PEDIATRICS CASE 1-NEWBORN GIRL

Difficulty breathing at birth
PEDIATRICS CASE 1-NEWBORN GIRL
NECK SONOGRAPHY DAY 1
CONTRAST ENHANCED CT NECK AND CHEST, T2 MRI
LABS

AFP 45418 ng/mL
HCG 1.79 mIU/mL
Right neck heterogeneous avascular mass involving thyroid
Deviates esophagus and trachea
Contains cysts and calcifications

SUMMARY OF FINDINGS
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
Lymphatic Malformation

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

DIFFERENTIAL DIAGNOSIS
NEONATAL NECK MASS
DIFFERENTIAL DIAGNOSIS
NEONATAL NECK MASS

Neuroblastoma

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

TRANSLATION MID NECK
Differential Diagnosis

Neonatal Neck Mass

Teratoma
- Congenital neck mass
- Calcifications
- Cysts
- Avascular
- Involves the thyroid
He sustained several fractures including left clavicle and femur; on arrival patient was conscious and oriented with a Glasgow Coma Scale 15/15
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
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
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
He awoke 3 weeks earlier with spontaneous swelling in his ankle, no injury recalled.
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 RADIOGRAPHICS AT TIME OF US

Presentation

PORTABLE

4 weeks
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
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 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

RENAAL TRANSPLANT

IMMUNOSUPPRESSED PT

SKIN CONDITION

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

- Horizontal metaphyseal line
- Rapidly progressive granulomatous lesion in the ankle in bone & soft tissue & skin
- Pulmonary solitary low density node

**INFLAMMATORY**
- Sarcoid
- Wegener G

**INFECTIONS**
- Fungal
- Mycobacteria
- Other: nocardia, bacillary angiomatosis

**TUMOUR**
- Lymphoma
- Kaposi

**LESS PROBABLE**

renal osteodystrophy vs steroids
## Complications in SOT

### Skin & bone granuloma

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<th>FUNGAL, 47%</th>
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<td>Blastomycosis, mucormycosis, coccidiodomycosis</td>
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<td>2</td>
<td>BACTERIA, 28%</td>
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<tr>
<td></td>
<td>• Mycobacteria</td>
</tr>
<tr>
<td></td>
<td>• Nocardia</td>
</tr>
<tr>
<td>3</td>
<td>NEOPLASM, unknown%</td>
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<tr>
<td></td>
<td>• Postranplant lymphoproliferative disorder</td>
</tr>
<tr>
<td></td>
<td>• Others SCS, BCS, MELANOMA, KAPOSI</td>
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### Solitary nodule low density

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<th>FUNGAL, 33%</th>
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<td>Actinomycosis, Aspergillus, coccido., blasto.</td>
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<tr>
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<td>BACTERIA, 22%</td>
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<td>• Mycobacteria</td>
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<tr>
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<td>• Nocardia</td>
</tr>
<tr>
<td>3</td>
<td>NEOPLASM, 30%</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
LYMPHOMA
- Less rapidly progressive
- Lymph nodes
- Homogenous attenuation

BACTERIA
A
- Nocardia
- Mycobacterias

FUNGAL
B
- Indolent course, dot in circle
- Solitary nodule: cavitation, calcium, lymph nodes
- Extrapulmonary (ankle rare)
- Time elapsed & geographics
- Target organ
  - Lung, mycetoma
  - Osteoarticular granulomas
She presented with pelvic pain and had history of a remote hysterectomy.
65 YEAR OLD WOMAN WITH PELVIC PAIN
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
COMPARISONS

In total, there were four biopsies, two of them surgical excisions, from 2012-2015. A definitive procedure was performed in 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

Kidney Injury/ Renal Artery Stenosis
Aortic pathology (coarctation, dissection, vasculitis)
Eclampsia
Hypercalcemia
Hyperthyroidism and Thyrotoxicosis
Pheochromocytoma
Subarachnoid Hemorrhage
Drugs
+ “small caliber aorta” + cardiomyopathy
VASCULITIS

LARGE VESSEL VASCULITIS

Takayasu: <40 yo, granulomatous inflammation of Ao and major branches, hypertension with 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
Lactic Acid: 2.8; hypertension persisted; patient remained minimally responsive
2 WEEKS LATER: POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME (PRES)

- Predominant parieto-occipital subcortical vasogenic edema
- Intraparenchimal / 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

Reversible cerebral vasoconstriction syndrome (85%)


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

Clinical Rheumatology 2013;32(3):409-415
Palpable upper abdominal mass discovered at pediatrician’s office during well child visit
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
Ectopic liver

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

DIFFERENTIAL DIAGNOSIS
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 angiolipoma
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
MSK CASE 2 - 45 YEAR OLD MAN WITH KNEE PAIN

No history of trauma
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 histiocytoma, fibrosarcoma (WHO 2013)
  - Osteosarcoma
  - Others, angiosarcomas ....

- Dedifferentiated Chondrosarcoma $\rightarrow$ No chondroid
- Osteomyelitis $\rightarrow$ 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
She presented for outpatient Barium esophagram for gastric sleeve planning
ABDOMINAL CASE 2 - 54 YEAR OLD WOMAN
ABDOMINAL CASE 2- 54 YEAR OLD WOMAN UNDERGOING PRE-BARIATRIC SURG ESOPHAGRAM
SHE REPORTED PRIOR SWALLOWING AND BREATHING ISSUES…….
FINDINGS

• Esophagrams
  • Smoothly marginated 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 flouroscopy, 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

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

Figure courtesy Joao Inacio, MD

Septal Pattern
Lymphatics
Venules
Interstitium
COMPARISONS

2014  2015  2015
Her pulmonary complaints began in 2005 with “choking sensation”
DIFFERENTIAL FOR SEPTAL/ LINEAR PATTERN

- Pulmonary edema
- 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
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)
Findings
Nonaggressive bone loss
“Vanishing”
Cortex preserved
Vertebral heights preserved

Lymphangiomatosis (lymphangiectasia)
Erdheim-Chester disease

Gorham-Stout disease (GSD), aka vanishing bone disease …is a rare bone disorder characterized by progressive bone loss and the overgrowth of lymphatic vessels.
SHE HAS MULTIPLE MEDICAL PROBLEMS:
IN 2011, EVALUATED FOR DIPLOPIA

Progressive bone loss, very thin bones
2012: EVALUATED FOR DECREASED HEARING AND TRIGEMINAL MUSCLE WASTING

No retro-orbital mass
Bilateral petrous apex cephalocele
Borderline low lying cerebellar tonsils