

# CSF-Venous Fistulas: Why or Why not Fibrin Glue

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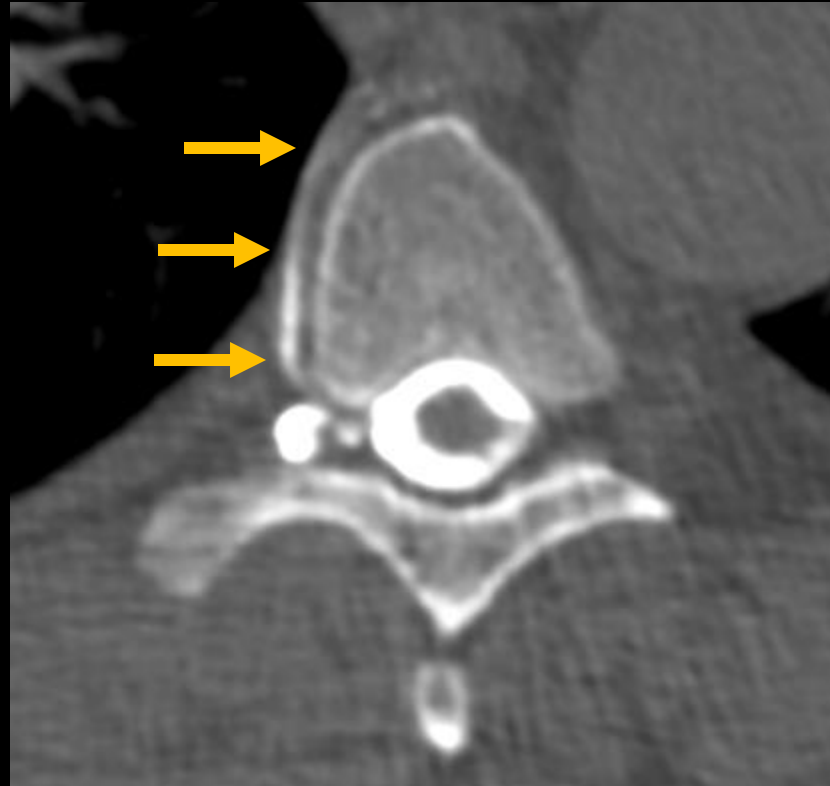
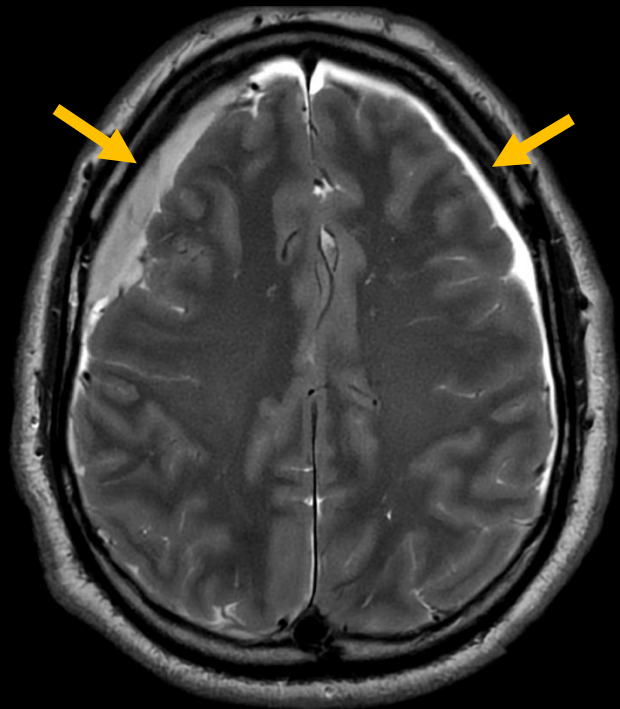
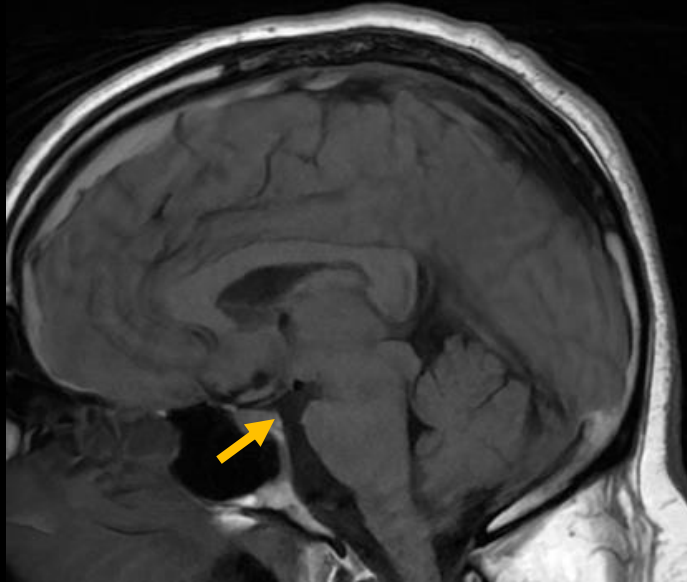
# Learning Objectives

Illustrate the patient experience in  
CVF patching

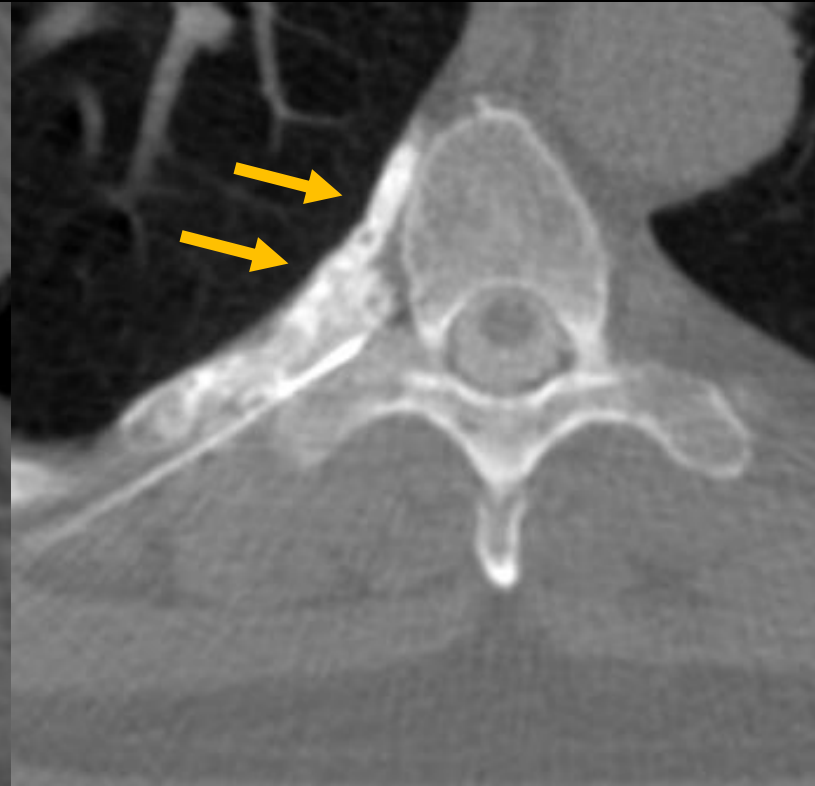
Highlight some operator tips, tricks,  
pitfalls, & additional uses

54M, severe HAs, ICU

Next Day



R T6 CVF



Fibrin Glue

Discharged following day

# Fibrin Glue Patient Experience

Minimally invasive. Use conscious sedation.

Perform in same session as myelogram (60-75 min total)

1 treatment often needed but more possible

Rebound hypertension possible (don't Rx Diamox routinely)

Bed rest at home that day. 1 week telephone/message f/up.  
1 month f/up MRI.

# Patient Discussion on All Treatments

Treatment	Pros	Cons
<b>Fibrin glue</b>	High success rate Minimally invasive Able to be repeated No permanent foreign body	May require >1 treatment
<b>Embolization</b>	High success rate Minimally invasive	May require >1 treatment Additional treatments can be tough Permanent foreign body limits future CTM evaluation
<b>Surgery</b>	Very high success rate	Invasive May need to be repeated if de novo CVFs develop

# CVF Fibrin Glue Occlusion Technique

1

Position patient prone and scan at CVF level

2

Place 1-2 20g spinal needles along CVF course, using anatomic landmarks

3

Test dose with air (or iodine) contrast

4

Add 0.2 cc contrast into both hubs of glue

5

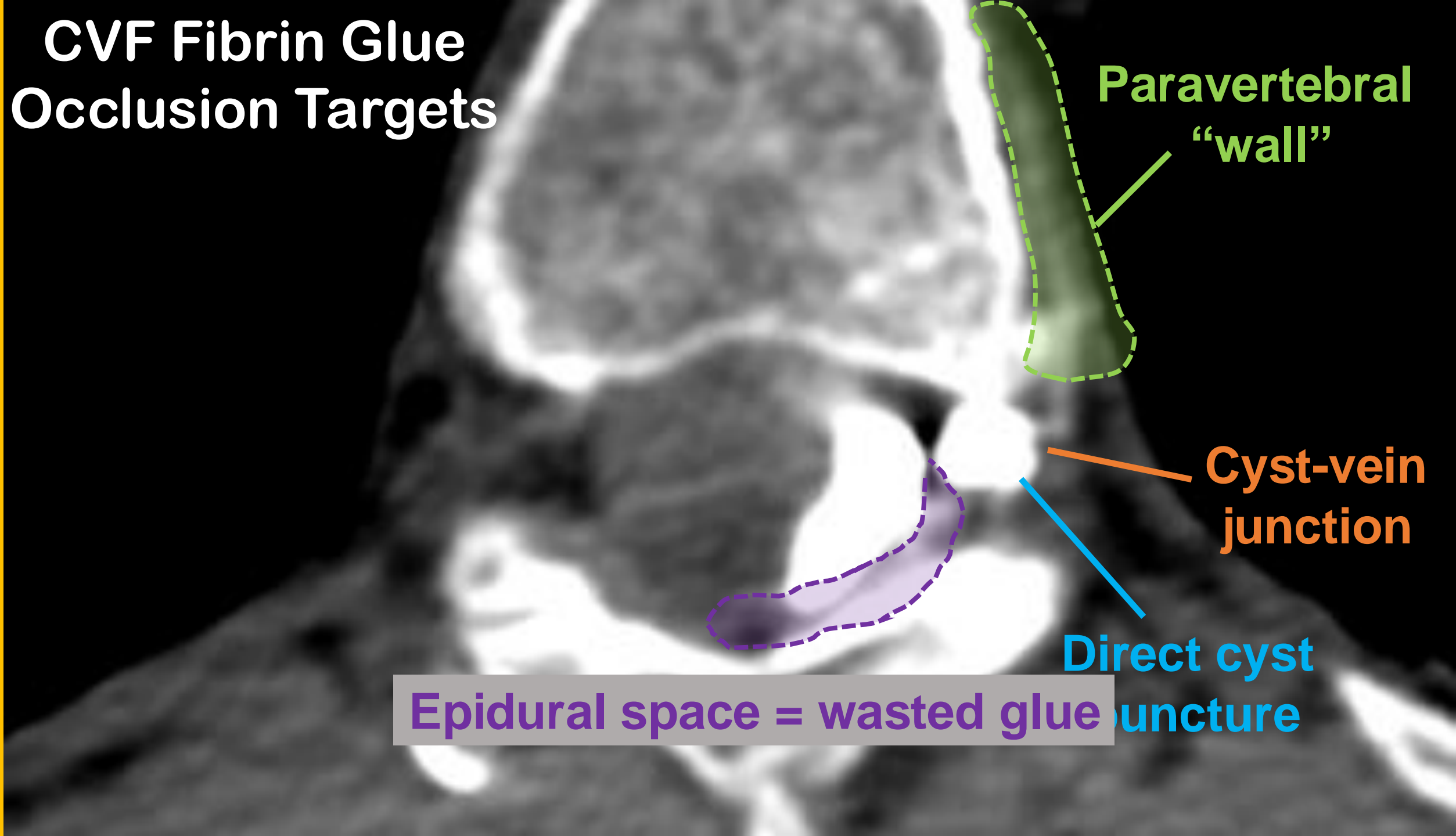
Inject 2 cc of glue (w/ high thrombin). Scan. Inject 1-2 cc more, if needed.



*Administer Benadryl*



# CVF Fibrin Glue Occlusion Targets



Paravertebral  
"wall"

Cyst-vein  
junction

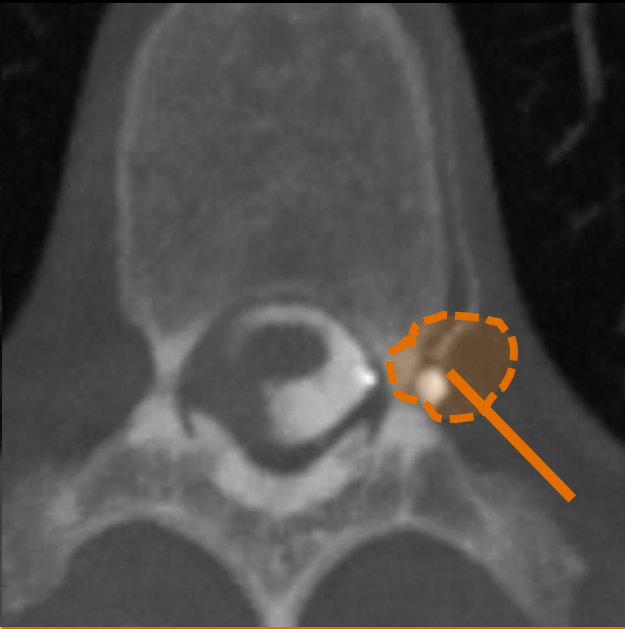
Direct cyst  
junction

Epidural space = wasted glue

# CVF Fibrin Glue Occlusion Targets



CSF-Venous Fistula  
on CT Myelogram



Target Cyst-Vein  
Junction



Paravertebral  
"Wall" Technique



Direct Cyst  
Puncture

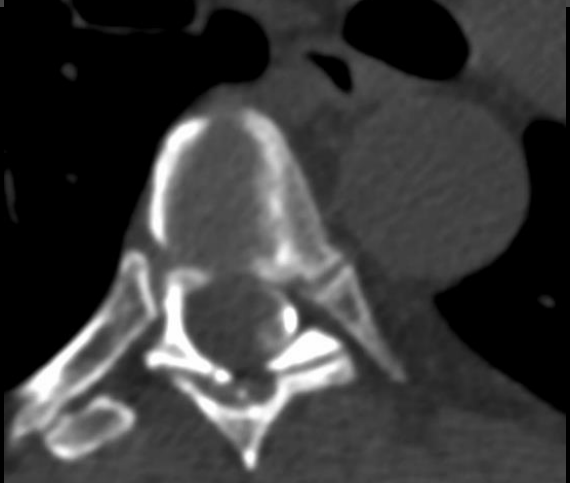
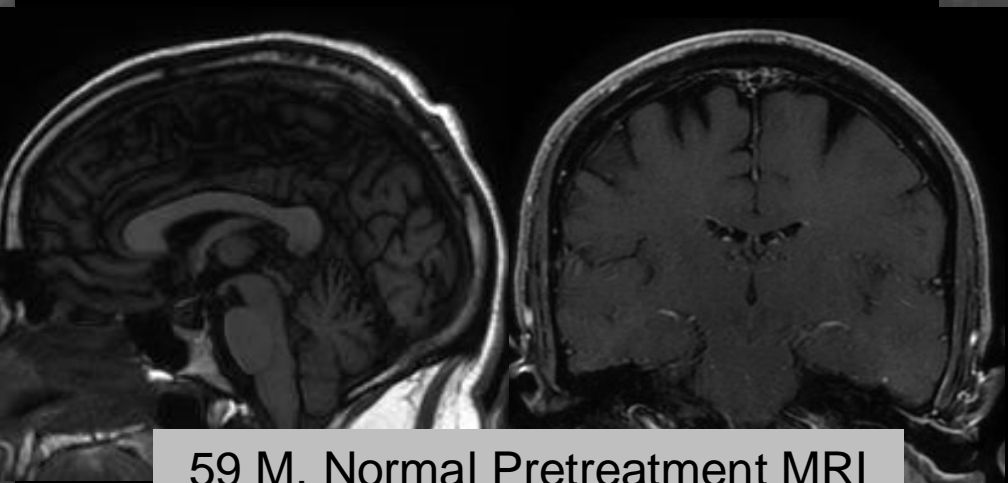
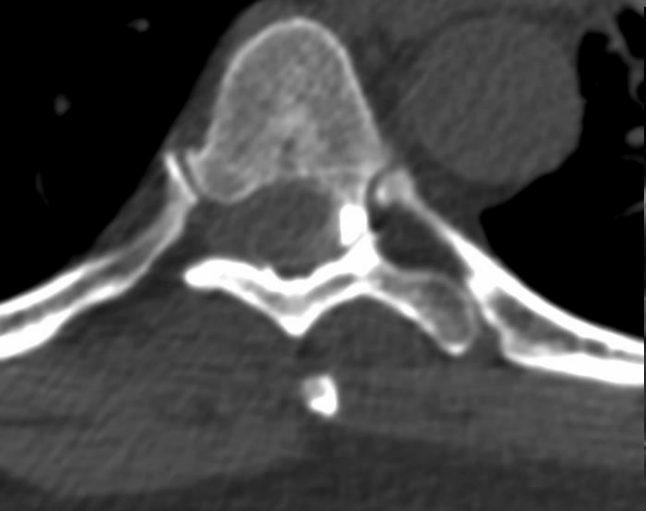
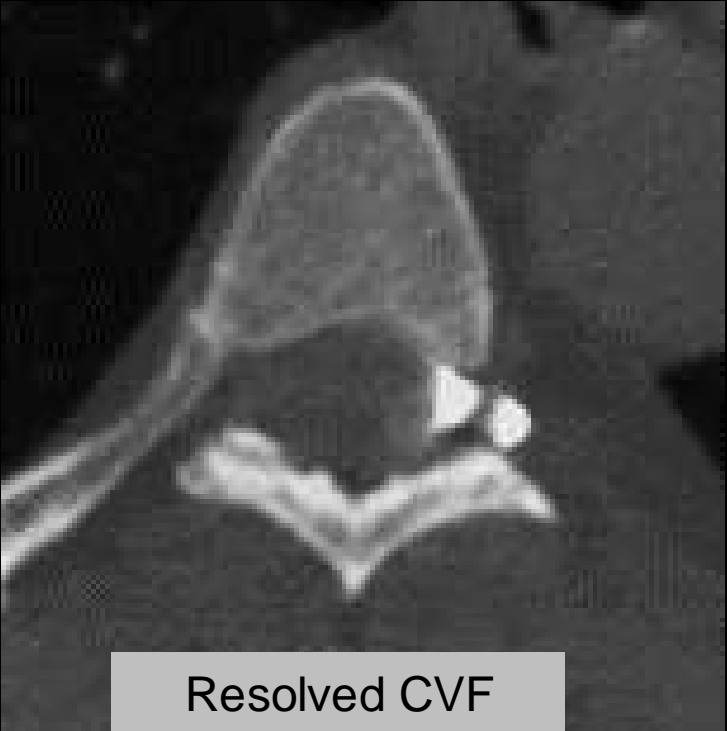
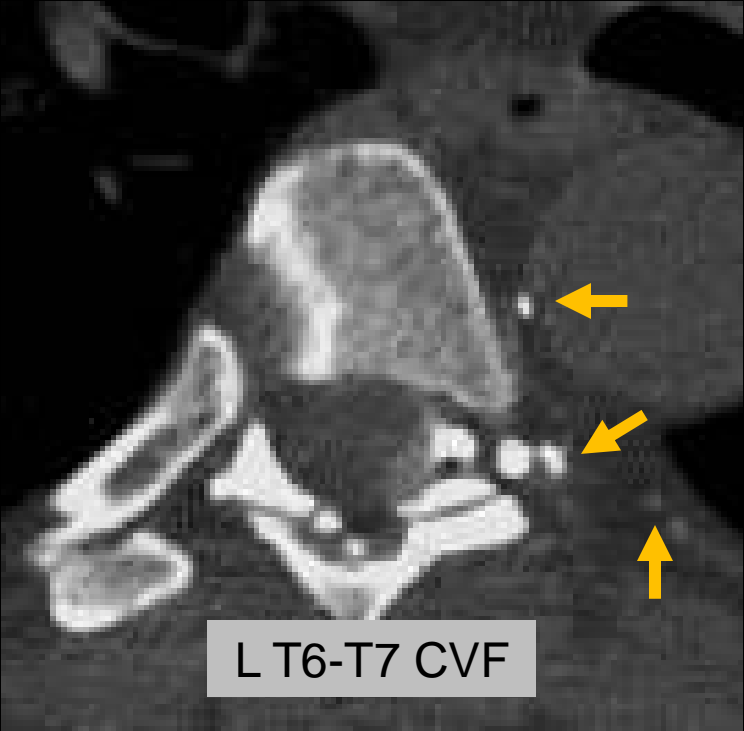


# CVF Fibrin Glue Occlusion: Targeting Cyst-Vein Junction

CTM

Glue

Posttreatment CTM

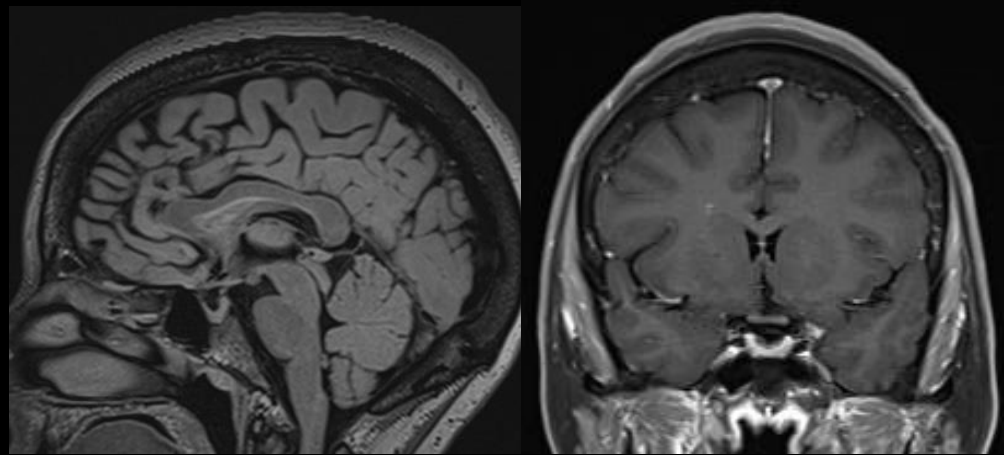
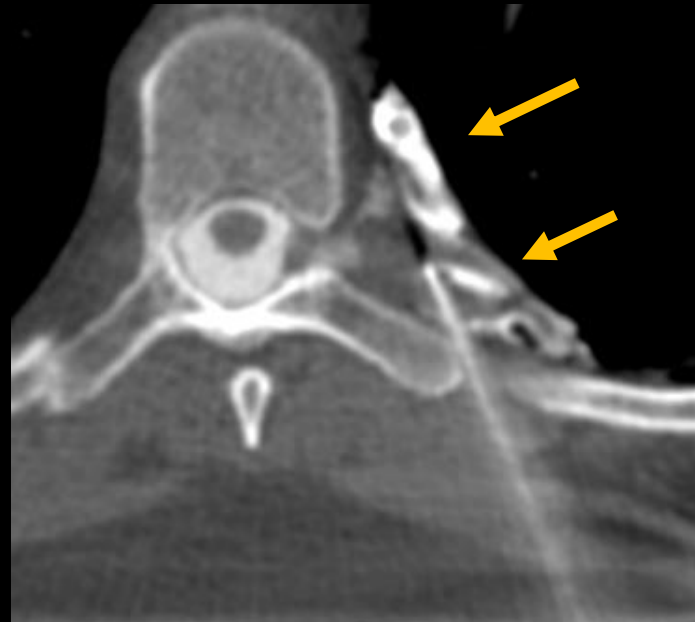
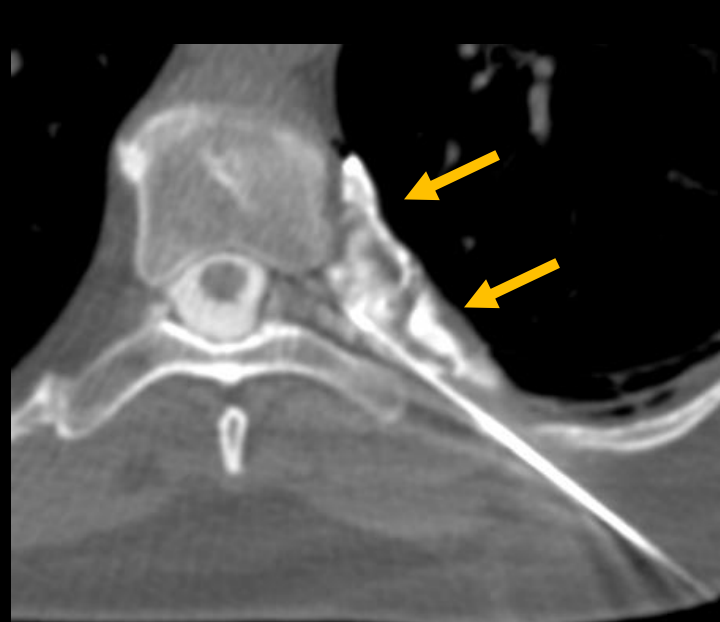
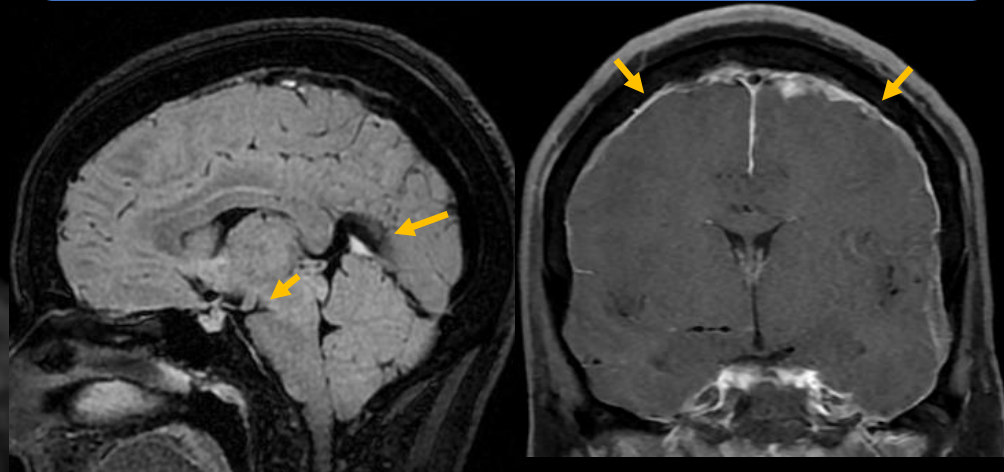
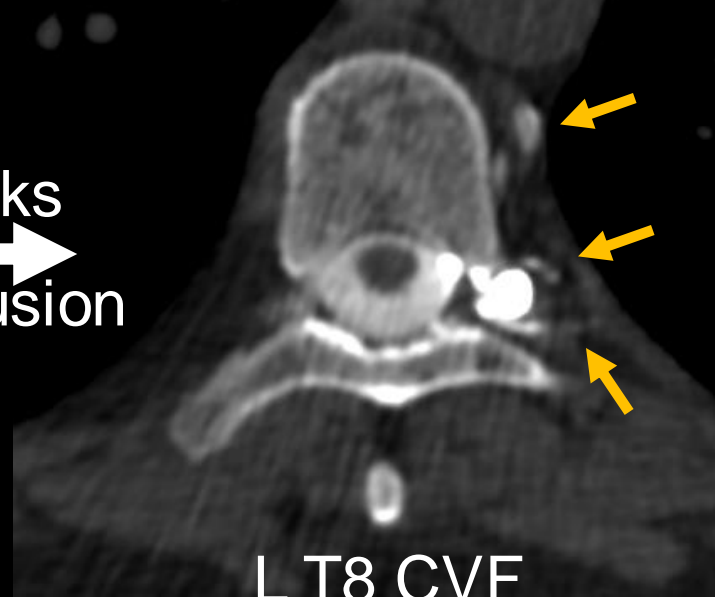


# CVF Fibrin Glue Occlusion: "Wall" Technique

50F, 2 prior treated CVFs



2 weeks  
saline infusion



2-needle "wall approach"

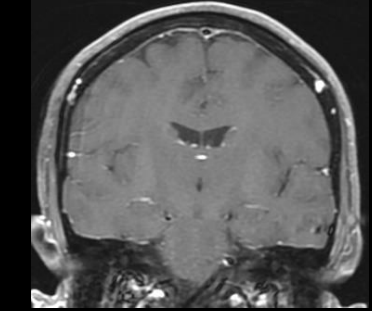
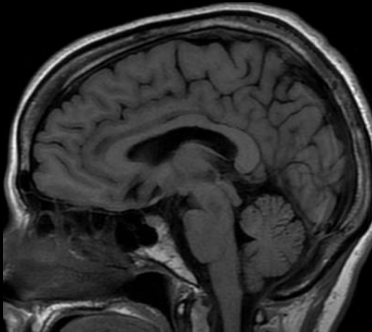
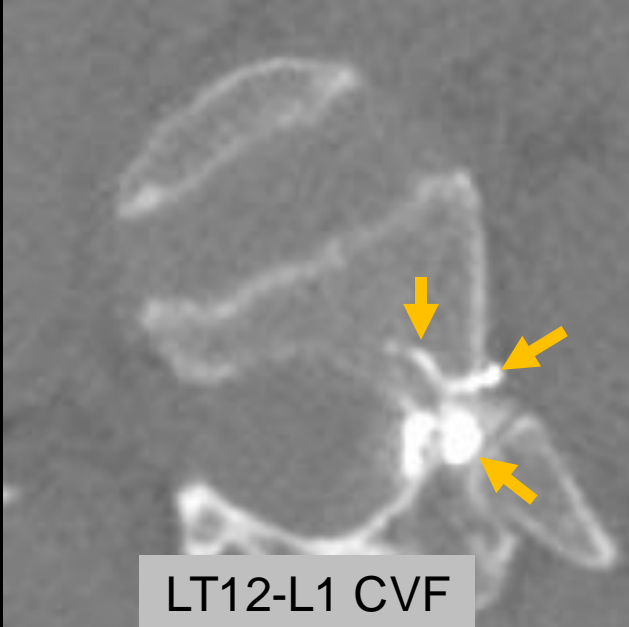
Posttreatment (1 month)

# CVF Fibrin Glue Occlusion: Direct Cyst Puncture

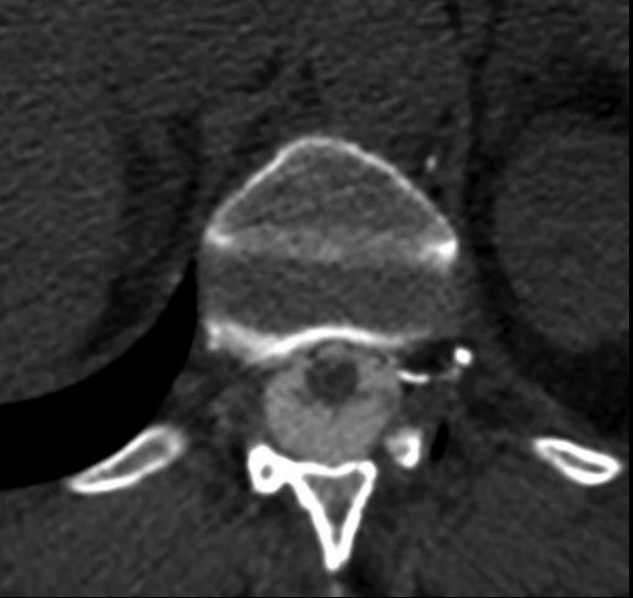
CTM

Glue

Posttreatment CTM



64F, h/o spinal leaks, normal pretreatment MRI



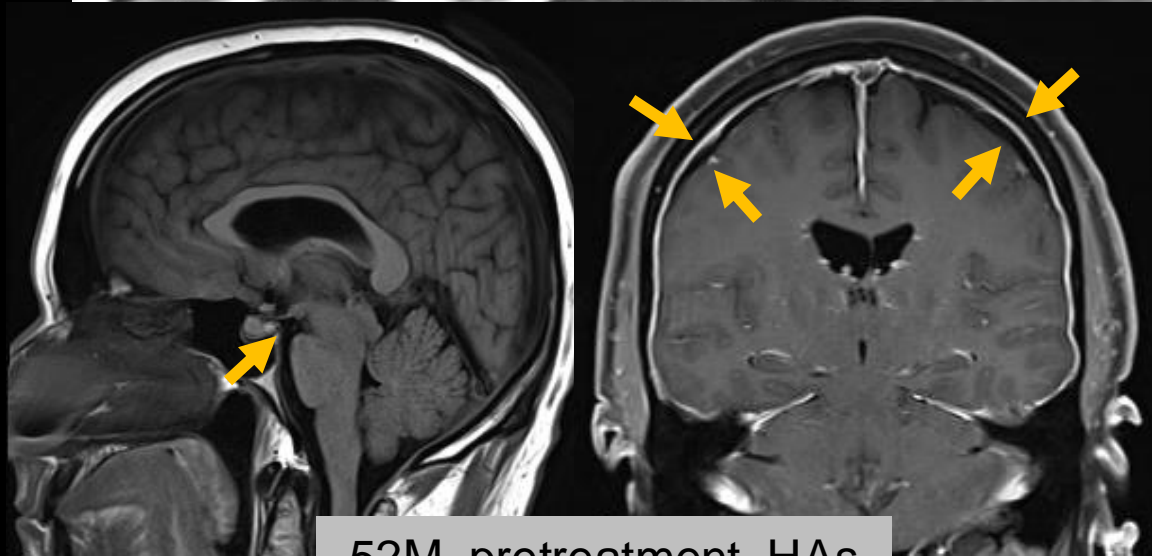
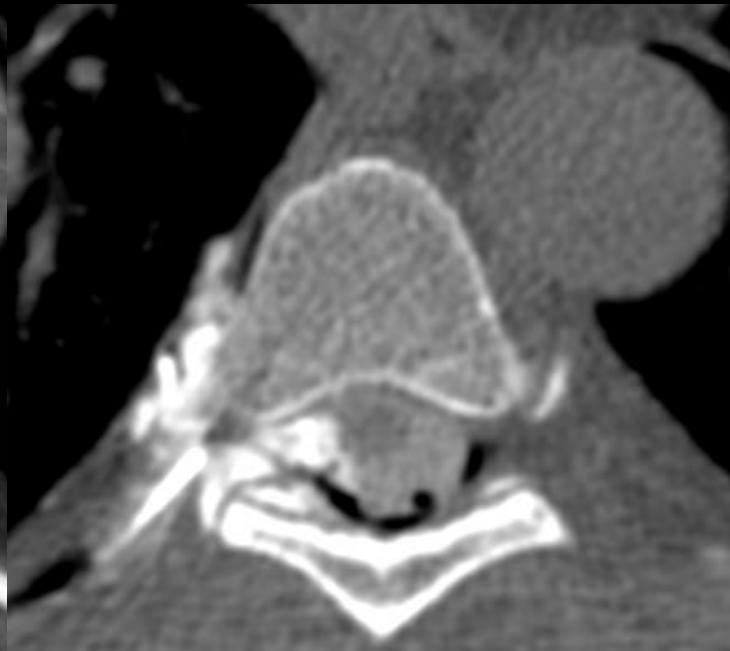
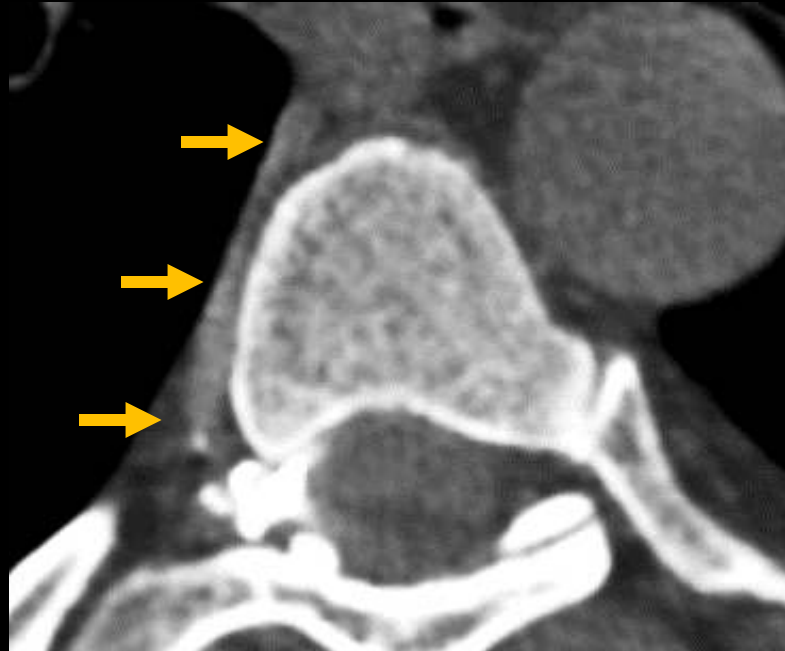


# CVF Fibrin Glue: Incomplete Treatment after 3 attempts

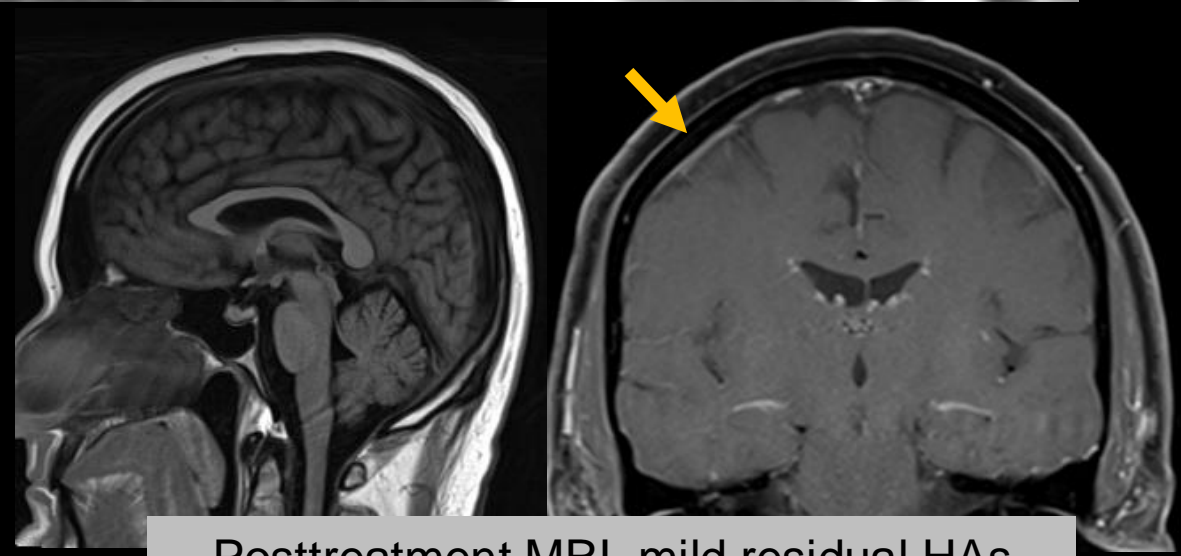
Pretreatment CTM

Glue Patch

Post treatment CTM



52M, pretreatment, HAs



Posttreatment MRI, mild residual HAs

# Data on CVF Glue Patching

## Factors Predictive of Treatment Success in CT-Guided Fibrin Occlusion of CSF-Venous Fistulas: A Multicenter Retrospective Cross-Sectional Study

2023

 Andrew L. Callen,  Lalani Carlton Jones,  Vincent M. Timpone,  Jack Pattee,  Daniel J. Scoffings,  David Butteriss,  Thien Huynh,  Peter Y. Shen, and  Mark D. Mamlouk

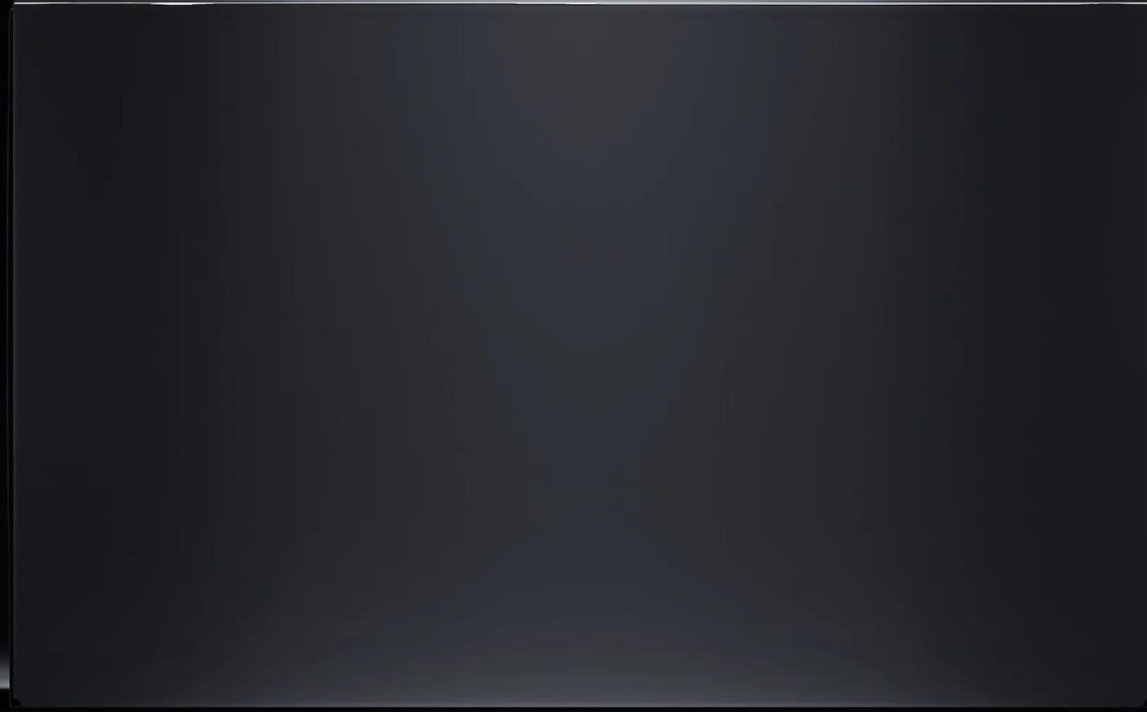
### Clinical Improvement

- 59.7% complete
- 34.5% partial
- 5.9% none

### Statistically Significant

Injectate spread & CVF drainage pattern

# The Fibrin Black Box...





# Our Glue Experience

No fibrin glue allergic reactions in CVP Tx in 100s of attempts

Intravascular glue probably ok for small draining veins

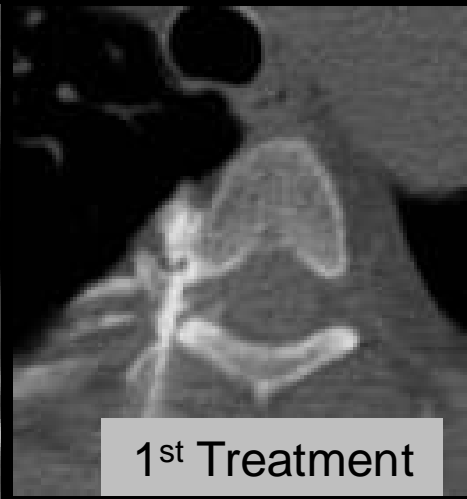
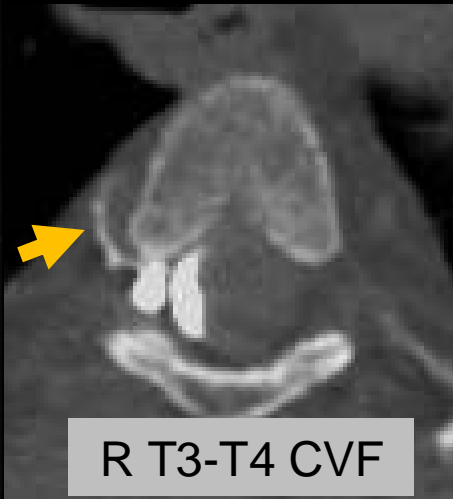
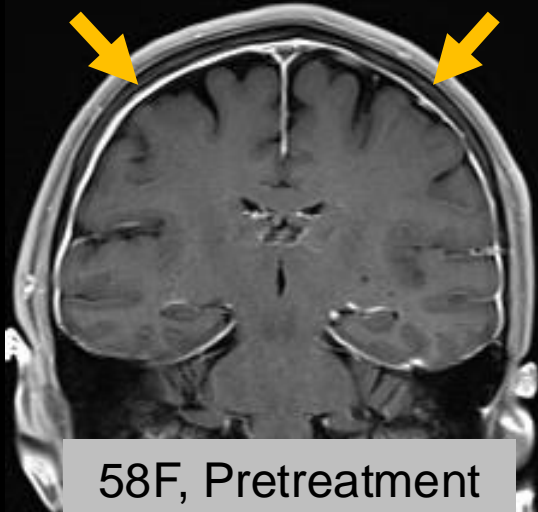
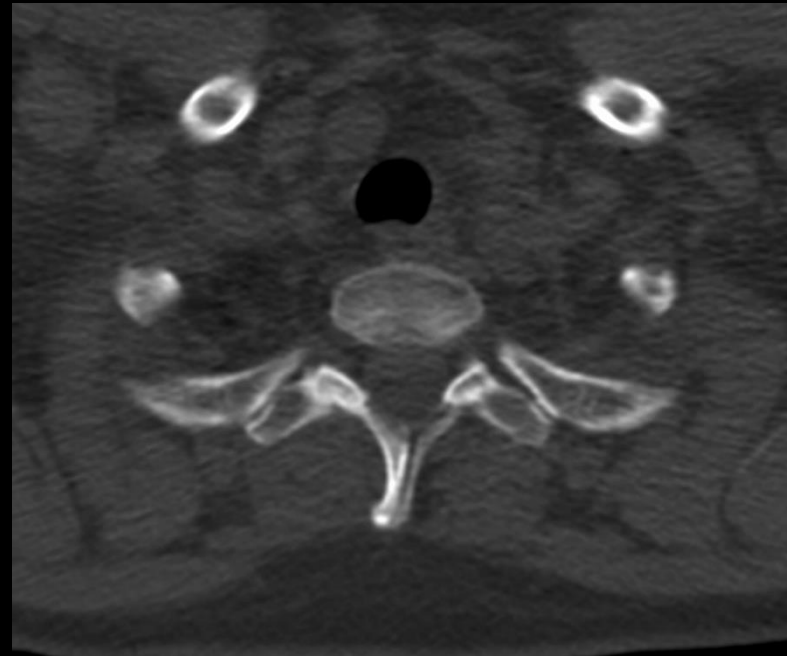
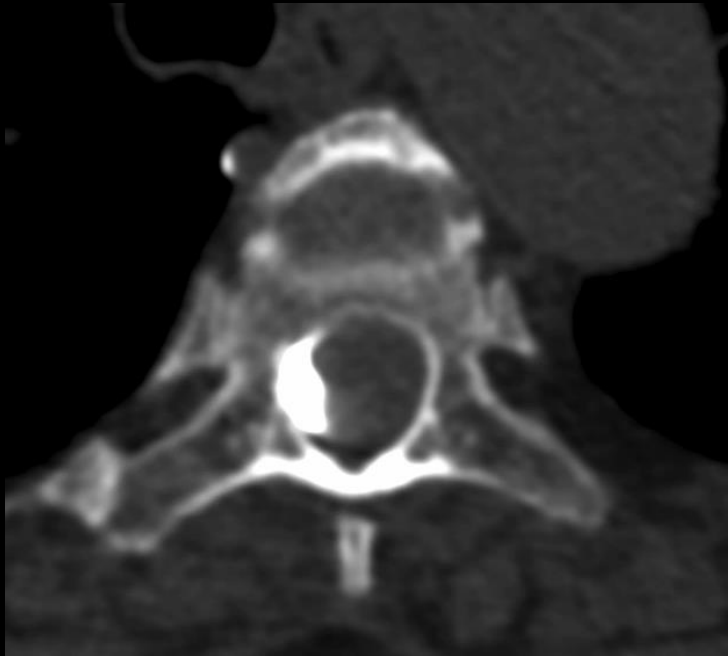
Extrinsic compression preferred for large draining veins for better occlusion & safety

# CVF Fibrin Glue Occlusion: Be Mindful of Big Veins

CTM

1<sup>st</sup> Treatment: PE

2<sup>nd</sup> Treatment:

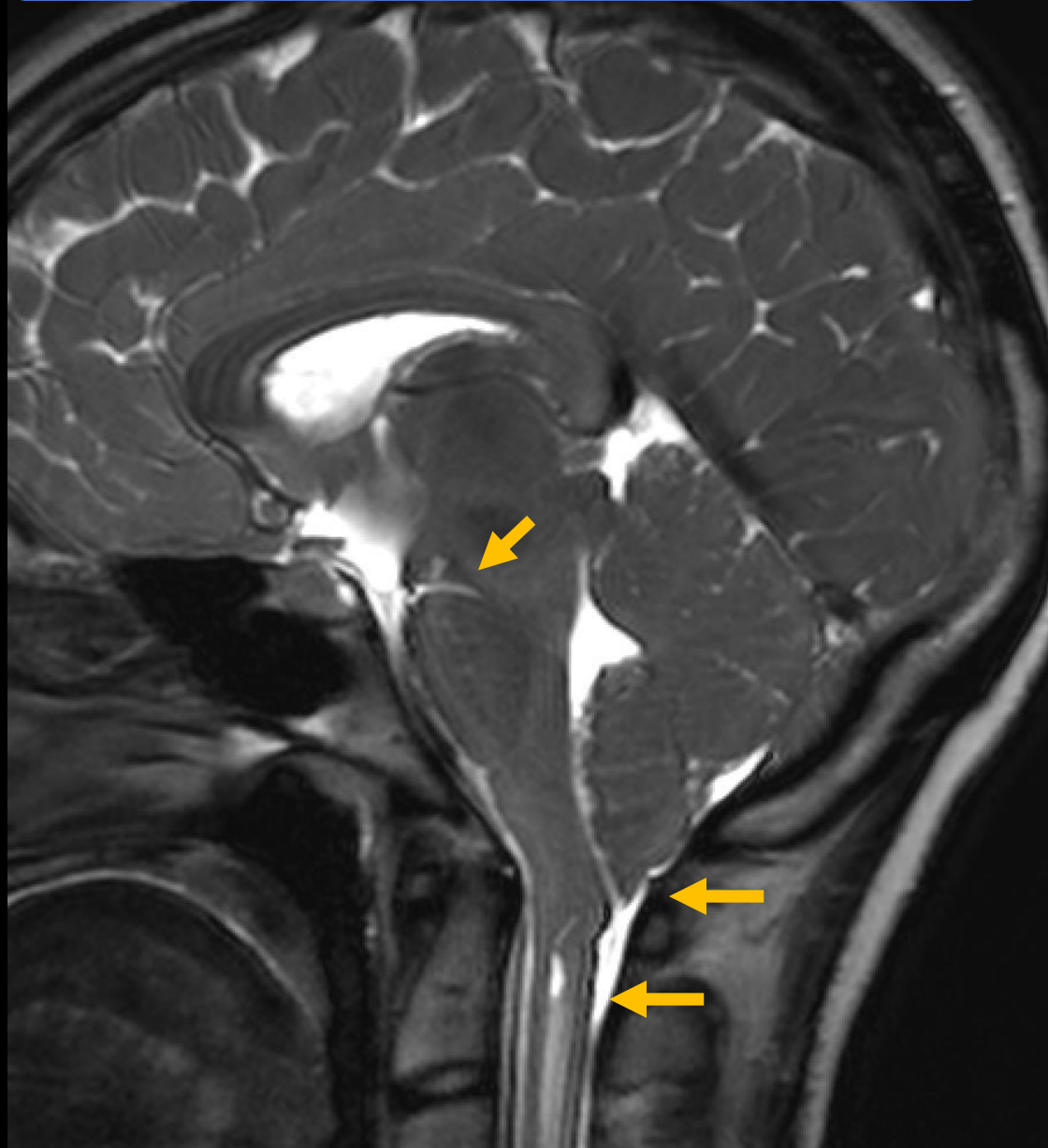




# Other Glue Patching Indications

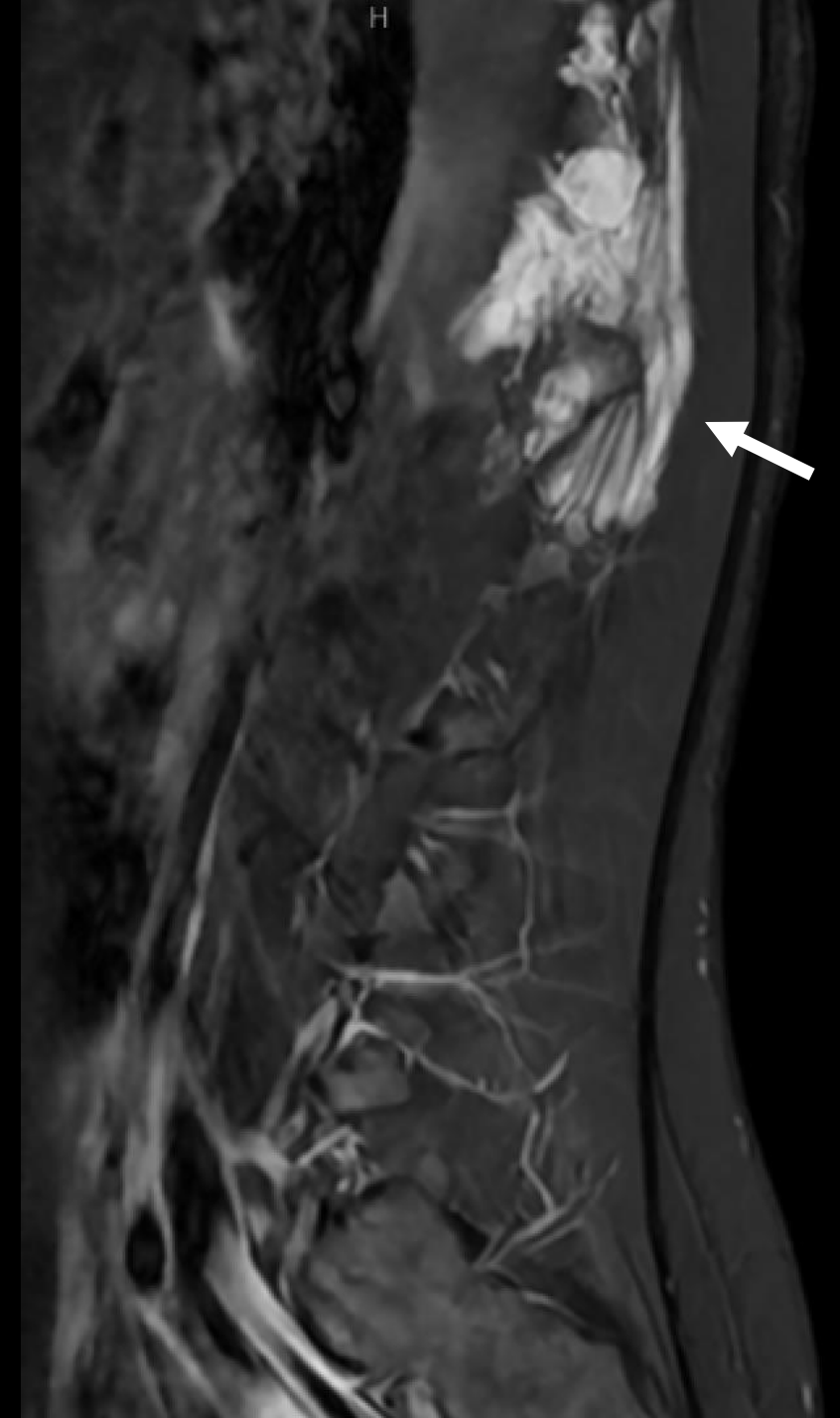
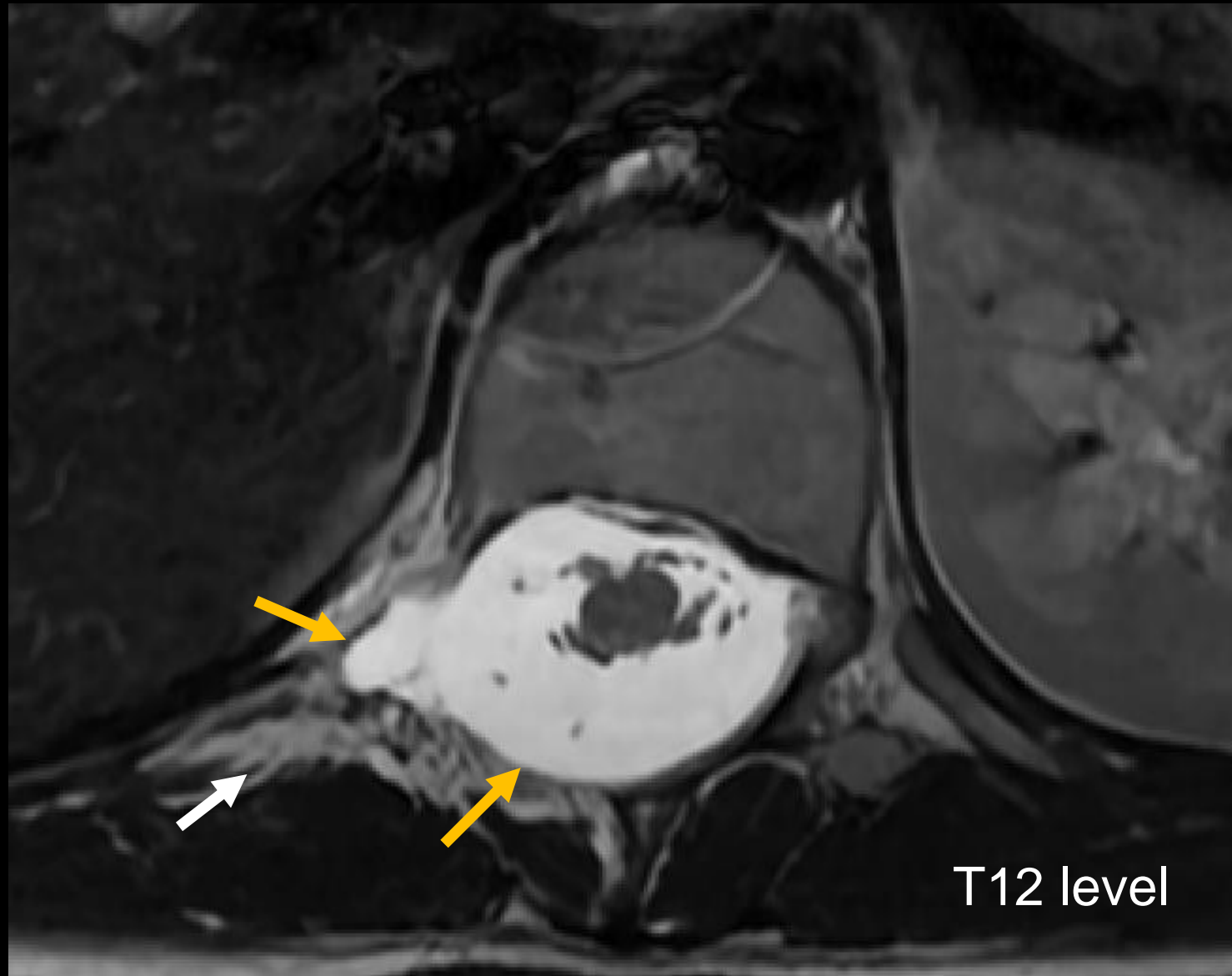


23F, HAs, "Chiari" evaluation





# Recent Outside Spine MRI



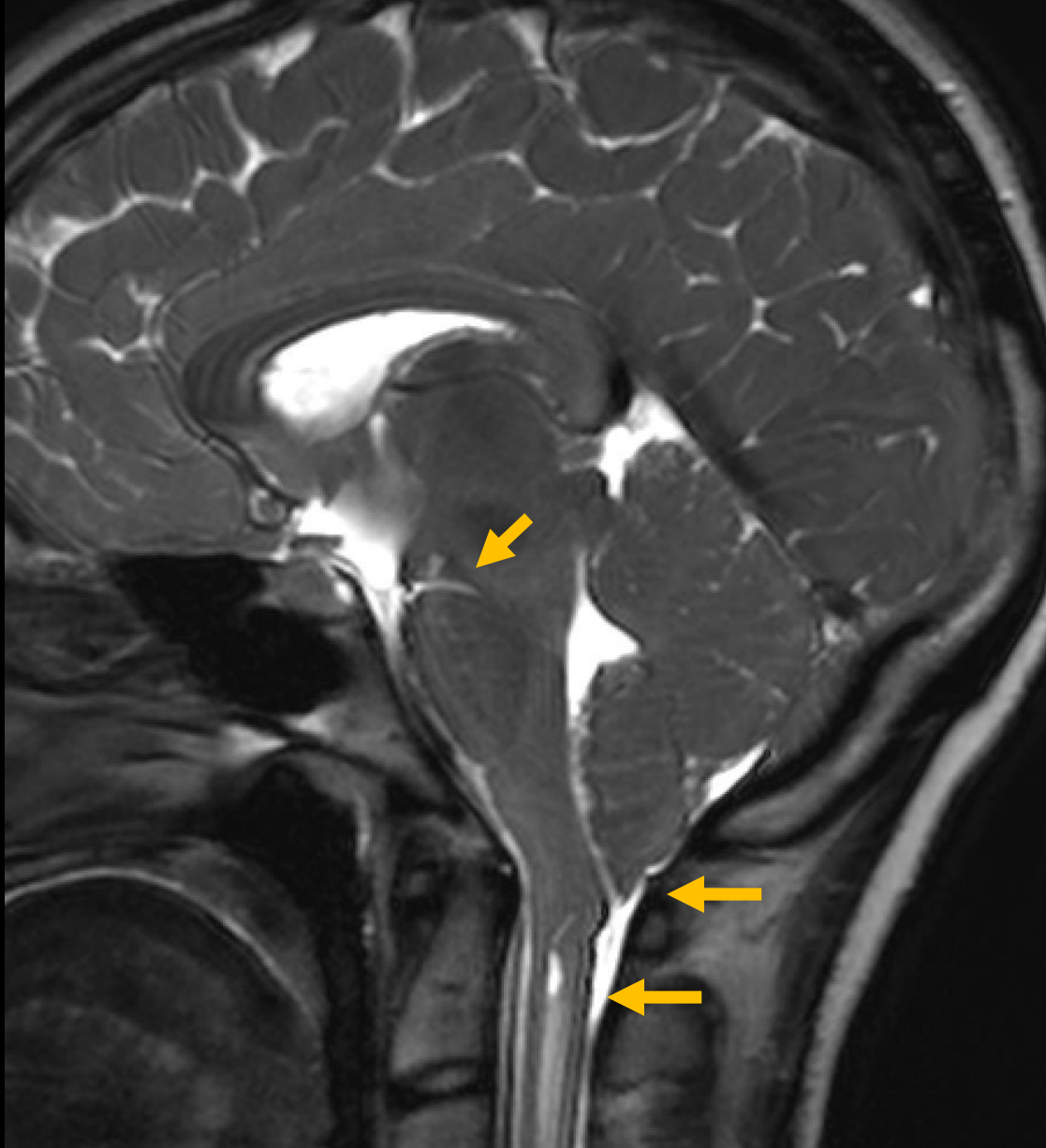
MRI 22 years prior

“Epidural hematoma or hemangioma”





23F, HAs, "Chiari" evaluation



Impression:  
Imaging findings concerning for  
SIH from a venous malformation  
fistula. Recommend right  
decubitus CT myelogram

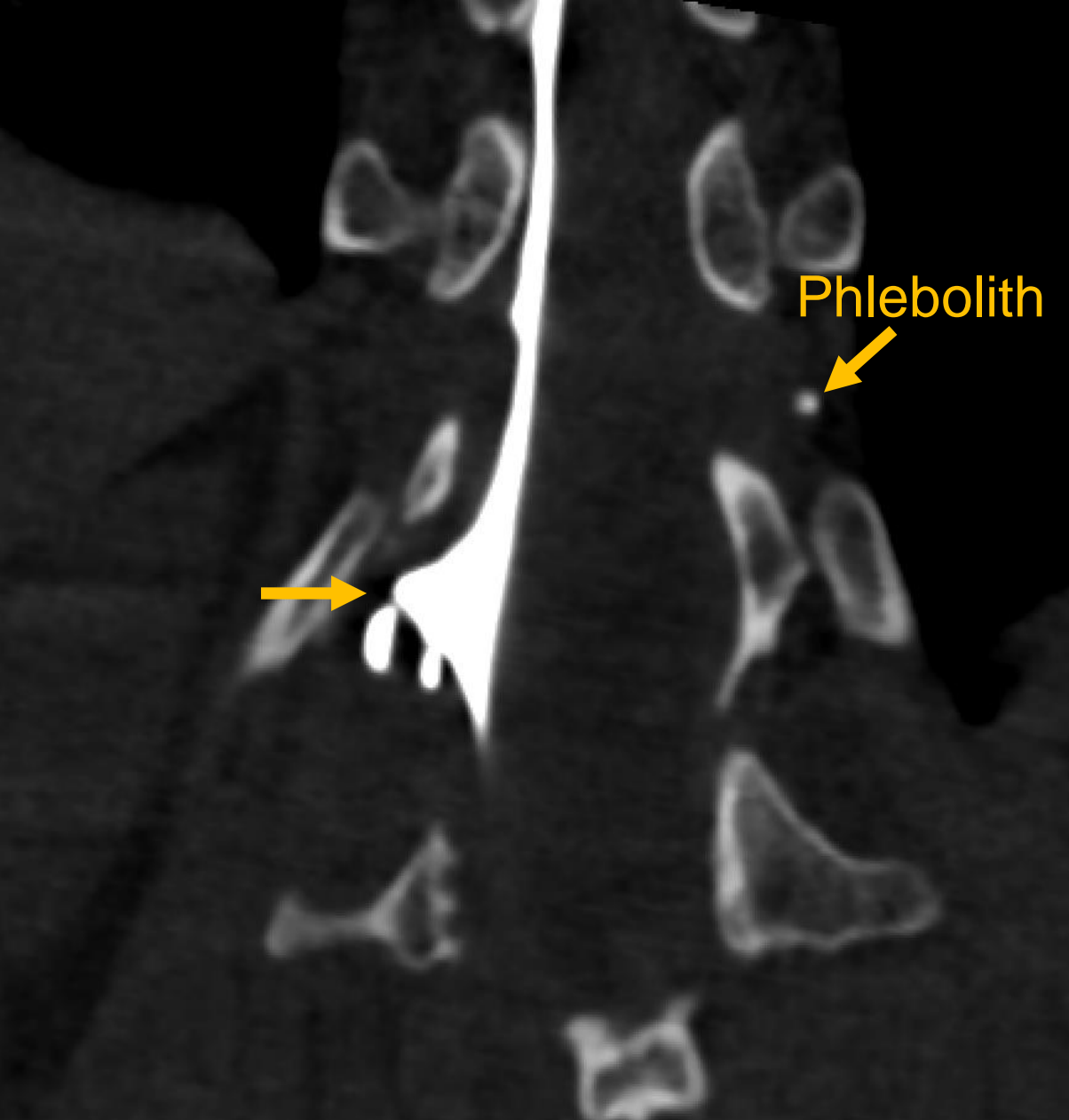
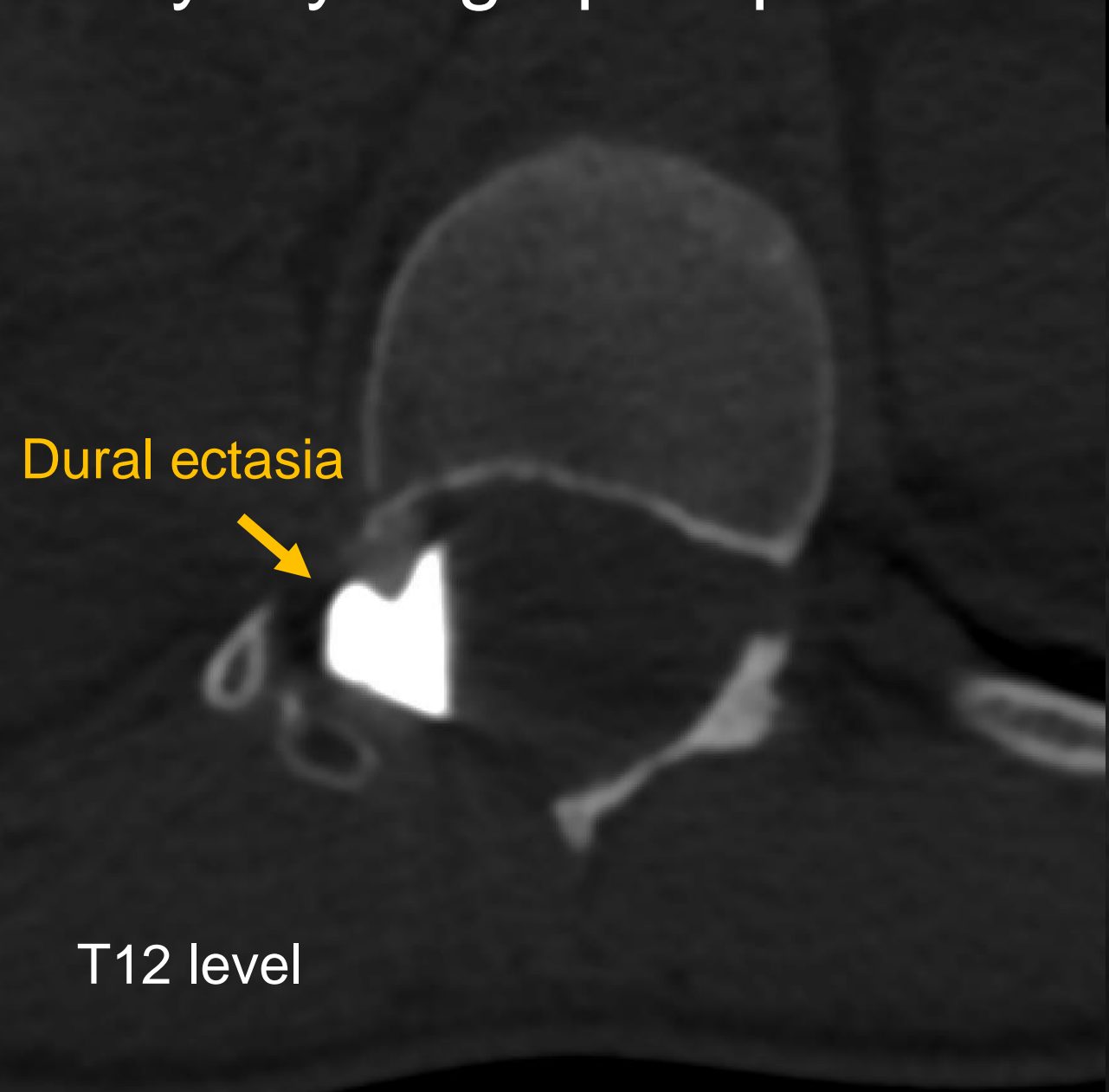
# Early myelographic phase

Dural ectasia

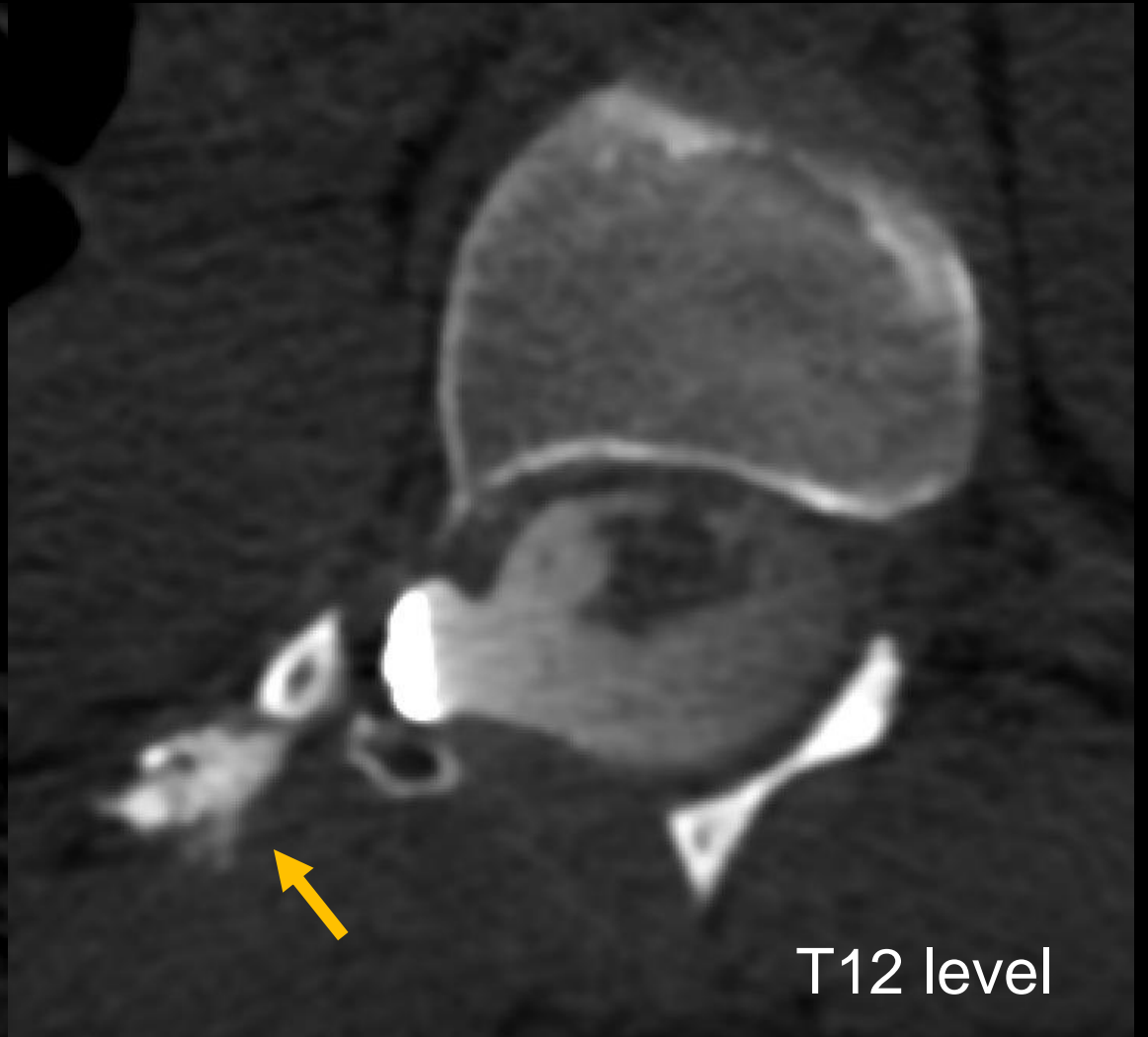
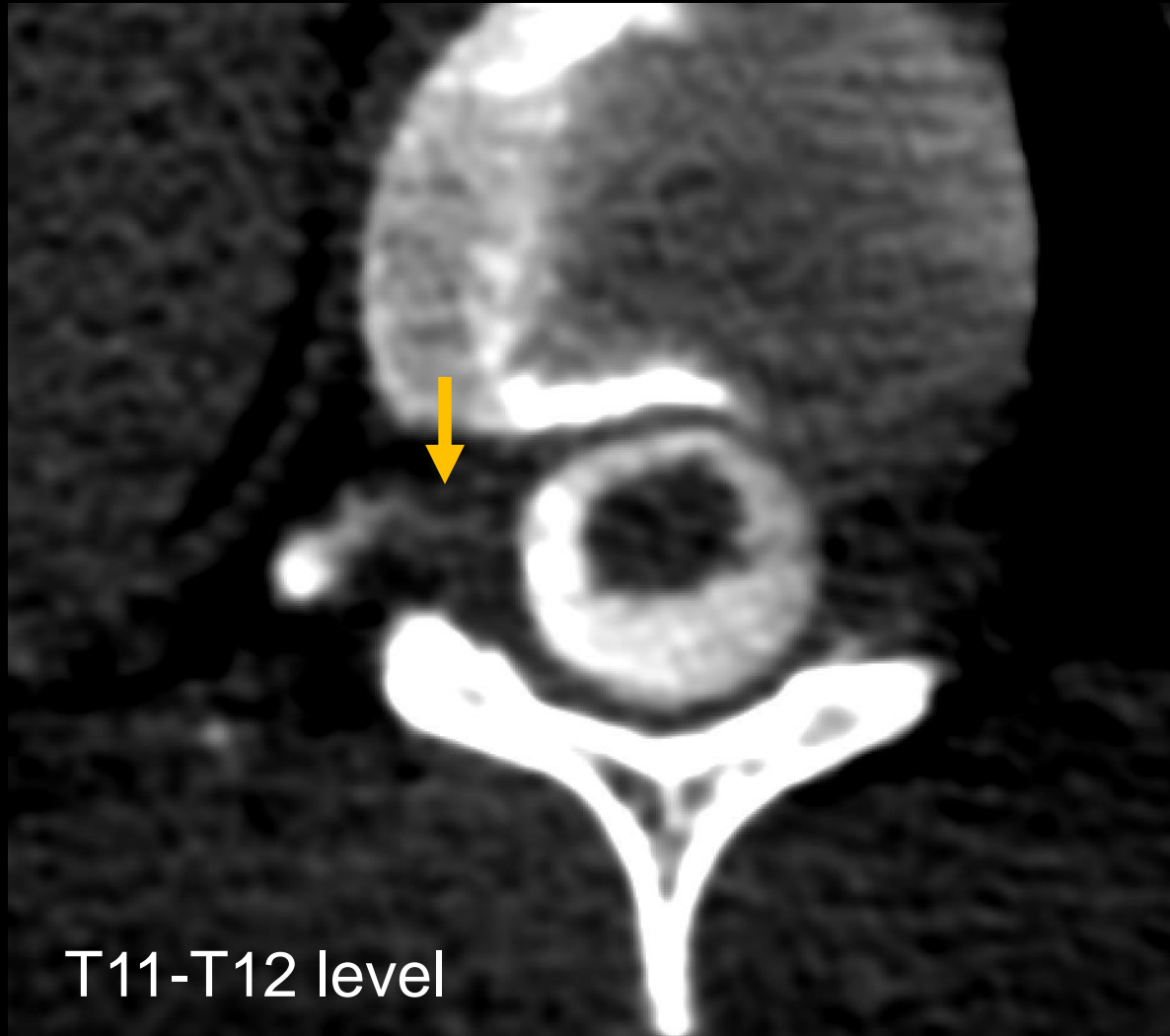


T12 level

Phlebolith



# Delayed myelographic phase



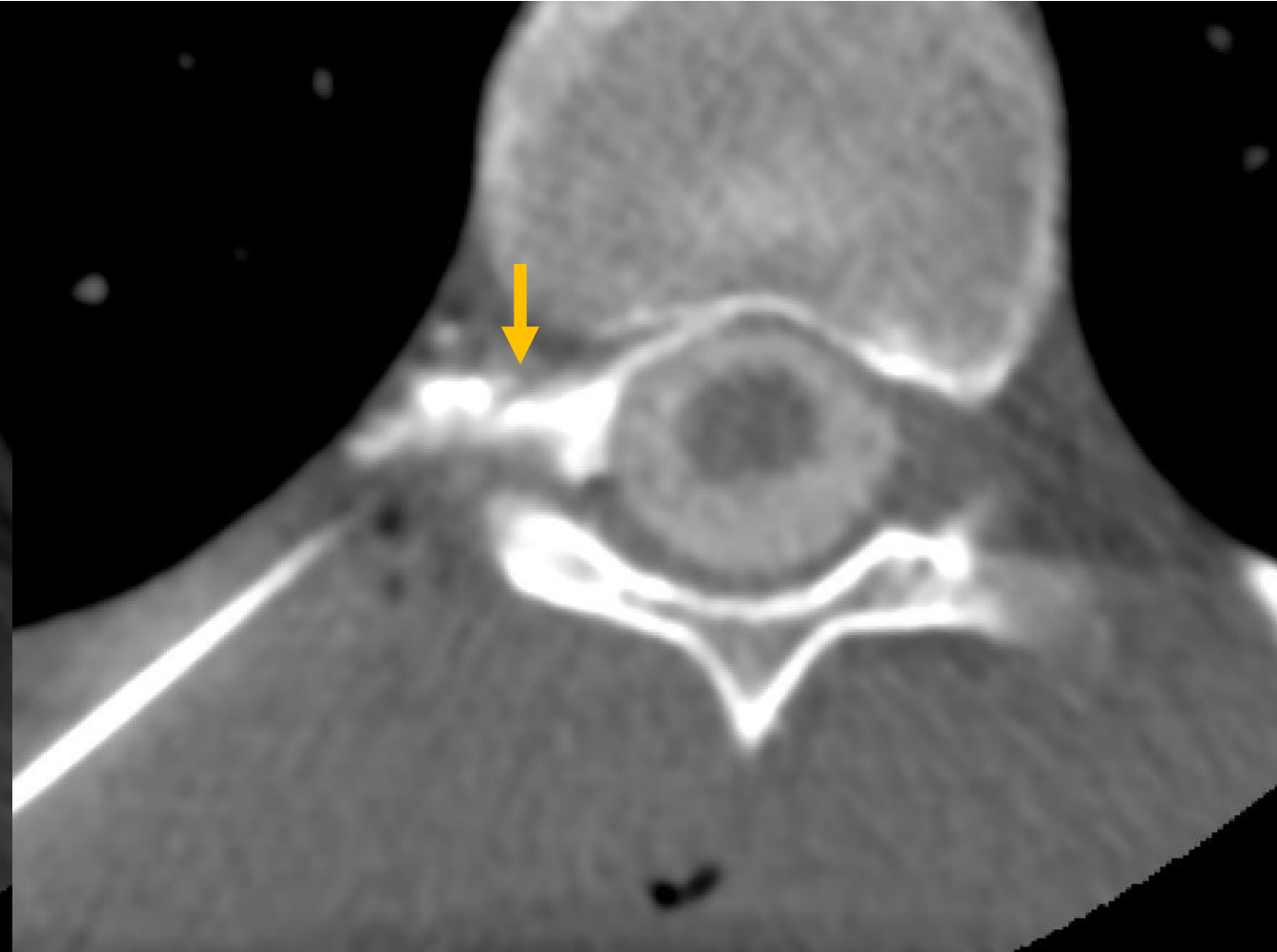
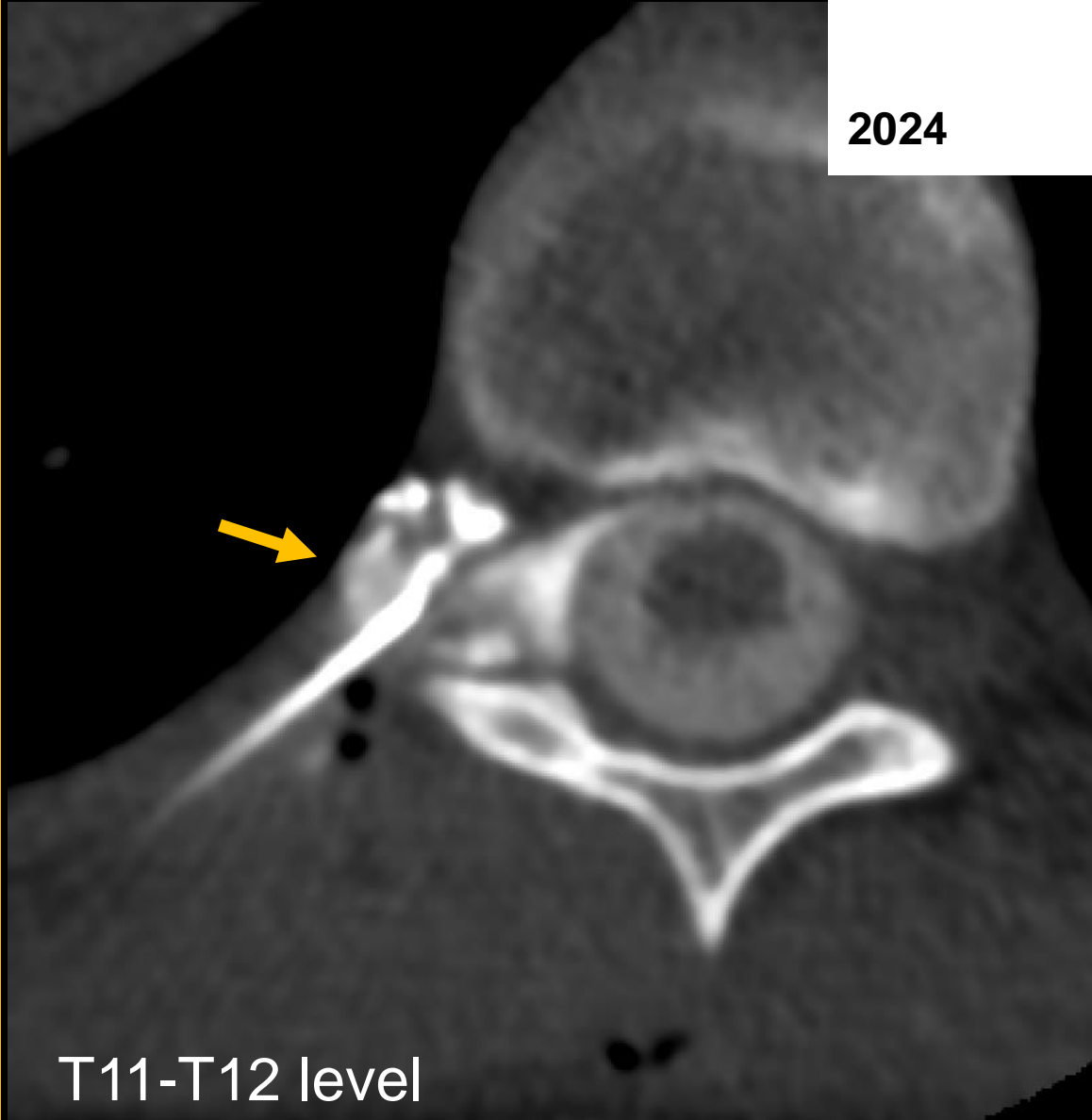
**CSF-Venous Malformation Fistula**

# Fibrin Glue Patch

## Spontaneous Intracranial Hypotension Associated With Vascular Malformations

2024

Mark D. Mamlouk, Adriana Gutierrez, William P. Dillon



Glue within CSF-VM fistula





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