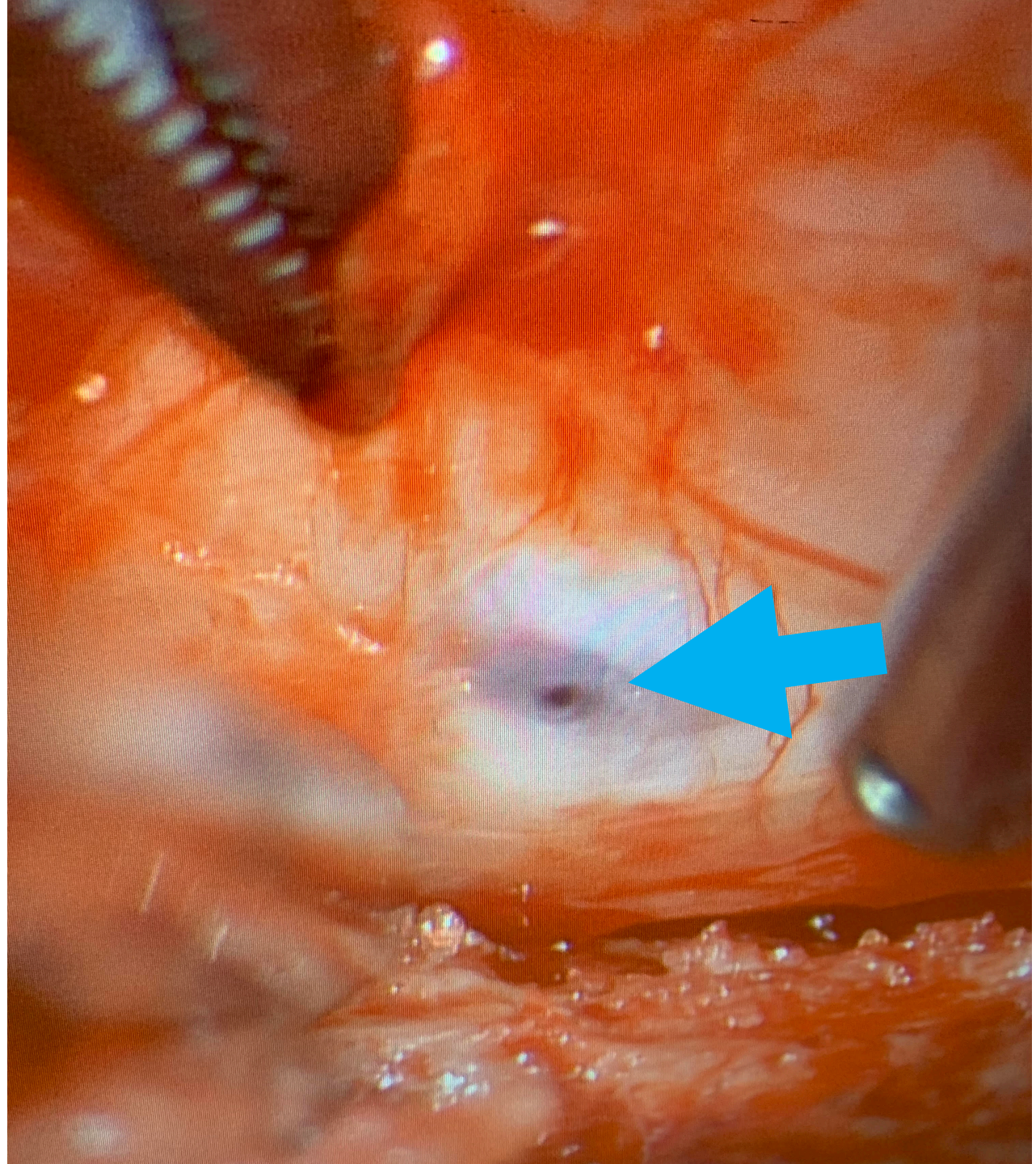
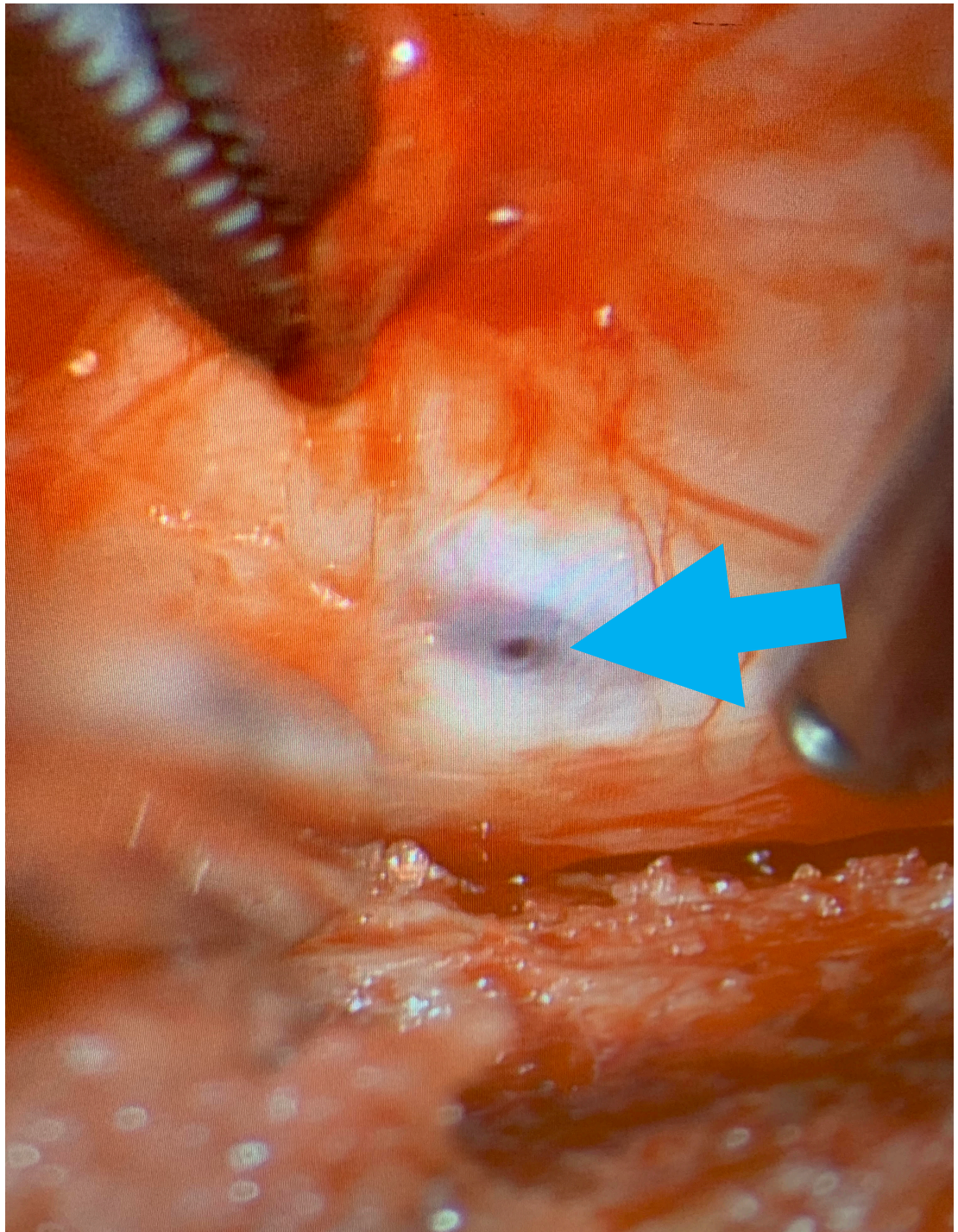




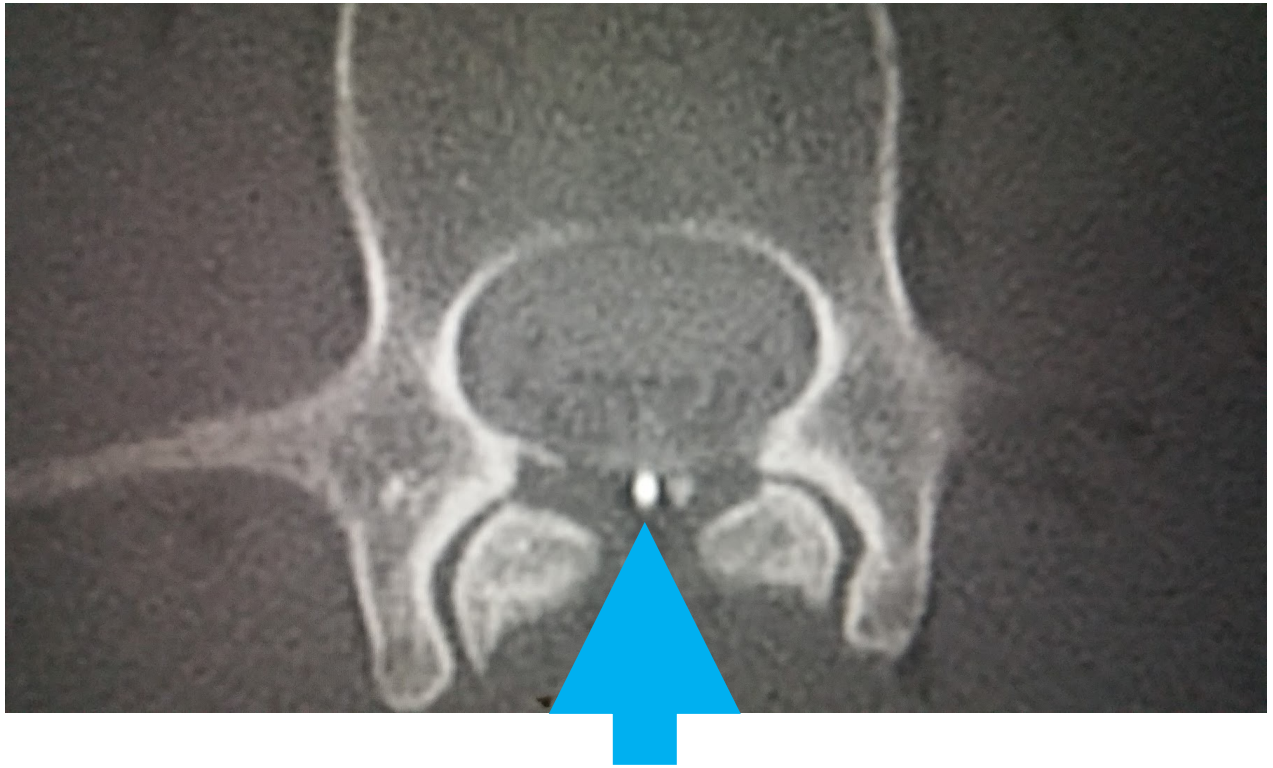


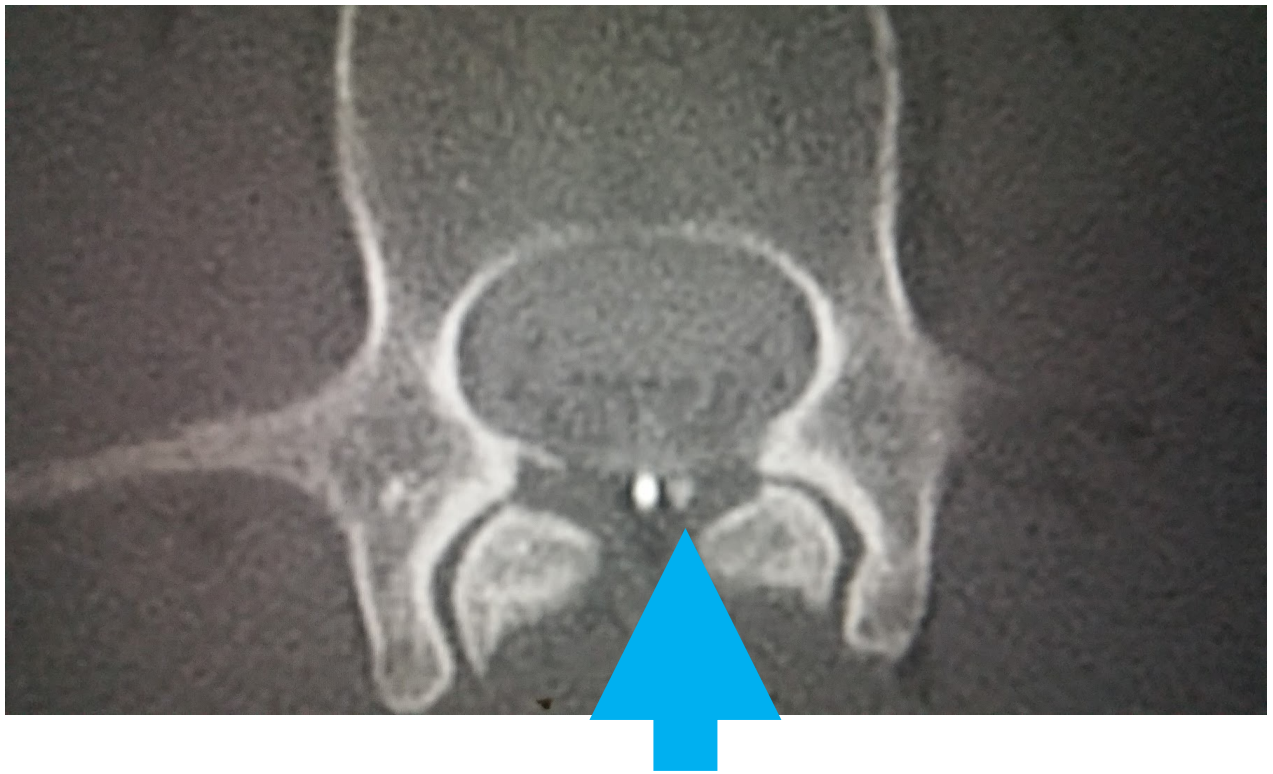


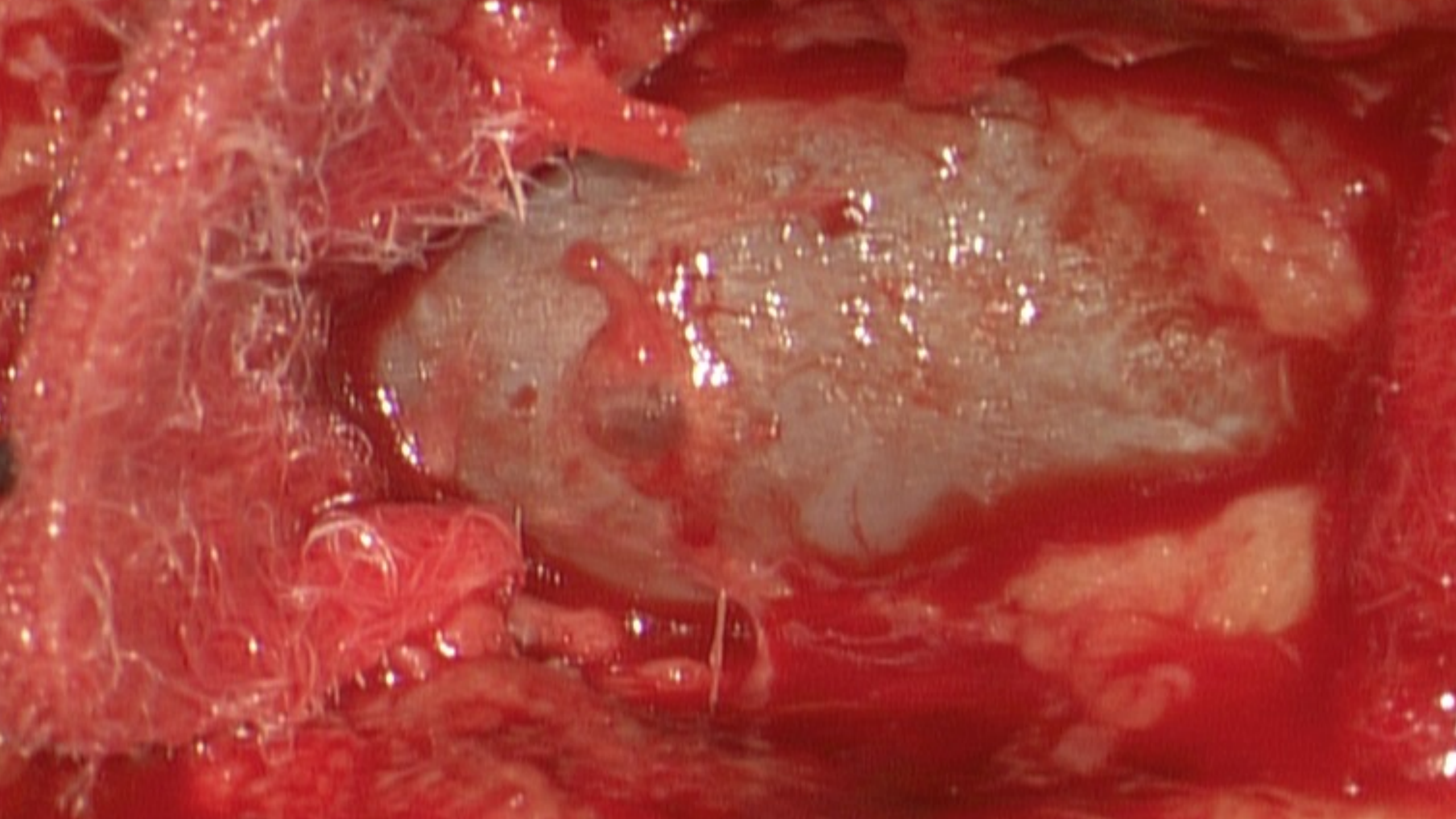
- A properly done bedside epidural blood patch may cover but not seal the defect
- The patient will feel better initially then recur.
- This will lead to a lower patch long term success rates and artificially inflated estimates of early success.
- Simply repeating is unlikely to help.
- What to do:
  - When doing a patch consider lateral digital subtraction sequences to look for intravasation. Or More commonly delayed lateral images.
  - If patching under CT consider measuring pre and post-patch Hounsfield units of spinal fluid.
  - Exhaust patching and push for surgical exploration

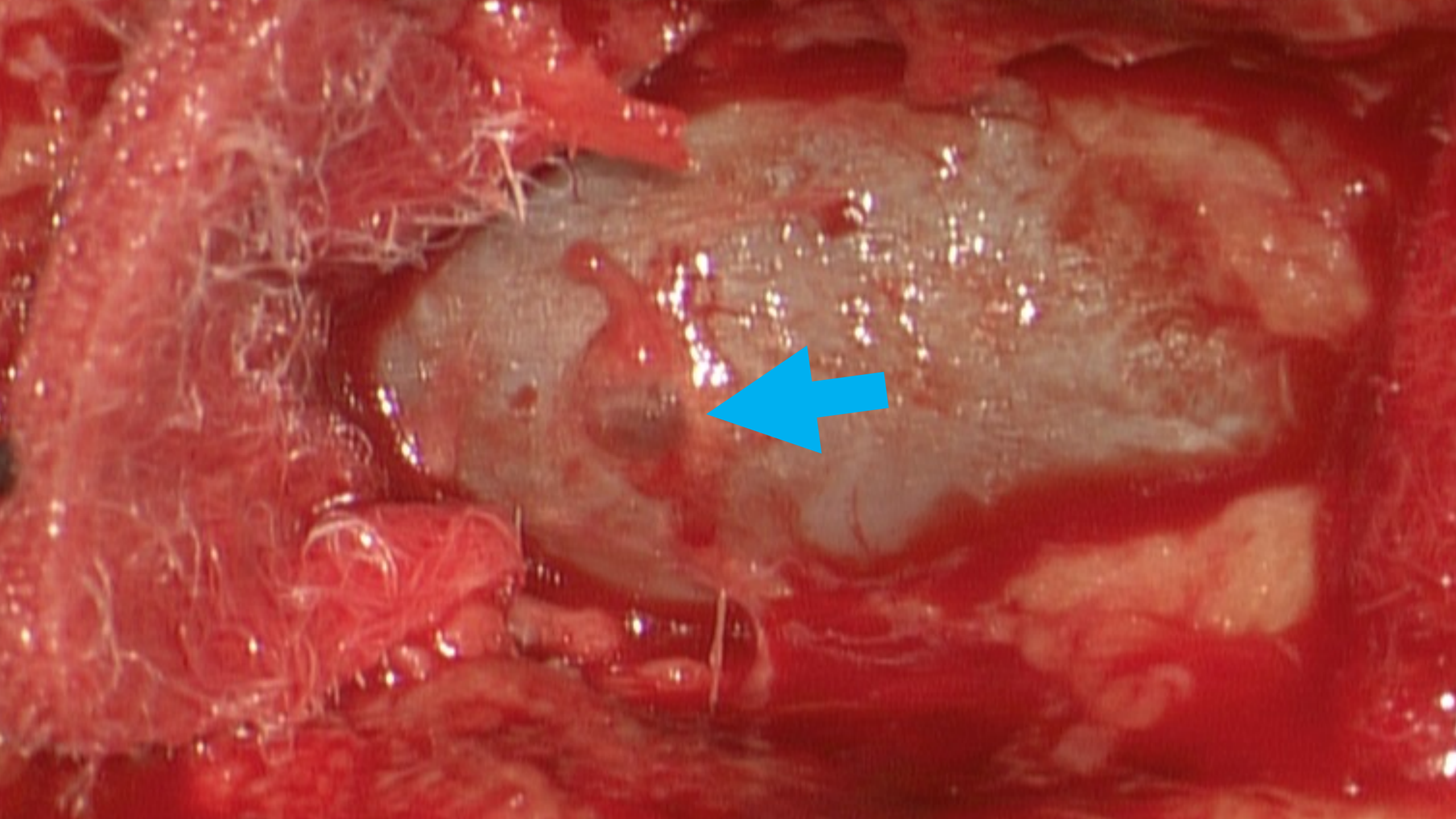


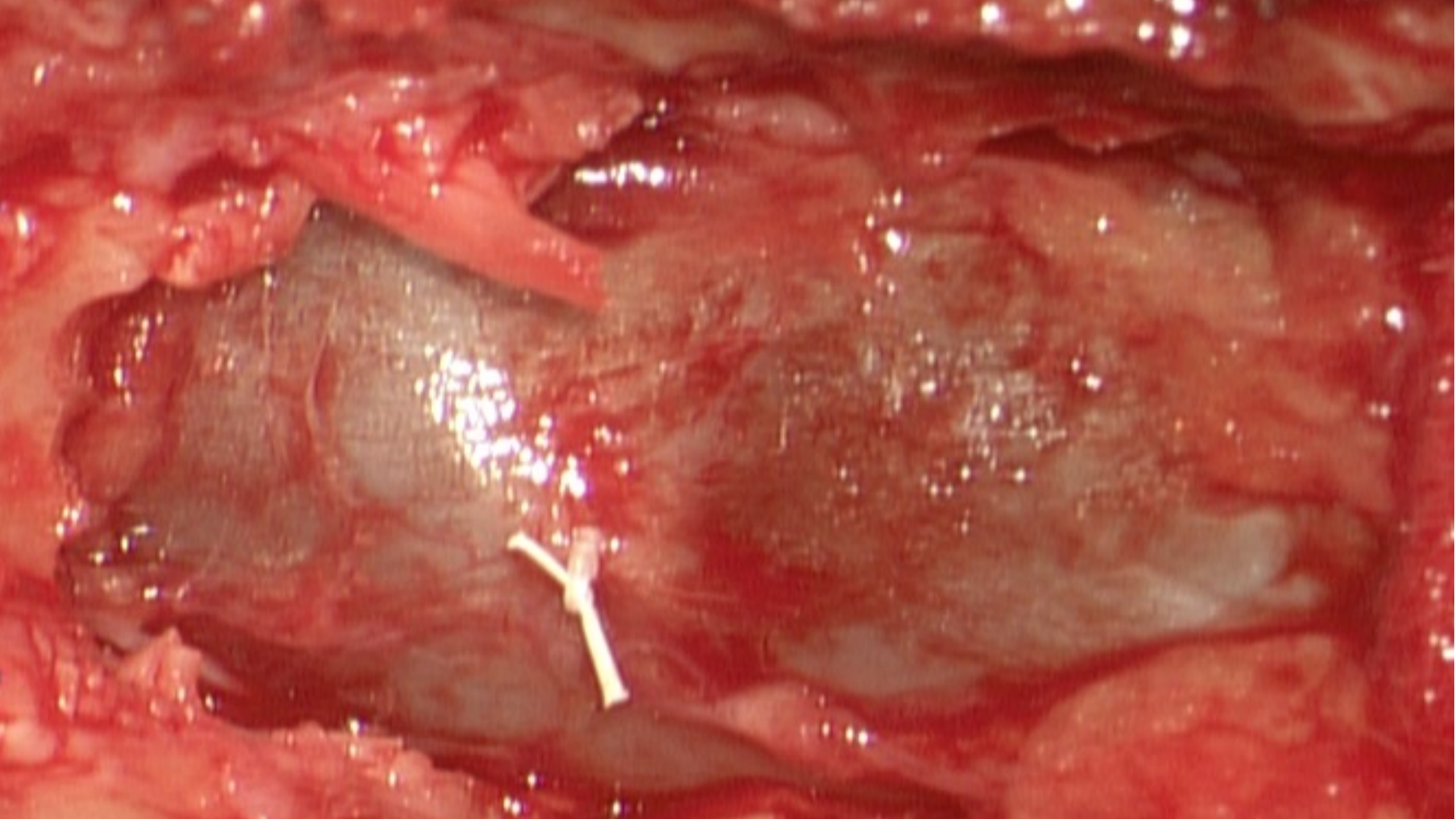
Failure Point 4:
Dural Bleb Formation











- A properly done bedside epidural blood patch may cover but not seal the defect
- The patient will feel better initially then recur.
- This will lead to a lower patch long term success rates and artificially inflated estimates of early success.
- Simply repeating is unlikely to help.
- What to do:
  - Repeat CT myelogram if needed
  - Very fine cuts 0.625 mm
  - Dorsal unmixed contrast
  - Repeat MRI with 3D T2 weighted fat suppressed sequences with 1 mm cuts. Sagittal and Axial reconstructions.
  - Exhaust patching and push for surgical exploration

SIX Causes of Persistent CSF Leak Despite a Properly Done Epidural Patch

- Intact Plica Mediana Dorsalis
- Ventral Dural Puncture
- Dural Fistula Formation
- Dural Bleb Formation
- CSF Venous fistula
- Neo-membrane/pseudodura

- Understanding these limitations shapes your response to both the refractory and the catastrophic leak.