

# Building Excellence: Quality Assurance & Error Reduction

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vRad

No Financial Disclosures.

# vRad QA Program

- 6-7 million cases annually
- 80% Finals/20% Prelim
- 1-2% of all Finals are Peer Reviewed

# Case identification

## Clients/facilities

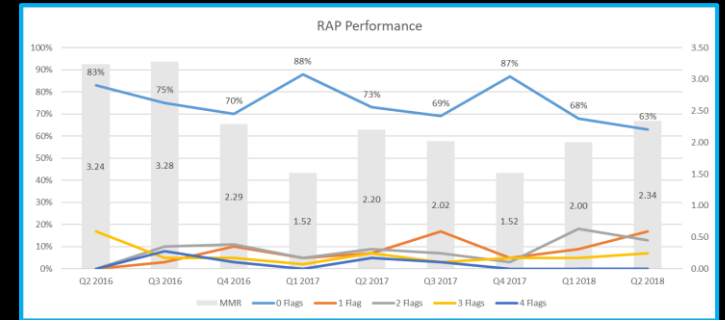
## Internal peer review, includes AI

## Radiologist Advisor Program (RAP)- iFPPE

**Quality Report - Finals**  
(Client Submitted and vRad Internal Review)  
 VEC Training Hospital  
 Date Range: 3/1/2014 to 6/30/2014  
 Date Generated: 6/23/2014

Month	Total Final Studies Head (Base Value)	Total Client Submitted Discrepancies Reviewed	Total vRad Internal Review of Finals	No Discrepancy	Slight discrepancy with no effect on patient care	Minor discrepancy with no effect on patient care	Minor discrepancy with effect or possible effect on patient care	Major discrepancy	Minor discrepancy with effect or possible effect on patient care percentage	Minor discrepancy with effect or possible effect on patient care percentage	Major discrepancy percentage
Mar 2014	0.0	0	0	0	0	0	0	0	0.000%	0.000%	0.000%
Apr 2014	0.0	0	0	0	0	0	0	0	0.000%	0.000%	0.000%
May 2014	0.0	0	0	0	0	0	0	0	0.000%	0.000%	0.000%
Jun 2014	0.0	0	0	0	0	0	0	0	0.000%	0.000%	0.000%
Total	0.0	0	0	0	0	0	0	0	0.000%	0.000%	0.000%

Year	VC	Quarter Of Year	VC	QA Created By	Final Studies	QA Request Count	QA Major Discrepancy Case Count	QA No Discrepancy Case Count	% Reviewed	MMR	Total Miss Rate
2011	Q1	Auto	233,622	3,704	6	3,539	1,596	1,448	3.51%		
2011	Q2	Auto	323,813	3,782	9	3,649	1,176	2,38	3.55%		
2011	Q3	Auto	364,497	4,573	22	4,420	1,256	4.81	3.85%		
2011	Q4	Auto	356,886	5,012	16	4,866	1,408	3.19	2.91%		
2012	Q1	Auto	380,150	3,845	7	3,740	1,018	1.82	2.21%		
2012	Q2	Auto	397,383	5,609	16	5,483	1,415	2.85	2.24%		
2012	Q3	Auto	421,428	5,981	22	5,833	1,426	3.59	2.48%		
2012	Q4	Auto	392,232	5,638	15	5,461	1,446	2.66	3.15%		
2013	Q1	Auto	376,868	5,384	19	5,248	1,438	3.44	2.60%		
2013	Q2	Auto	392,481	5,646	18	5,537	1,444	3.19	1.94%		
2013	Q3	Auto	393,178	5,678	22	5,563	1,444	3.87	2.05%		
2013	Q4	Auto	378,512	5,982	17	5,907	1,428	3.36	1.46%		
2014	Q1	Auto	400,022	5,953	13	5,774	1,465	2.14	1.35%		
2014	Q2	Auto	423,000	5,274	9	5,208	1,356	1.71	1.26%		
2014	Q3	Auto	428,873	950	4	936	0.226	4.21	1.53%		
2014	Q4	Auto	433,159	5,605	12	5,528	1,296	2.14	1.39%		
2015	Q1	Auto	471,257	4,610	9	4,545	0.986	1.85	1.41%		
2015	Q2	Auto	509,495	6,296	20	6,216	1,266	3.18	1.27%		
2015	Q3	Auto	583,188	8,817	21	8,735	1,551	2.38	0.91%		
2015	Q4	Auto	621,350	7,854	18	7,760	1,266	1.60	0.94%		
2016	Q1	Auto	712,000	8,999	11	8,289	1,188	1.31	1.31%		
2016	Q2	Auto	747,881	7,855	13	7,743	1,058	1.59	1.17%		
2016	Q3	Auto	731,653	8,511	24	8,399	1,168	2.82	1.32%		
2016	Q4	Auto	788,672	7,848	10	7,788	0.995	1.21	0.76%		
2017	Q1	Auto	817,889	6,958	14	6,893	0.858	2.01	0.94%		
2017	Q2	Auto	819,243	9,275	21	9,185	1,136	2.21	0.97%		
2017	Q3	Auto	865,760	9,516	22	9,445	1,106	2.31	0.75%		
2017	Q4	Auto	912,178	9,702	12	9,653	1,065	1.23	0.65%		
2018	Q1	Auto	992,616	9,143	18	9,049	0.926	1.97	1.03%		
2018	Q2	Auto	1,039,499	8,527	20	8,411	0.826	2.35	1.17%		



## Pathology High to Low- ALL QA

Fracture, Dislocation, Subluxation or Listhesis

PE or Pulmonary Embolus

Cyst Mass Nodule Adenopathy

Arterial Dissection, Stenosis, Thrombus or Occlusion, non-Aortic

Administrative

Hematoma Hemorrhage or Extravasation

Pneumothorax

Ischemia, Infarct (incl Torsion or Necrosis)

Abscess, Fluid or Fluid Collection

Urinary Stone or Obstruction

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# Error Reduction Strategies

## ✓ **SEARCH PATTERN**

✓ Symmetry/Asymmetry

✓ Measure ALL Fluid Density

✓ Take Breaks

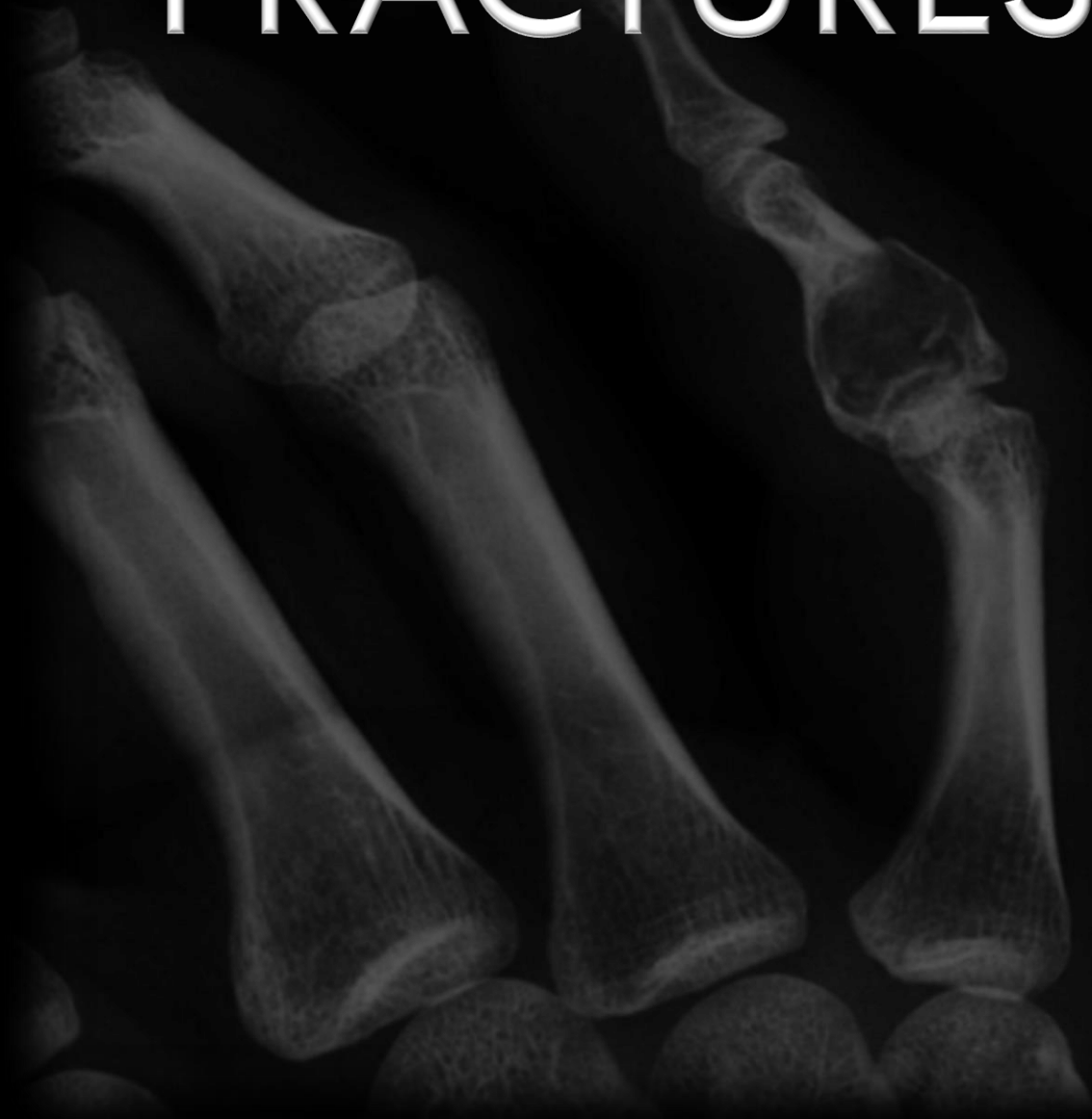
✓ Structured Reports

✓ Minimize Distractions

✓ *Use ALL available information  
(Priors, clinical hx, MPRs, MIPs)*

✓ Continuing Education

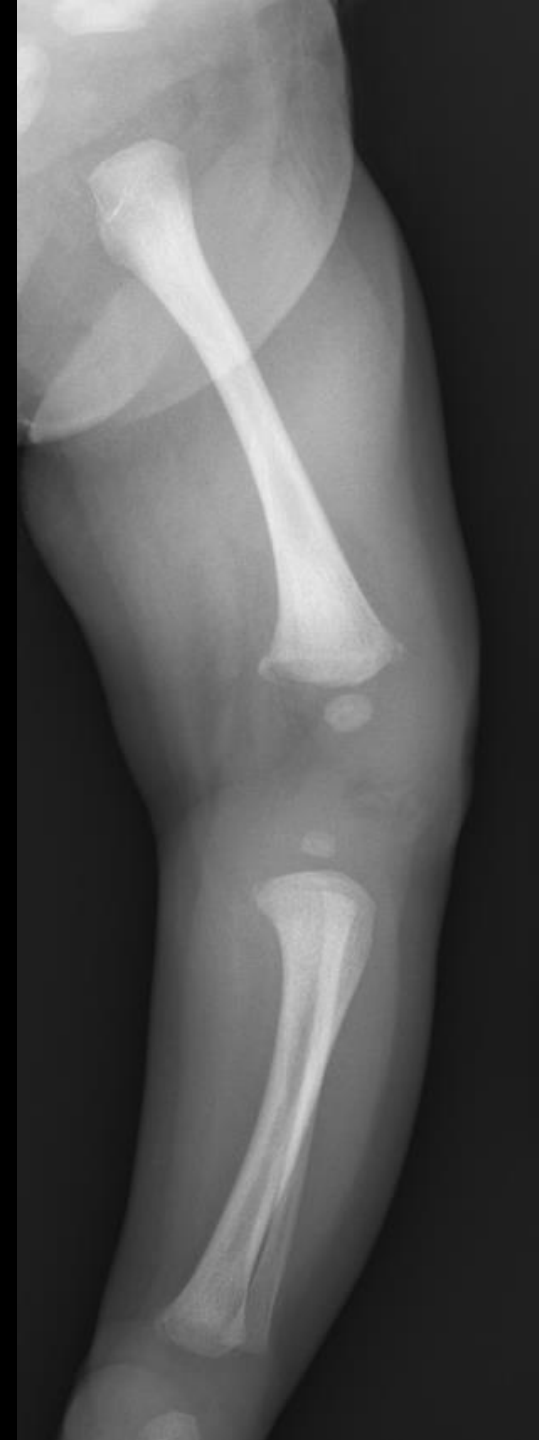
# FRACTURES





2 week-old male infant

Loss of lower extremity  
movement







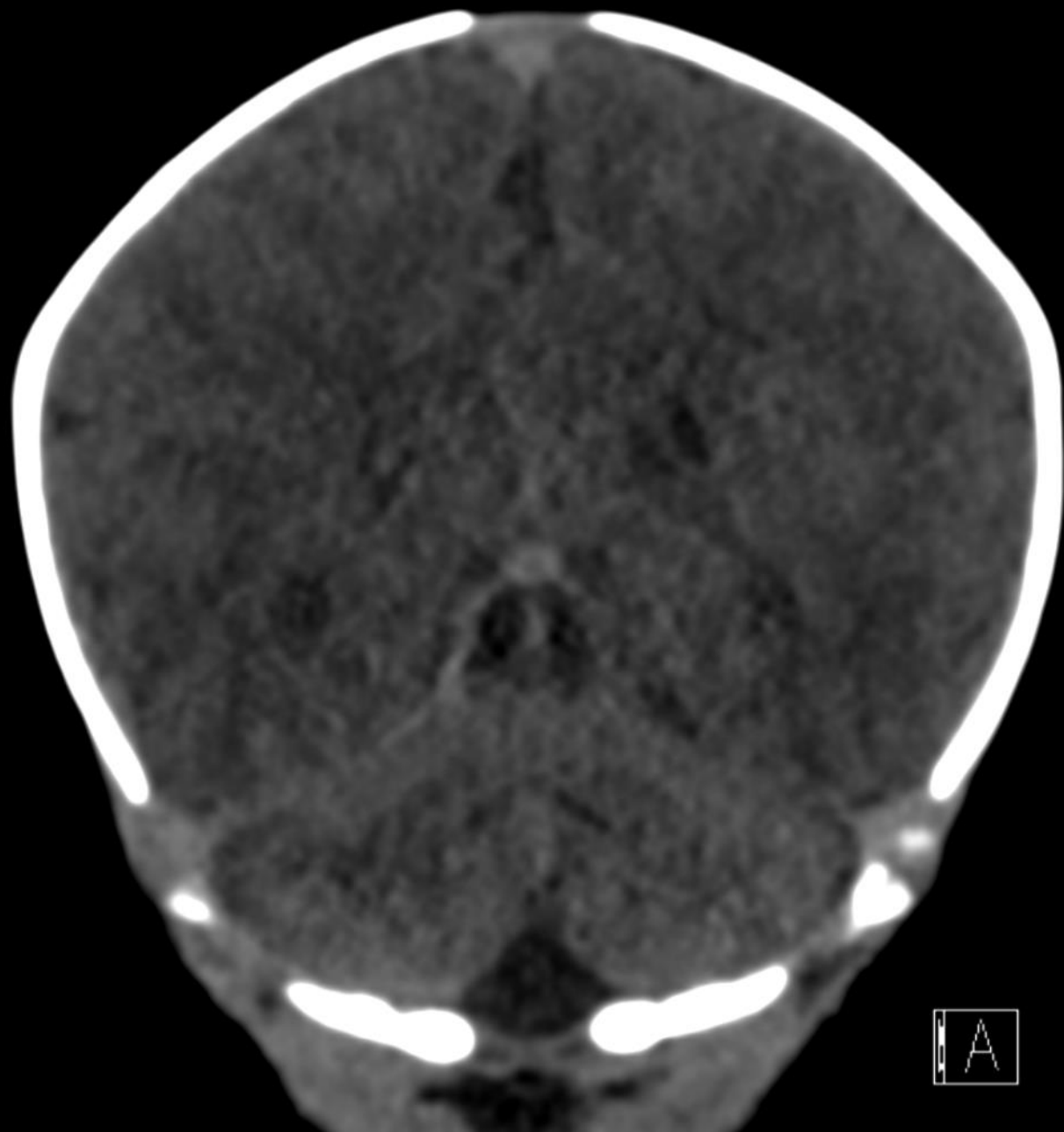
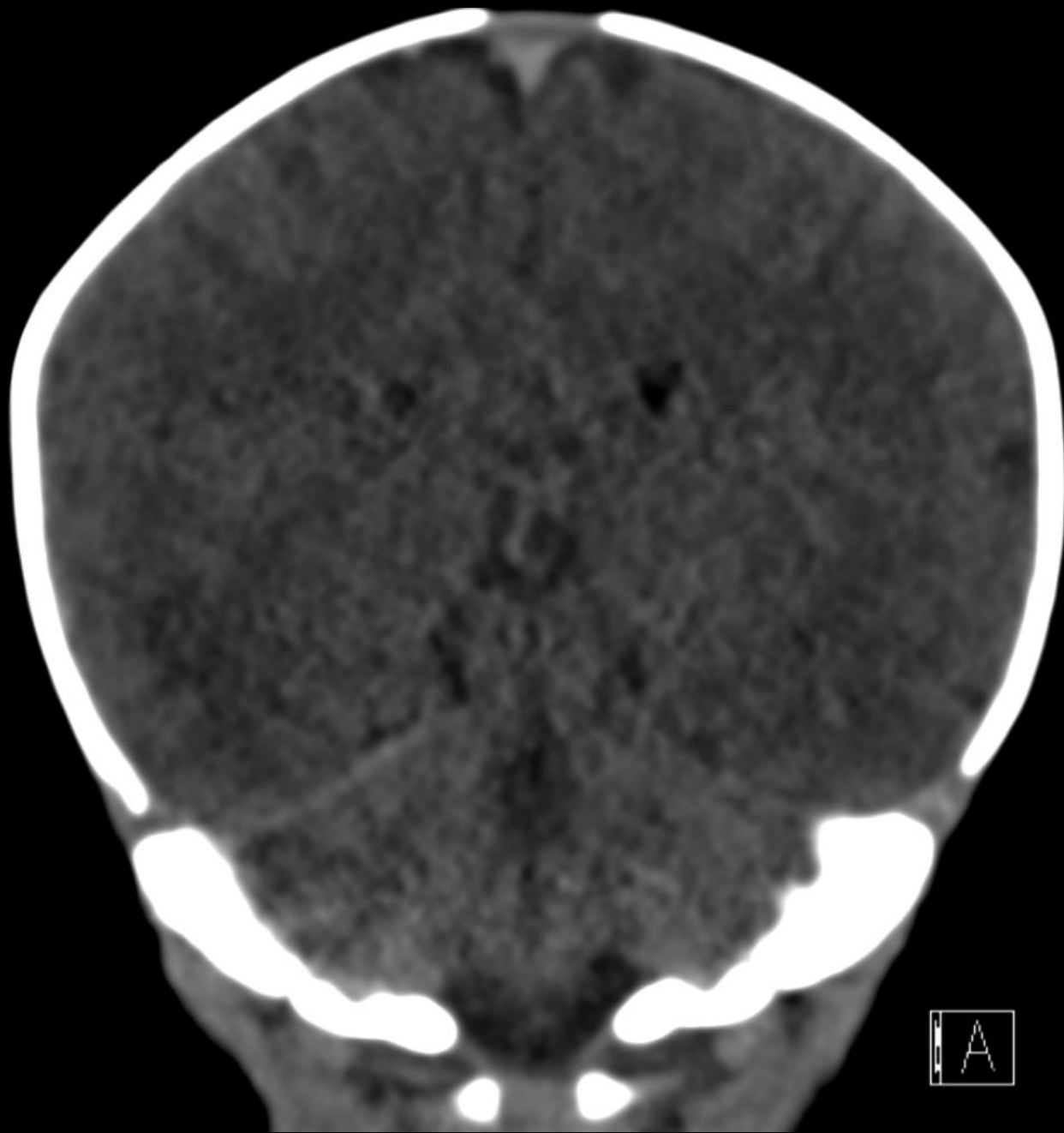
Non-ambulatory Infant

Metaphyseal Corner Fractures

Non-Accidental Trauma (NAT)

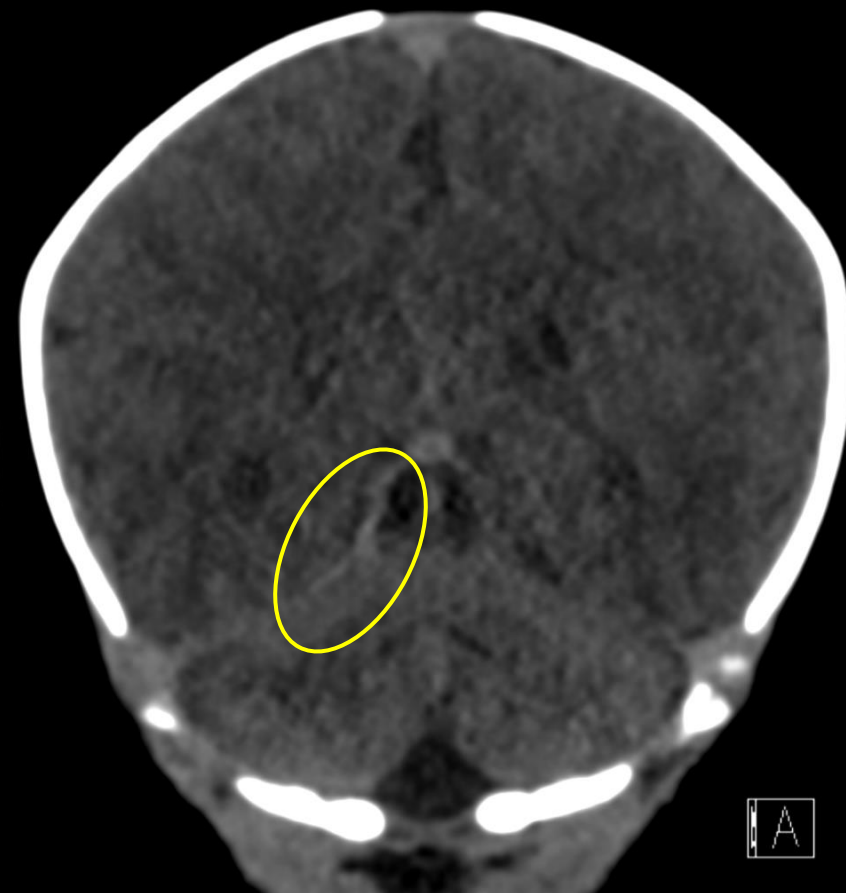
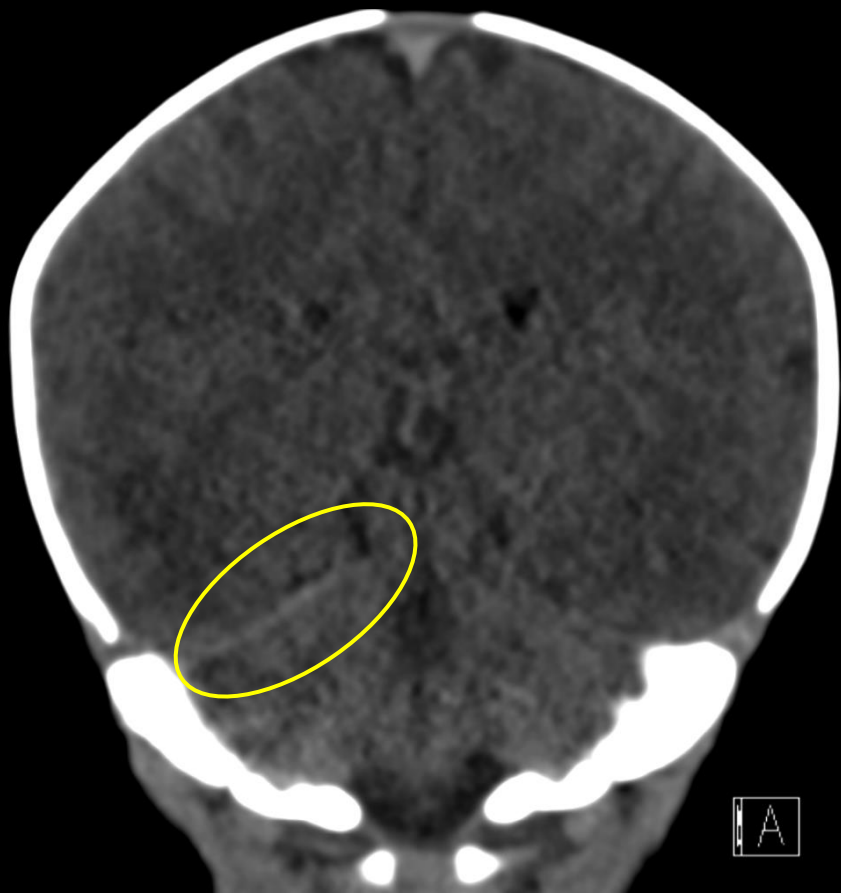
6 day-old Male

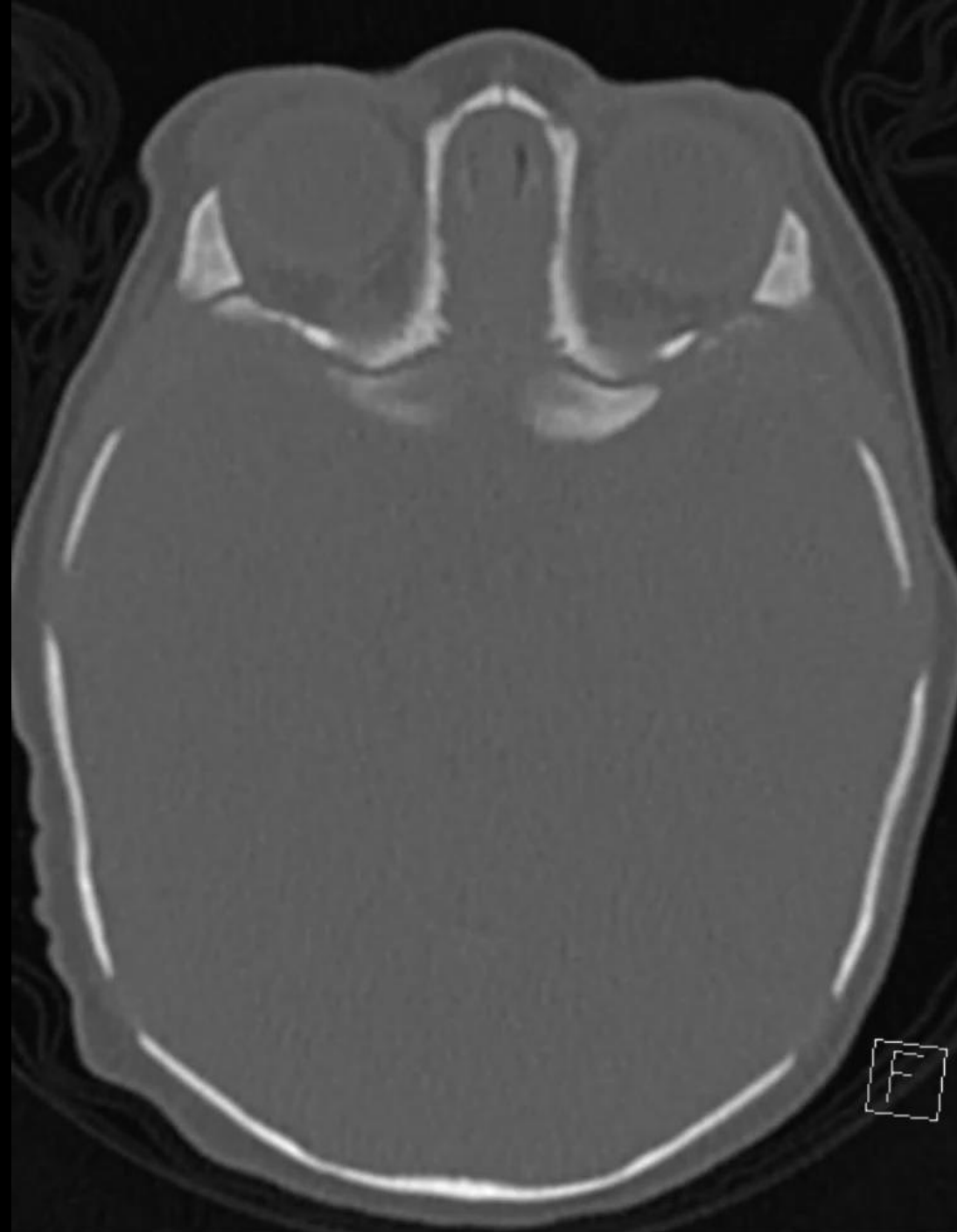
Fall from arms (witnessed)

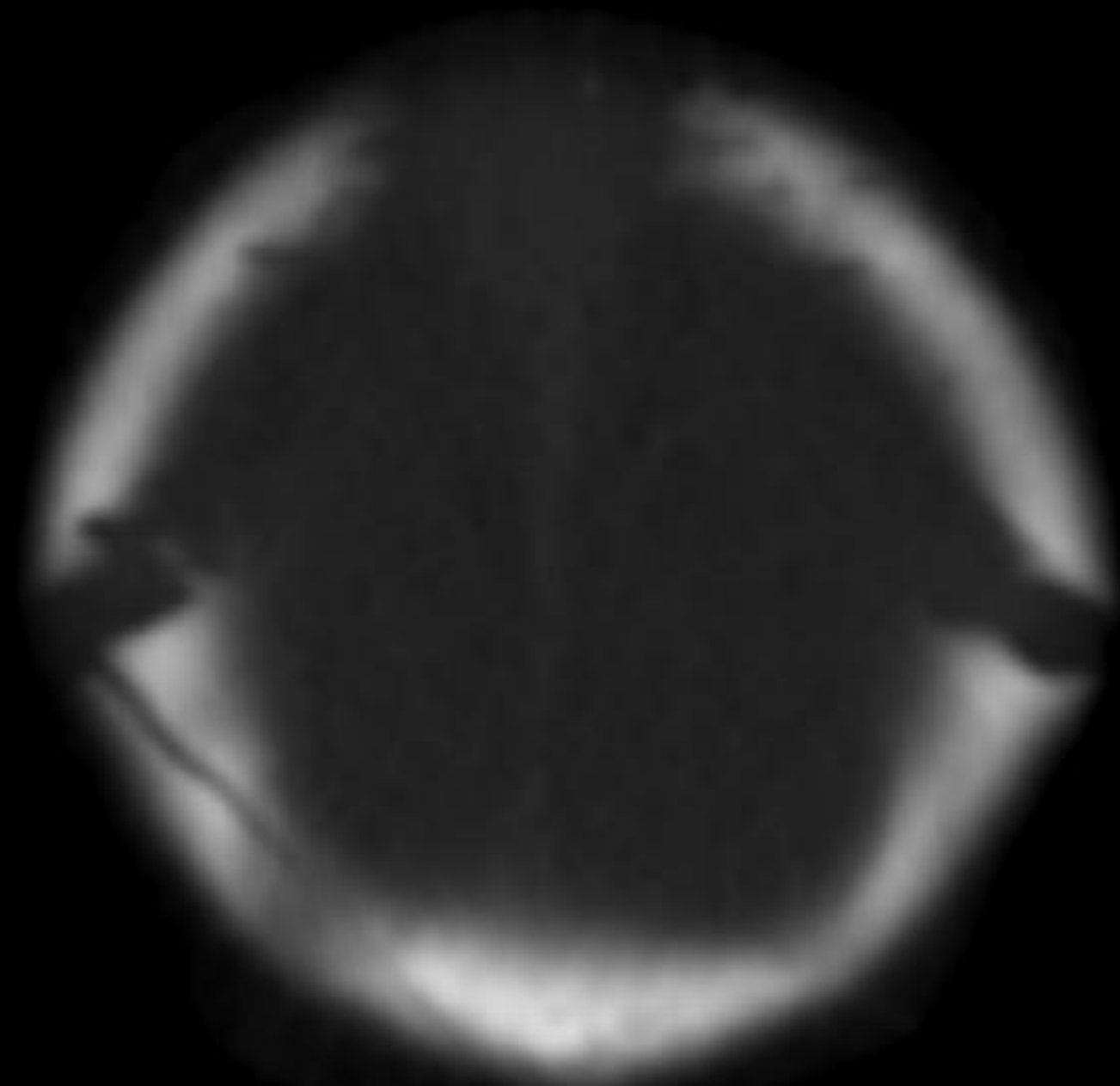


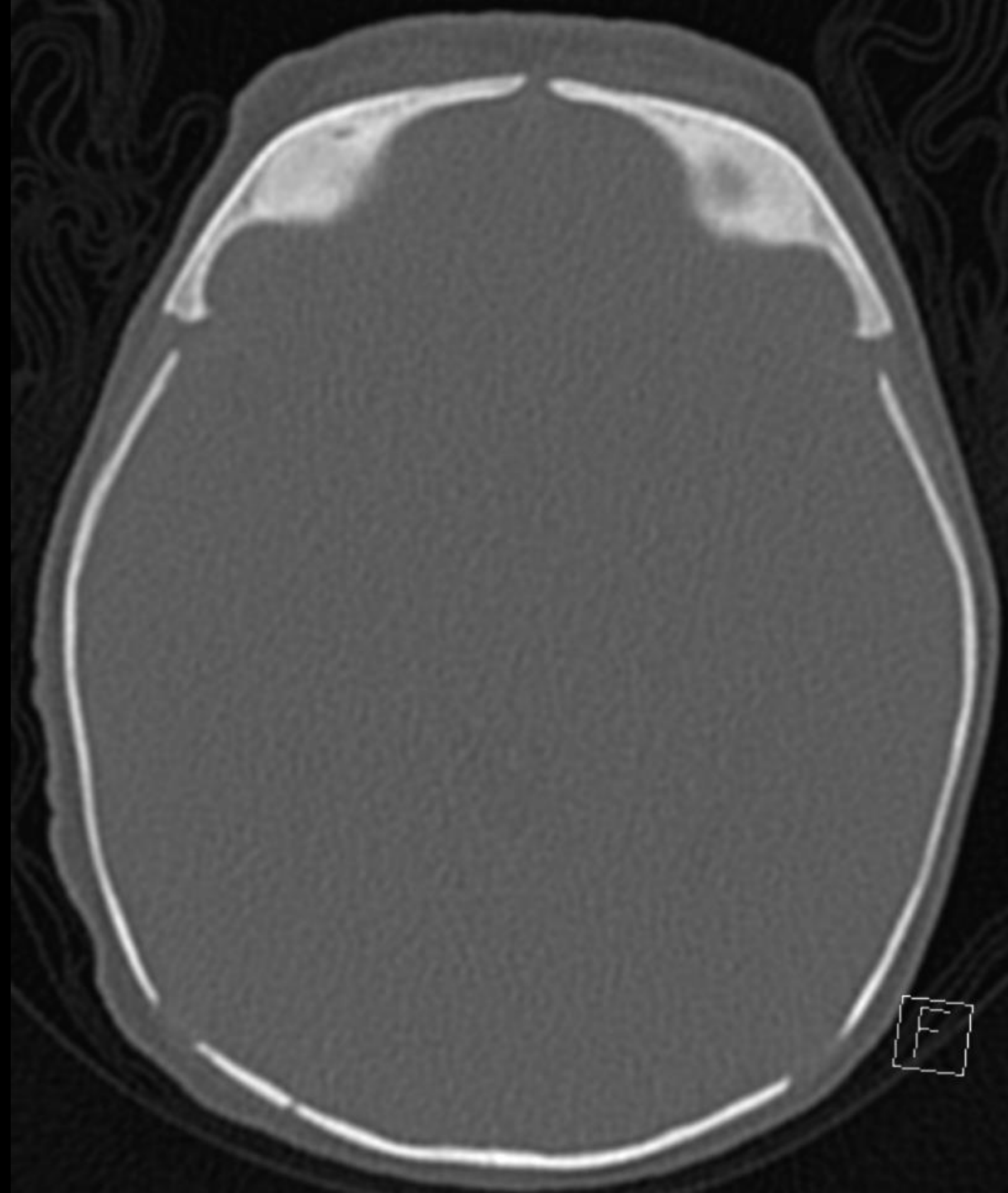


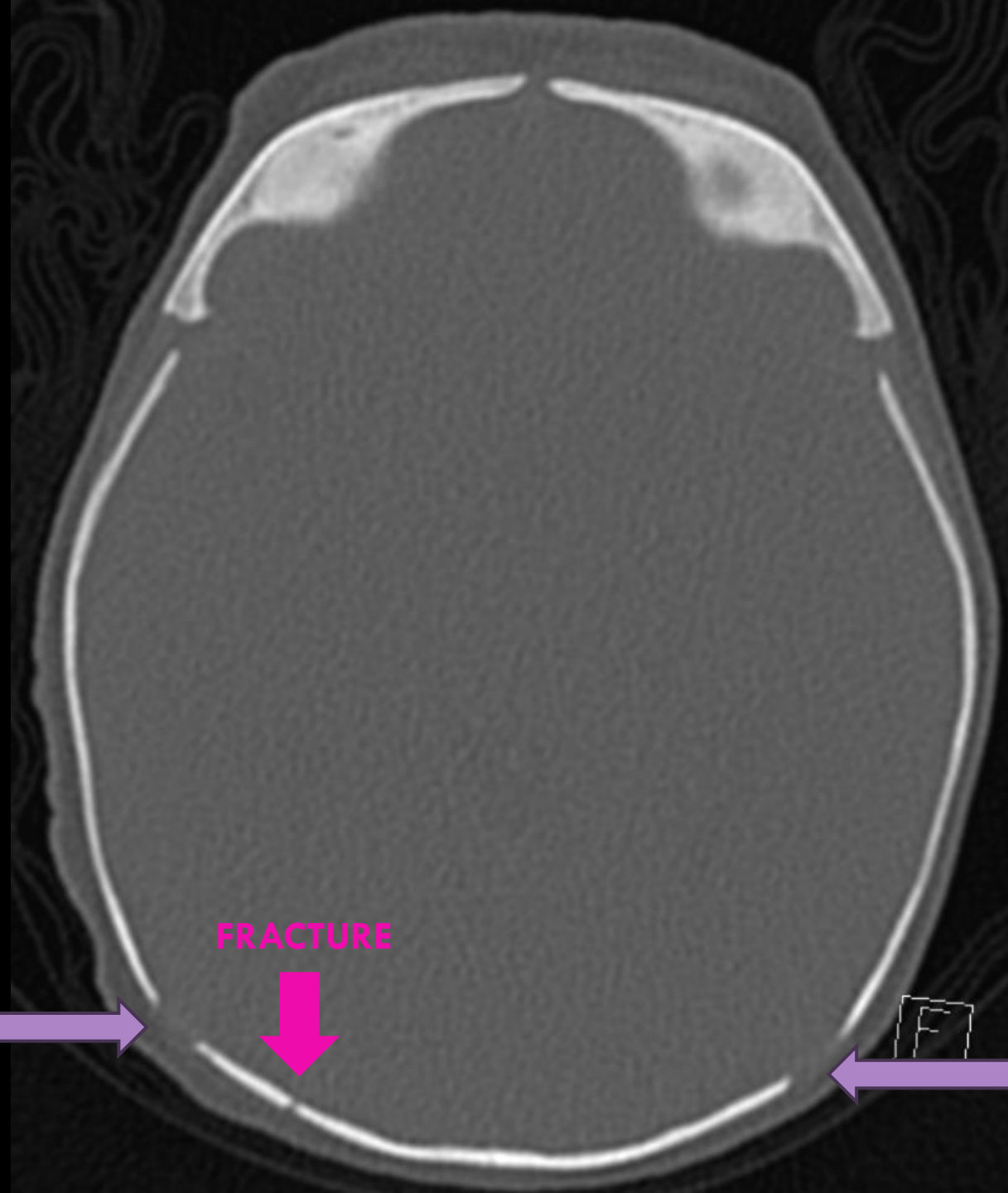












Normal  
suture

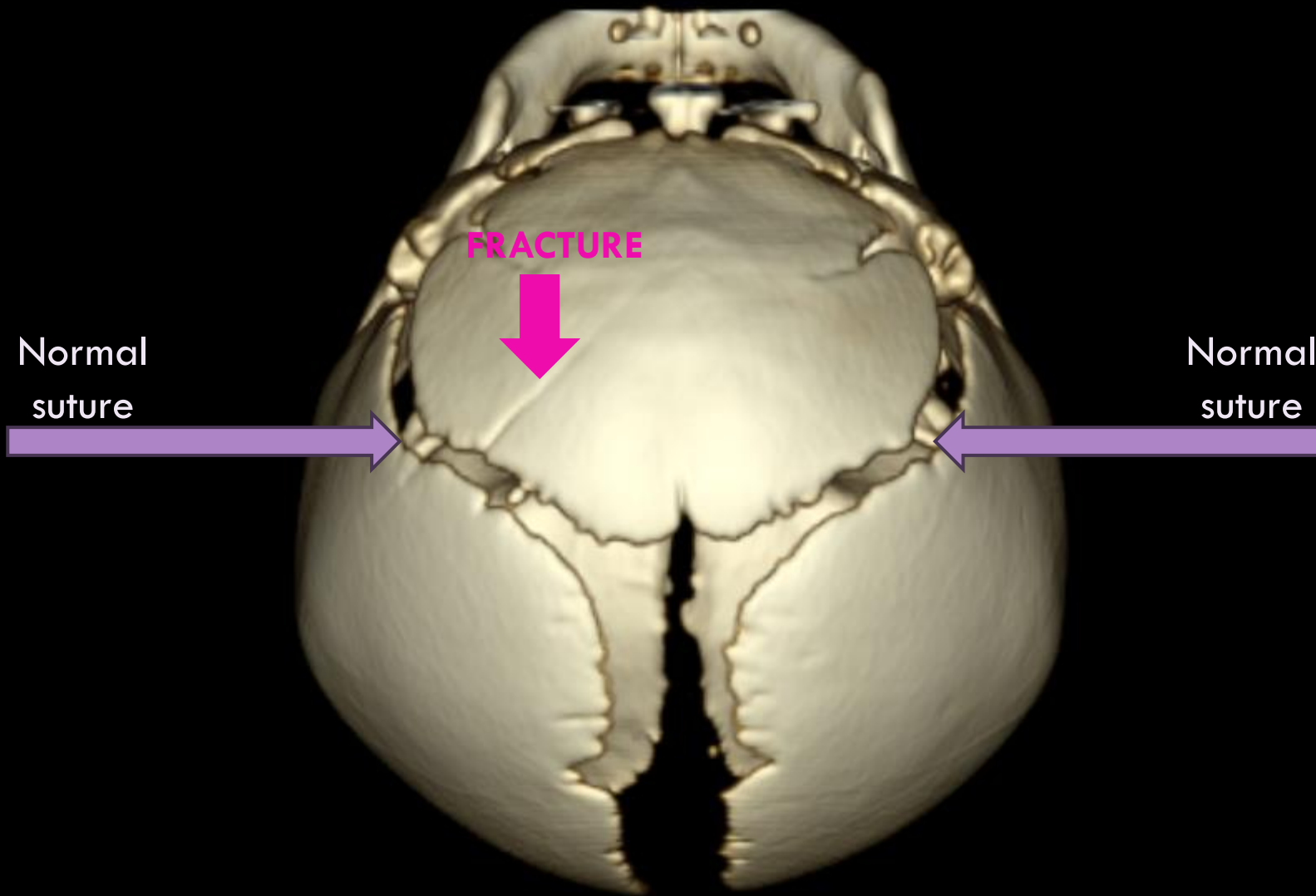


**FRACTURE**



Normal  
suture





FRACTURE

Normal  
suture

Normal  
suture

Right occipital skull fracture

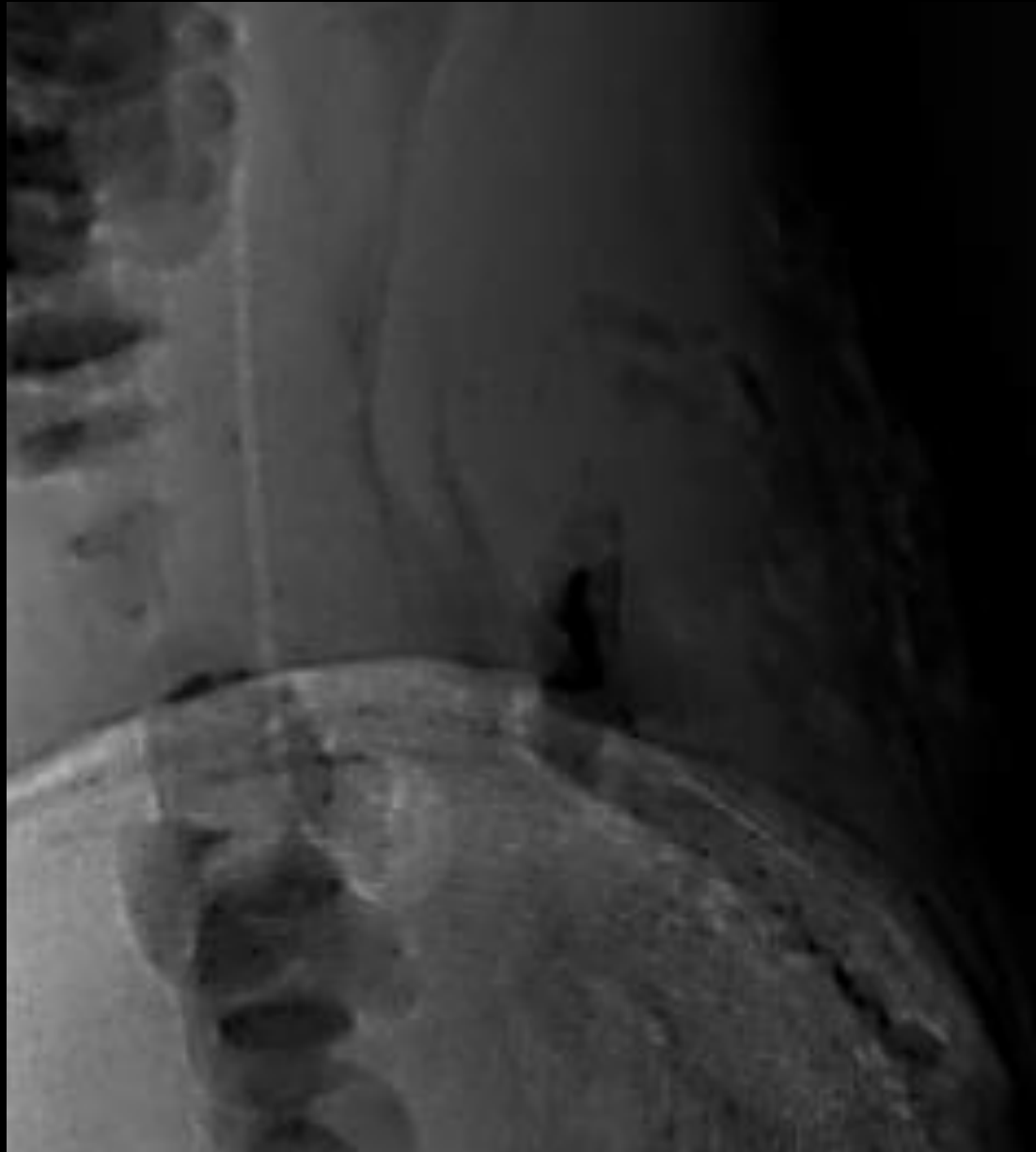
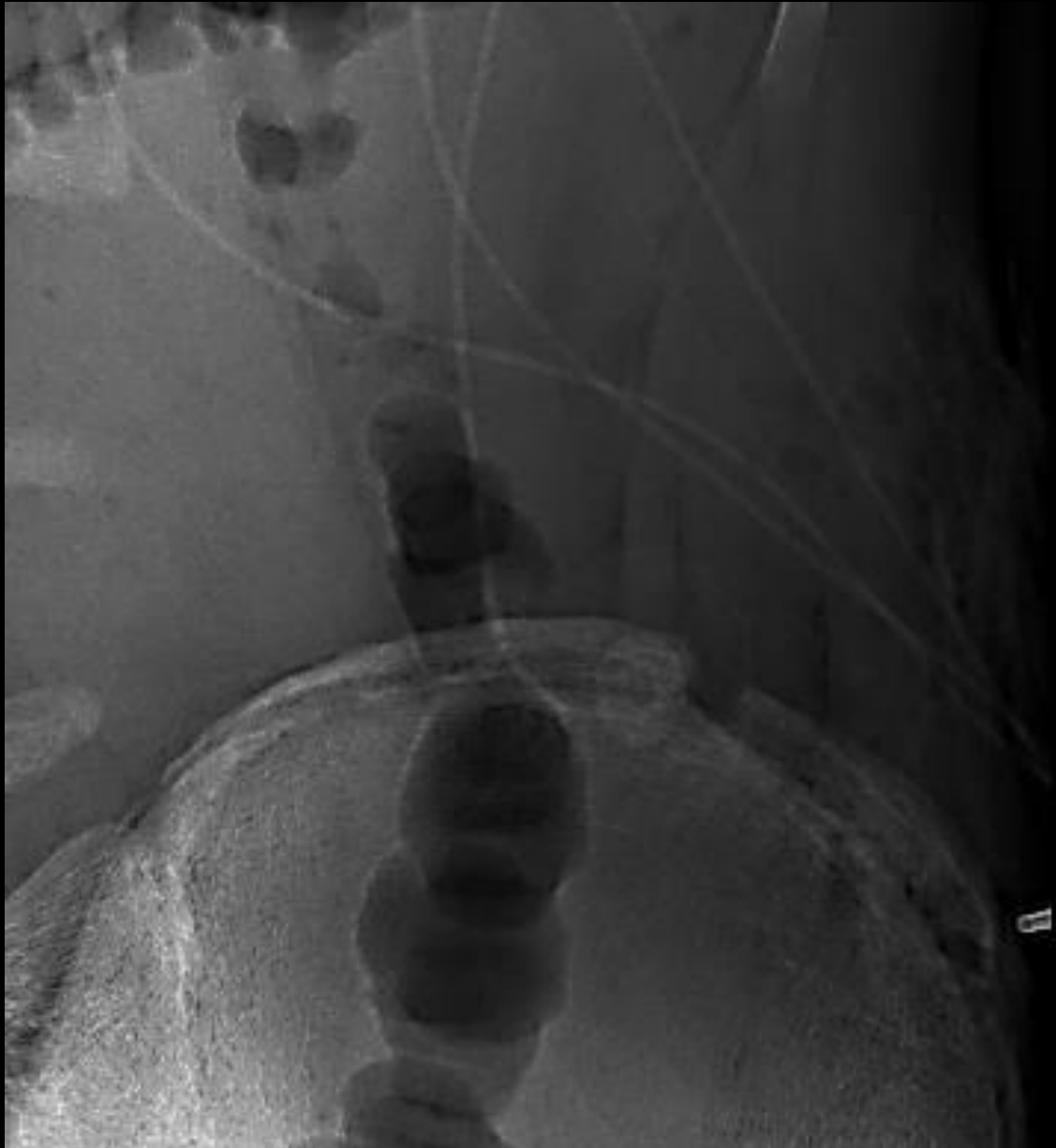
Trace right tentorial acute  
subdural hematoma

17yo male

Left flank injury





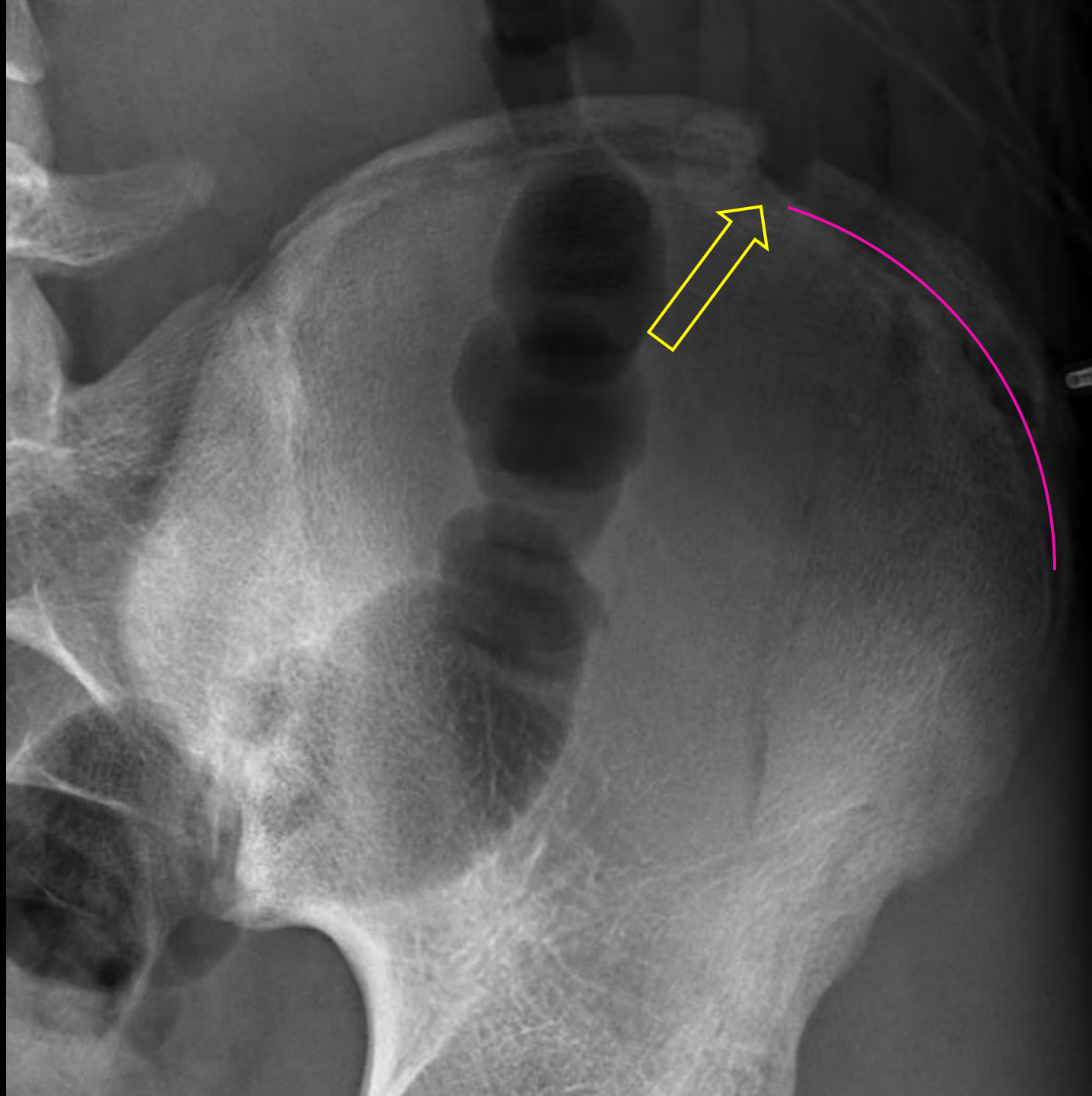












Left flank laceration

Iliac crest apophysis avulsion  
fracture (*open!*)

Pediatric patient

Sledding accident





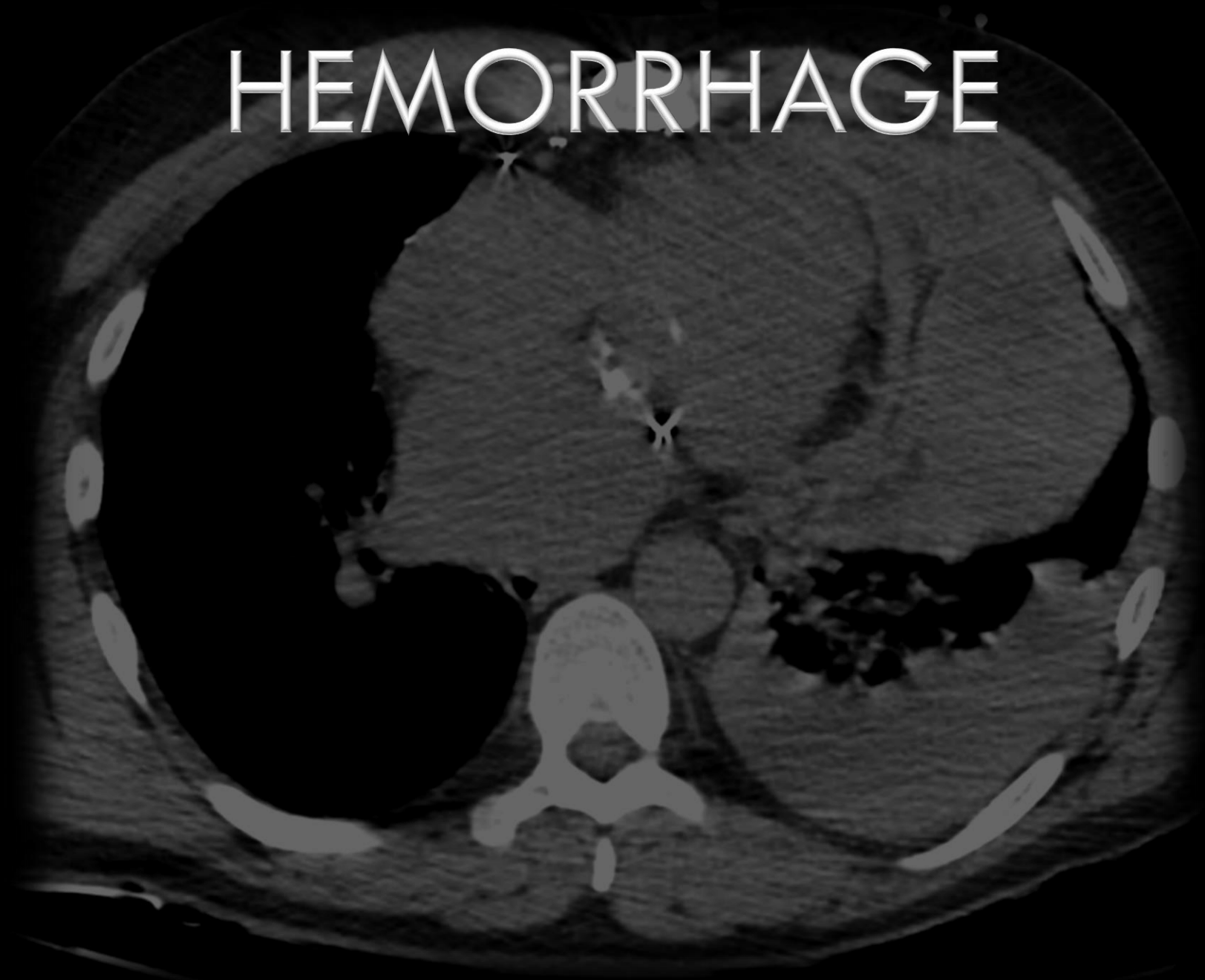






Distal radius buckle fracture

# HEMORRHAGE

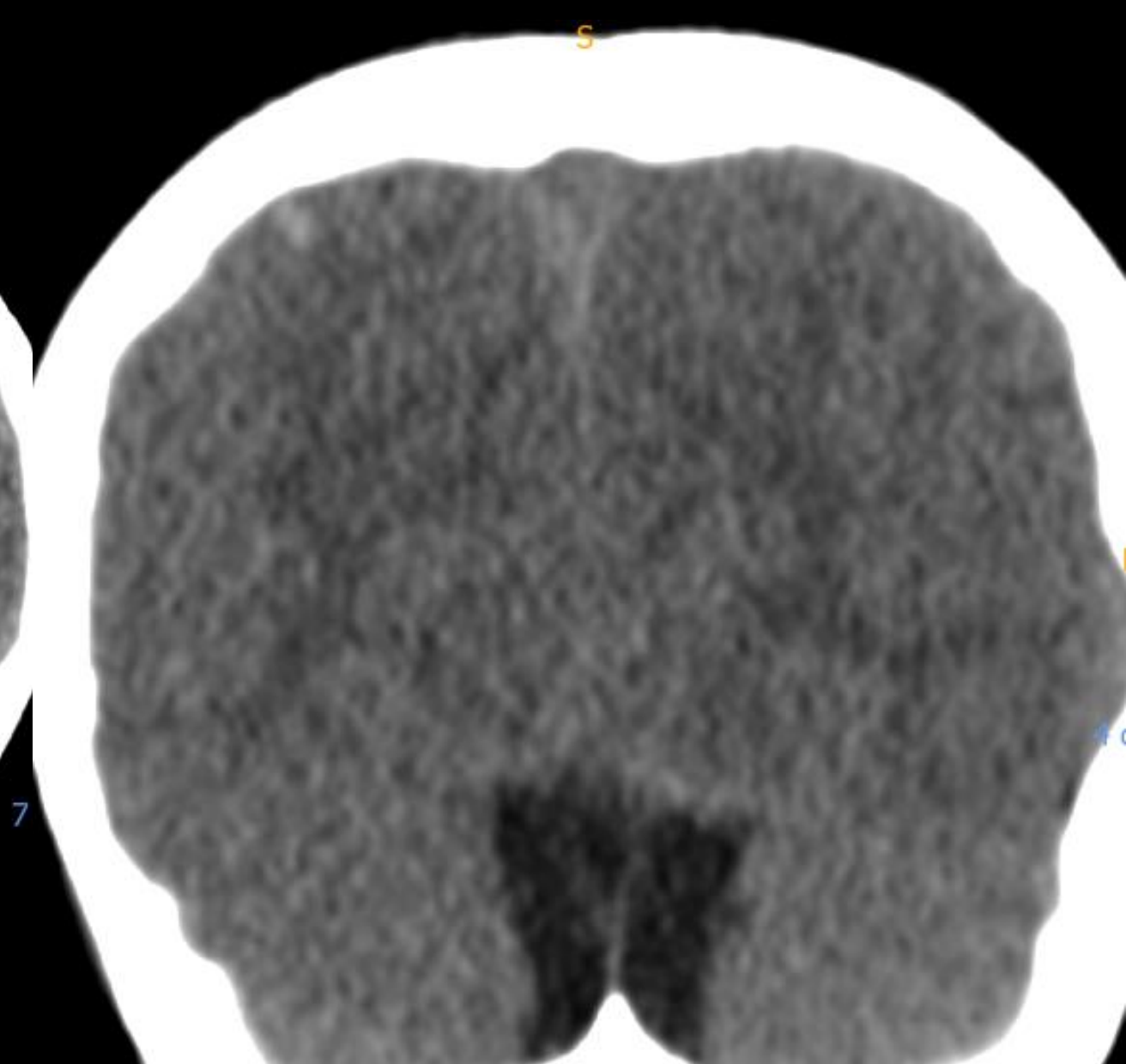


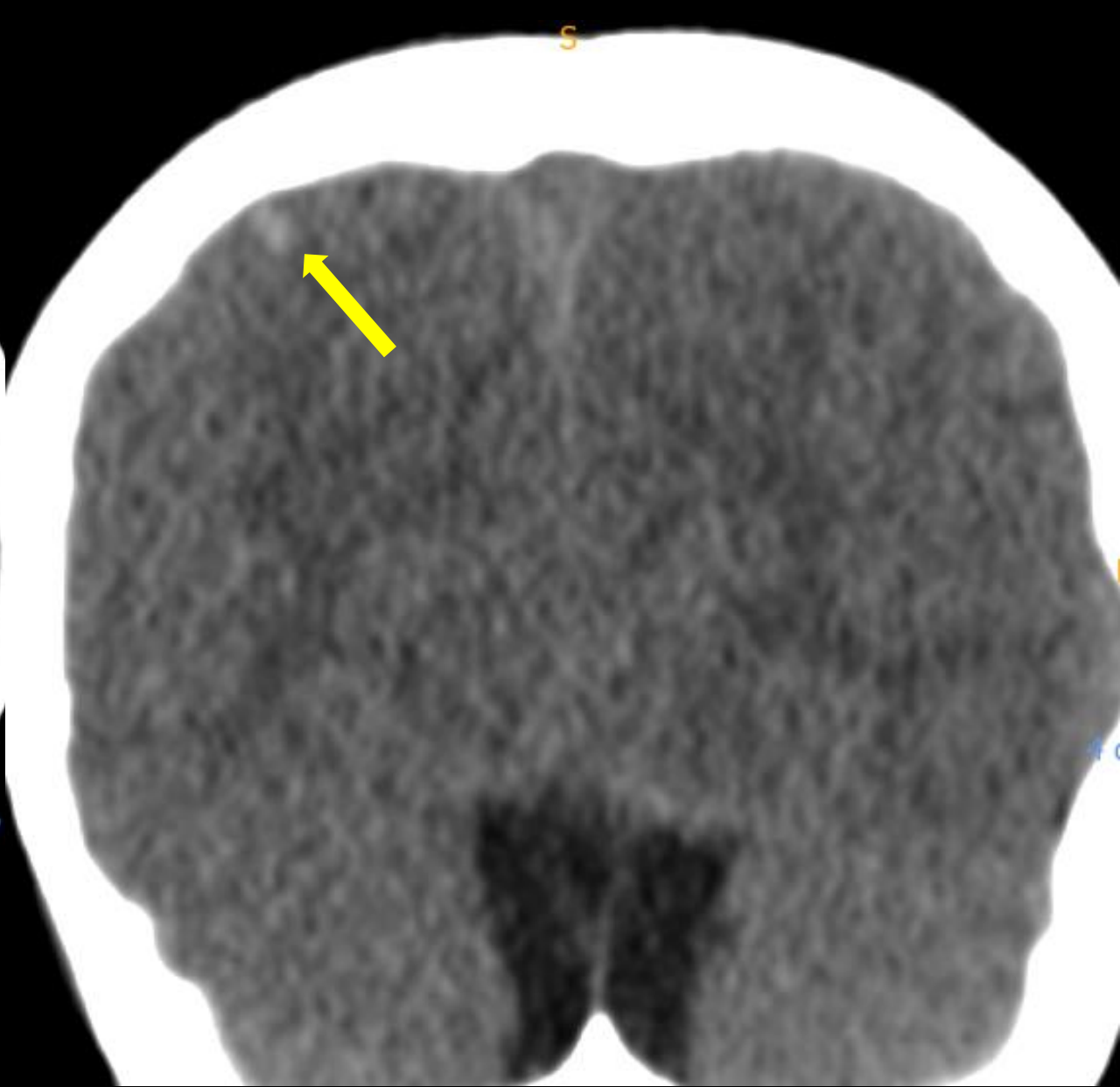
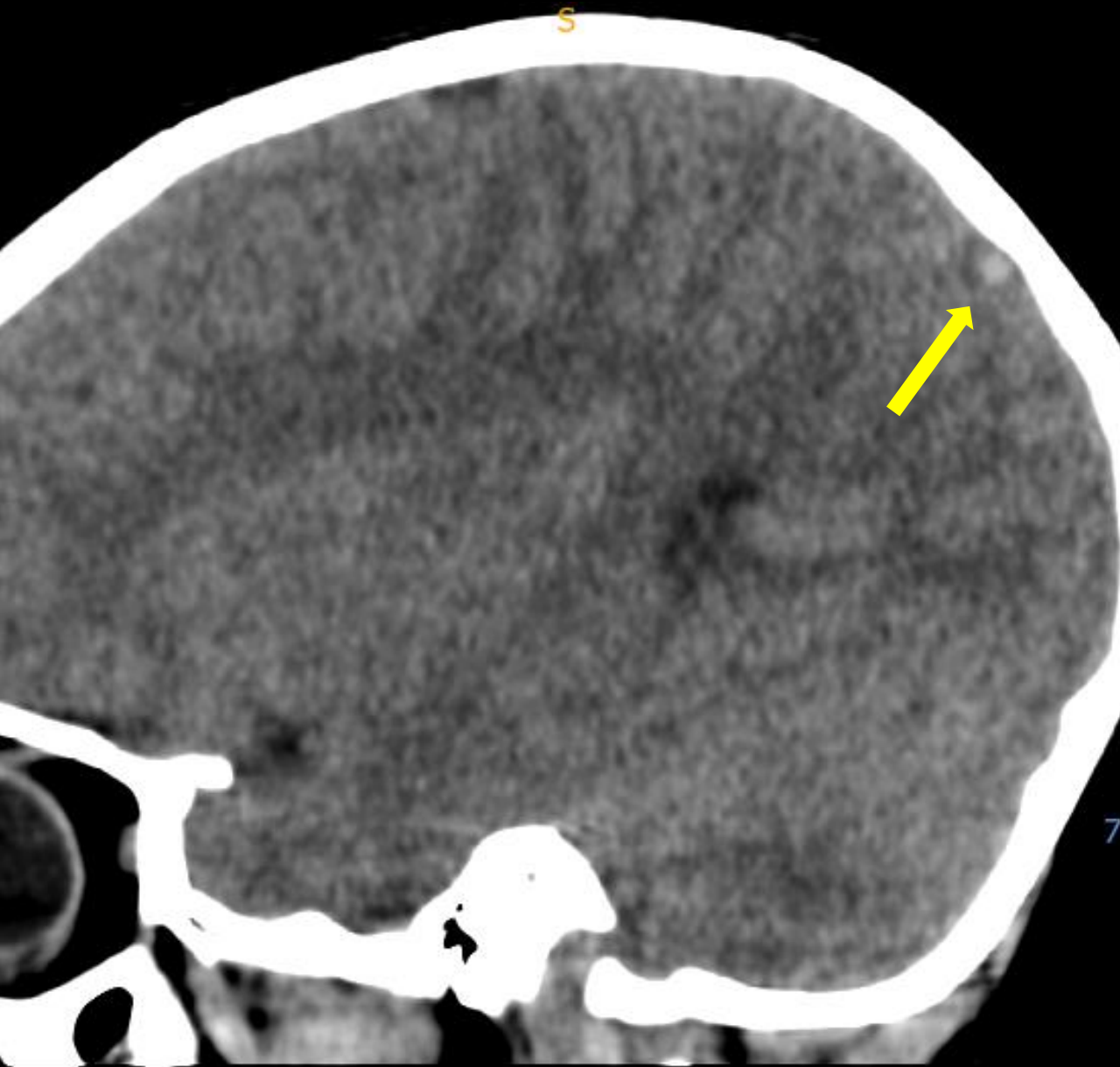
5yo male

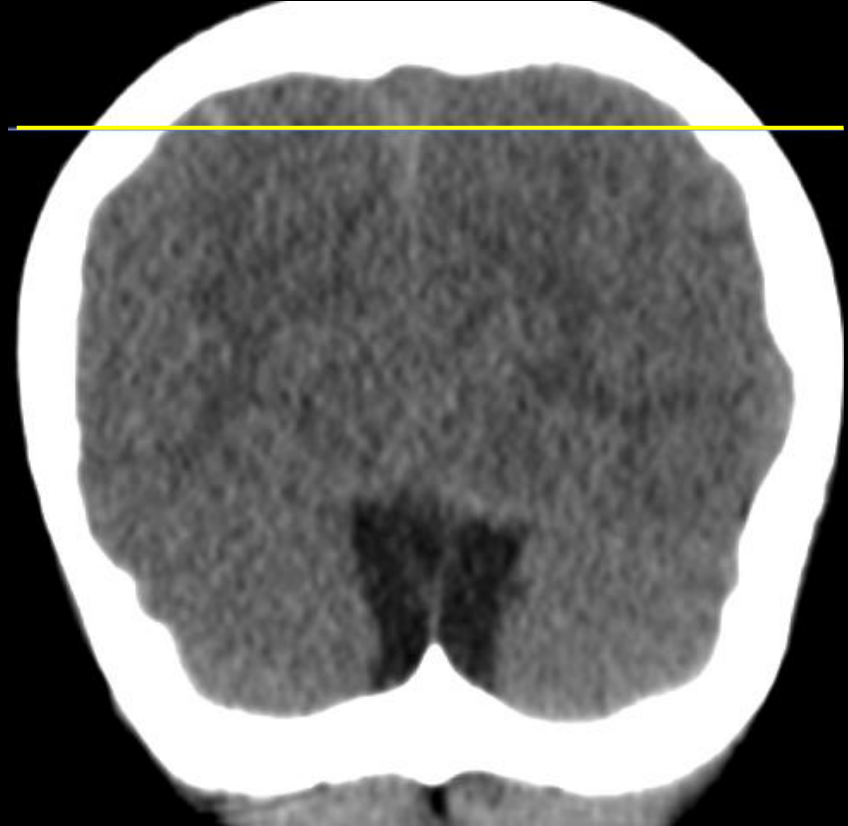
Fall down stairs











Focal parenchymal hemorrhage

Not diagnosed on axials

**\*Orthogonal MPRs!!**

42yo Female

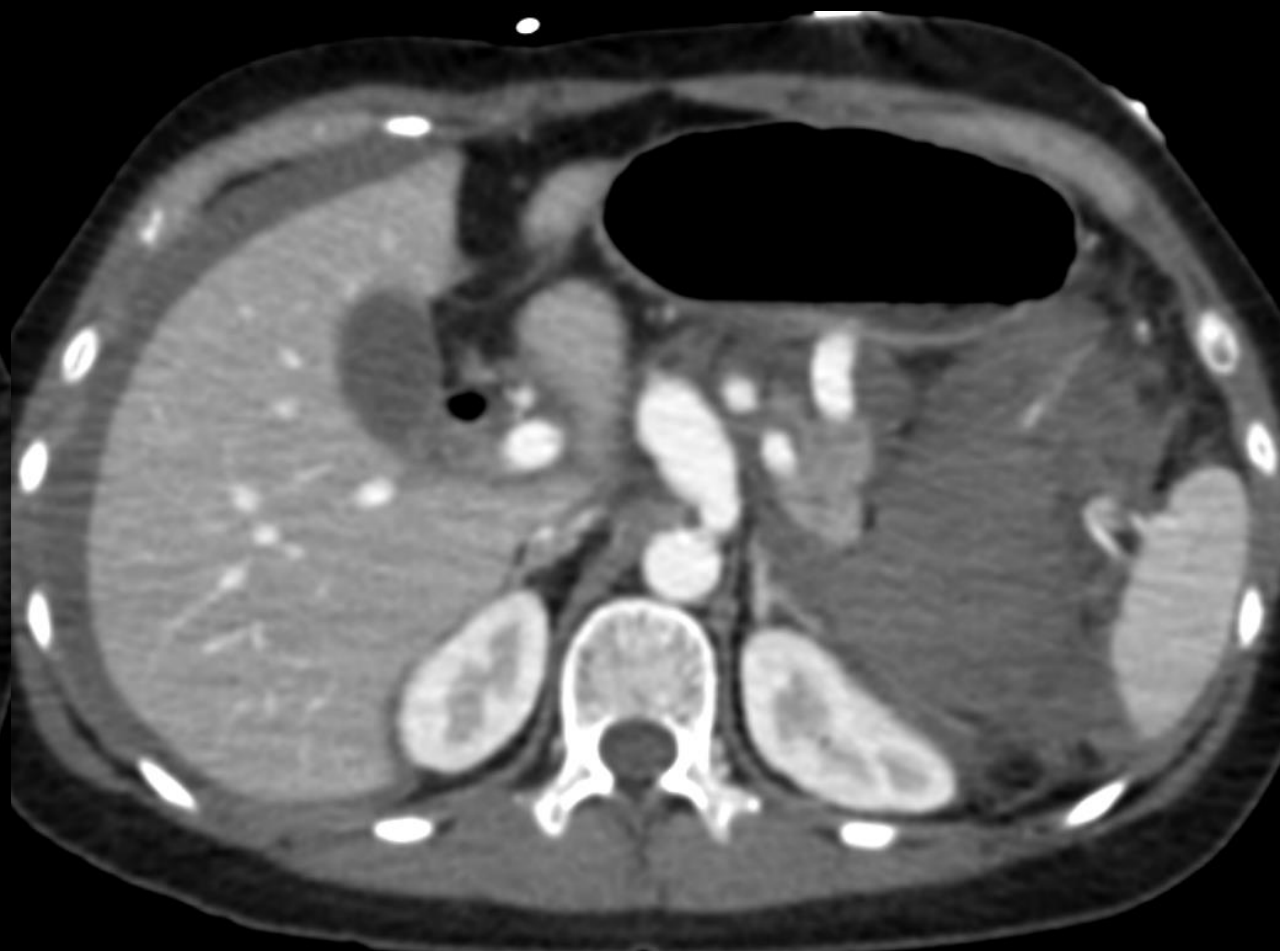
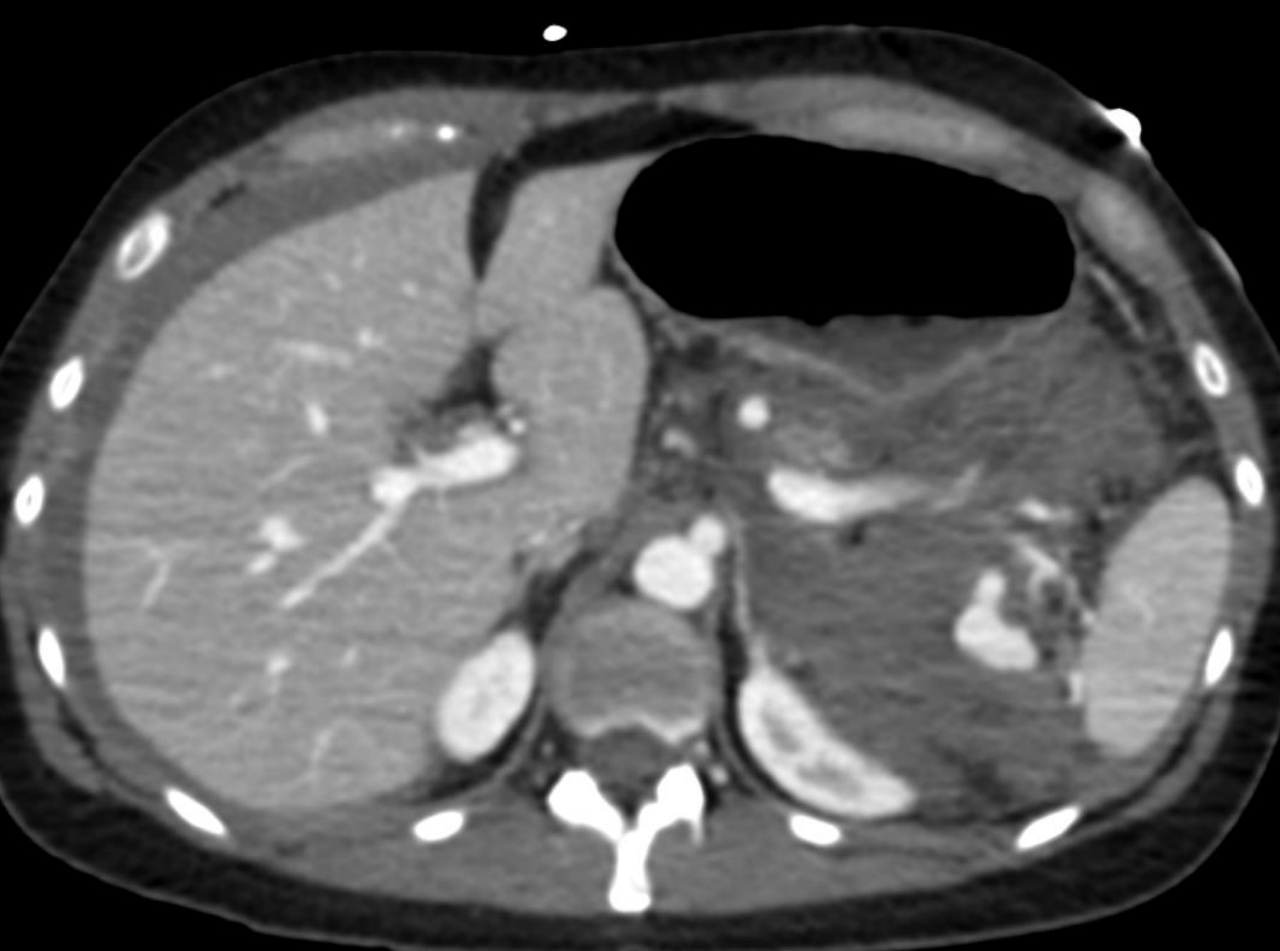
Abdominal pain

Evaluate for dissection

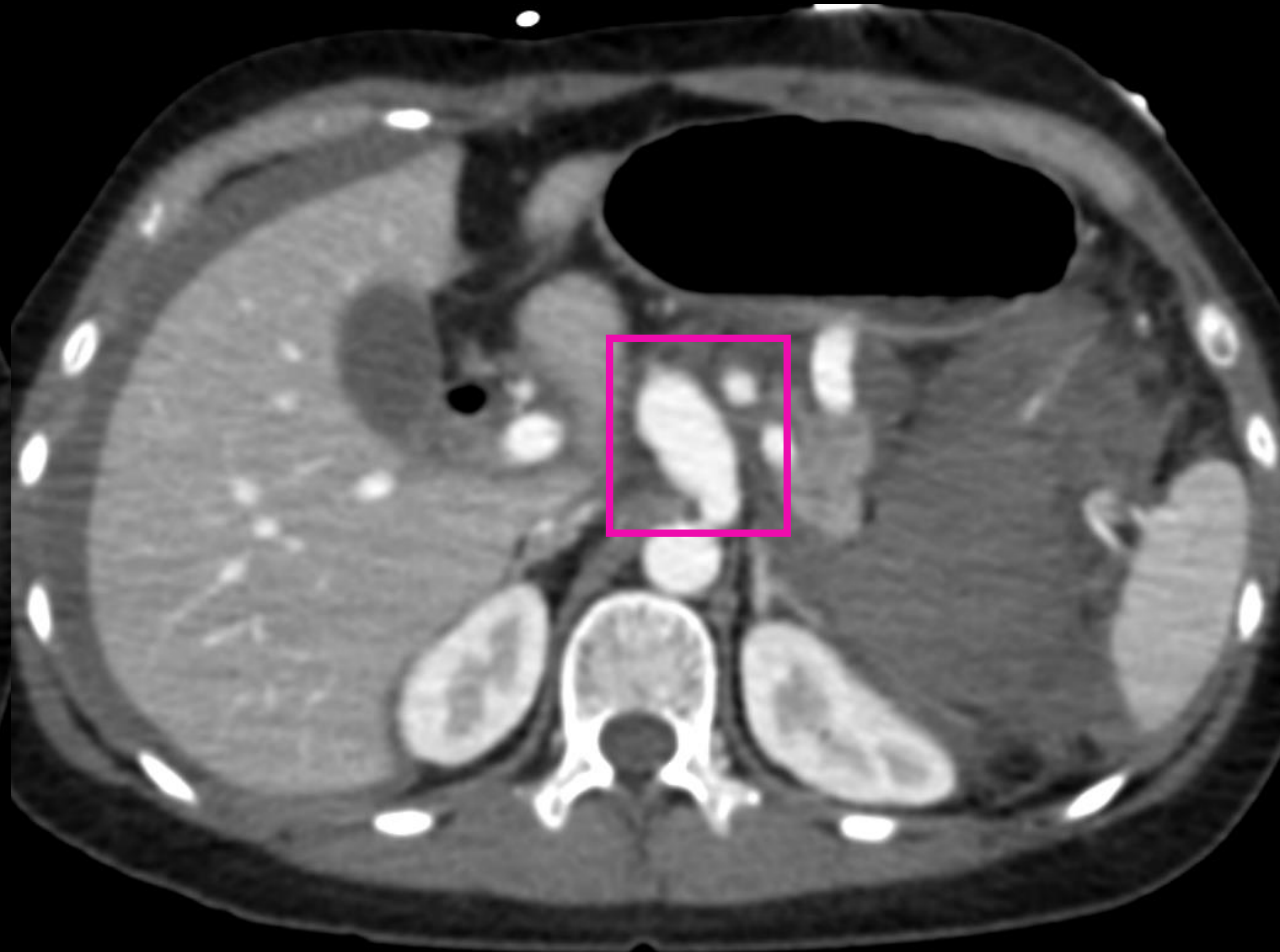
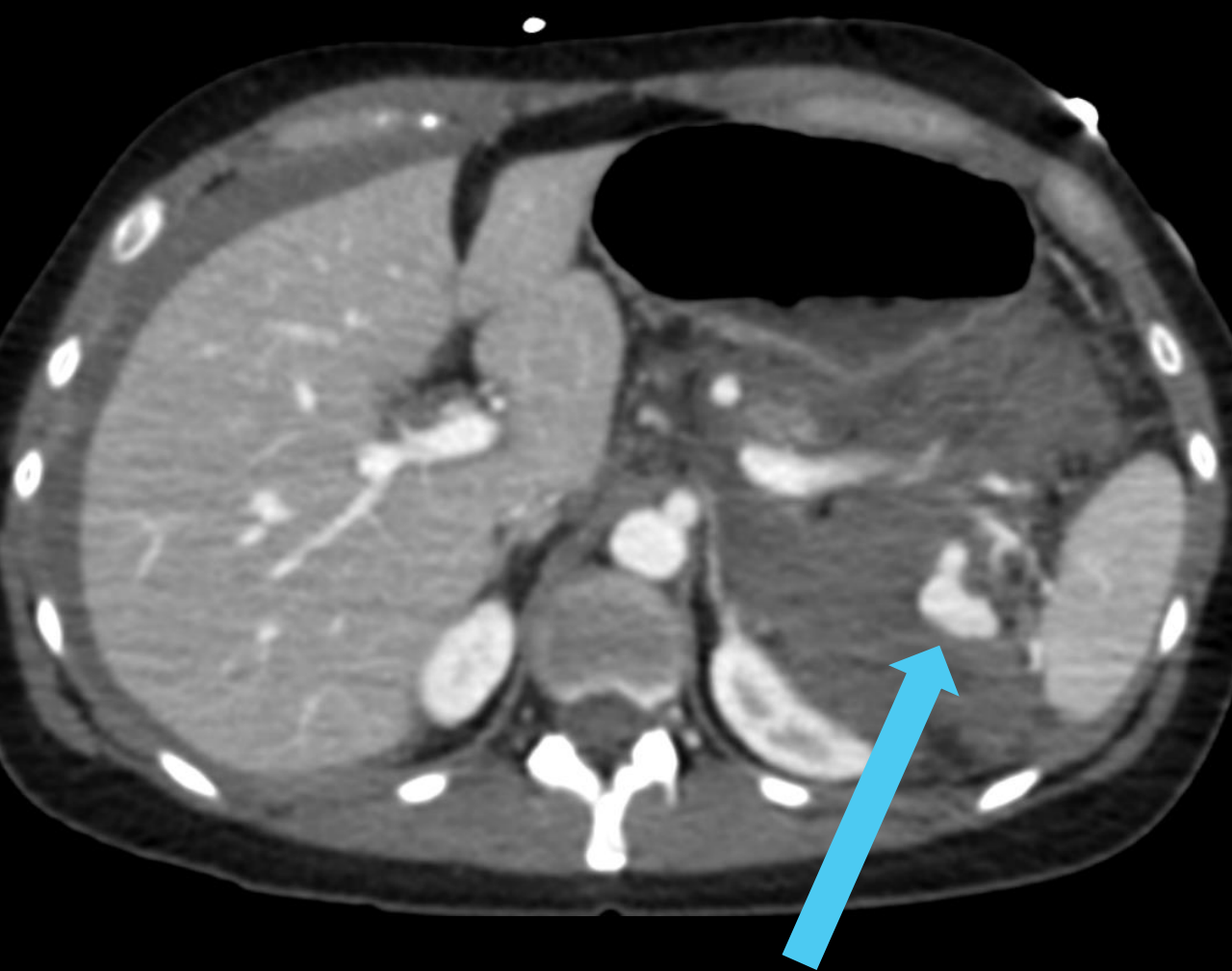


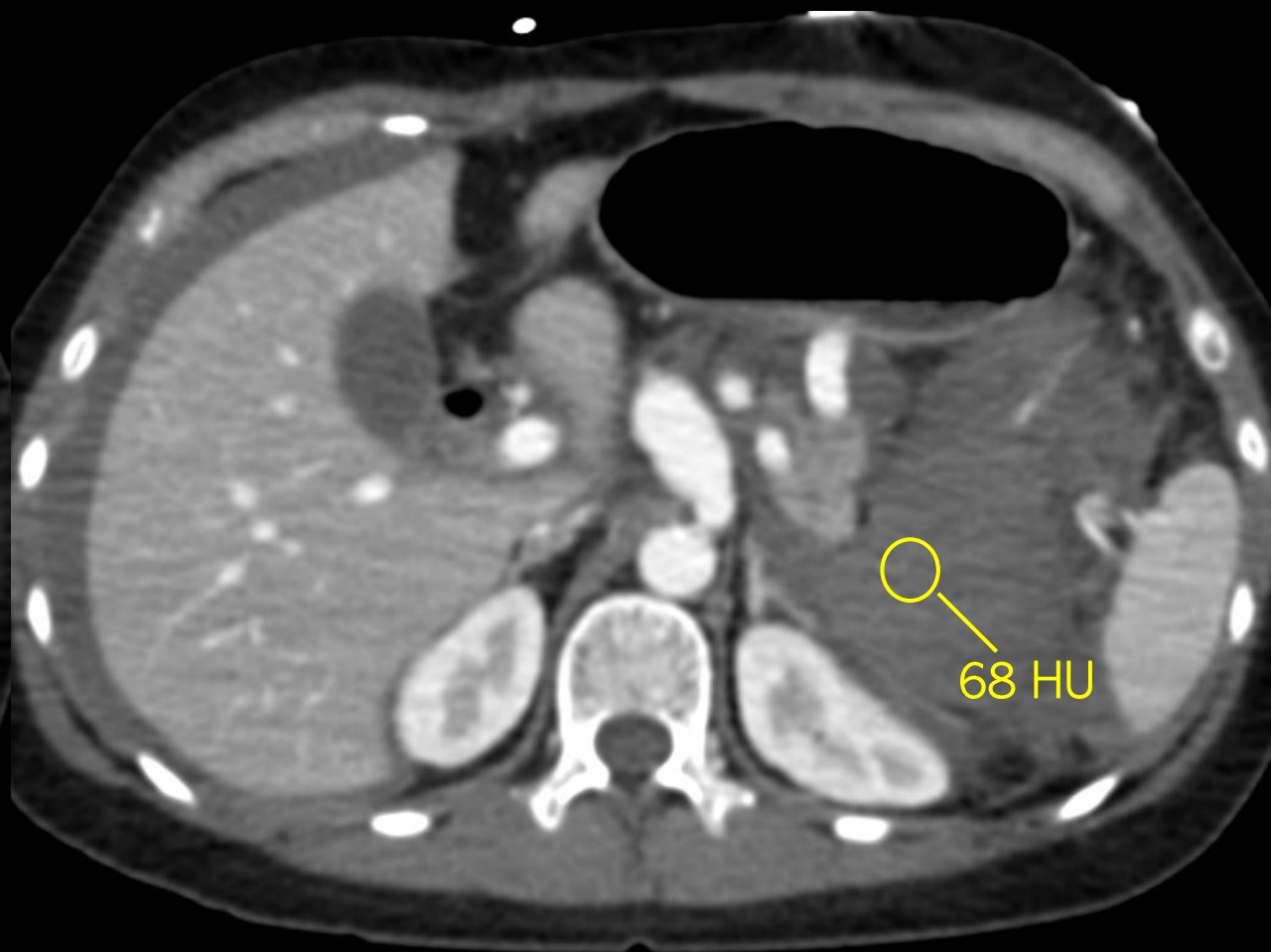
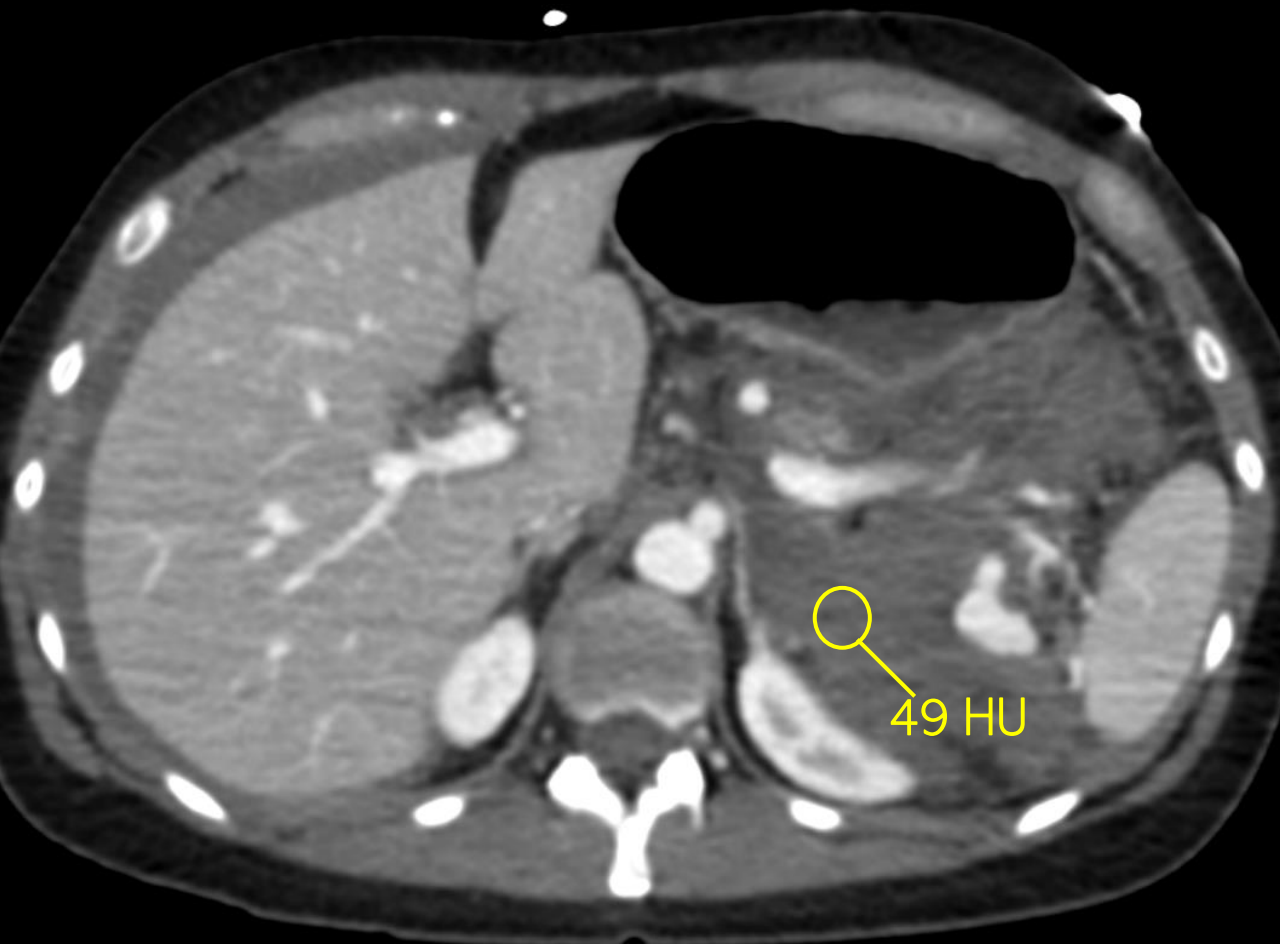


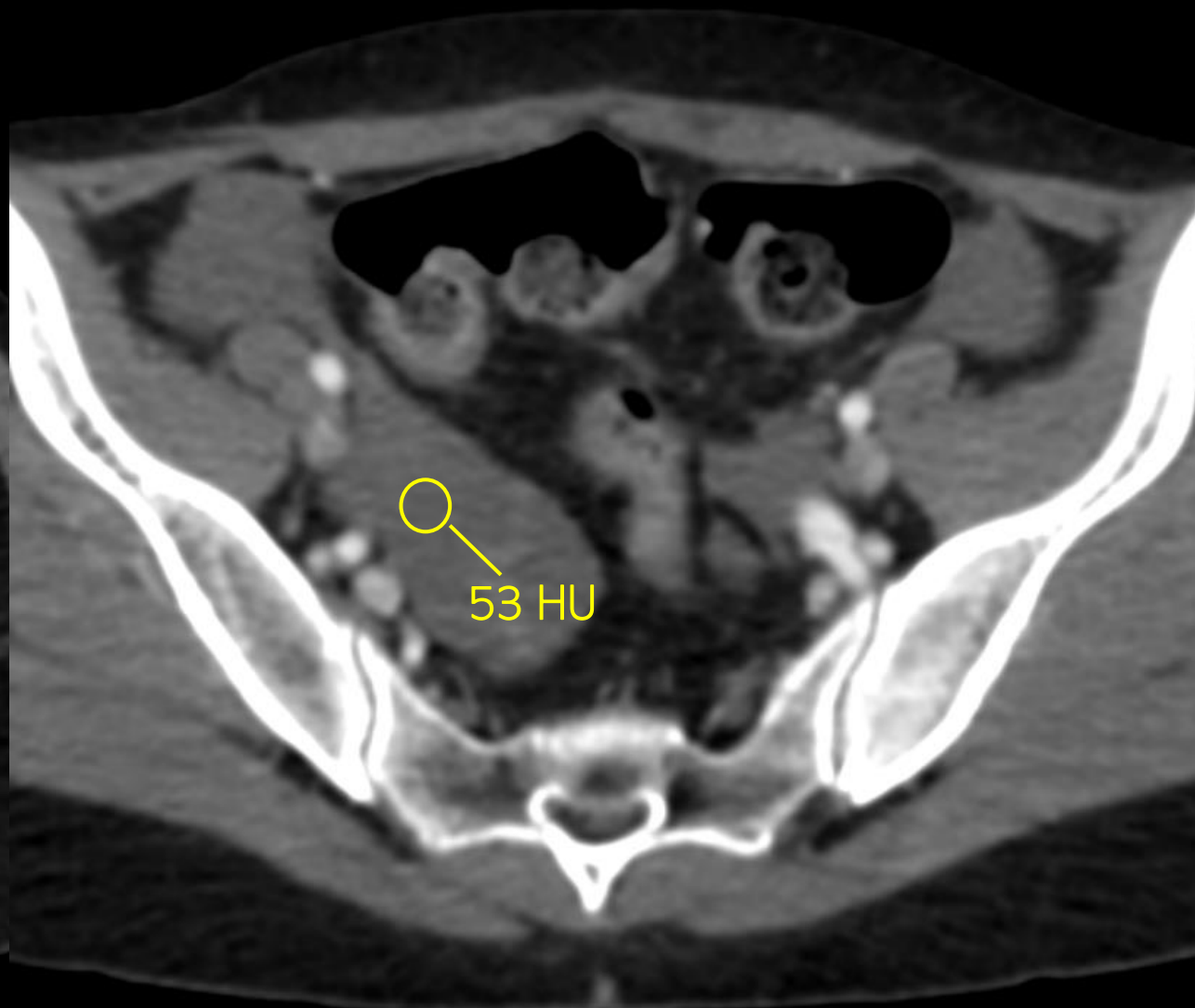
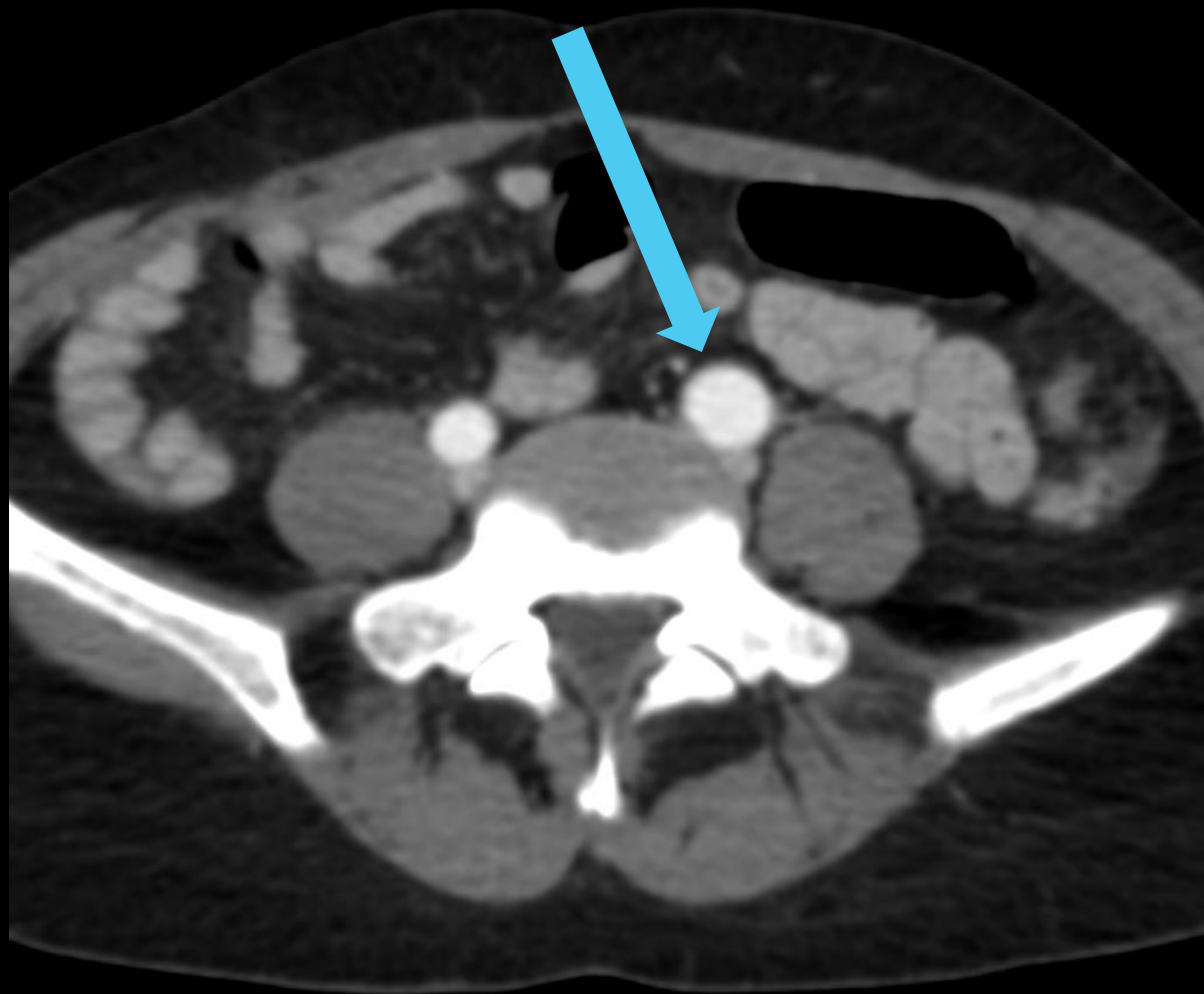












Ruptured splenic artery  
aneurysm

Hemoperitoneum

Post-code

Evaluate for dissection





Intraabdominal  
blood

Active arterial  
hemorrhage



Intraabdominal  
blood

Active arterial  
hemorrhage

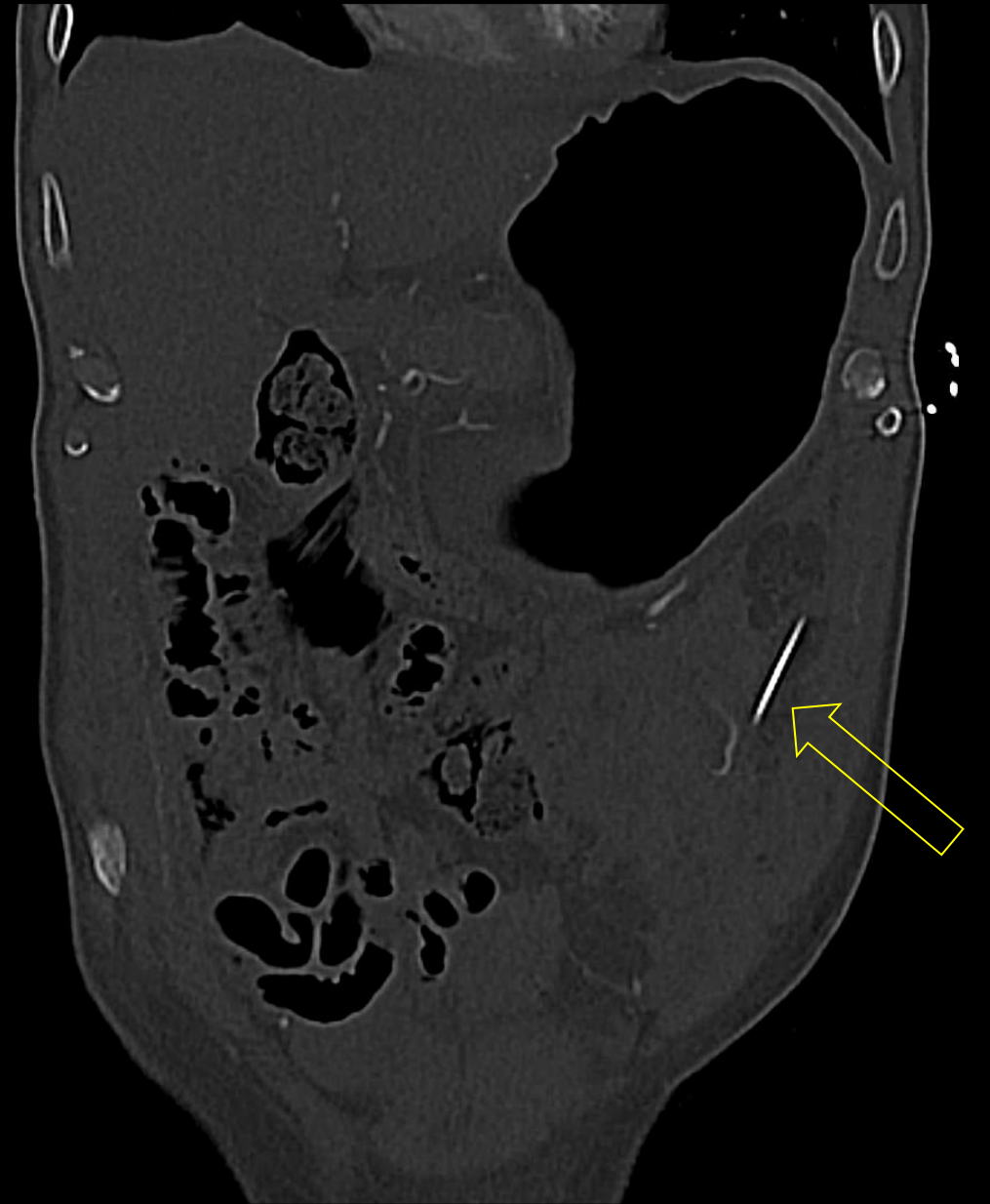






Months of left  
abdominal pain

**Intraabdominal  
needle** of unknown  
origin



NOT FOR DIAGNOSTIC USE

S



R

L

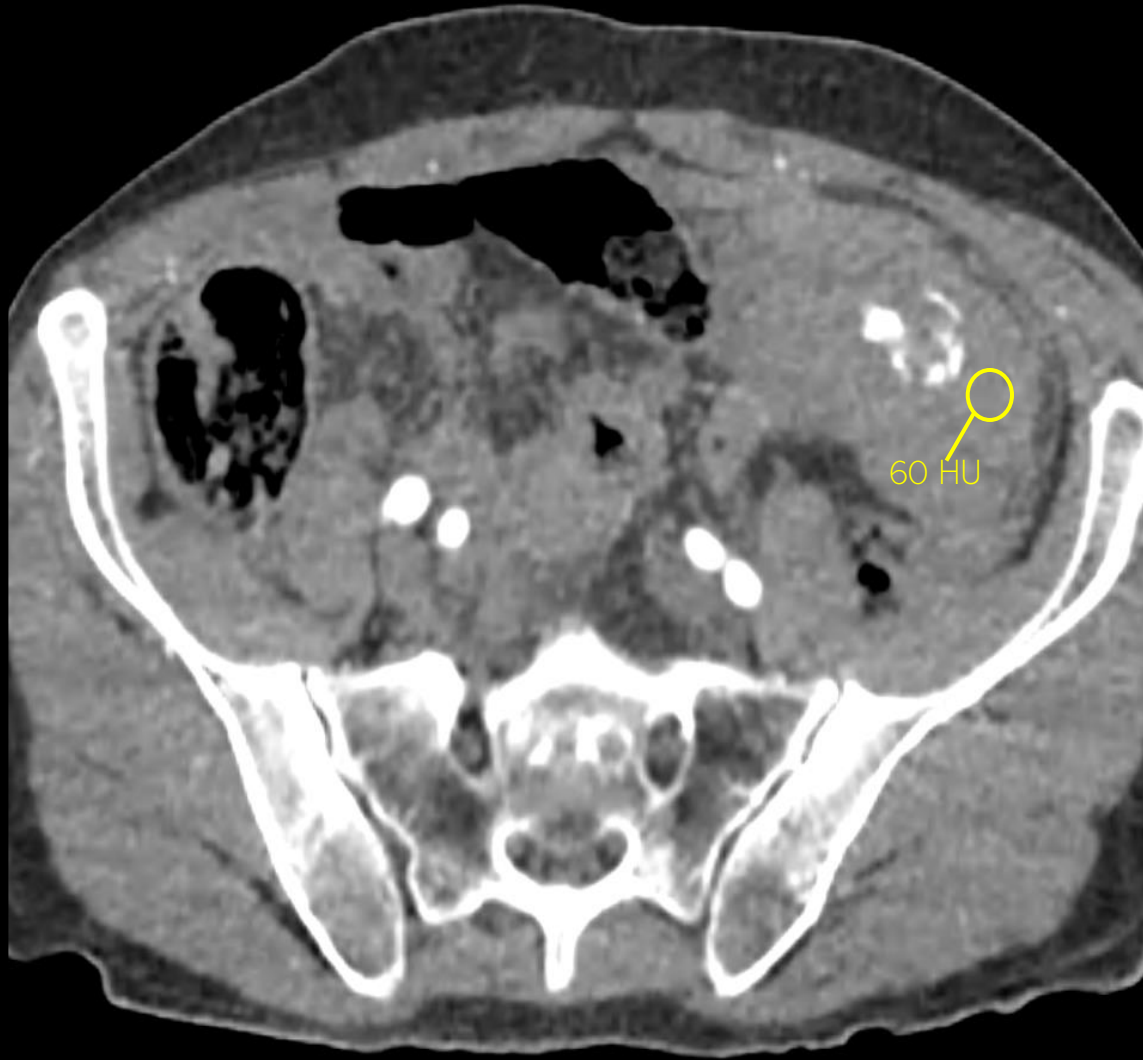


18 cm

I

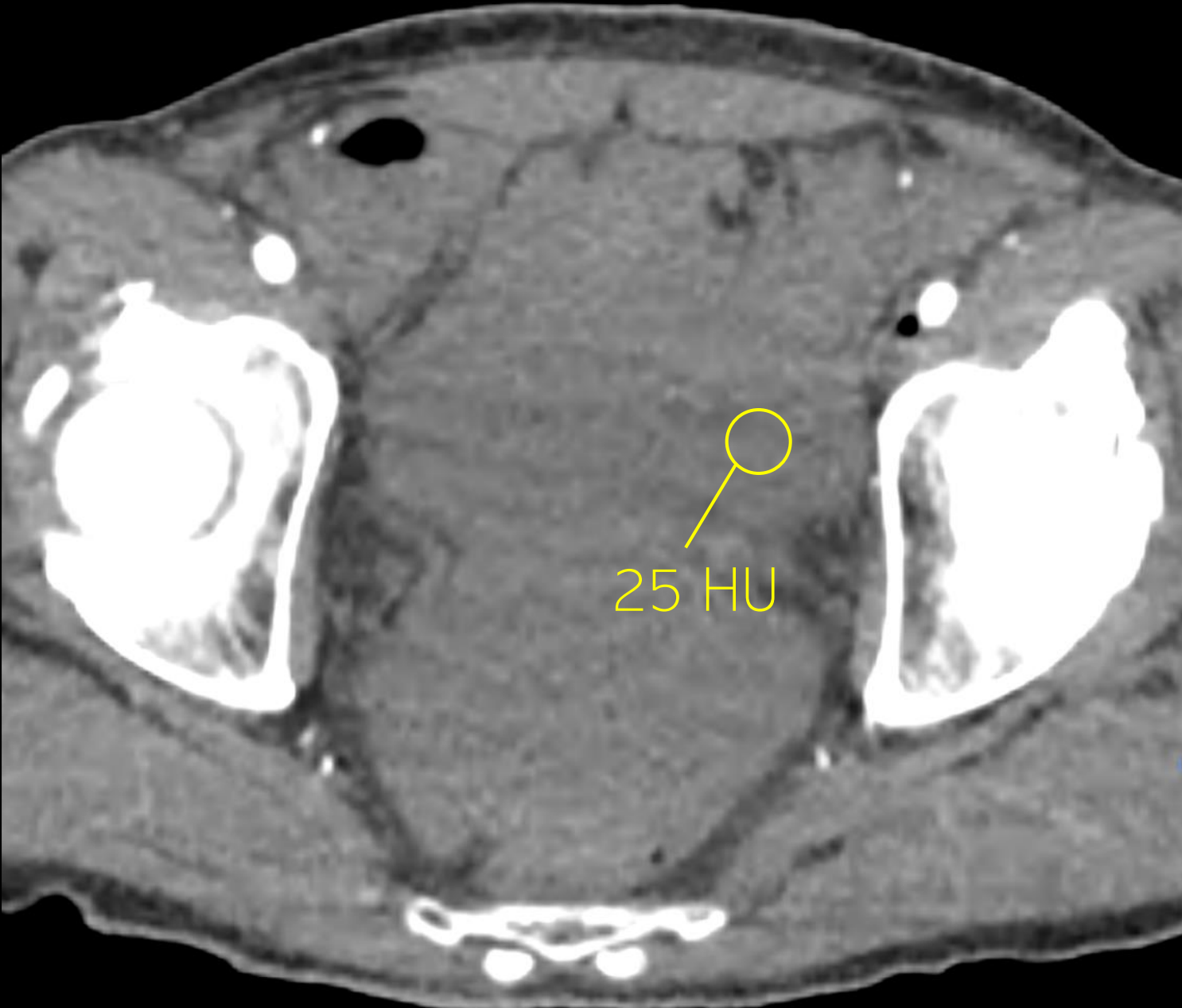






“Sentinel Clot Sign”

A



25 HU



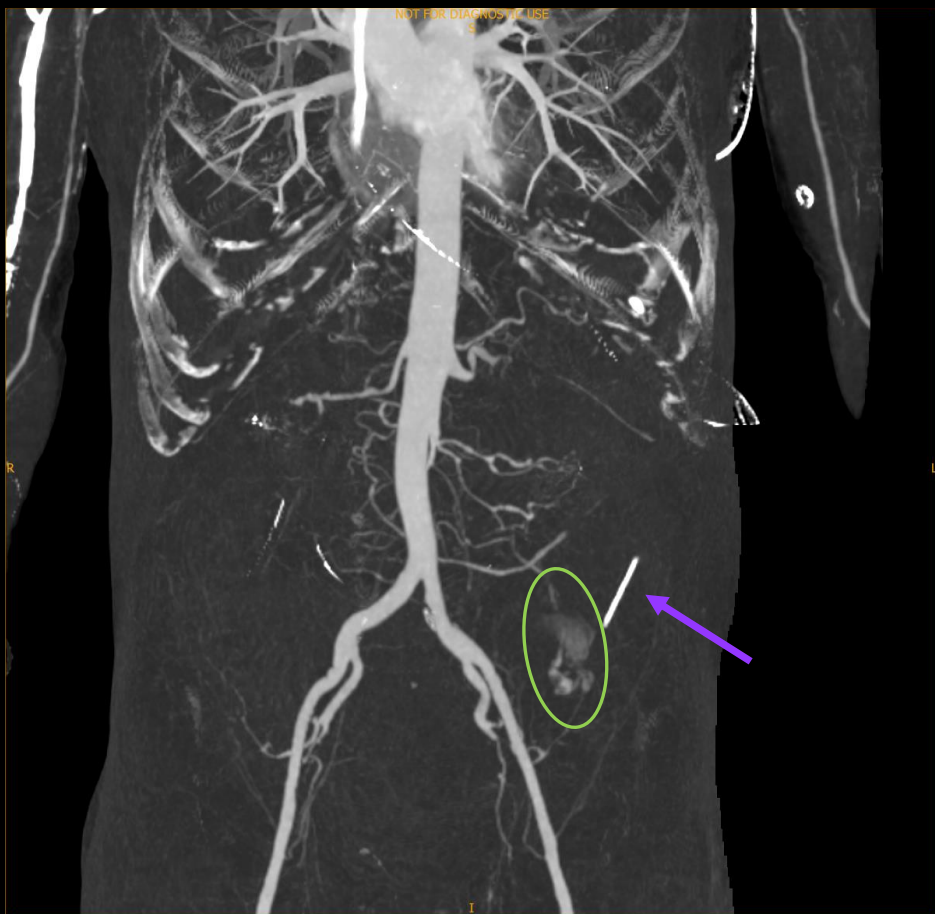


Blush of contrast  
from SMA branch

Linear metallic FB  
(needle)

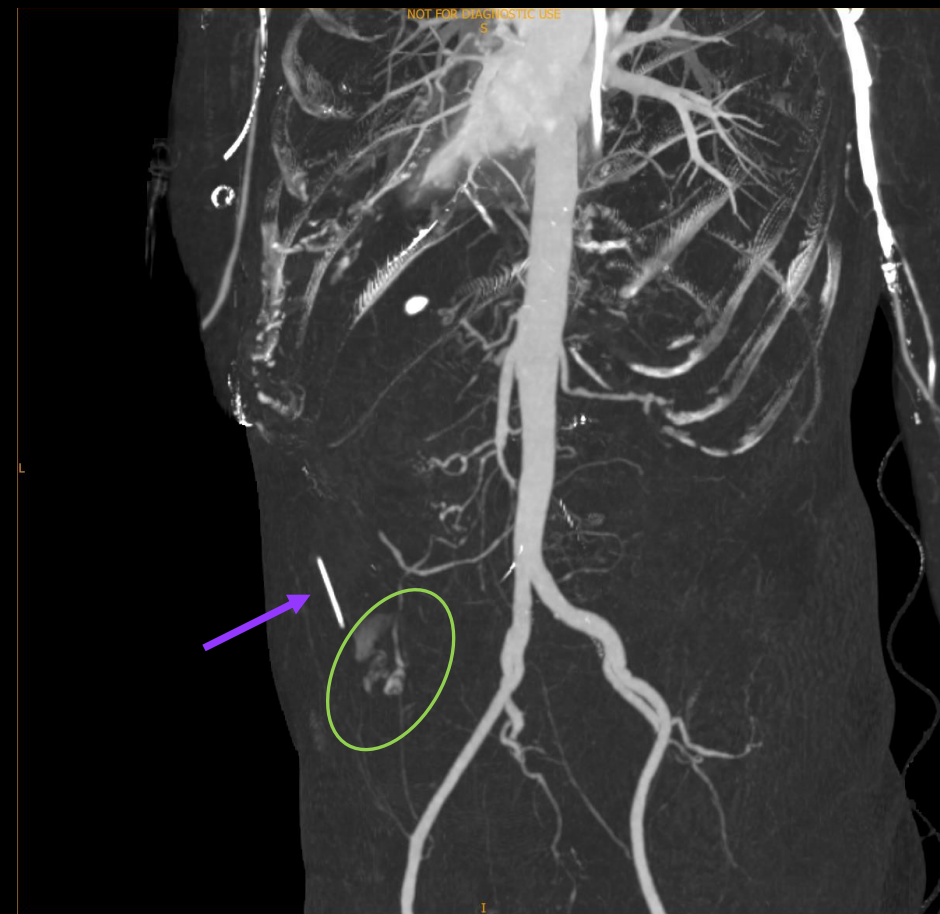






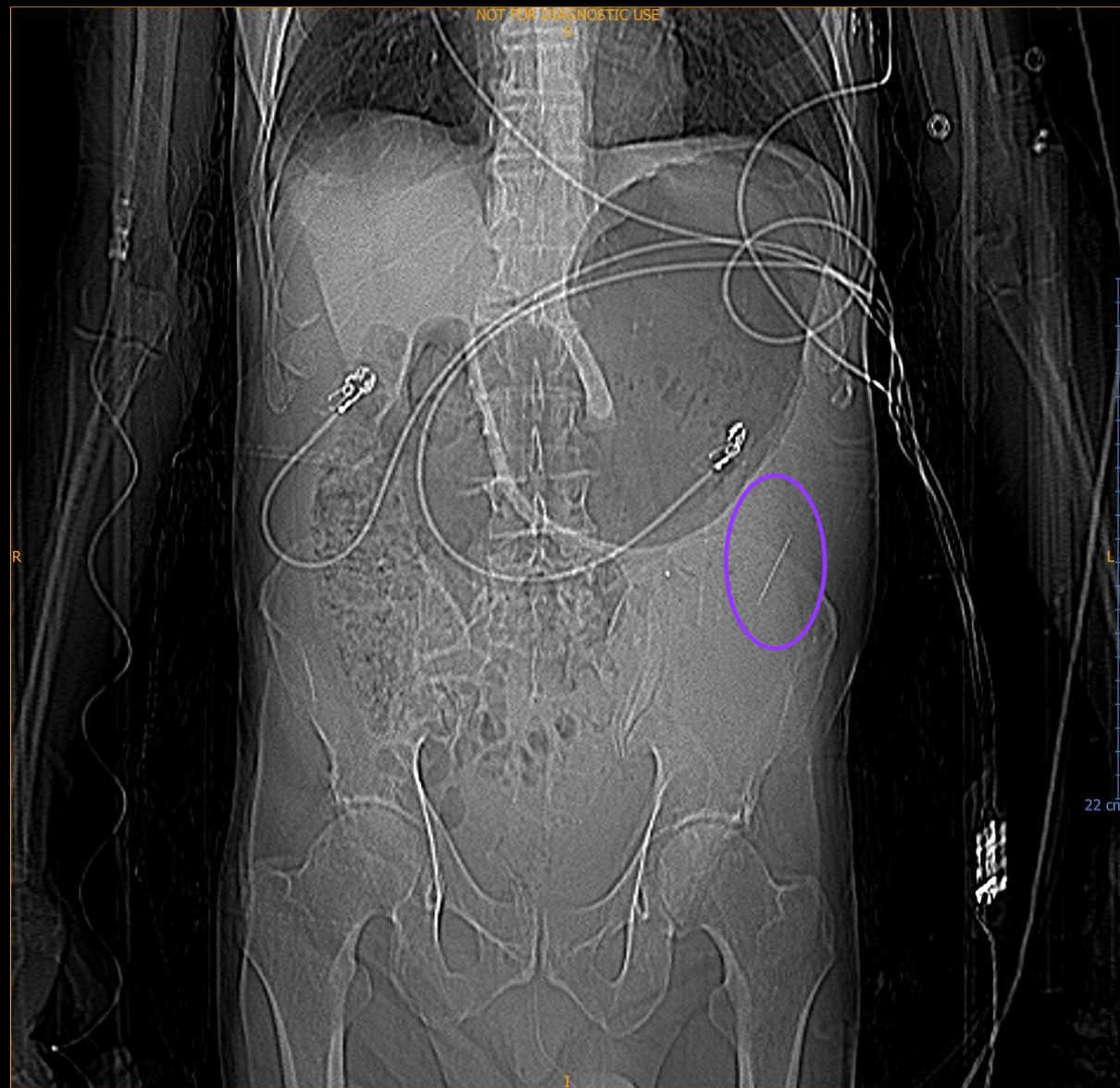
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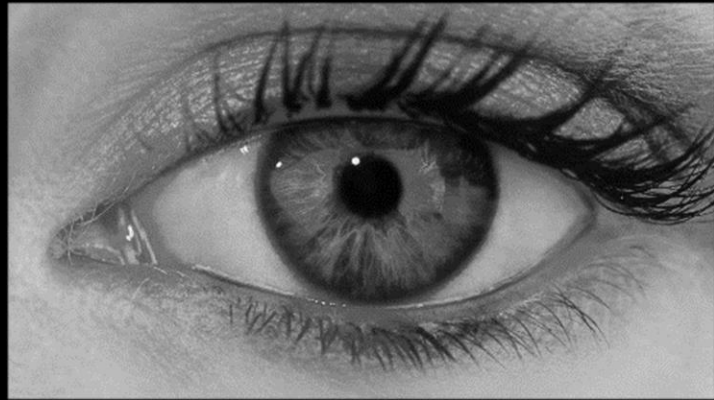
Linear  
metallic FB  
(needle)





1 MILLION  
different  
colors





700-900  
different  
shades of  
gray



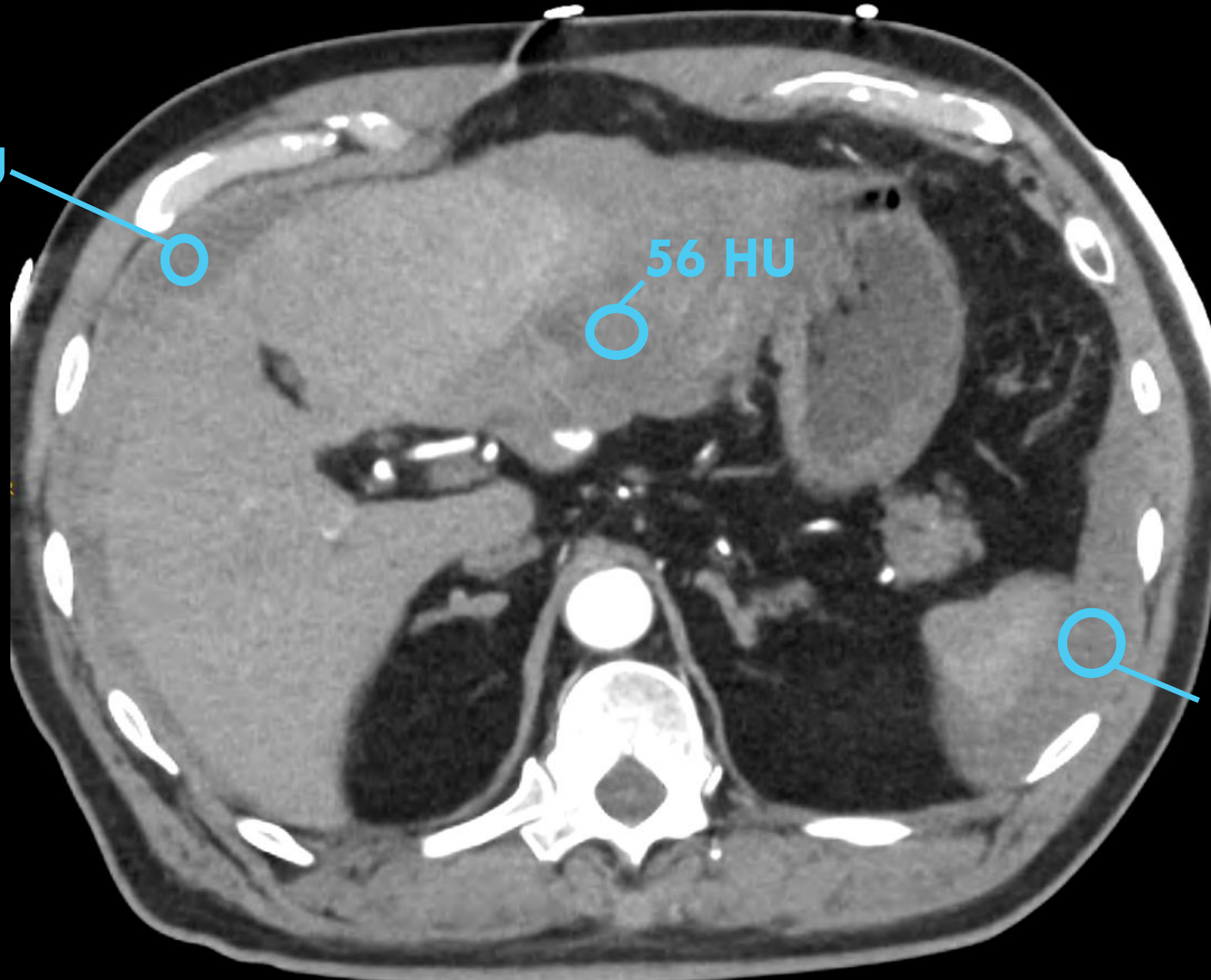
40 HU



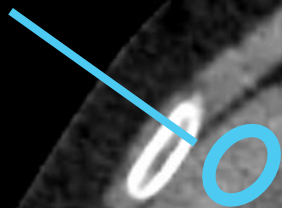
56 HU



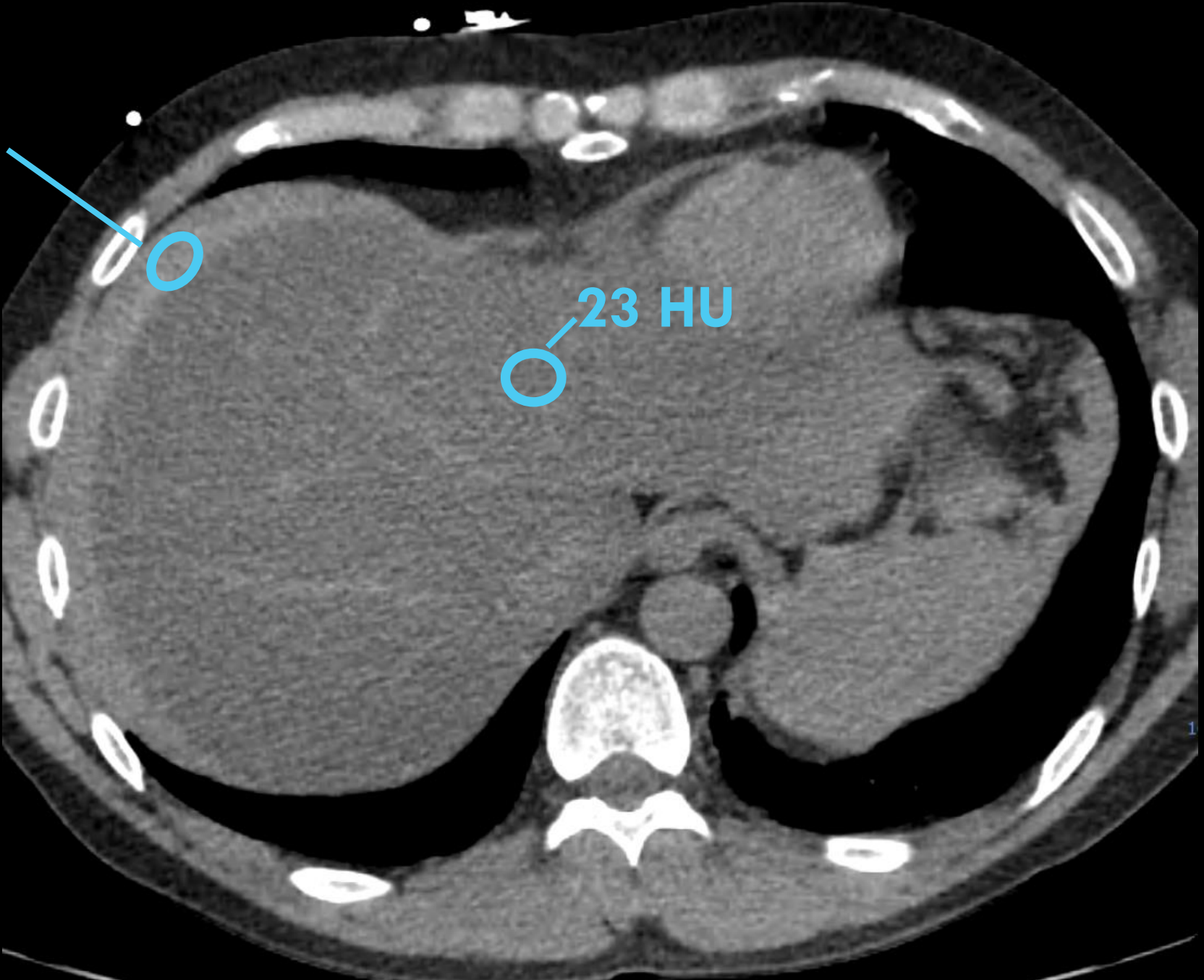
43 HU



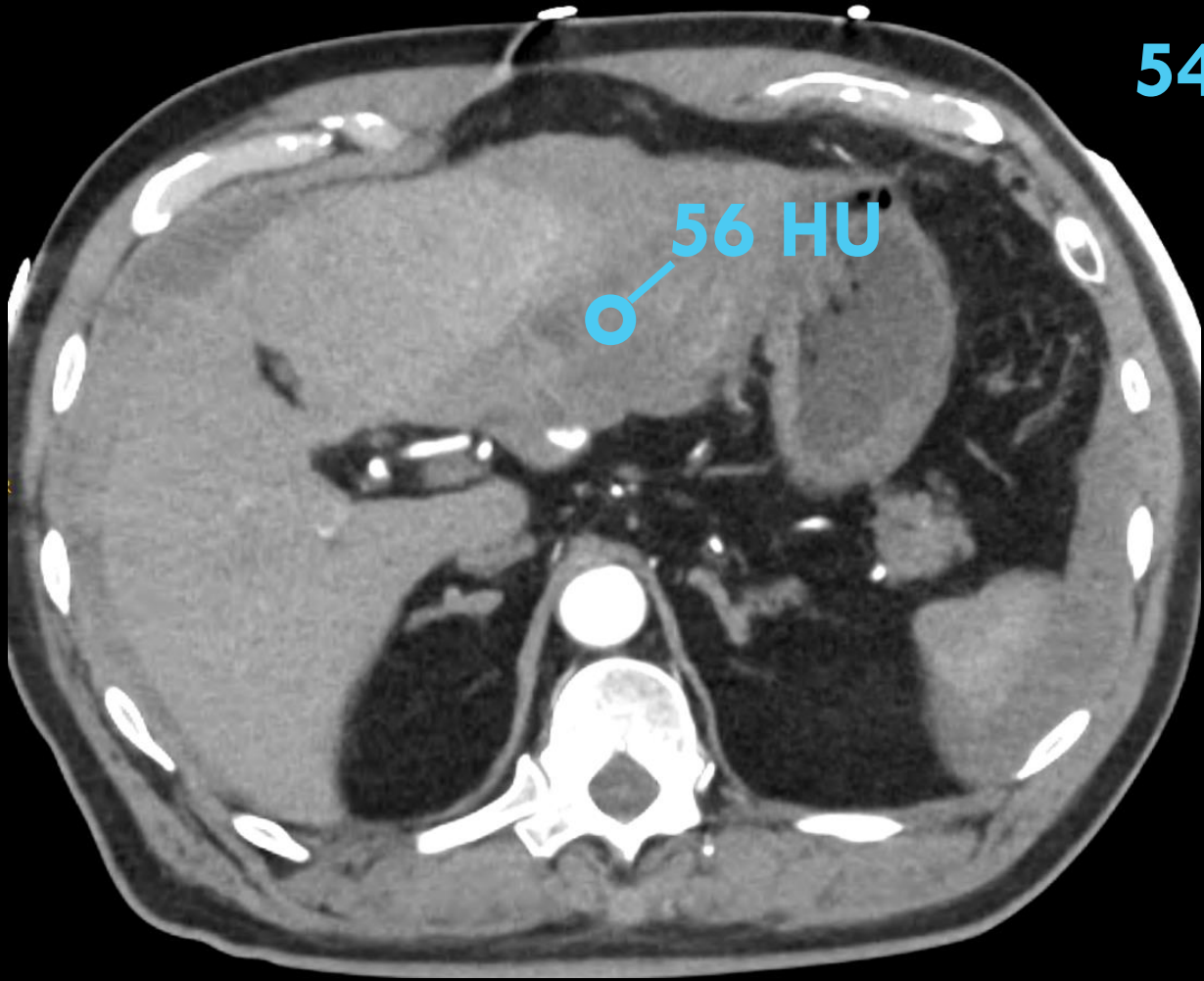
54 HU



23 HU







54 HU



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THANK YOU!