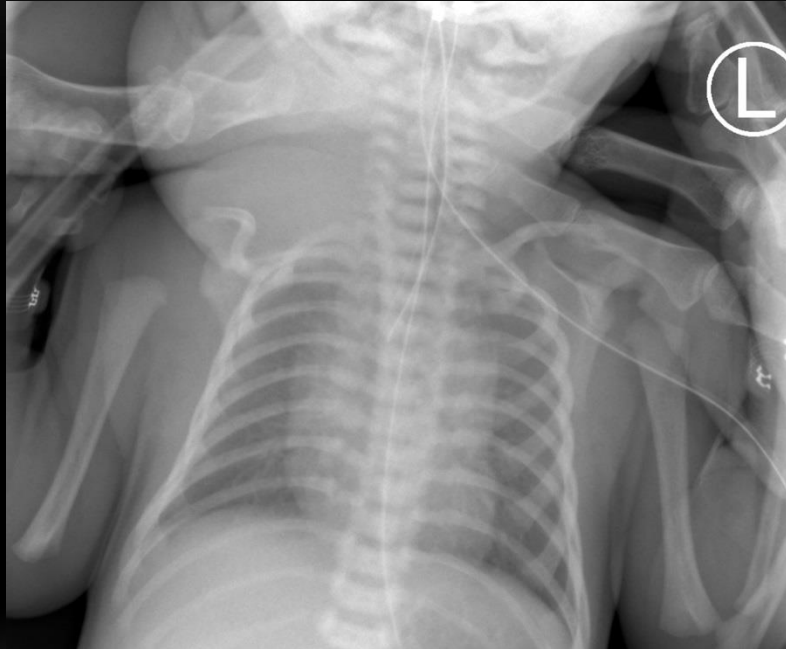


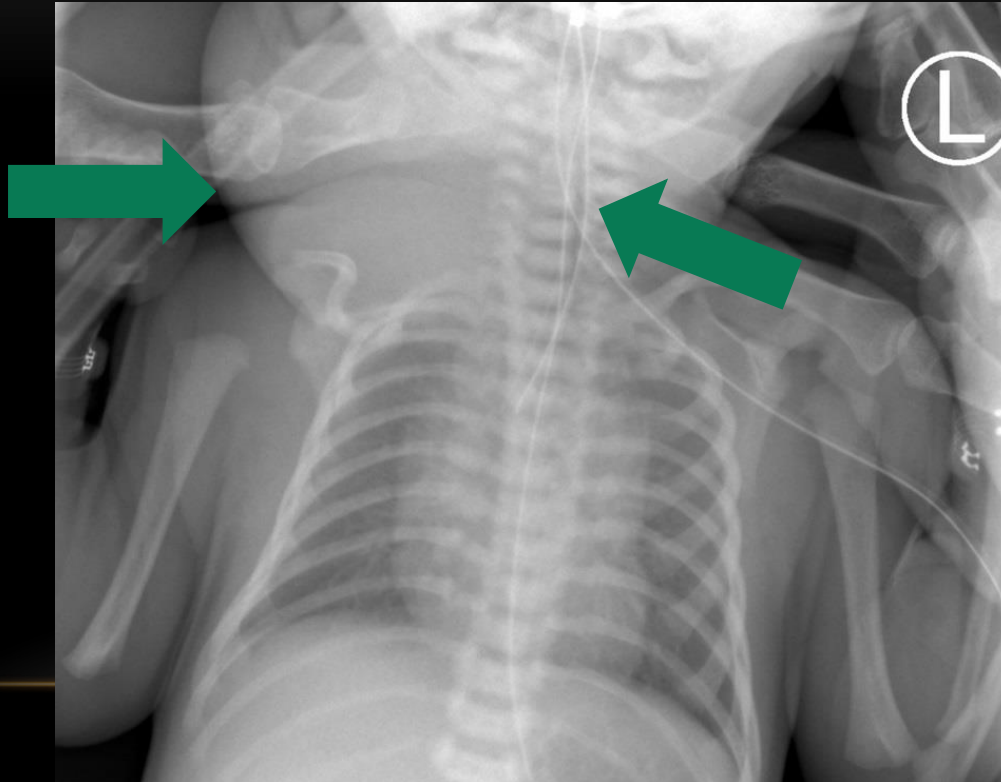
**2017 SUNDAY
IMAGE INTERPRETATION SESSION**

PEDIATRICS CASE 1-NEWBORN GIRL



Difficulty breathing at birth

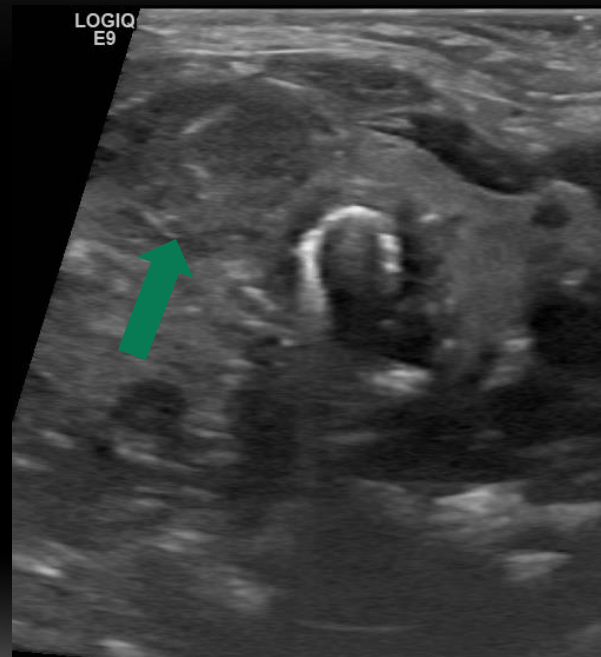
PEDIATRICS CASE 1-NEWBORN GIRL



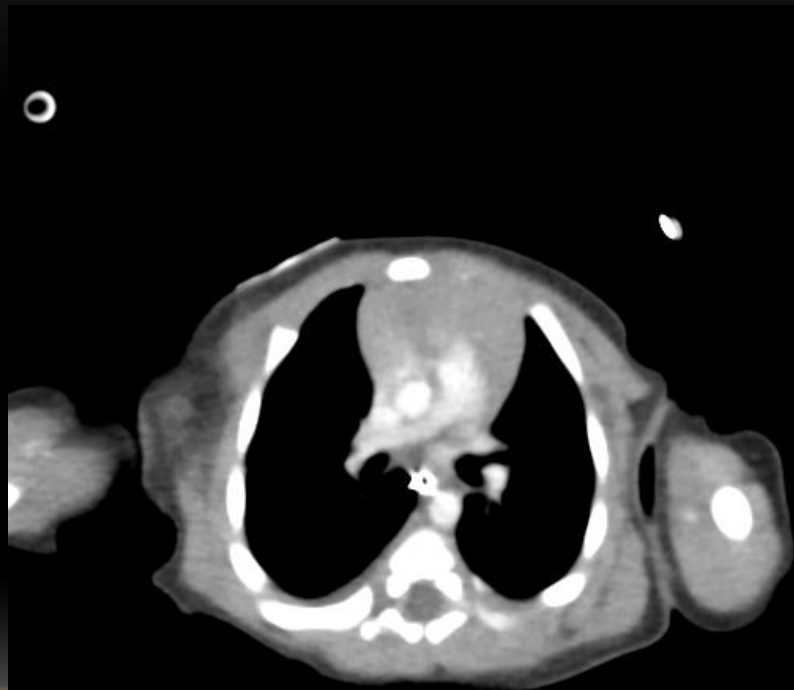
NECK SONOGRAPHY DAY 1



TRANS RT MID NECK



CONTRAST ENHANCED CT NECK AND CHEST, T2 MRI

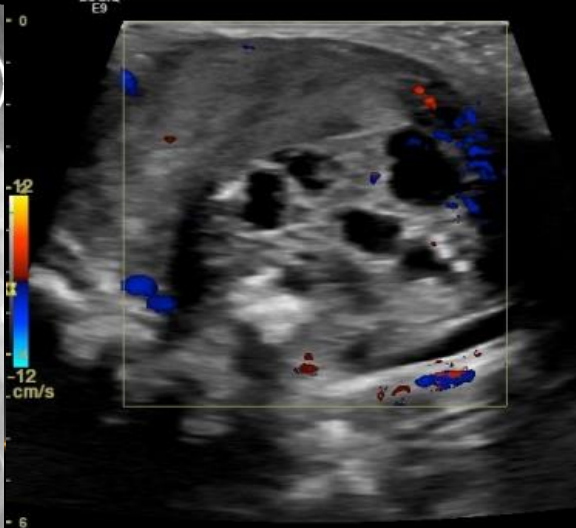
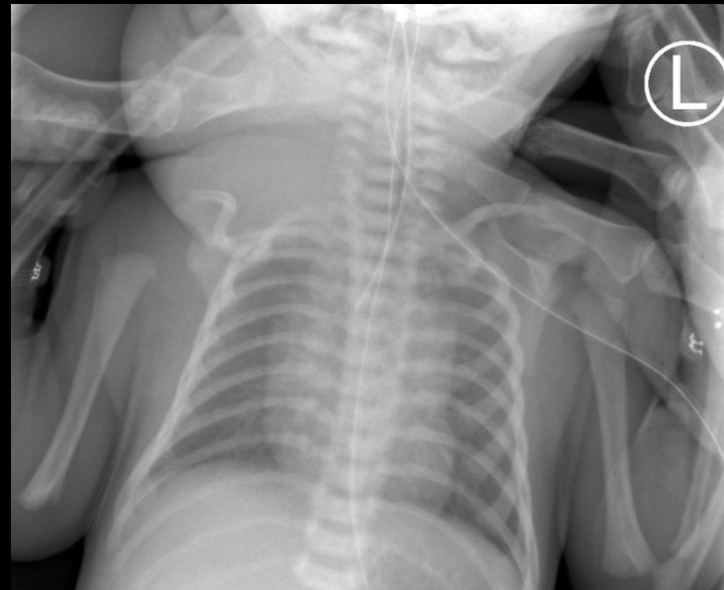


LABS

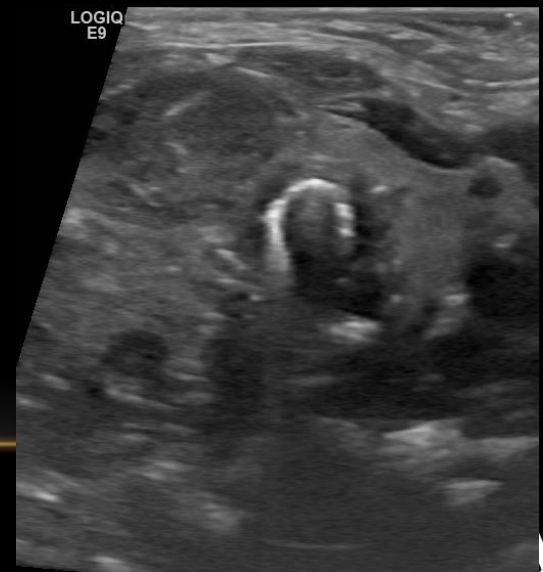
AFP 45418 ng/mL
HCG 1.79 mIU/mL

SUMMARY OF FINDINGS

Right neck heterogeneous avascular mass involving thyroid
Deviates esophagus and trachea
Contains cysts and calcifications



TRANS RT MID NECK

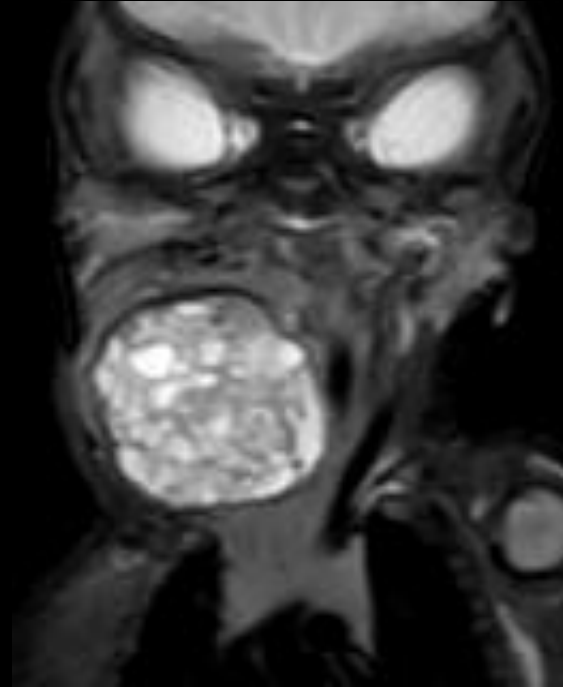
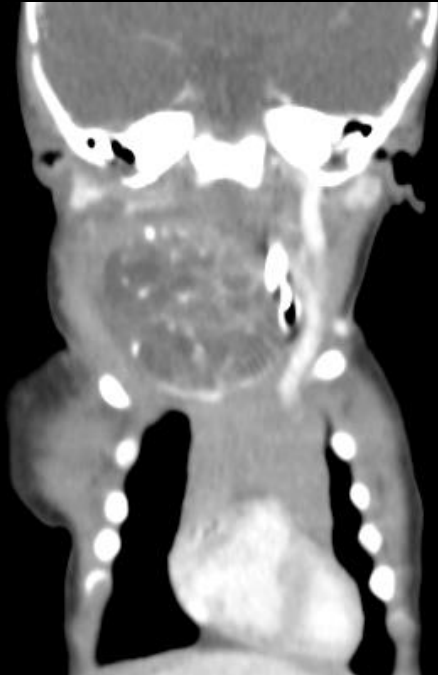


SUMMARY OF FINDINGS

Thin septal enhancement

Normal AFP and HCG for a newborn

AFP 45418 ng/mL
HCG 1.79 mIU/mL



DIFFERENTIAL DIAGNOSIS

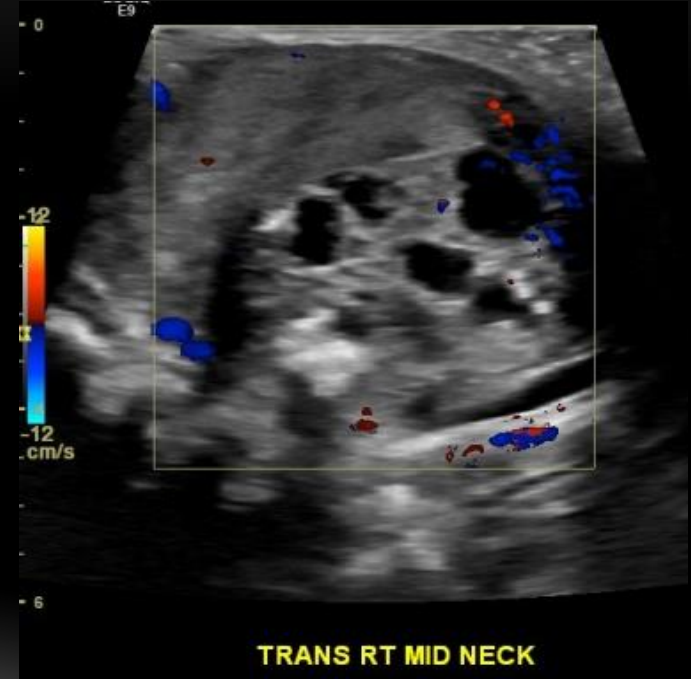
NEONATAL NECK MASS

Congenital

- Lymphatic malformation

Neoplastic

- Neuroblastoma
- Teratoma

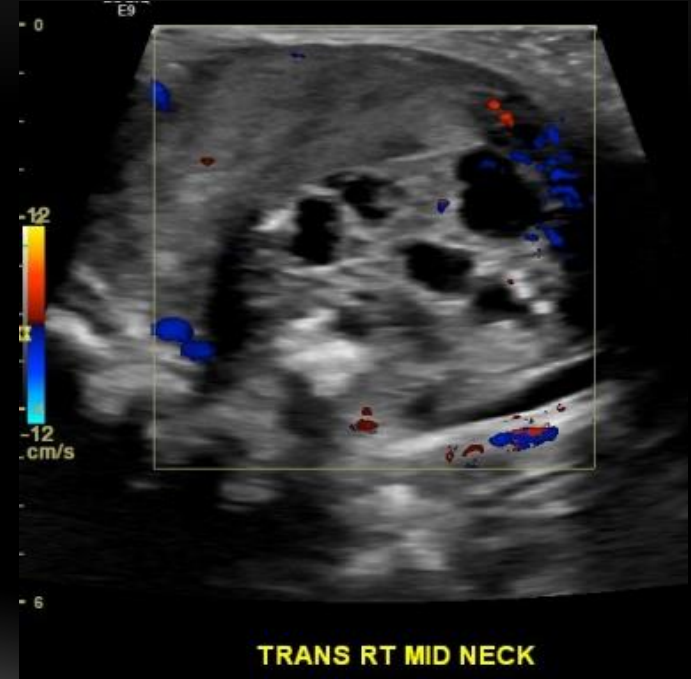


DIFFERENTIAL DIAGNOSIS

NEONATAL NECK MASS

Lymphatic Malformation

- ✓ Congenital neck mass
- ✓ Cysts
- ✓ Thin enhancing septa
- ✓ Avascular
- ✗ Calcification
- ✗ Large solid components
- ✗ Thyroid

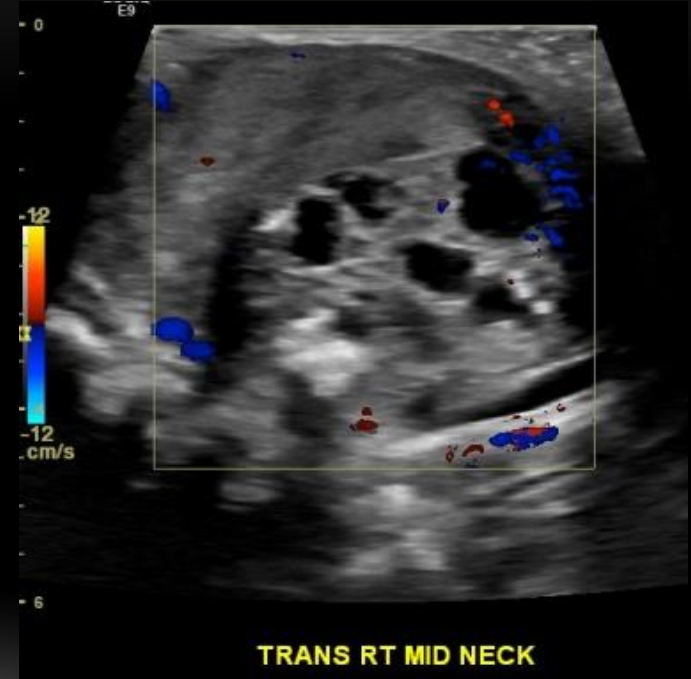


DIFFERENTIAL DIAGNOSIS

NEONATAL NECK MASS

Neuroblastoma

- ✓ Congenital neck mass
- ✓ Calcifications
- ✗ Elevated Chatecholamines
- ✗ Cysts
- ✗ Vascular

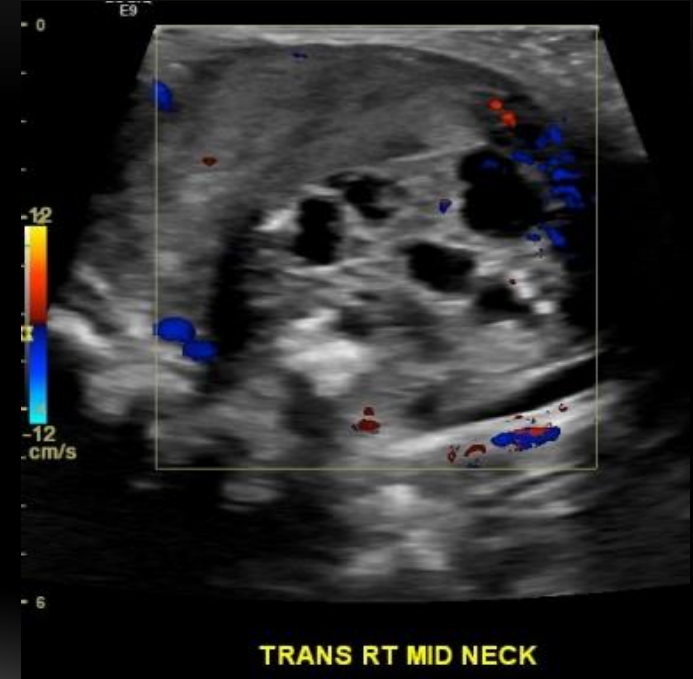


DIFFERENTIAL DIAGNOSIS

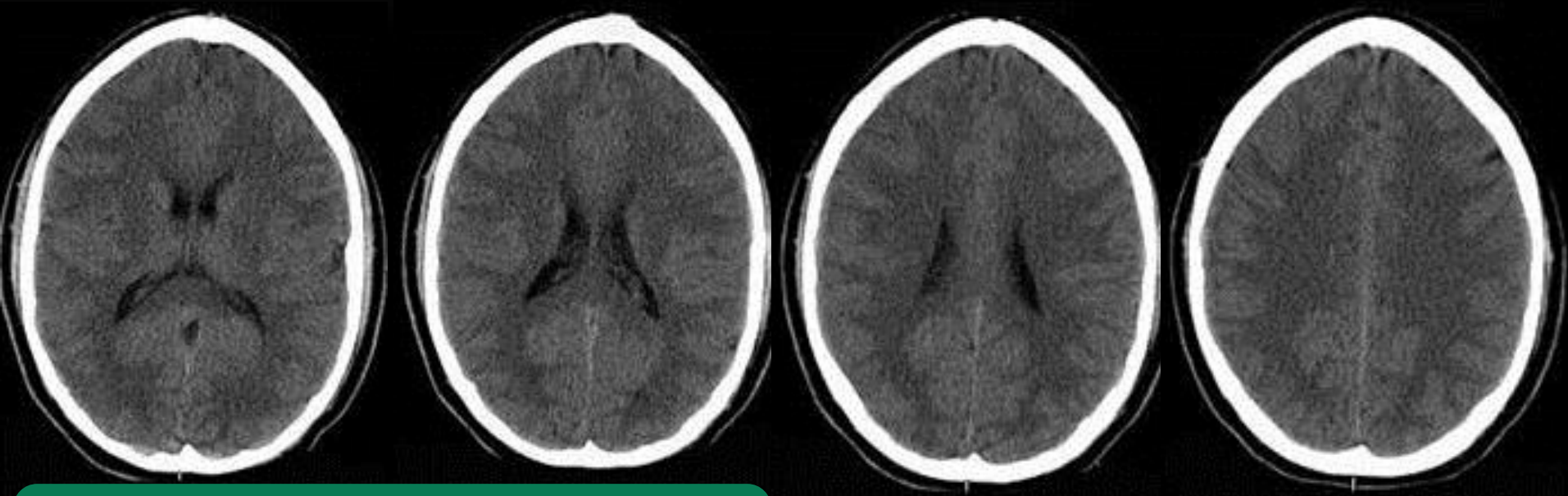
NEONATAL NECK MASS

Teratoma

- ✓ Congenital neck mass
- ✓ Calcifications
- ✓ Cysts
- ✓ Avascular
- ✓ Involves the thyroid

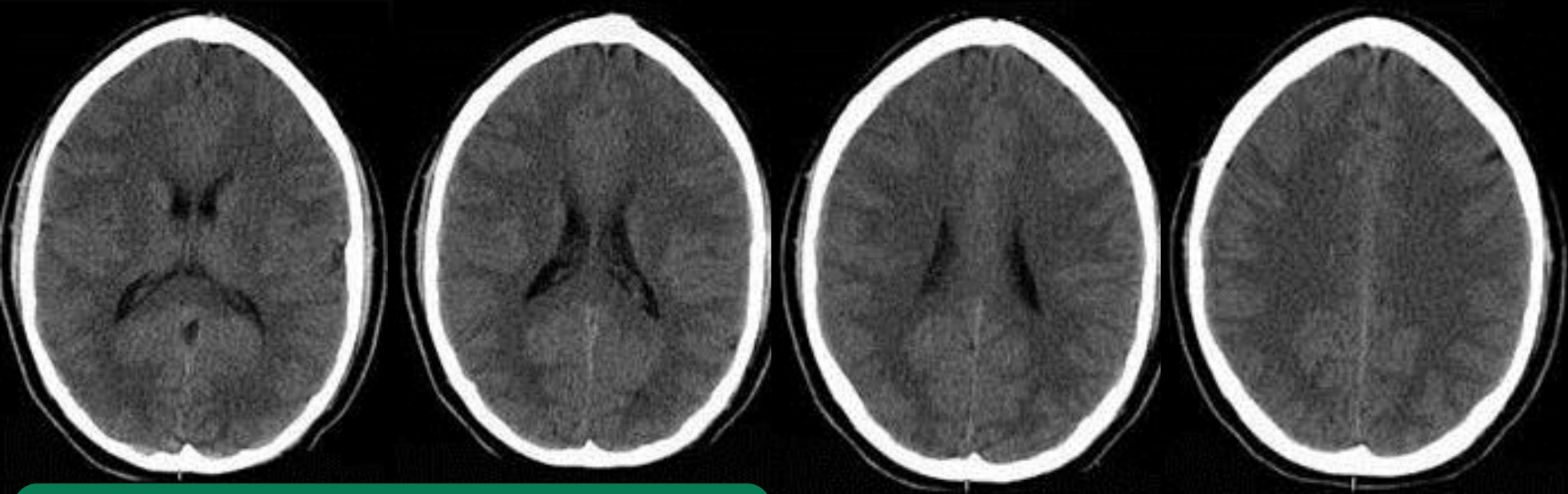


NEURO CASE 1- 23 YEAR OLD MALE IN MVC



He sustained several fractures including left clavicle and femur; on arrival patient was conscious and oriented with a Glasgow Coma Scale 15/15

NEURO CASE 1- 23 YEAR OLD MALE IN MVC



He sustained several fractures including left clavicle and femur; on arrival patient was conscious and oriented with a Glasgow Coma Scale 15/15

INITIAL THOUGHTS

- No readily apparent intracranial injury
- History indicates significant other injuries. However, GCS is 15
- Subtle abnormality possible in frontal bone +/- scalp contusion
 - Would need to see soft tissue and bone windows to see if that is real or something else
- At this point with no clinical findings to indicate neurological abnormality would get a standard "no acute intracranial abnormality" dictation

CHEST CT

The patient became short of breath within 24 hours and was intubated; mental status deteriorated → coma



CHEST CT ?????

- Am I suppose to interpret this?
- Looks worse, hope it doesn't need some special pulmonary knowledge
 - That knowledge jumped off the iceberg a long time ago



MENTAL STATUS CHANGE AND COMA

- With chest findings and clinical deterioration and the initial history of fractures I would be wondering about:
 - Fat emboli – history is good for that

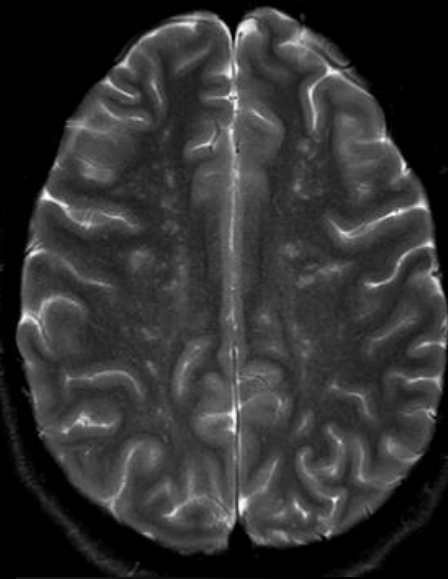
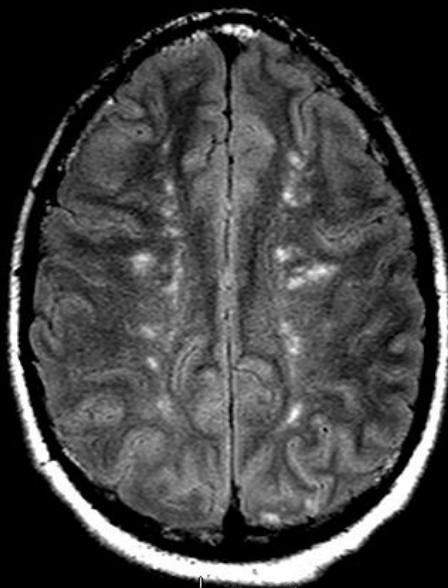
MENTAL STATUS CHANGE AND COMA

- Other thoughts ...
 - DAI
 - Can have a normal appearance initially or not be detected on CT
 - Would be highly unlikely with initial GCS of 15 (usually 8 or less)
 - There could have been occult SAH with subsequent vascular spasm and infarct
 - Vascular injury with subsequent intracranial findings

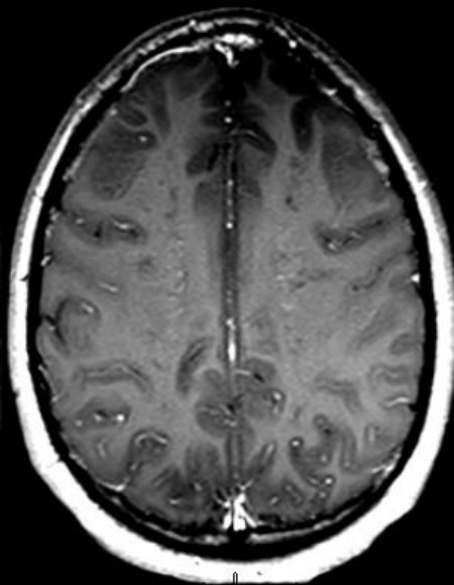
REPEAT NONCONTRAST HEAD CT, GADO MRI



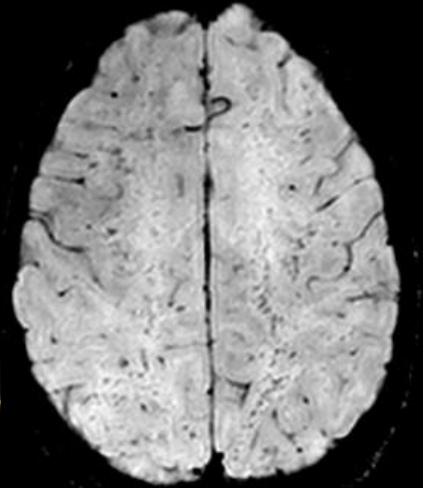
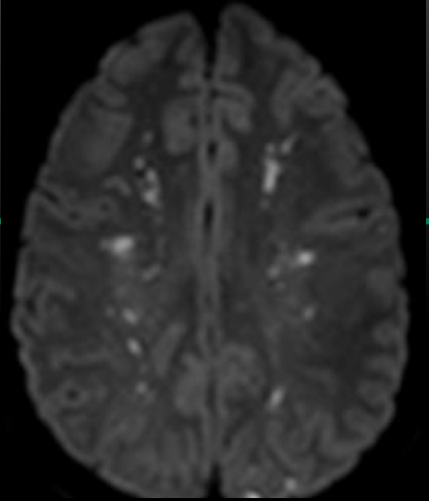
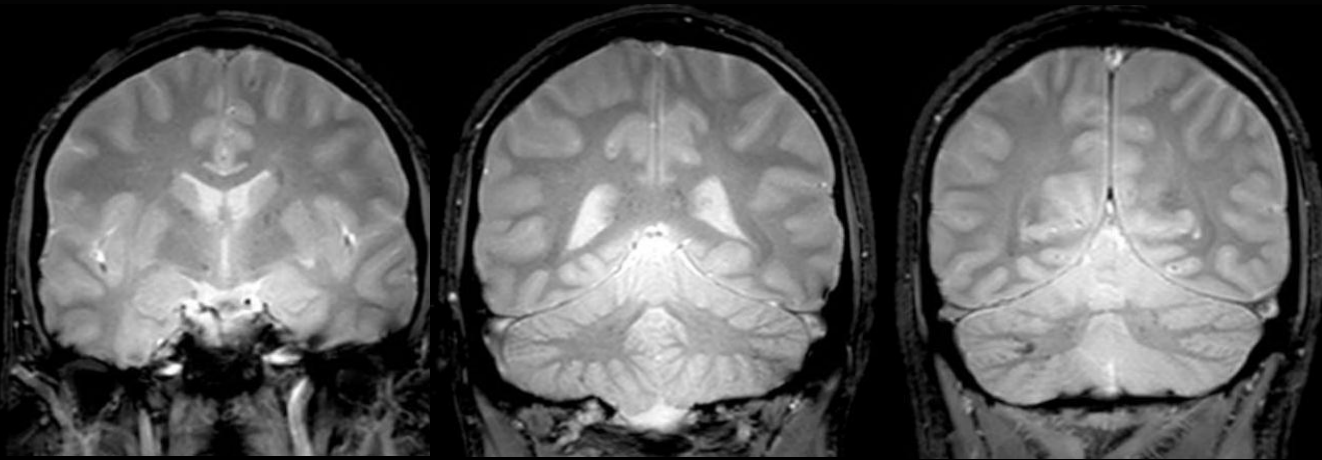
24 hours



24 hours



BRAIN MRI, CONT



CT AND MR IMAGES – 24 HOURS LATER

- CT – still nothing
- MRI – T2 hyperintensities in white matter primarily in centrum semiovale, mostly a watershed distribution. Micro hemorrhages diffusely.
 - No images suggesting corpus callosal injury or lesions predominately at grey/white junction

MSK CASE 1- 23 YEAR OLD MAN



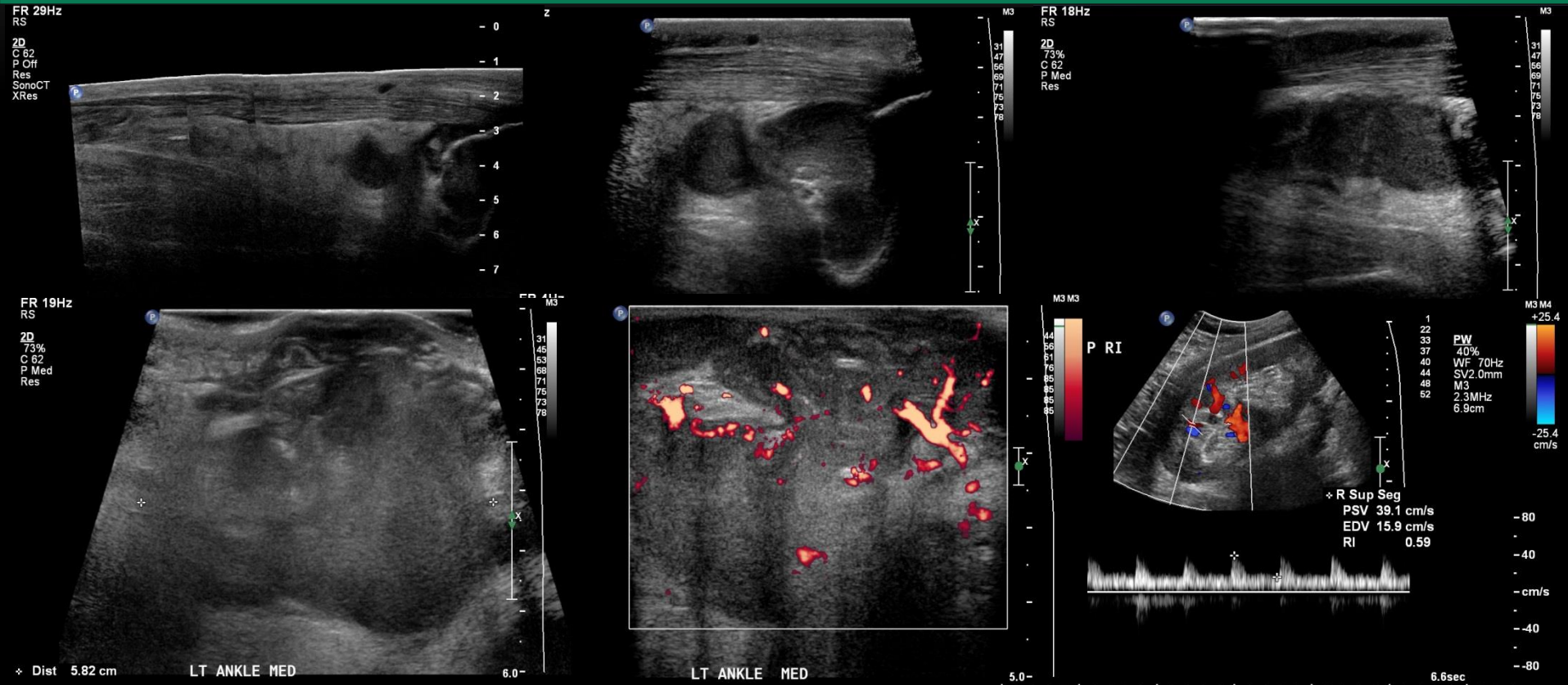
He awoke 3 weeks earlier with spontaneous swelling in his ankle, no injury recalled

THREE VIEW ANKLE



He was treated conservatively for
presumed spontaneous Achilles
rupture

US 4 WEEKS LATER- MORE ANKLE SWELLING AND CC "BLOOD COMING OUT OF MY ANKLE"



REPEAT RADIOGRAPHS AT TIME OF US



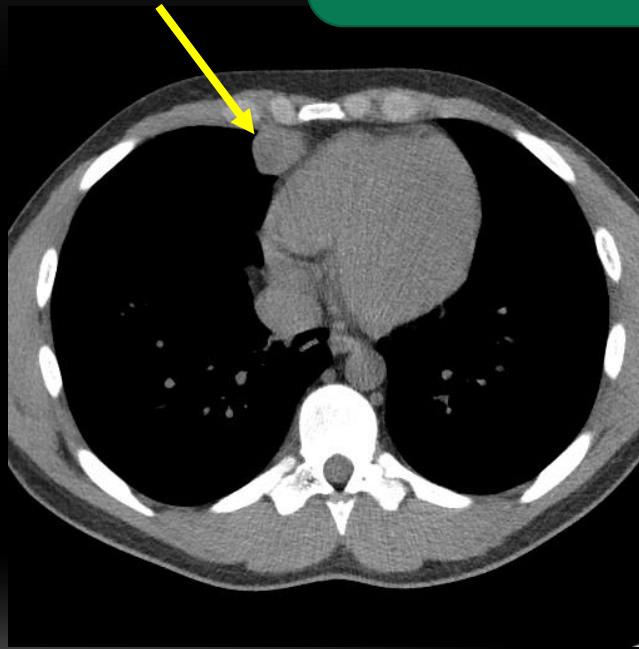
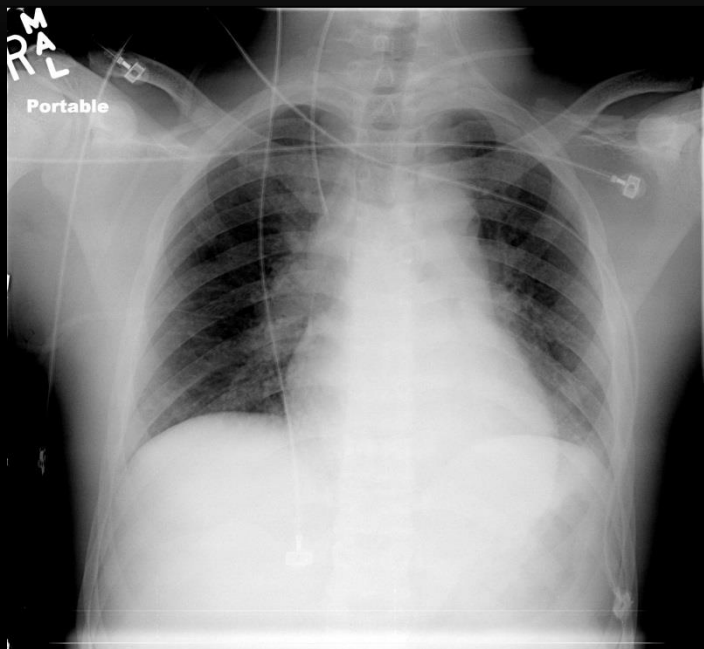
ANKLE MRI NEXT DAY





CHEST CT- NONCONTRAST

He had been on therapy for a chronic skin condition, and a chest CT was obtained



MSK CASE 1-FINDINGS

ANKLE

SOFT TISSUE & BONE

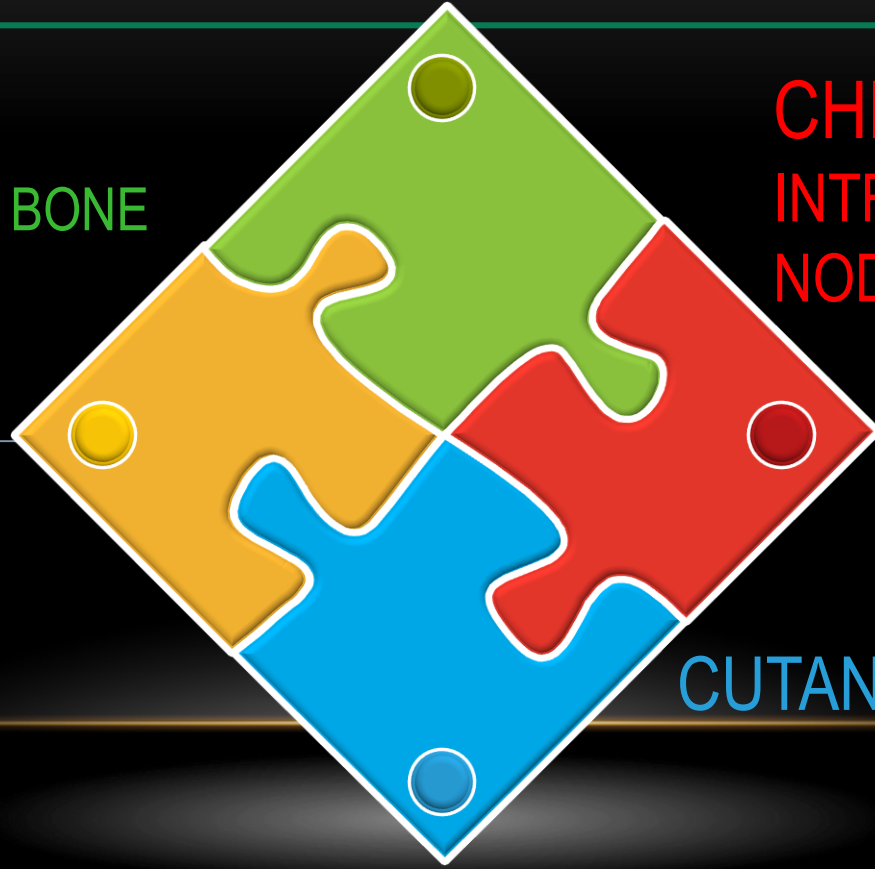
CHEST

INTRAPULMONARY
NODE

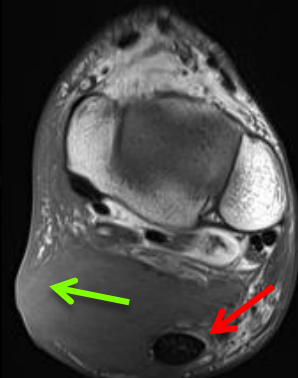
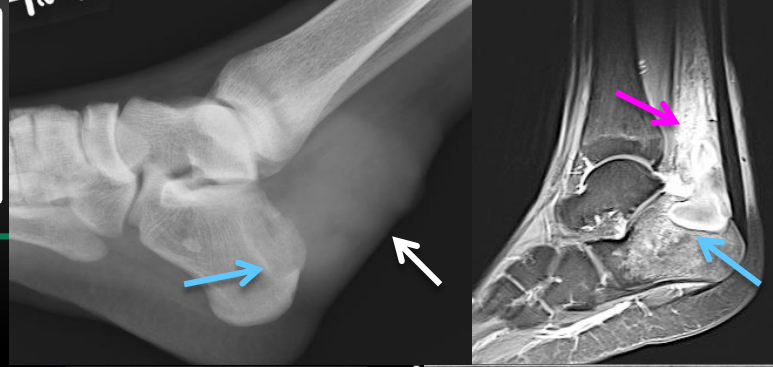
KIDNEY

US

CUTANEOUS LESIONS



MSK CASE 1- ANKLE



- Lytic lesion with sclerotic border & BME
- Rapidly increasing soft tissue swelling
 - Heterogenous with peripheral doppler US & thick wall enhancement on MR
 - Inflammatory signs in the surrounding fat
 - Fistula opening to the skin
 - Achilles tendon displaced
- Skin: ulcerations & bluish areas

MSK CASE 1-CT FINDINGS

CHEST CT



- Chest X-ray, 5 years ago, normal.
- Location
 - ~~Anterior mediastinum (lymph nodes, ectopic parathyroid, thymus)~~
 - Intraparenchymal
- Solitary pulmonary nodule
 - No calcifications, no fat
 - Well defined
 - Central low density (non contrast CT) thick wall

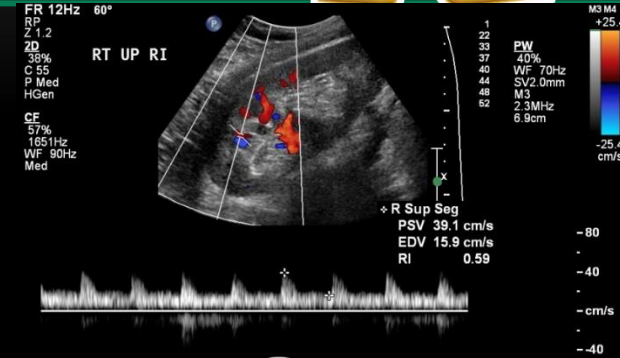


MSK CASE 1-FINDINGS

KIDNEY DISEASE



- Normal corticomedullary differentiation & shape
- Normal doppler, normal resistance index ratio, 0.59
- Abnormal location: too close to the skin



RENAL TRANSPLANT

IMMUNOSUPPRESSED PT



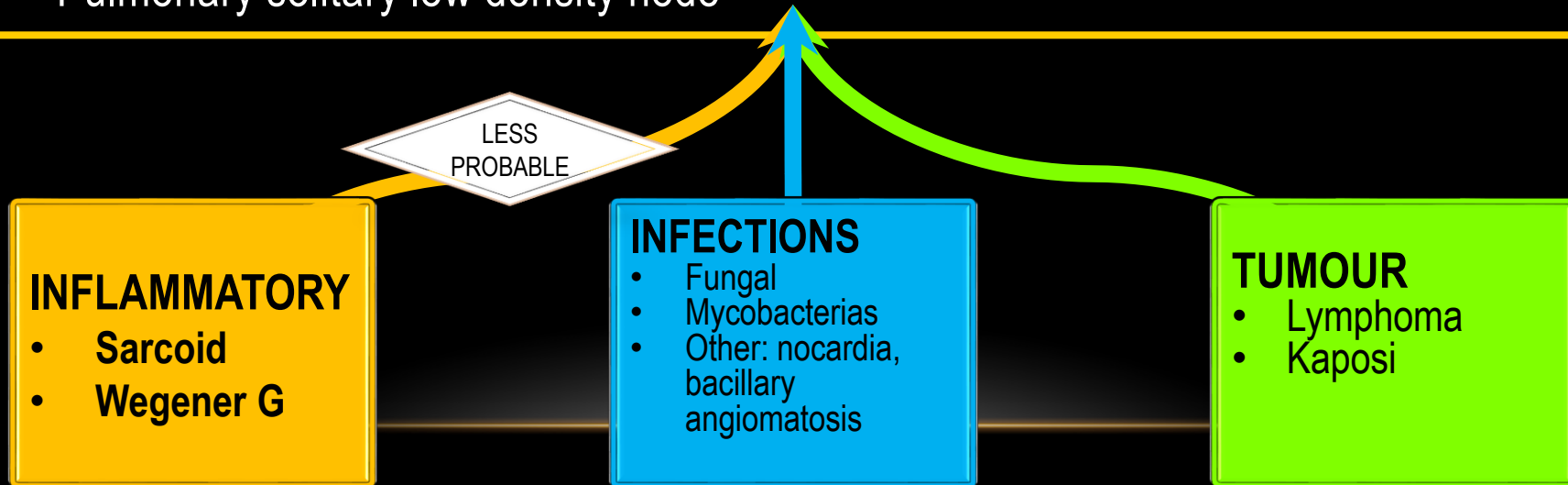
SKIN CONDITION

CUTANEOUS LESIONS



MSK CASE 1-Immunosuppressed patient sec. to renal transplant medication

- Horizontal metaphyseal line —————→ renal osteodystrophy vs steroids
- Rapidly progressive granulomatous lesion in the ankle in bone & soft tissue & skin
- Pulmonary solitary low density node



MSK CASE 1-

Complications in SOT

Skin & bone granuloma

1

FUNGAL, 47%

Blastomycosis, mucormycosis, coccidioidomycosis

2

BACTERIA, 28%

- Mycobacteria
- Nocardia

3

NEOPLASM, unknown%

- Postranplant lymphoproliferative disorder
- Others SCS, BCS, MELANOMA, KAPOS

Solitary nodule low density

1

FUNGAL, 33%

Actinomycosis, Aspergillus, coccidio., blasto.

2

BACTERIA, 22%

- Mycobacteria
- Nocardia

3

NEOPLASM, 30%

- Postranplant lymphoproliferative disorder

1 | LYMPHOMA

- Less rapidly progressive
- Lymph nodes
- Homogenous attenuation

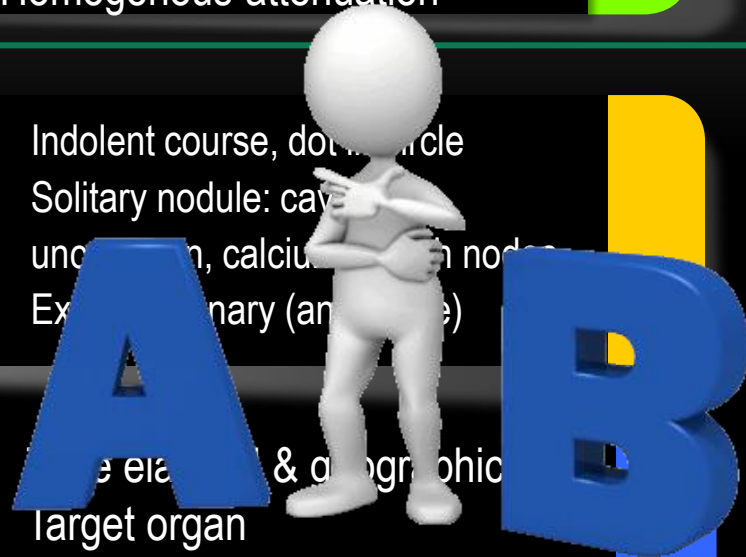
A | BACTERIA

- Nocardia
- Mycobacterias

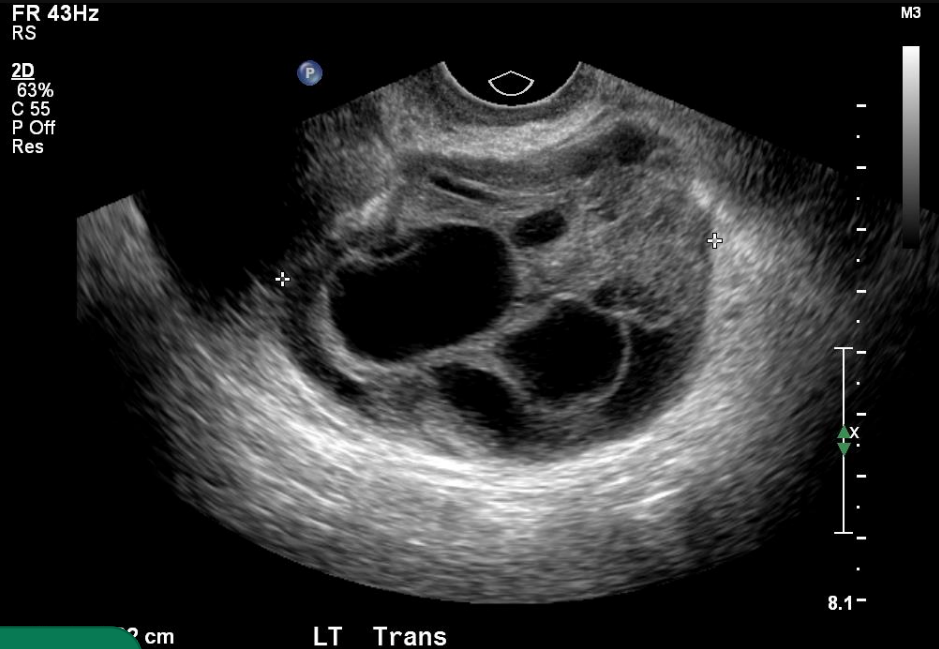
- Indolent course, dot-like nodule
- Solitary nodule: cavitary, necrotic, calcification, nodules
- Extrapulmonary (anterior)

B | FUNGAL

- Multiple & oligonodular
- Target organ
 - Lung, mycetoma
 - Osteoarticular granulomas

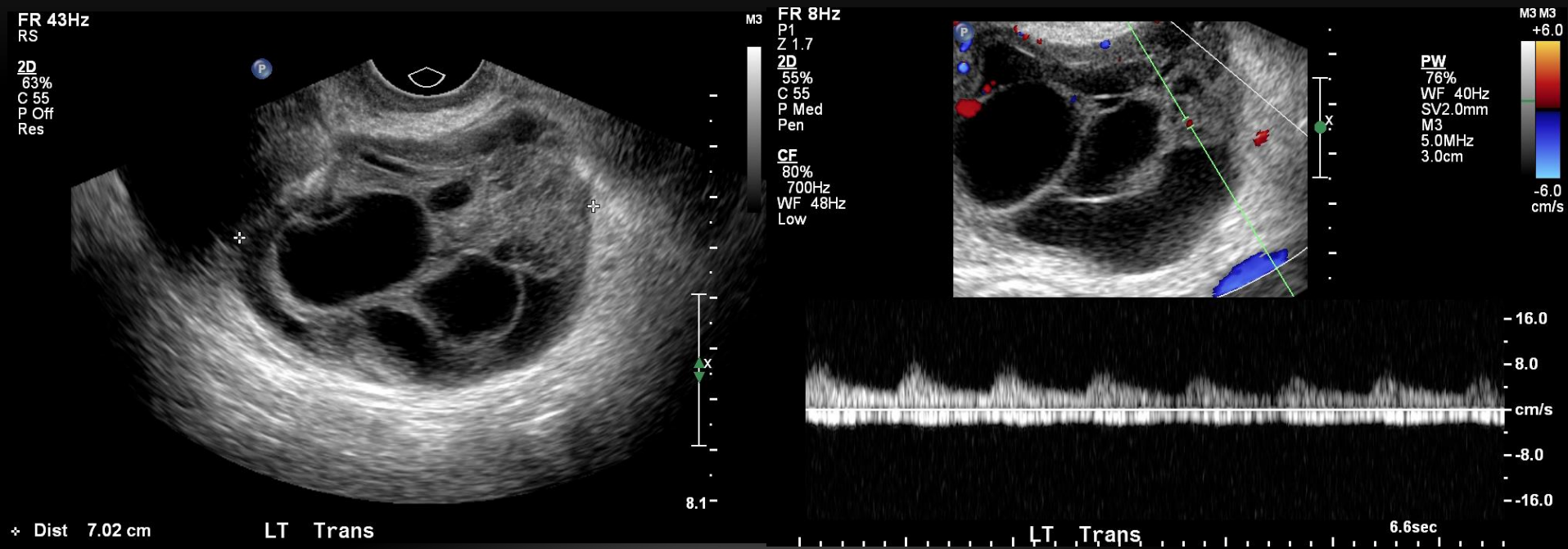


ABDOMINAL CASE 1- 65 YEAR OLD WOMAN



She presented with pelvic pain
and had history of a remote
hysterectomy

65 YEAR OLD WOMAN WITH PELVIC PAIN



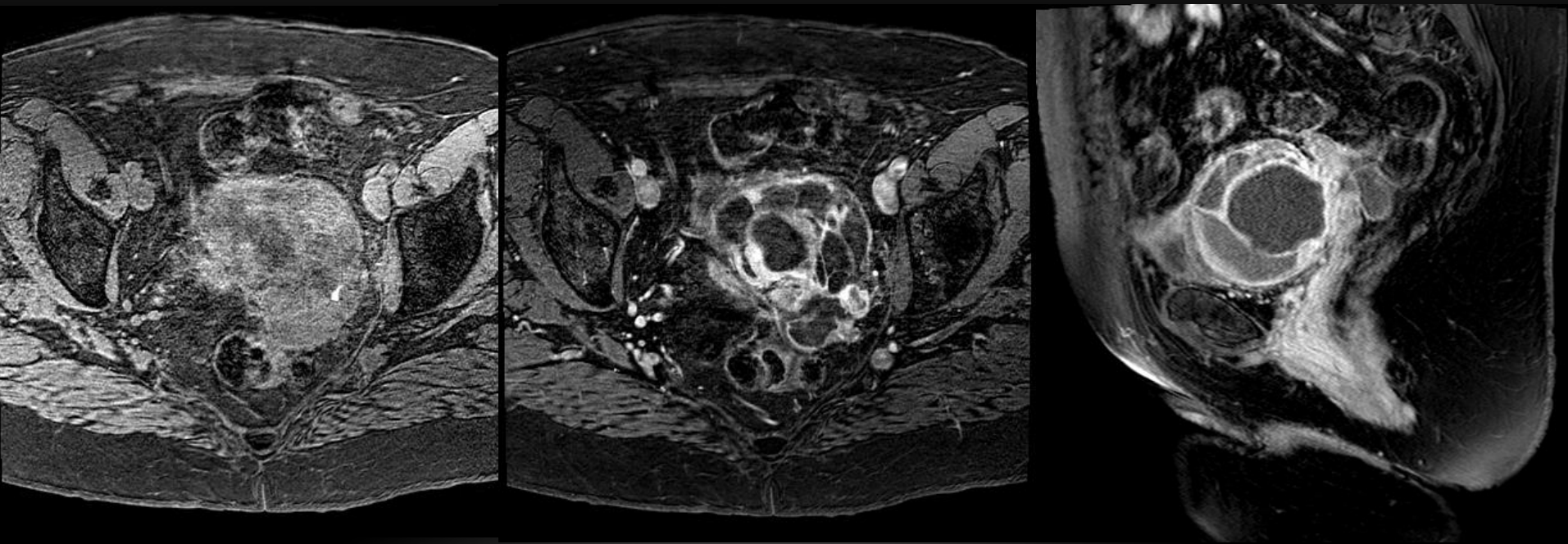
CONTRAST ENHANCED ABDOMINOPELVIC CT

She developed gross hematuria
and was scanned 2 weeks later



Cystoscopic biopsy/TUR: benign
urothelial tissue, no malignancy;
chronic inflammation; pelvic mass
biopsy: similar histomorphology to
a 2012 pelvic mass
CD 10 and ER positivity

MRI 3 MONTHS LATER, PERSISTENT HEMATURIA



2015

COMPARISONS

In total, there were four biopsies,
two of them surgical excisions,
from 2012-2015

A definitive procedure was
performed in 2016



2012



2016

FINDINGS

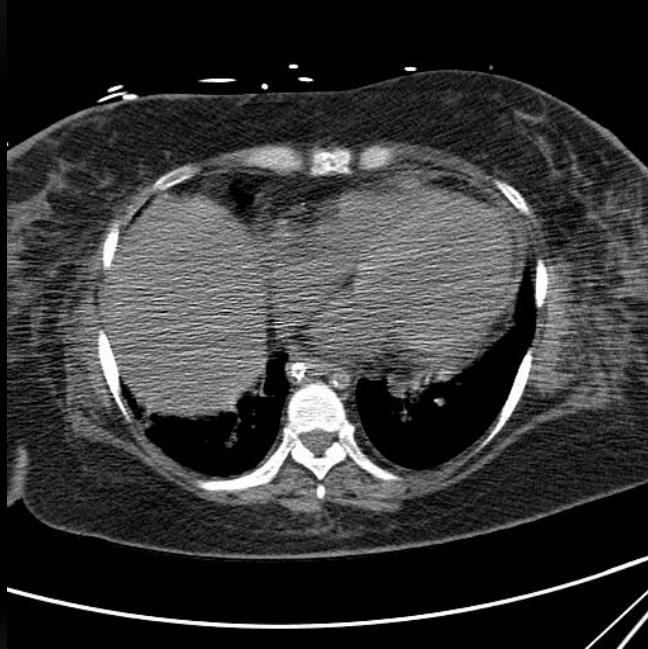
- Initial 2015:
 - US: 7 cm heterogeneous cystic and solid adnexal mass with vascular flow
 - CT: Mass is inseparable from vaginal cuff on L, L ureter is encased but no hydro
 - MRI: Mass has grown rapidly, no fat is present in lesion
- Comparisons
 - 2012: More solid, clearly arising from L vaginal fornix, not ovarian/tubal
 - 2016: Recurrence along laparotomy incision
- Clinical: Post menopausal, remote hysterectomy, mass is ER+/CD10+
- Recommendations: Surgical consultation/resection

DISCUSSION: WHERE DID THE MASS START?

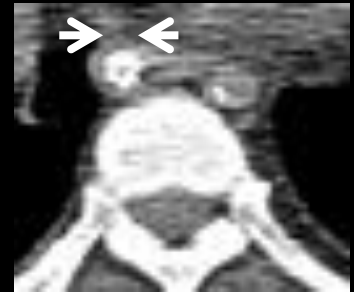
- If Adnexa: What benign/low malignant potential lesions could this be?
 - Endometrioma with malignant transformation: Most commonly will be clear cell carcinoma
 - Will be CD10+/ER+
 - Tends to occur in younger women, need a hx of endometriosis
- If Uterine: What benign/low malignant potential lesions could this be?
 - Endometrial Stromal Sarcoma
 - Will be CD10+/ER+
 - Tends to occur in younger women, with late recurrences
 - Cervical CA/Endometrial Ca/Uterine carcinosarcoma
 - Will be aggressive

CARDIOTHORACIC CASE 1- 39 YEAR OLD WOMAN

Transfer from another hospital in respiratory failure and malignant hypertensive urgency



4-6 mm



MALIGNANT HYPERTENSION

39 YEAR OLD FEMALE

+ “small caliber aorta” + cardiomyopathy

Kidney Injury/ Renal Artery Stenosis

Aortic pathology (coarctation, dissection, vasculitis)

Eclampsia

Hypercalcemia

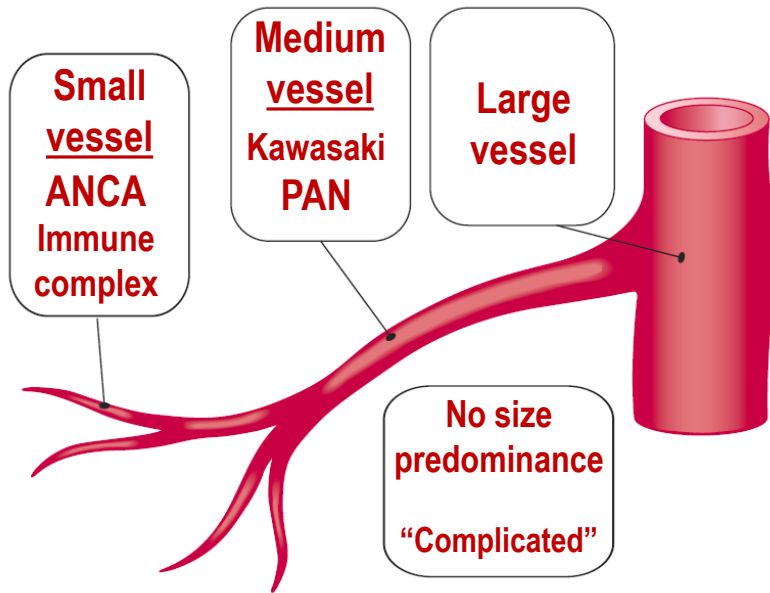
Hyperthyroidism and Thyrotoxicosis

Pheochromocytoma

Subarachnoid Hemorrhage

Drugs

VASCULITIS



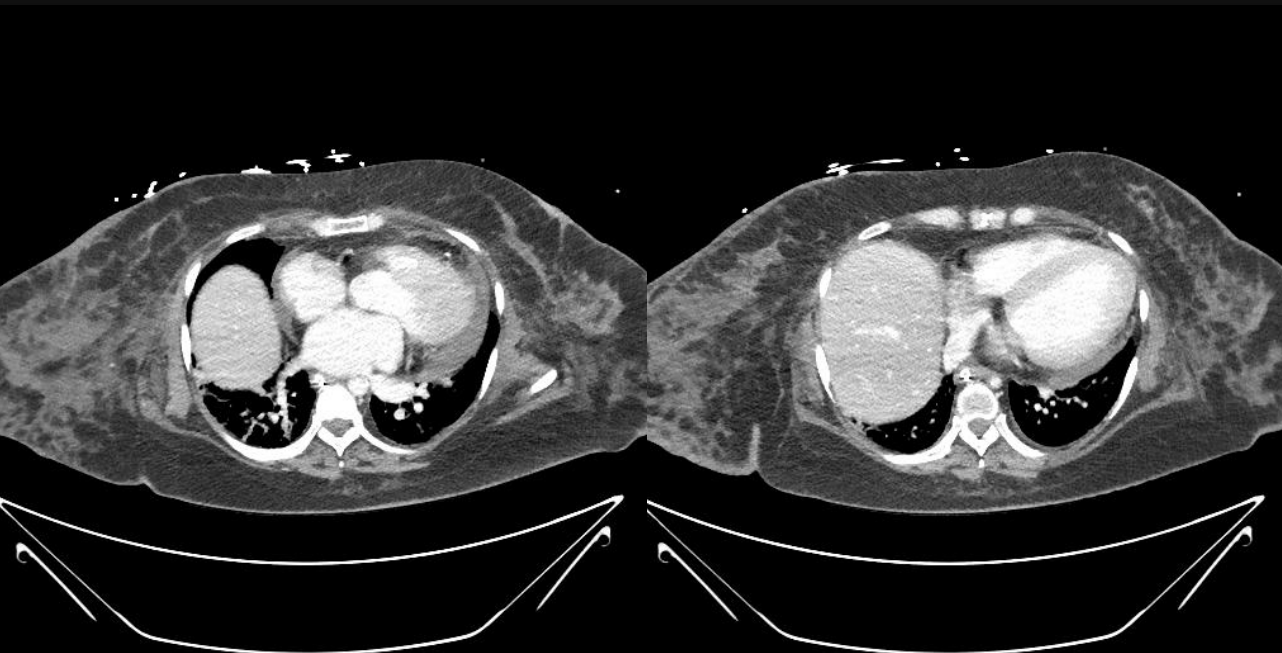
LARGE VESSEL VASCULITIS

Takayasu: <40 yo, granulomatous inflamm of Ao and major branches, hypertension w emergencies

Giant Cell: >50 yo, Ao and extracranial carotid (temporal), polymyalgia rheumatica

Watts RA et al. Rheumatology 50:643 (2011)

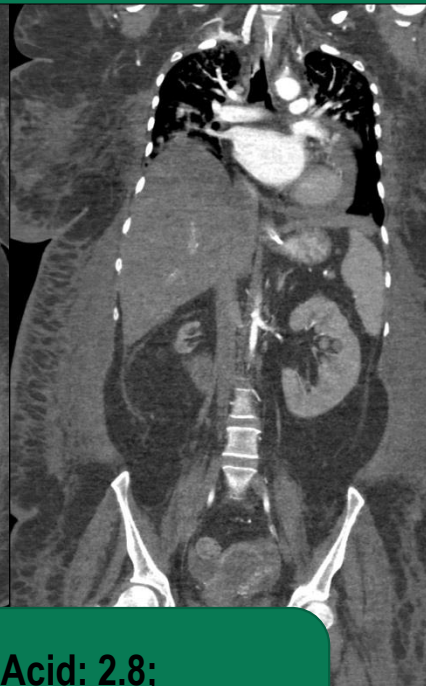
CHEST CT ANGIOGRAM SAME DAY



ROLE OF RADIOLOGY IN TAKAYASU

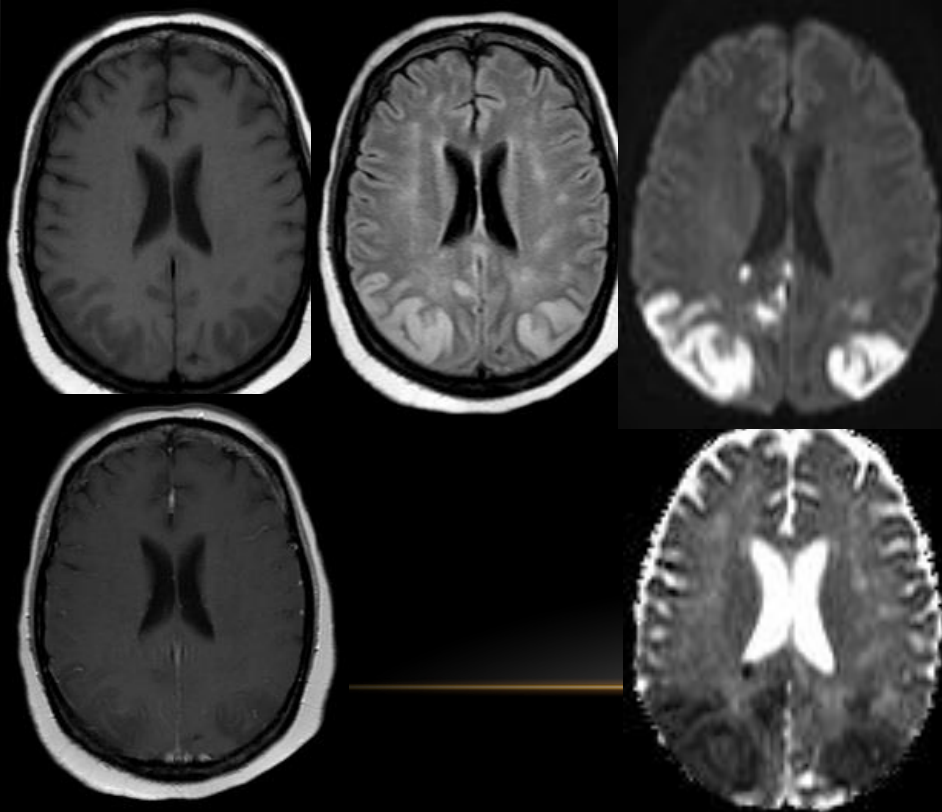
- Secure diagnosis – histopathology can be contraindicated
- Differentiate inflammatory versus atherosclerotic disease
- Determine if a vascular lesion is active
- Evaluate downstream ischemia & complications

ABDOMINOPELVIC CT ANGIOGRAM SAME DAY



Lactic Acid: 2.8;
hypertension persisted; patient
remained minimally responsive

2 WEEKS LATER: POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME (PRES)



Predominant parieto-occipital subcortical vasogenic edema

Intraparenchymal / subarachnoid hemorrhage* in/ along edema

Restricted diffusion* 11% - 26% of cases

Contrast enhancement (gyriform / leptomeningeal)

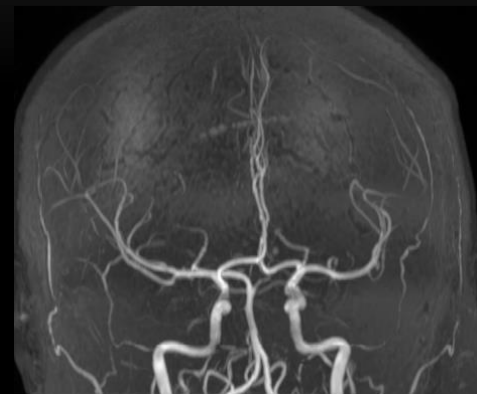
Reversibility 70%- 90% cases

*Poorer outcomes

PRES: LOSS OF AUTOREGULATION, HYPERPERFUSION, VASOGENIC EDEMA



Our patient



Normal patient TOF

Watts RA et al. Clin Imag 47:80 (2018)

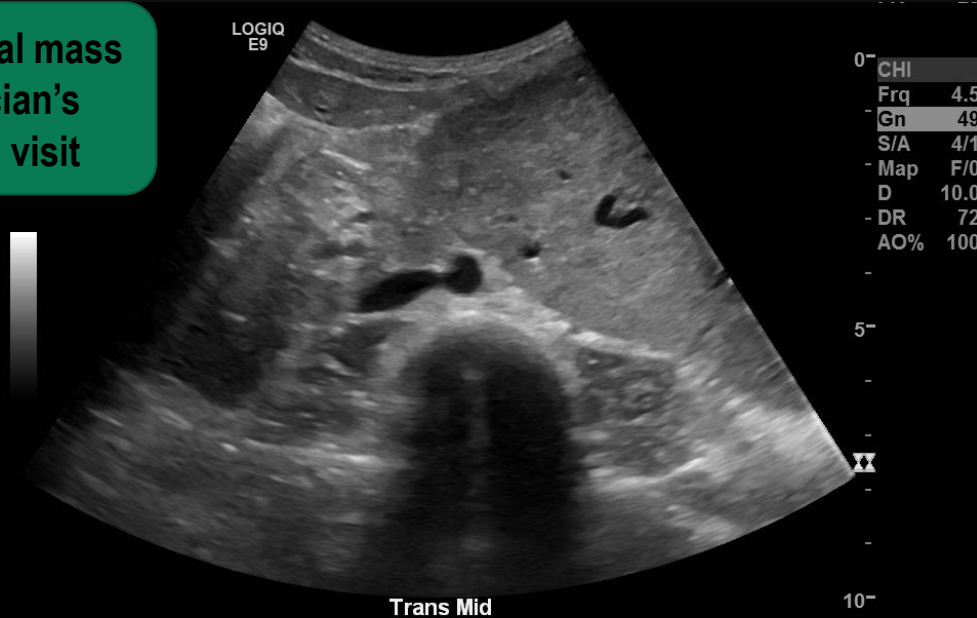
Reversible cerebral vasoconstriction syndrome (85%)

Takayasu's arteritis and posterior reversible encephalopathy syndrome: a case-based review

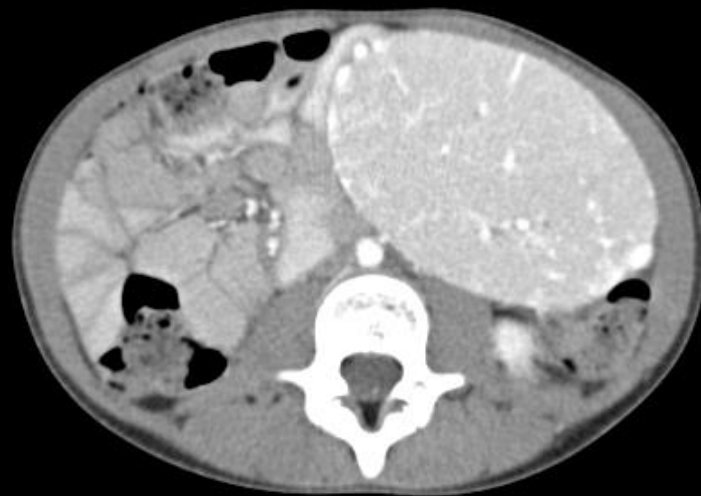
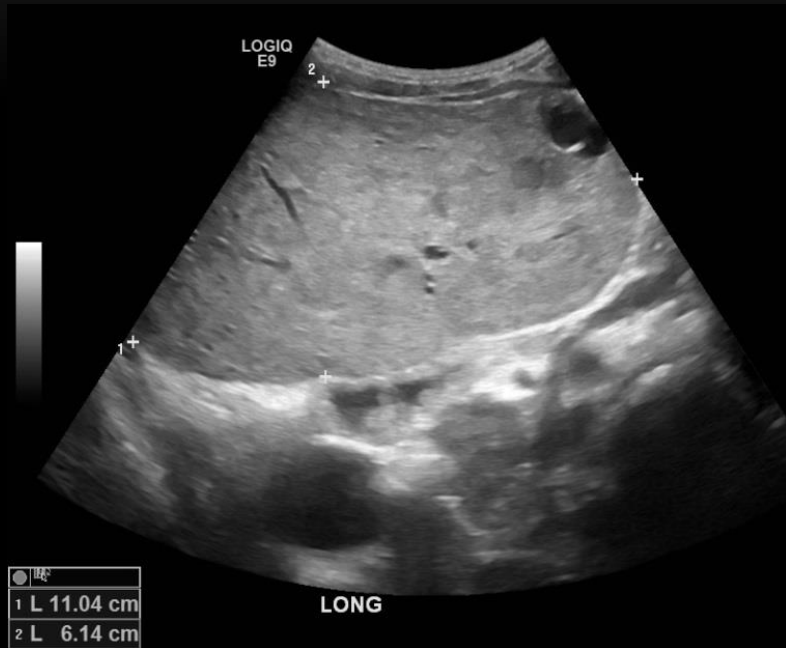
Clinical Rheumatology 2013;32(3):409-415

PEDIATRICS CASE 2- 7 YEAR OLD GIRL

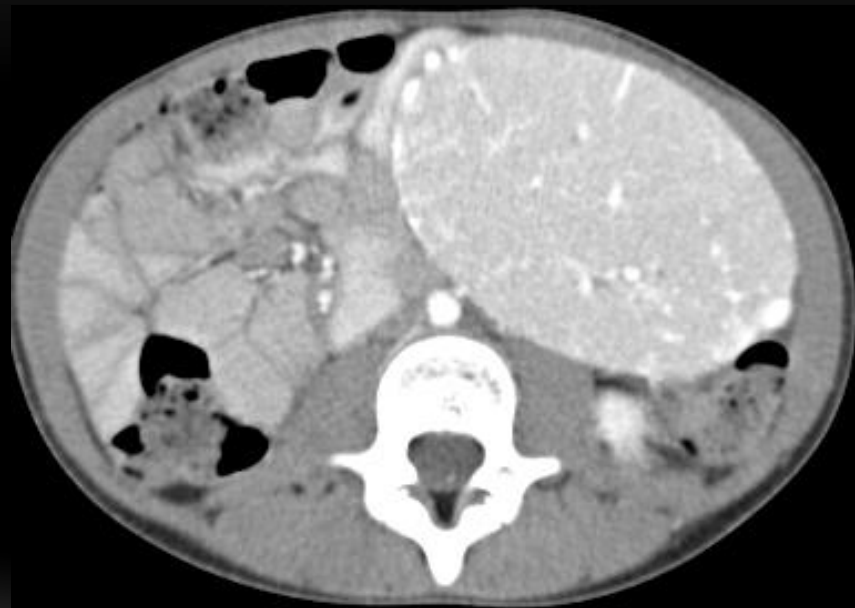
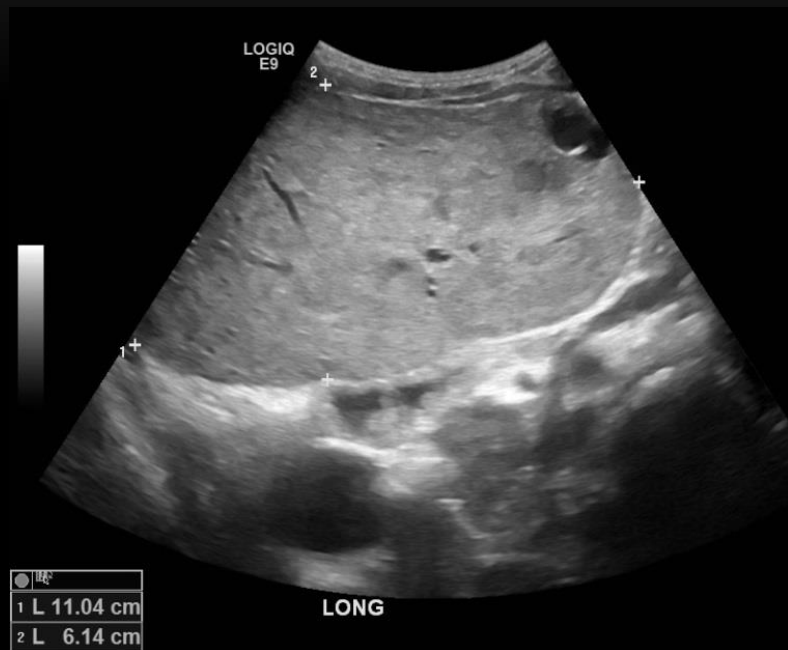
Palpable upper abdominal mass
discovered at pediatrician's
office during well child visit



ABD US, CT ANGIOGRAM



ABDOMINAL ULTRASOUND AND CT ANGIOGRAM

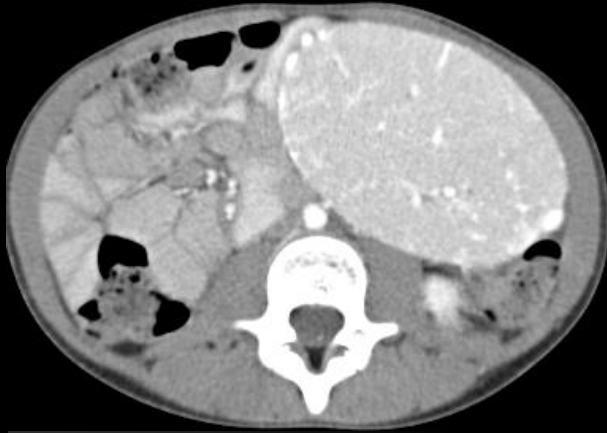


CT ANGIOGRAM



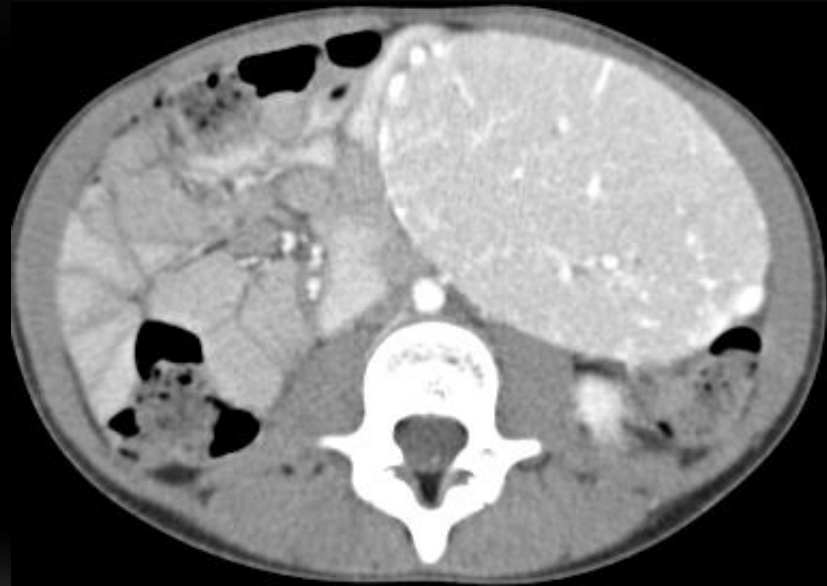
SUMMARY OF FINDINGS

11 cm well circumscribed mass with uniform density
Separate from liver, stomach, spleen and kidneys
Large draining veins into IVC



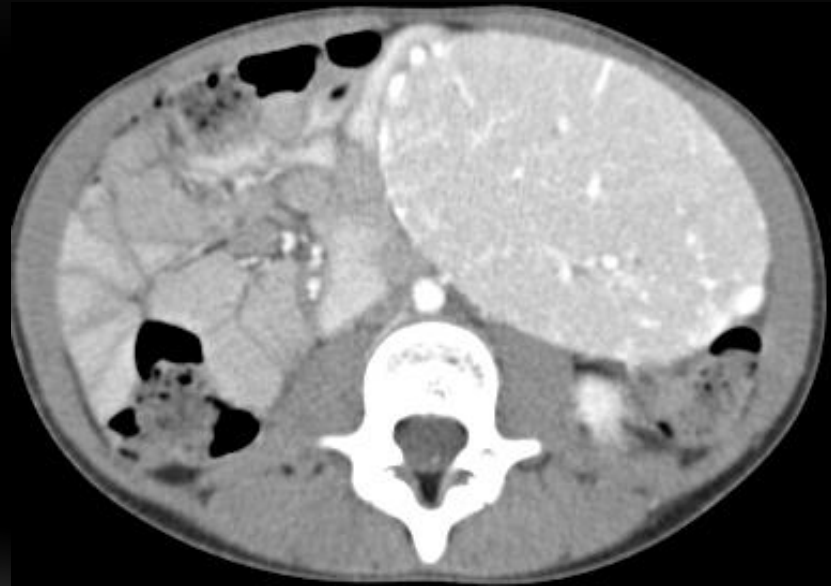
PERTINENT NEGATIVES

- No Calcifications
- No Cysts
- No Central scar
- No Necrosis
- No Abnormal arteries from aorta



DIFFERENTIAL DIAGNOSIS

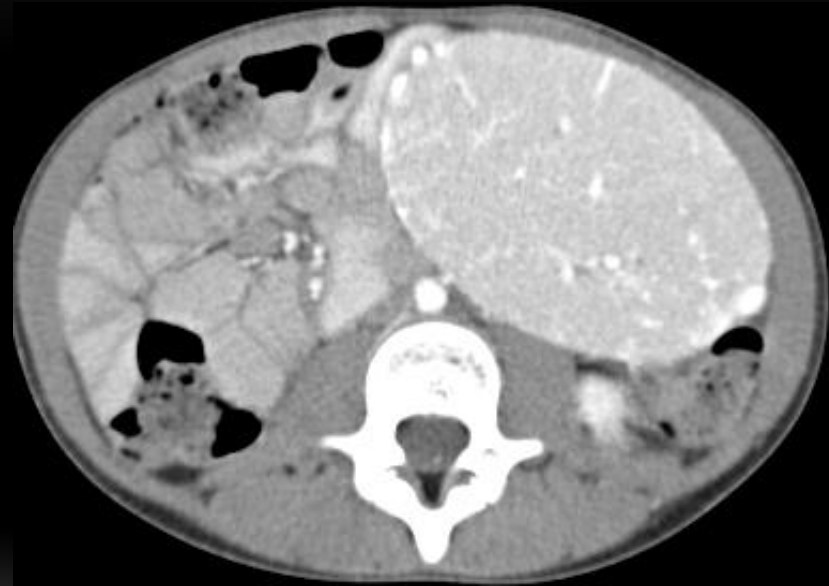
- Extralobar pulmonary sequestration
- Pedunculated FNH
- Ectopic liver



DIFFERENTIAL DIAGNOSIS

Extralobar pulmonary sequestration

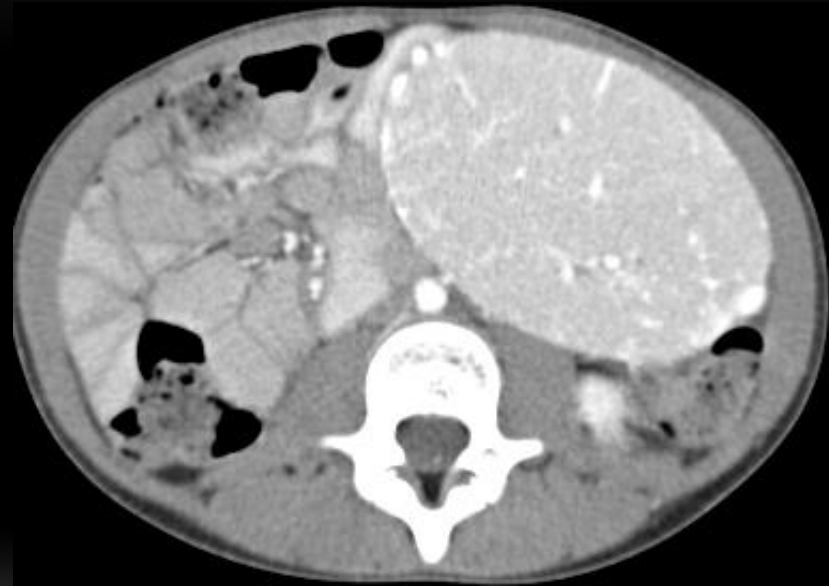
- ✓ Solid mass
- ✓ Systemic venous drainage
- ✗ Systemic arterial supply
- ✗ Near diaphragm



DIFFERENTIAL DIAGNOSIS

Ectopic liver

- ✓ Solid mass
- ✓ Systemic venous drainage
- ✓ Similar enhancement
- ✓ Completely separate liver



NEURO CASE 2- 15 YO FEMALE W/ CEREBRAL PALSY



She developed spastic
paraplegia

NEURO CASE 2- 15 YO FEMALE W/ CEREBRAL PALSY



She developed spastic
paraplegia

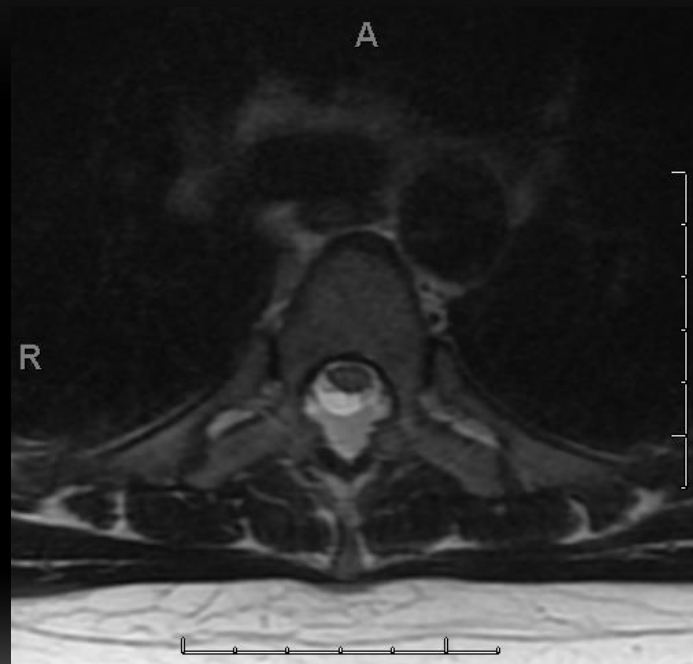
INITIAL THOUGHTS

- Findings:
 - Indentation along the posterior cord in the upper thoracic region
 - Increased posterior epidural fat, however this does not appear to be causing thecal sac compromise and isn't uncommon in this area
 - If real: This could represent spinal lipomatosis or less likely, given the relative uniform appearance, spinal angioliipoma

INITIAL THOUGHTS

- I think the epidural fat is just that and the real finding is the displaced cord; so I would primarily consider:
 - Arachnoid cyst (intradural) or arachnoid web
 - Anterior cord herniation
 - Less likely: other extra-medullary, intradural mass that is iso-intense to CSF such as epidermoid

SPINE MRI



MORE THOUGHTS

- Axial T2 image shows area of relatively higher signal intensity posterior to cord with lack of any CSF pulsation artifact. Nothing traversing through this area
- Cord is focally displaced on sagittal and there may be a syrinx or minimal central cord edema in cord superior to displacement
- Neither image shows the cord abutting the ventral thecal sac or herniating through the dura

POSSIBLE NEXT STEPS

- Could do a CSF flow study to look at CSF motion in this area
- Hi-res thin T2 images might help to define or indicate if walls/septations are present
- FLAIR or DWI might be helpful to help exclude epidermoid or other non-CSF containing mass

ADDITIONAL IMAGES NEURO CASE 2

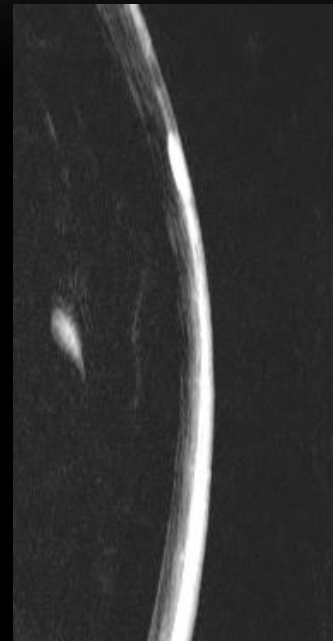


4mm

1.4mm



1.4mm

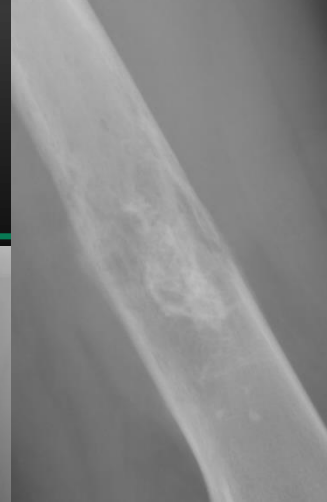


MSK CASE 2- 45 YEAR OLD MAN WITH KNEE PAIN



No history of trauma

SAME DATE RADIOGRAPHS



MSK CASE 2-X RAY FINDINGS

1

Increased density centrally located with irregular margins

2

Permeative bone destruction with cortical disruption

3

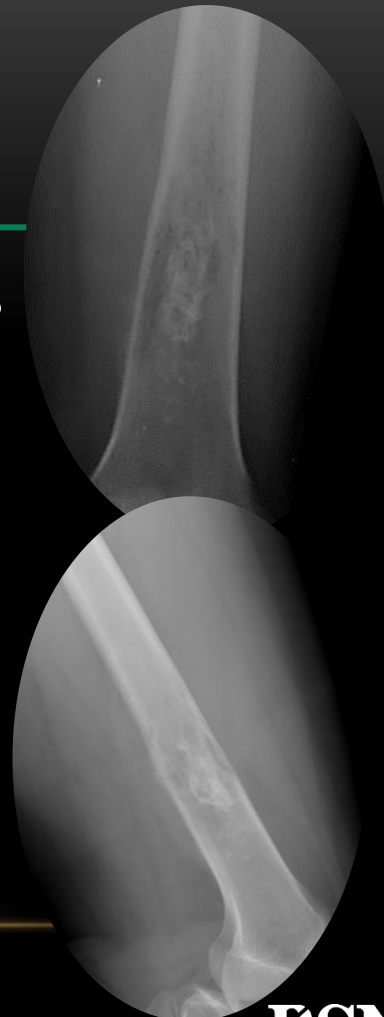
Aggressive periosteal reaction

4

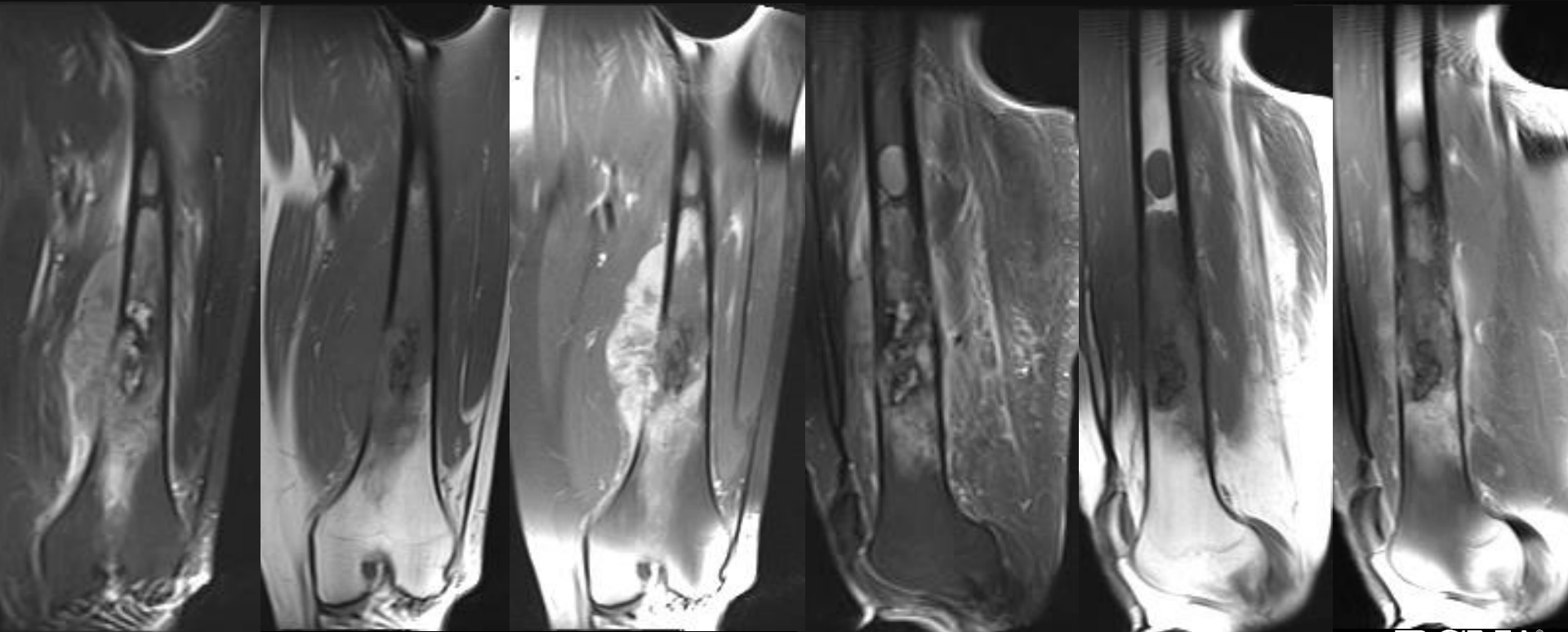
No matrix (osteoid or chondral)

5

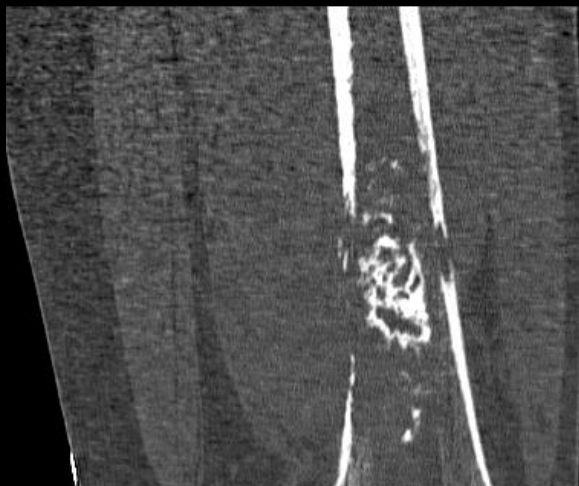
Soft tissue mass displacing normal fat planes



OUTSIDE MRI THREE WEEKS EARLIER



A PROCEDURE WAS PERFORMED



MSK CASE 2-FINDINGS, MR & CT

1

Bone tumor with large soft tissue mass

2

Central area in the mid diaphysis of the femur low SI on MR, heterogeneous calcifications on CT

3

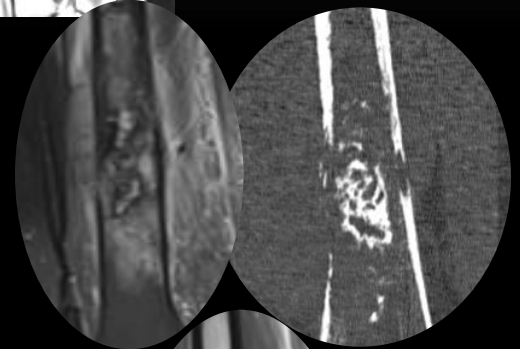
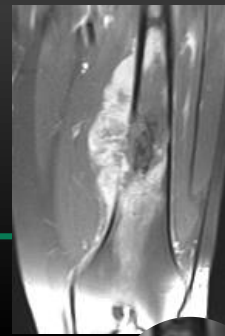
No matrix, osteoid or chondral

4

Marked cortical destruction

5

Proximal skip metastasis



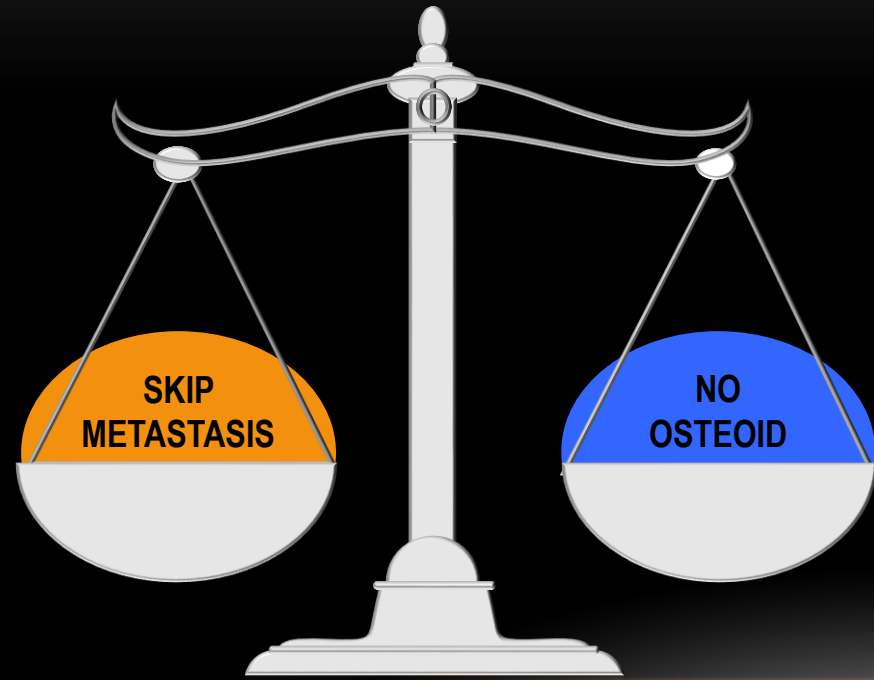
MSK CASE 2-DDX, AGGRESSIVE BONE TUMOUR

- UNDERLYING BONE INFARCT
 - Malignant fibrous histiocyoma, fibrosarcoma (WHO 2013)
 - Osteosarcoma
 - Others, angiosarcomas
- ~~Dedifferentiated Chondrosarcoma~~ → No chondroid
- ~~Osteomyelitis~~ → Soft tissue mass....

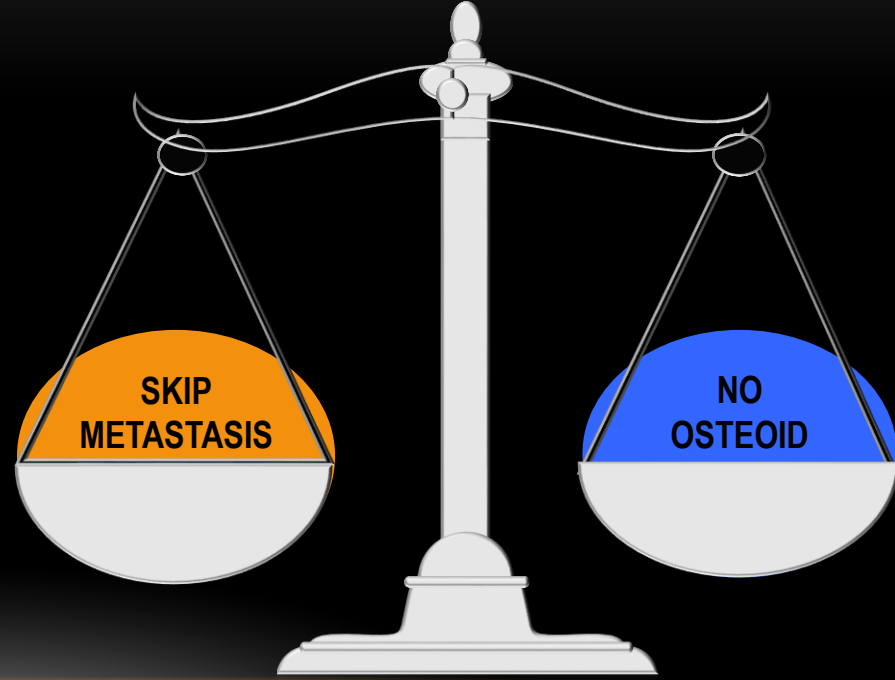
MSK CASE 2-BONE INFARCT & BONE SARCOMAS

- 40-70yo, Male
- Associated: alcoholism > dysbaric ...
- Femur > Tibia > Humerus
- Histology,
 - Fibrosarcoma (66%)
 - Osteosarcoma (19%), (fibrohistiocytomatous osteosarcoma)
 - Angiosarcoma (9%).....

FINDINGS, infarct-associated bone sarcomas



OSTEOSARCOMA



FIBROSARCOMA

ABDOMINAL CASE 2- 54 YEAR OLD WOMAN



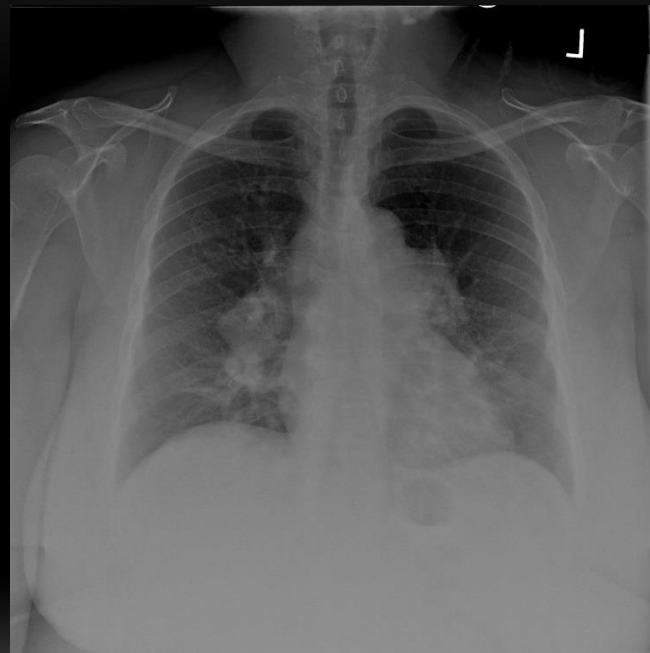
She presented for outpatient
Barium esophagram for gastric
sleeve planning

ABDOMINAL CASE 2- 54 YEAR OLD WOMAN

09/14/2016
Fr: 1, WL: 126, WW: 256



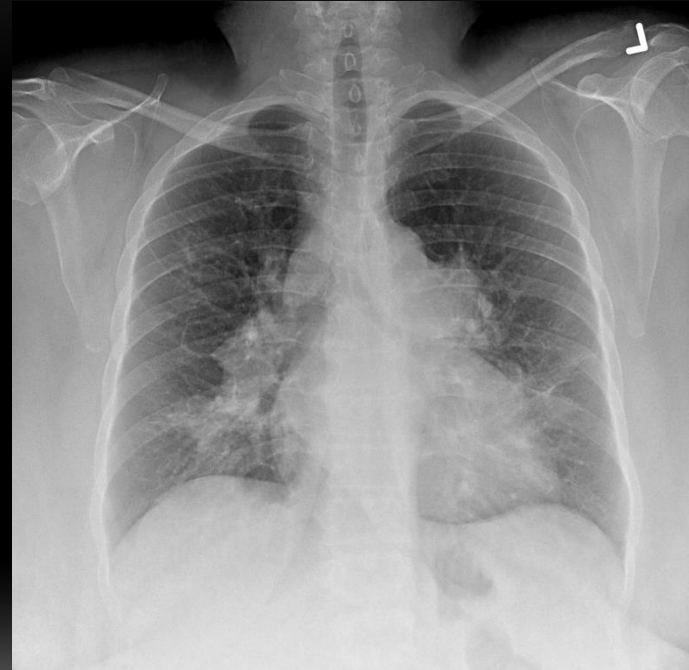
ABDOMINAL CASE 2- 54 YEAR OLD WOMAN UNDERGOING PRE-BARIATRIC SURG ESOPHAGRAM



SHE REPORTED PRIOR SWALLOWING AND
BREATHING ISSUES.....



2014



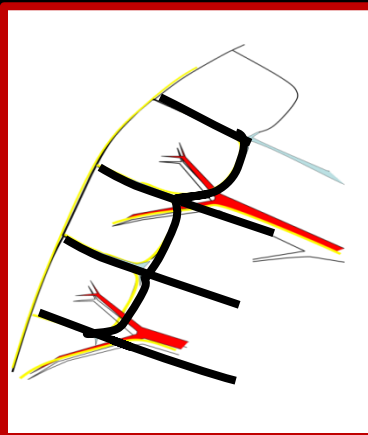
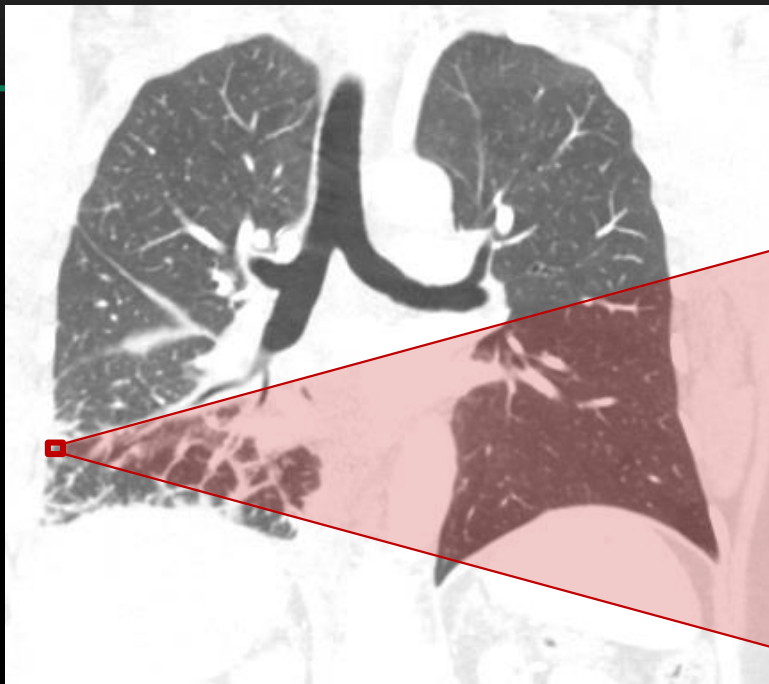
FINDINGS

- Esophagrams
 - Smoothly margined mass near the level of the vallecula.
 - Does not appear to infringe upon swallow
 - On double contrast esophagram, a Schatzki ring is noted. No intrinsic or extrinsic lesions. No achalasia or otherwise patulous esophagus
 - Findings on swallow were present previously
- Radiographs
 - Bulky hilar adenopathy and right paratracheal adenopathy
 - No definite pulmonary abnormality. Normal heart size.
 - Adenopathy is minimally improved since initial workup

DISCUSSION

- Radiography suggests Sarcoid (ah – she knows that I have more thoracic radiology experience than fluoroscopy, even though I am an abdominal imager)
 - Other in DDX includes TB, Metastatic dz, Lymphoma, Multicentric Castleman's
 - These would not be expected to have such an indolent course, with persistent and mildly improved adenopathy 2-3 years later.
- Sarcoid is known to occur in larynx, usually with other manifestations of the disease

CARDIOTHORACIC CASE 2- 32 Y.O. WOMAN IN MVC



Septal Pattern

Lymphatics

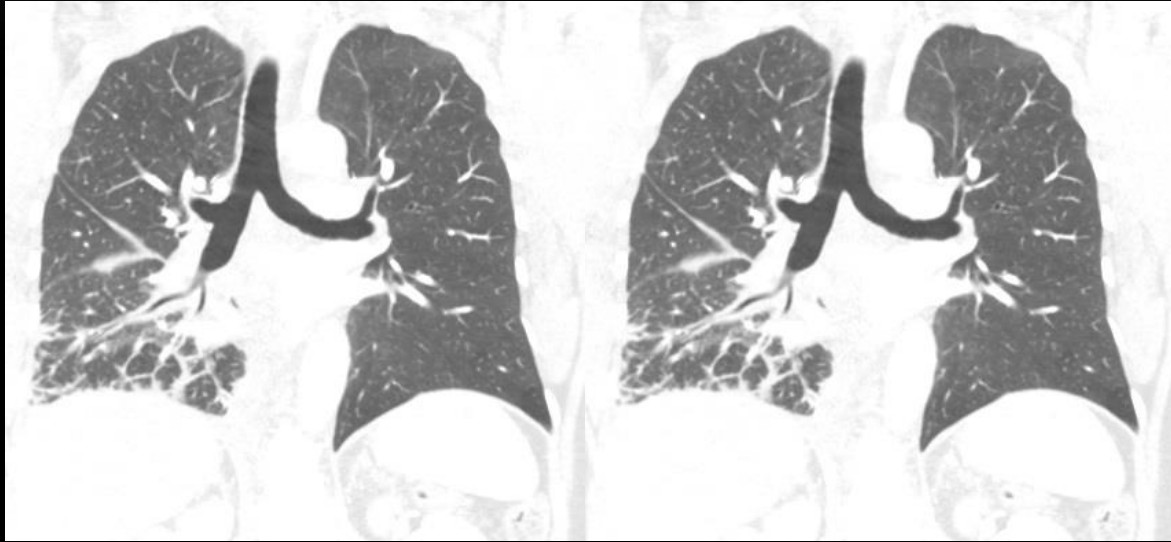
Venules

Interstitium

She developed a headache after a low impact motor vehicle collision and came to the emergency department

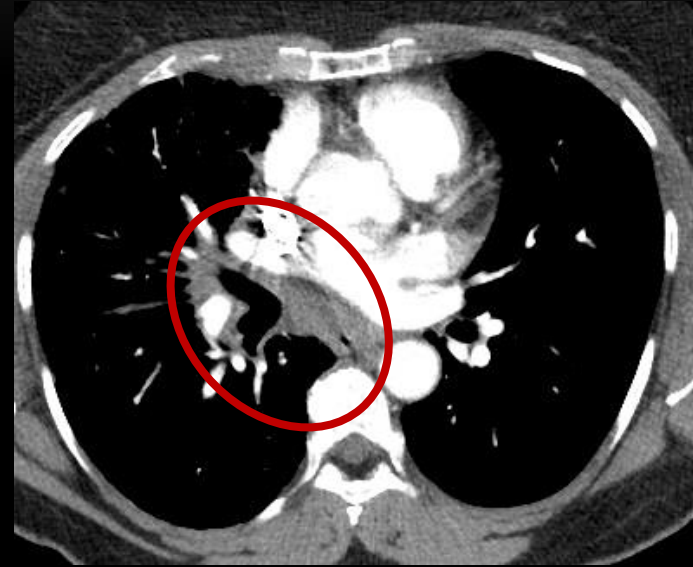
Figure courtesy Joao Inacio, MD

COMPARISONS



2014

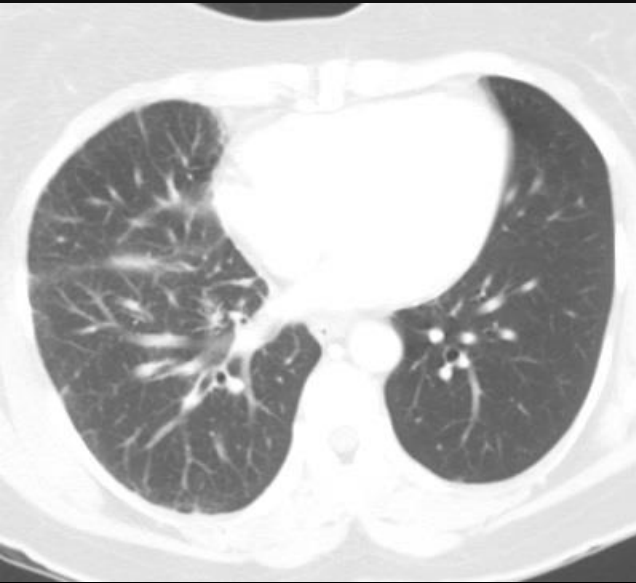
2015



2015

COMPARISONS

Her pulmonary complaints began in 2005 with “choking sensation”



2005



2014



2015

DIFFERENTIAL FOR SEPTAL/ LINEAR PATTERN

Pulmonary edema

* rare

Lymphangitic spread of tumor

Chronic / recurrent pulmonary hemorrhage

Pulmonary fibrosis (e.g. sarcoidosis)

* Pulmonary venocclusive disease

* Lymphoproliferative disease

* Lymphangiomatosis

* Metabolic lung disease (e.g. amyloidosis, Niemann-Pick)

* Histiocytic Disorders (e.g. Erdheim-Chester)

DIFFERENTIAL FOR SEPTAL/ LINEAR PATTERN

Pulmonary edema

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* **Lymphoproliferative disease**

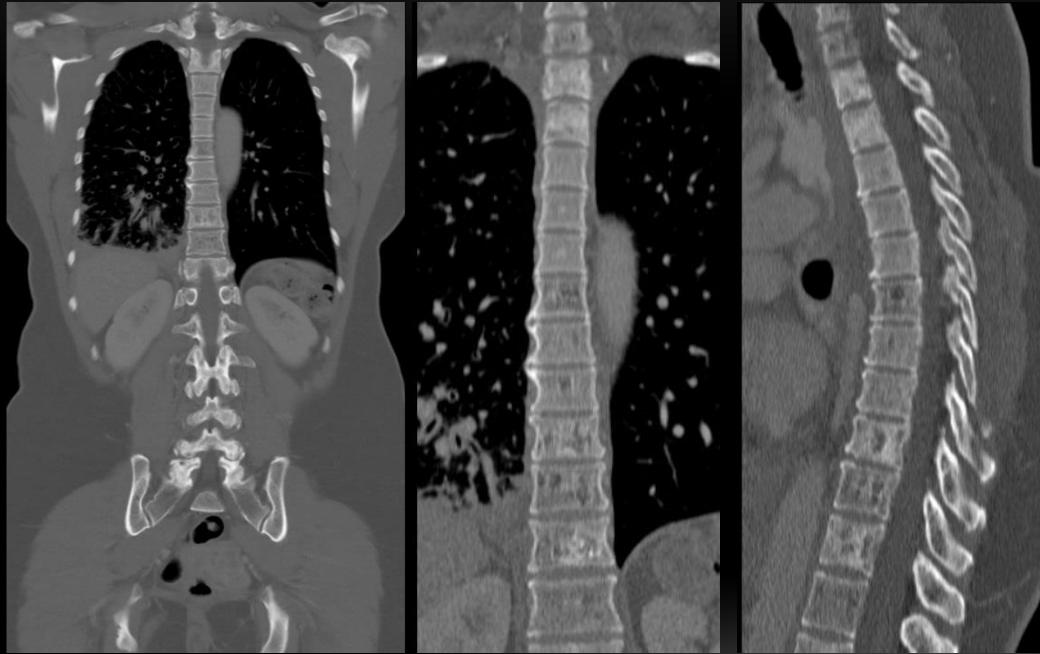
* **Lymphangiomatosis**

* Metabolic lung disease (e.g. amyloidosis, Niemann-Pick)

* Histiocytic Disorders (e.g. **Erdheim-Chester**)

T SPINE, SAME POST TRAUMA CT EXAM

GORHAM-STOUT DISEASE



Findings

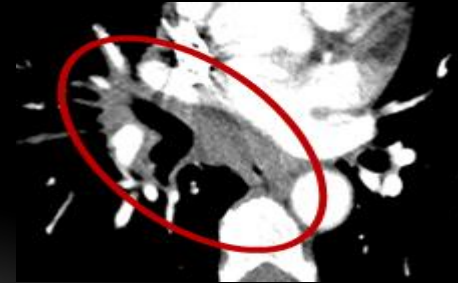
Nonaggressive bone loss

“Vanishing”

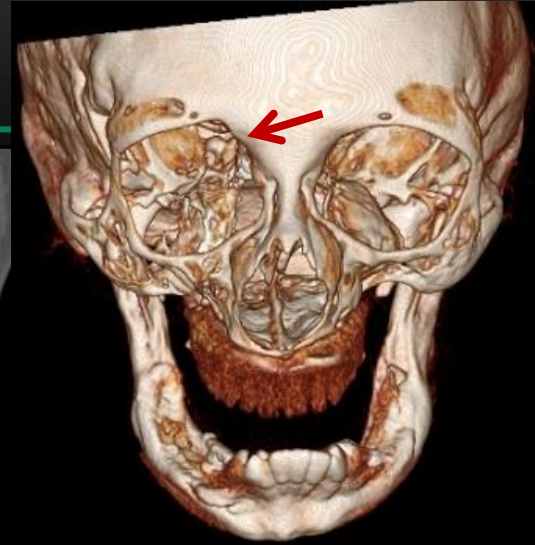
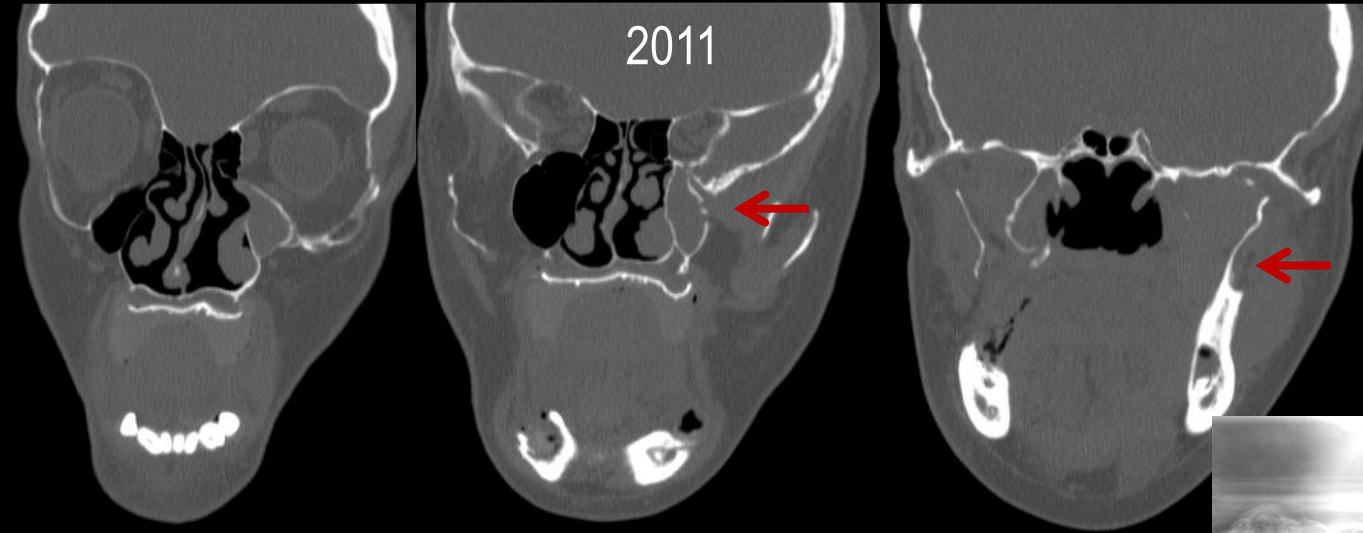
Cortex preserved

Vertebral heights preserved

Lymphangiomas (lymphangiectasia)
Erdheim-Chester disease

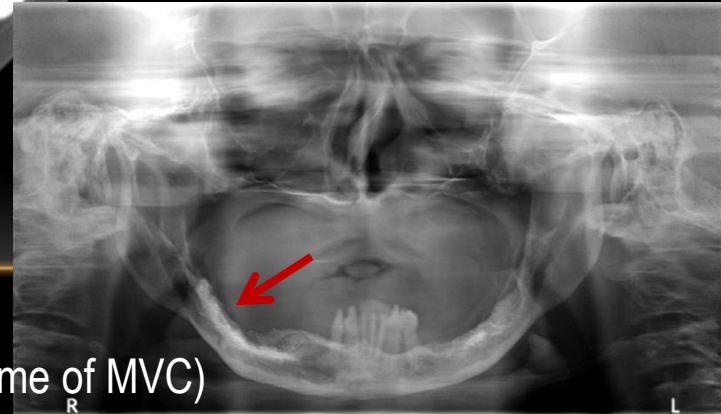


SHE HAS MULTIPLE MEDICAL PROBLEMS: IN 2011, EVALUATED FOR DIPLOPIA

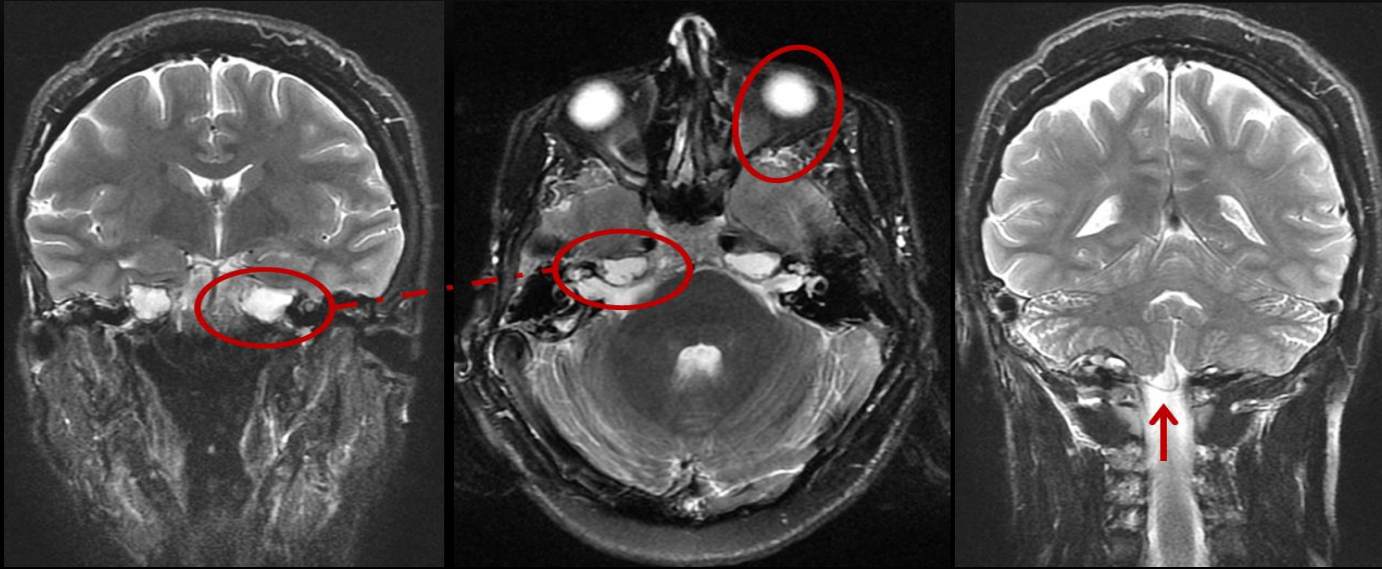


Progressive bone loss, very thin bones

2015 (at time of MVC)



2012: EVALUATED FOR DECREASED HEARING AND TRIGEMINAL MUSCLE WASTING



Carlos Torres, MD

No retro-orbital mass

Bilateral petrous apex cephaloceles

Borderline low lying cerebellar tonsils