A Case of COVID and TB

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Case presentation- COVID

Early February 2021

- 15 year-old female, born in Central Mexico
- Otherwise healthy, immunizations UTD
- Resident of Glenn county, CA (population 30,000)
- Presented to ED with 1 week of general aches and pains progressing to HA, nausea and vomiting, fatigue

    -Head CT negative

    -COVID positive

- Discharged to home in isolation

Case presentation-COVID MISC

Late February 2021:

Hospitalized with fever (T 36.9˚C), chills, SOB, bilateral foot pain, “severe tremors”, and fatigue. Reported initial fever had resolved, but returned in past 24 hours

- CT Chest: diffuse reticulo-nodular infiltrates and significant mediastinal adenopathy
- Anemia and thrombocytopenia (WBC 6.5, Hgb 11.3, platelets 128)
- Transaminitis: AST 209, ALT 107, alk phos 172, T bili 0.9, creat 0.5
- High inflammatory markers: ferritin 3110, CRP 57.8
- MRI brain: At least 3 enhancing intraparenchymal lesions the largest within the right cerebellar hemisphere measuring 4 mm. Considerations include subacute embolic infarcts, versus conceivably septic emboli, infectious inflammatory process, versus neoplastic process or conceivably sequela of vasculitis. Neurology: MRI brain lesions “not concerning and do not require follow-up”
- MRI spine: WNL

-Diagnosed with Multisystem Inflammatory Syndrome in Children (MIS-C)

-Received IVIG 100g and started on Solumedrol 30 mg bid

Discharged on ASA and prednisone 10 mg qd

Case Presentation-Worsening COVID-MISC

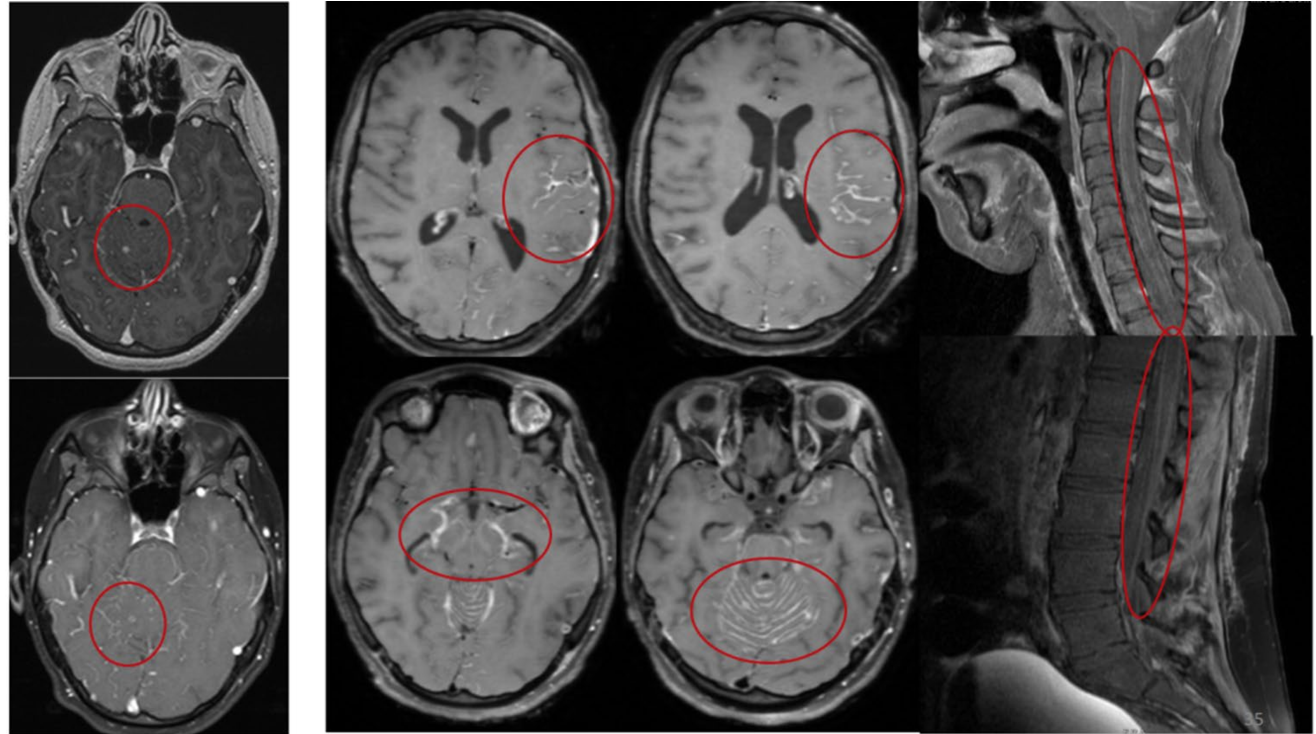
Mid-March 2021:

- Re-presented to ED with increasing confusion, agitation, uncooperative behavior x 24 hours
- Temp 38.2˚C, HR 120, BP 114/93, RR 25
- Persistently elevated inflammatory markers:
  - D-dimer >4000, ferritin 2140, LDH 1423, lactate 4.3
- Head CT negative
- Chest CT: Diffuse nodular airspace opacities throughout both lungs which may represent sequela of MIS-C/Covid
- Patient intubated for airway protection
- Diagnosis: Community-acquired pneumonia/sepsis, relapsed MIS-C

Case presentation: COVID-MISC with CNS lesions

March 2021 hospital course:

- Persistent fevers
- Brain MRI: abnormal enhancement seen along the leptomeninges, perivascular spaces of the infratentorial compartment and supratentorial compartment, and right superior cerebellum.
- Spine MRI: leptomeningeal enhancement in cervical/thoracic cord, conus medullaris and cauda equina
- LP: RBC 3, WBC 215, 83% PMNs, 14% lymphs, glucose 31, TP 166. AFB smear negative. Multiplex PCR negative.
- Started on empiric fluconazole, pentamidine, ceftriaxone, vancomycin



Case Presentation: Worsening COVID-MISC

- CT abdomen/pelvis:
  - Hepatomegaly, 1.2 cm wedge-shaped hypoattenuation in spleen
- Labs- worsening pancytopenia
  - WBC 2.1 (Neu 1.78, Lymph 0.29), Hgb 9.7, platelets 59.

Case presentation: COVID-MISC and HLH

- BM biopsy: Normacellular bone marrow (85%) with trilineage hematopoiesis and hemophagocytic histiocytes. No increase in blasts.
- H-score: 240 c/w HLH
- siL2R (soluble IL-2): 2124
- NK cell function test: 34 (normal)

Diagnosed with Hemophagocytic Lymphohistiocytosis (HLH)

- Received IVIG x 1, steroids increased to dexamethasone 10 mg qd, anakinra x 6 days, etoposide x 2, plasmapharesis x 1

Disseminated TB/TB meningitis

April 2021

Transferred to UCSF PICU

BAL: smear negative, MTB PCR positive, PSQ positive for M bovis

Ophthalmologic exam: Bilateral chorioretinal lesions

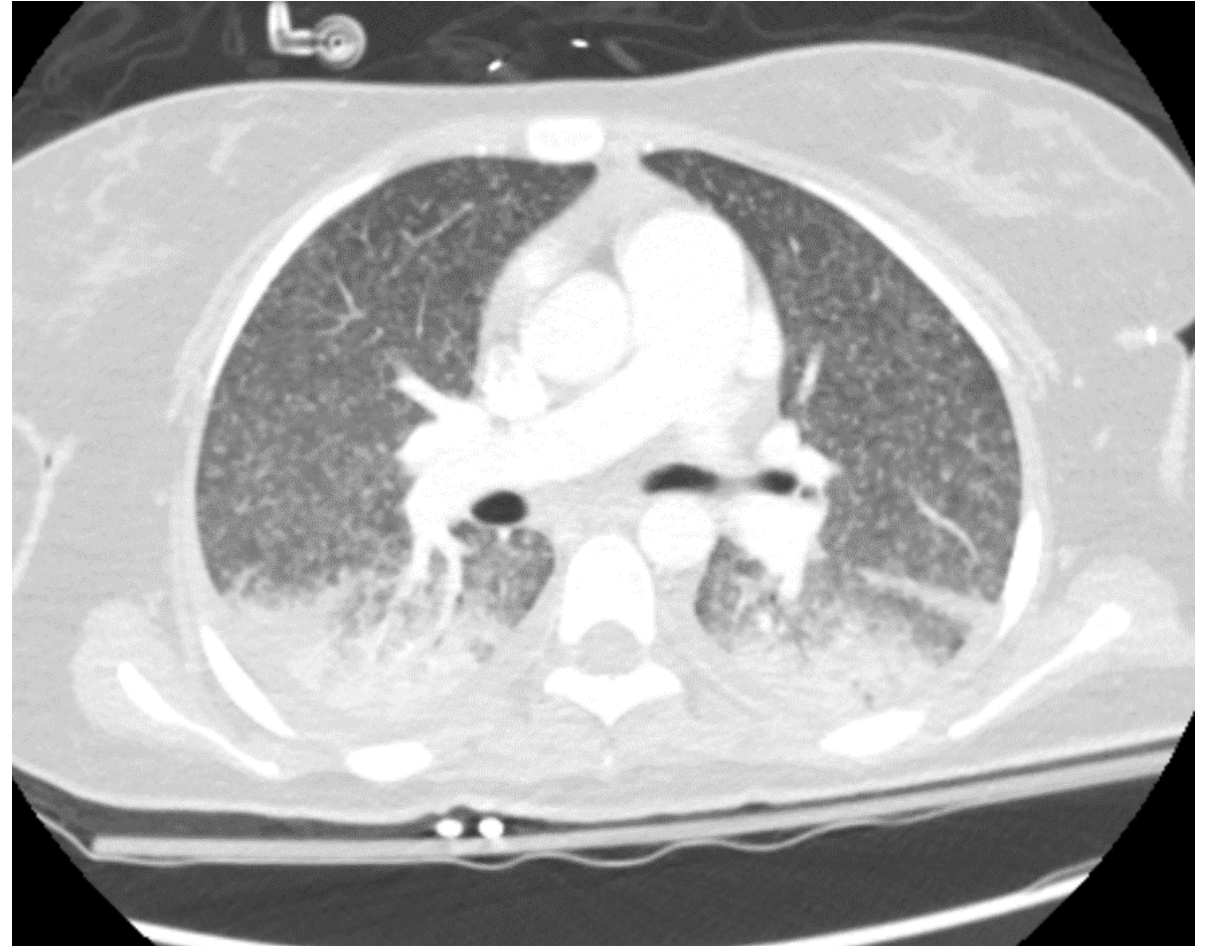
Diagnosis: Disseminated M bovis/TBM

Patient started on:

- INH 300 mg pos qd
- RIF 20 mg/kg IV qd
- Levo 750 mg IV qd
- Dexamethasone 0.4 mg/kg/d

Later:

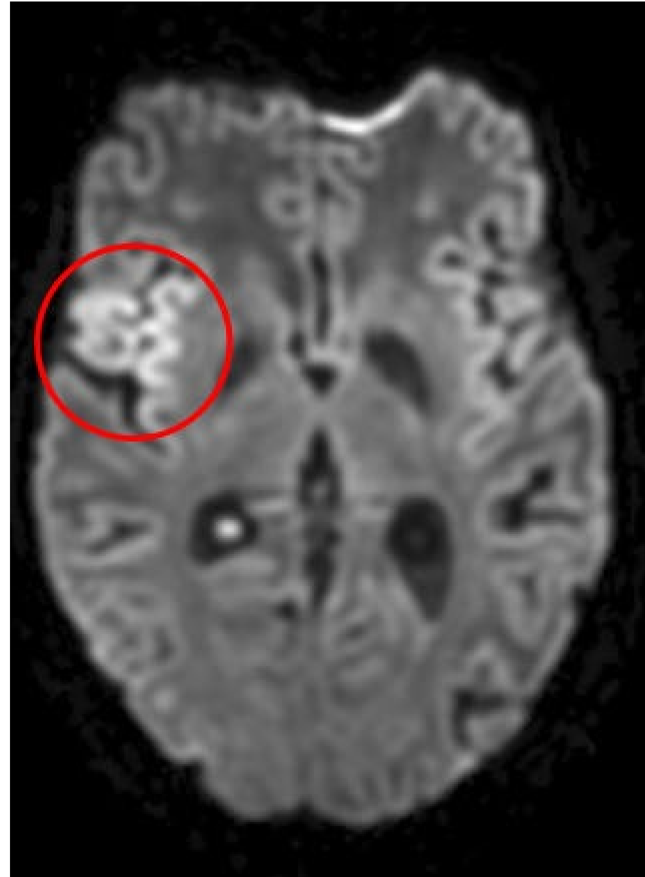
- +Linezolid 600 mg IV qd

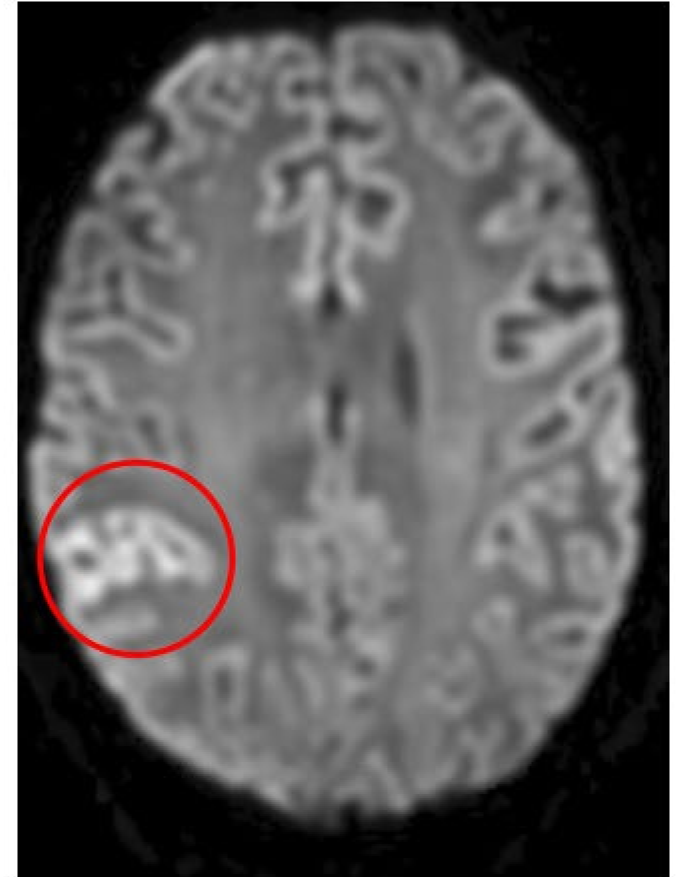


Diffusely innumerable groundglass micronodules throughout both lungs in a uniform miliary pattern, without significant variable sized of larger nodules or preferential lung distribution. There is a dependent distribution of groundglass opacity with dependent heterogeneous consolidative changes

New Cerebrovascular Accidents

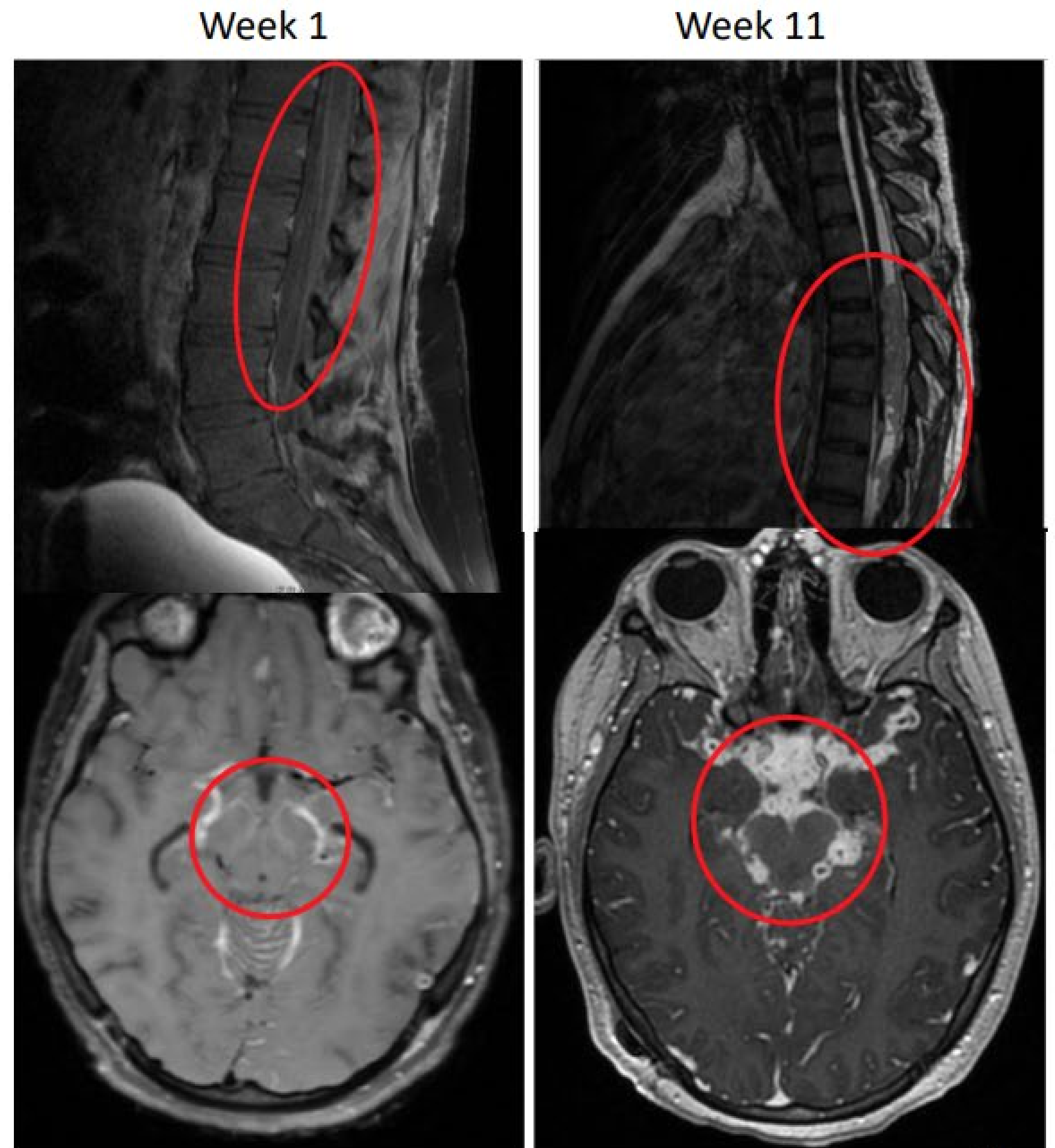
- Vasculopathy and stroke seen on MRI
- Worsening hydrocephalus
  - VP shunt placed
  - Extubated
  - Patient awake, but unable to move lower extremities
- ASA 81 mg started





MRI: Week 11

- Progression of leptomeningitis
- New compression of thoracic spinal cord
- Increase in nodular lesions



TB Paradoxical Reaction Management

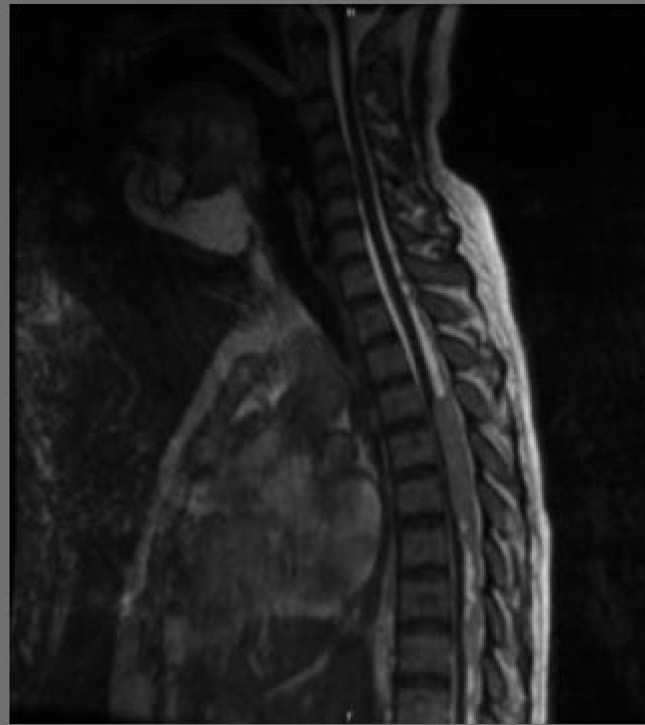
- Received 3-dose series of infliximab 500 mg (approx. 7.5 mg/kg/dose) –weeks 1, 2 and 6
- The patient started to walk with walker between the second and third dose
- Discharged after ~6 months to home rehab
- Now able to walk without a walker
- Currently on RIF 900, Levo 750, LNZ tiw and prednisone 1 mg qd with plan to end treatment at 365 doses (INH stopped to transaminitis)

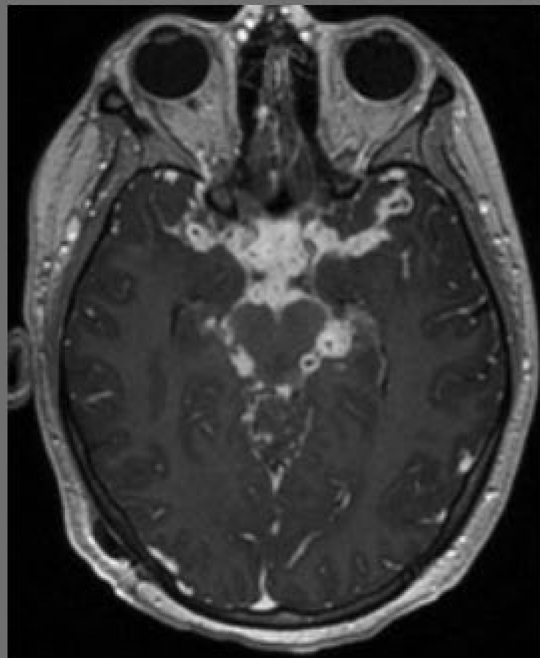
Conclusions:

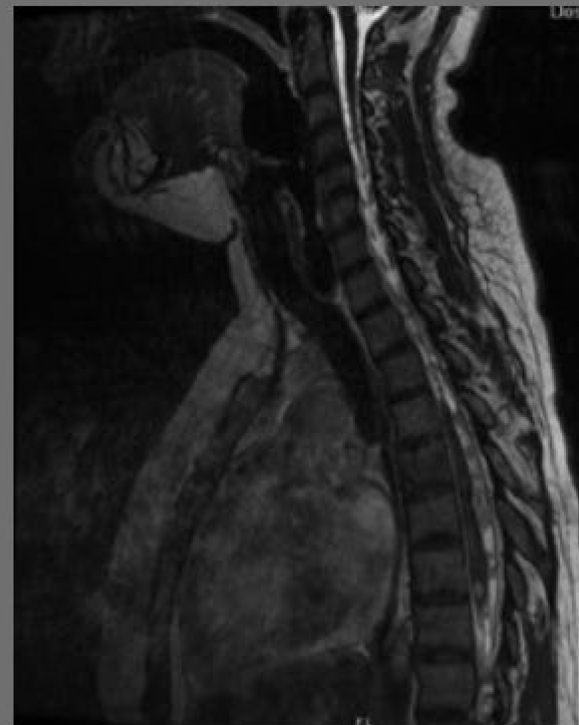
- Appropriate focus on COVID-19 diagnosis and possible sequelae
- Subsequent treatment for both MIS-C and HLH included prolonged course of high-dose steroids, IVIG, anakinra, etoposide
- Profound immunosuppression may have resulted in subsequent severe, disseminated TB disease, complicated hospital course and prolonged disability
- COVID diagnosis may have delayed consideration and evaluation for TB

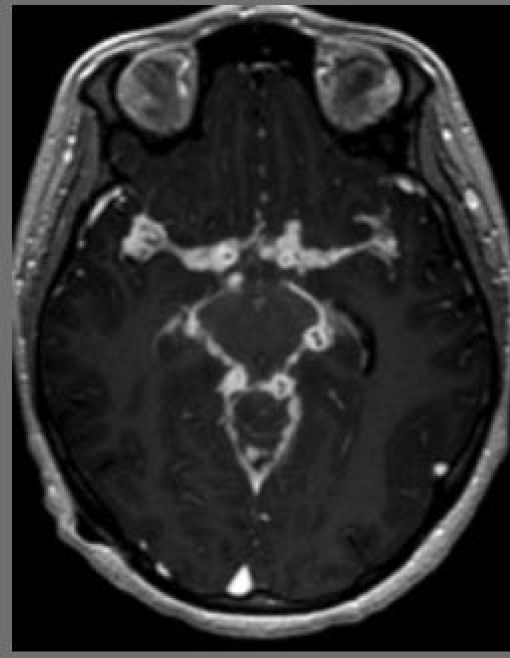
Extra slides

Week 13





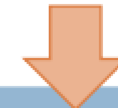




Month 6

Serial LPs

Steroid taper started in week 8



	LP (Week 1)	Shunt (Week 2)	LP (Week 6)	LP (Week 7)	LP (Week 11)
Glucose (mg/dL)	31	46	45	47	45
Total Protein (mg/DL)	624	61	1237	1707	2203
Appearance	Clear	Clear	Clear	Clear	Slightly hazy
RBC (/mm^3)	25	4	25	5	147
WBC (/mm^3)	265	8	135	290	310
PMNs (%)	55	48	40	21	60
Lymphocytes (%)	25	43	57	65	24
Mono (%)	18	9	3	13	15
Absolute PMN count (/mm^3)	146	4	54	61	186