



Pediatric Infectious Disease Vignettes 2-10-18

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1.) Abdominal Pain in an Immigrant from Khazakstan

- 10-year-old girl adopted from orphanage in Khazakstan 1 year prior to presentation
- Minimal information on past medical history available
 - Did receive 9 months of therapy with INH for latent TB infection (completed 1 year prior to adoption)

1.) Abdominal Pain in an Immigrant from Khazakstan

- 4-5 lb weight loss over several weeks prior to presentation
- Intermittent diarrhea (3-4 times per week) without blood
- Migratory polyarthralgias of the upper and lower extremities
- Mild abdominal pain and 'fullness'
- No fevers
- No emesis
- No rashes

1.) Abdominal Pain in an Immigrant from Kazakhstan

- **Contrasted CT of the chest, abdomen and pelvis:**
 - Left-hepatic hypoattenuating lesion and a right-sided hepatic calcified lesion



Thoughts?

Histopathology Results

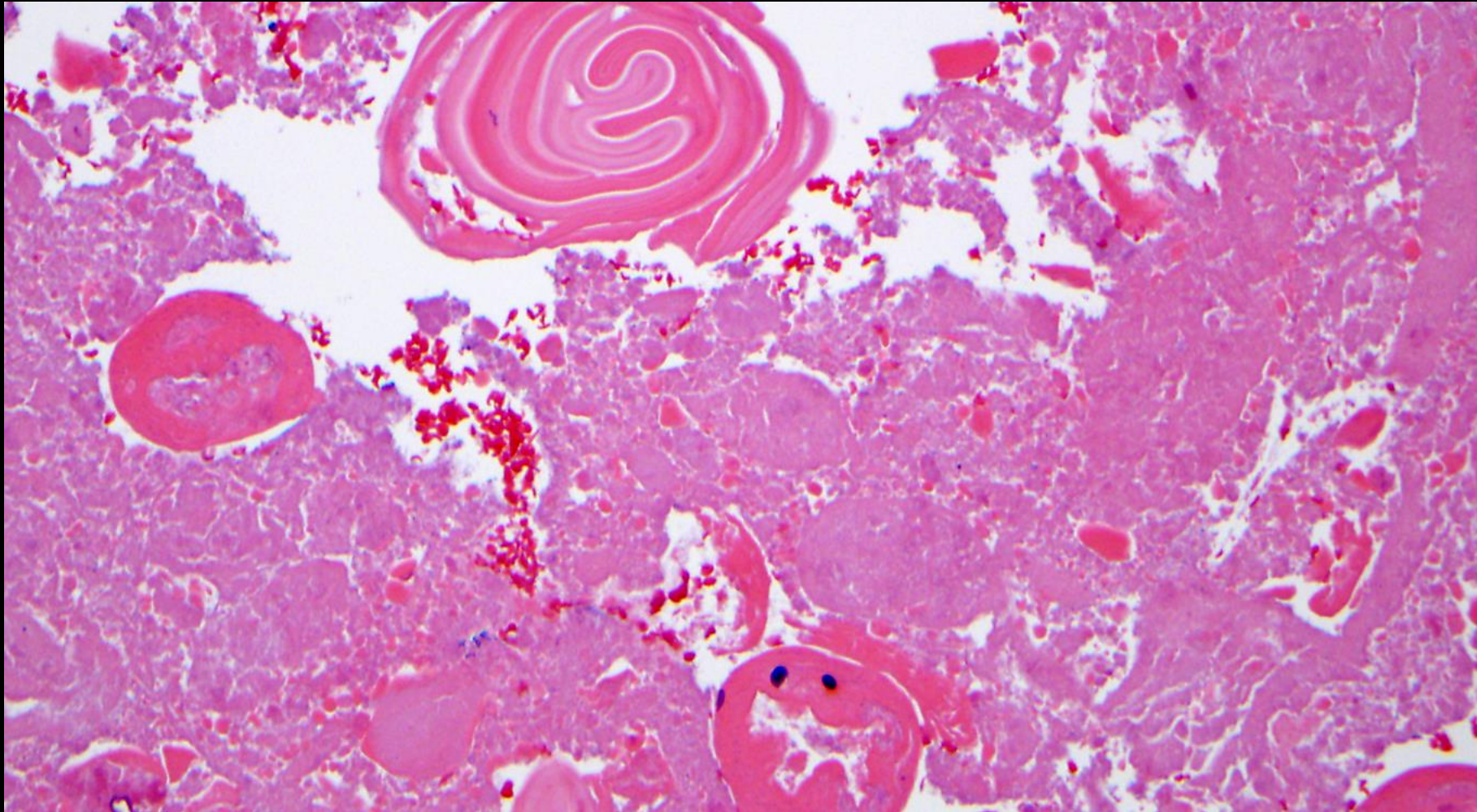
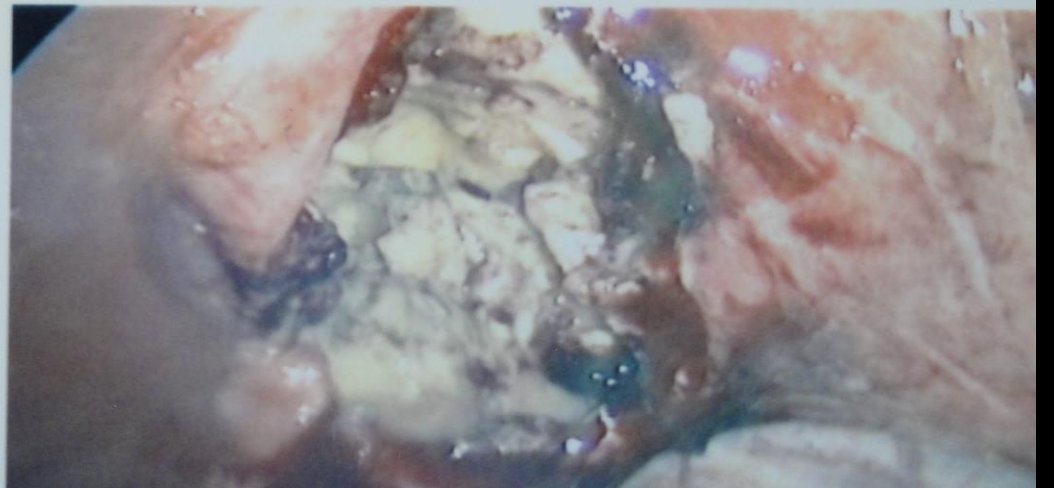
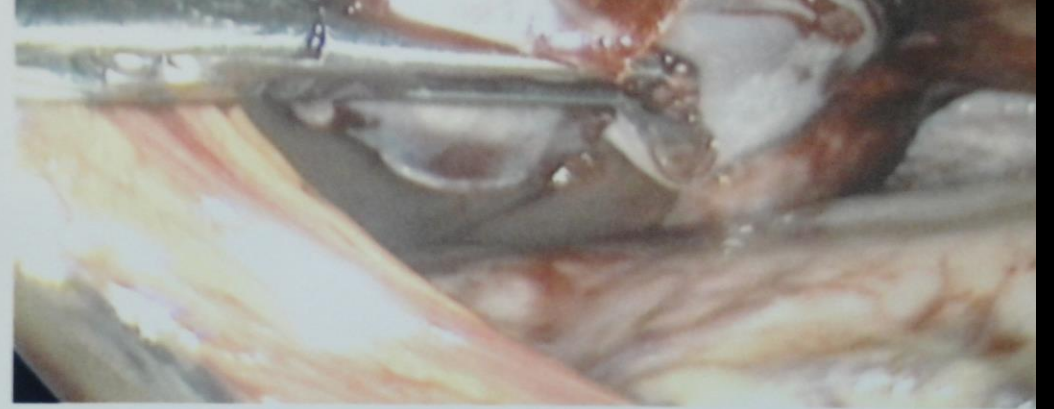
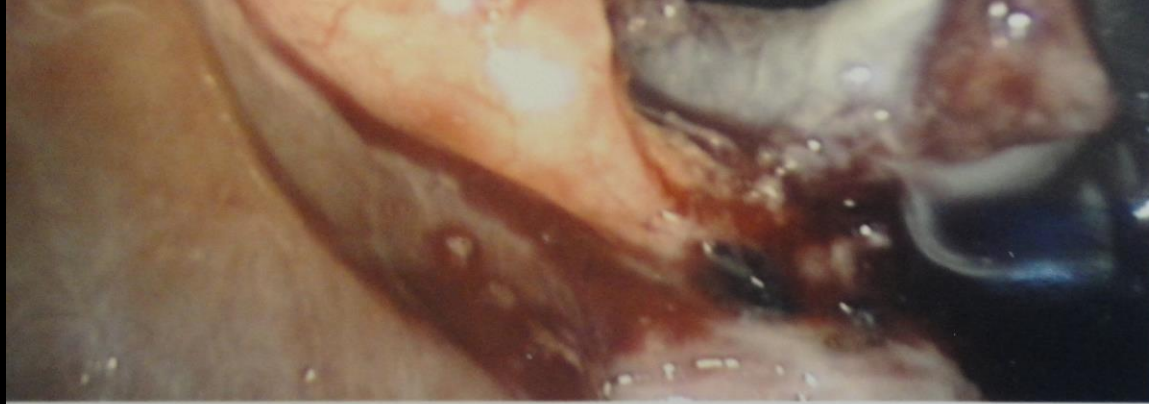


Image Courtesy UNM Pathology Department

Intraoperative Findings



Diagnosis?

Diagnosis?

- Echinococcal serologies reactive at 1.55 (>0.51 positive)
- Histopathology consistent with echinococcal cyst of the liver
- Patient returned to baseline after 6 months of albendazole therapy and surgical resection
- Rheumatology consultant (here and Denver) felt the arthralgias may have been reactive in nature in response to the *Echinococcus*

Echinococcus in Kazakhstan

- Serological, cross-sectional study of Jalanash, Kazakhstan (pop. 4000)
- Dogs in the town also assessed
 - Parasite count performed from feces of each domestic and feral dog

Echinococcus in Kazakhstan

- 2,984 people assessed
 - Suspicious hepatic lesions seen on ultrasound in 0.7%
 - 2.5% seropositive
- 973 dogs
 - 18% infected (13% *E. granulosus*, 5% *E. multilocularis*)

Take Home Points

- Travel history
- Need for a biopsy
- Cross-disciplinary support for a challenging diagnosis

2.) Paralysis in a Neonate: History

- 6 week old term infant admitted from clinic with extreme irritability with any manipulation of his arms or legs
- No erythema or swelling of the extremities
- Anorexic
- Afebrile
- No emesis or diarrhea
- No weight loss

2.) Paralysis in a Neonate: History

- Resident informs you that maternal pregnancy labs were all normal

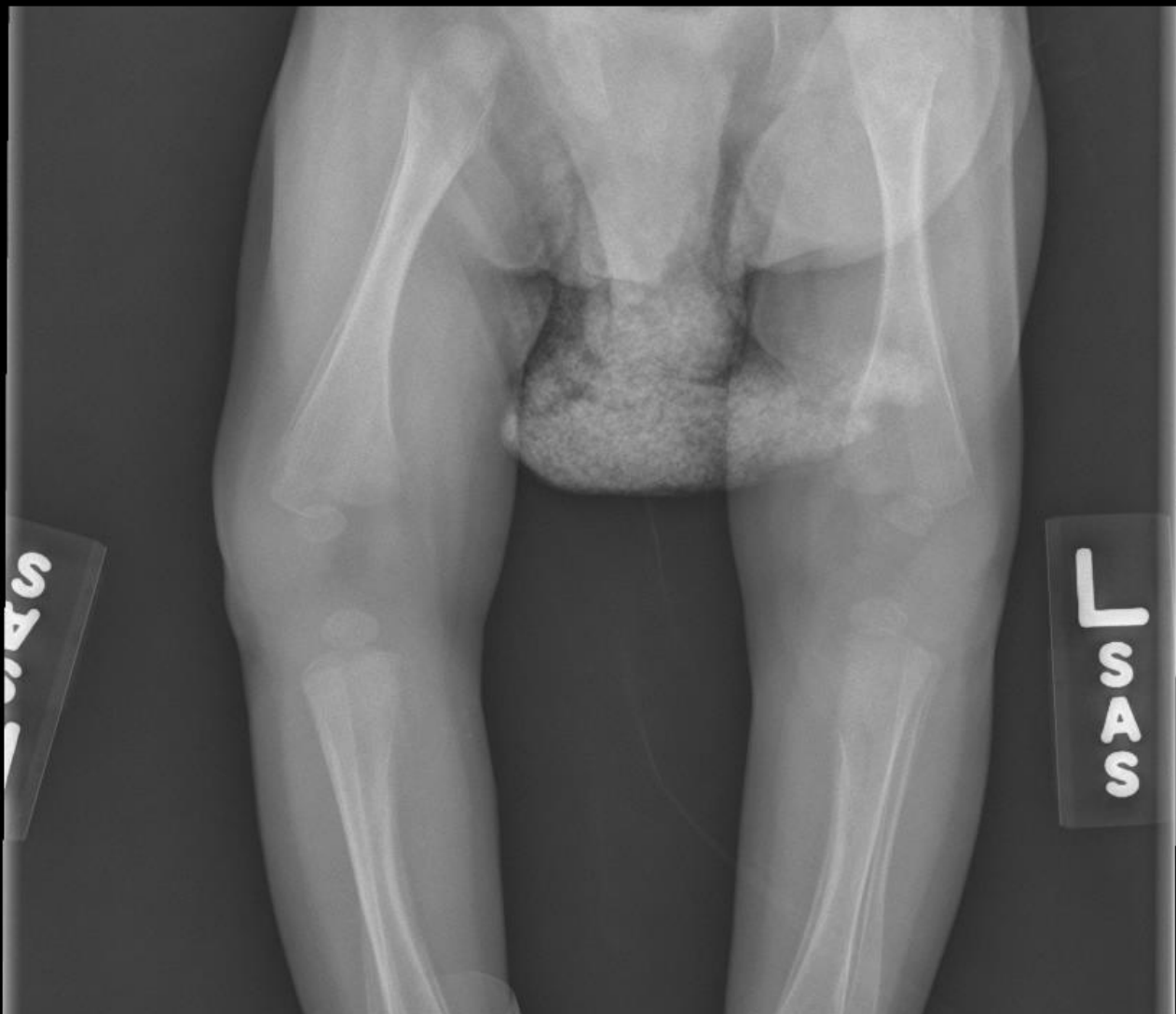
2.) Paralysis in a Neonate: Exam

- Afebrile, room air
- Faint red, papular rash over arms and legs on exam
- Cries with movement of arms or legs during exam

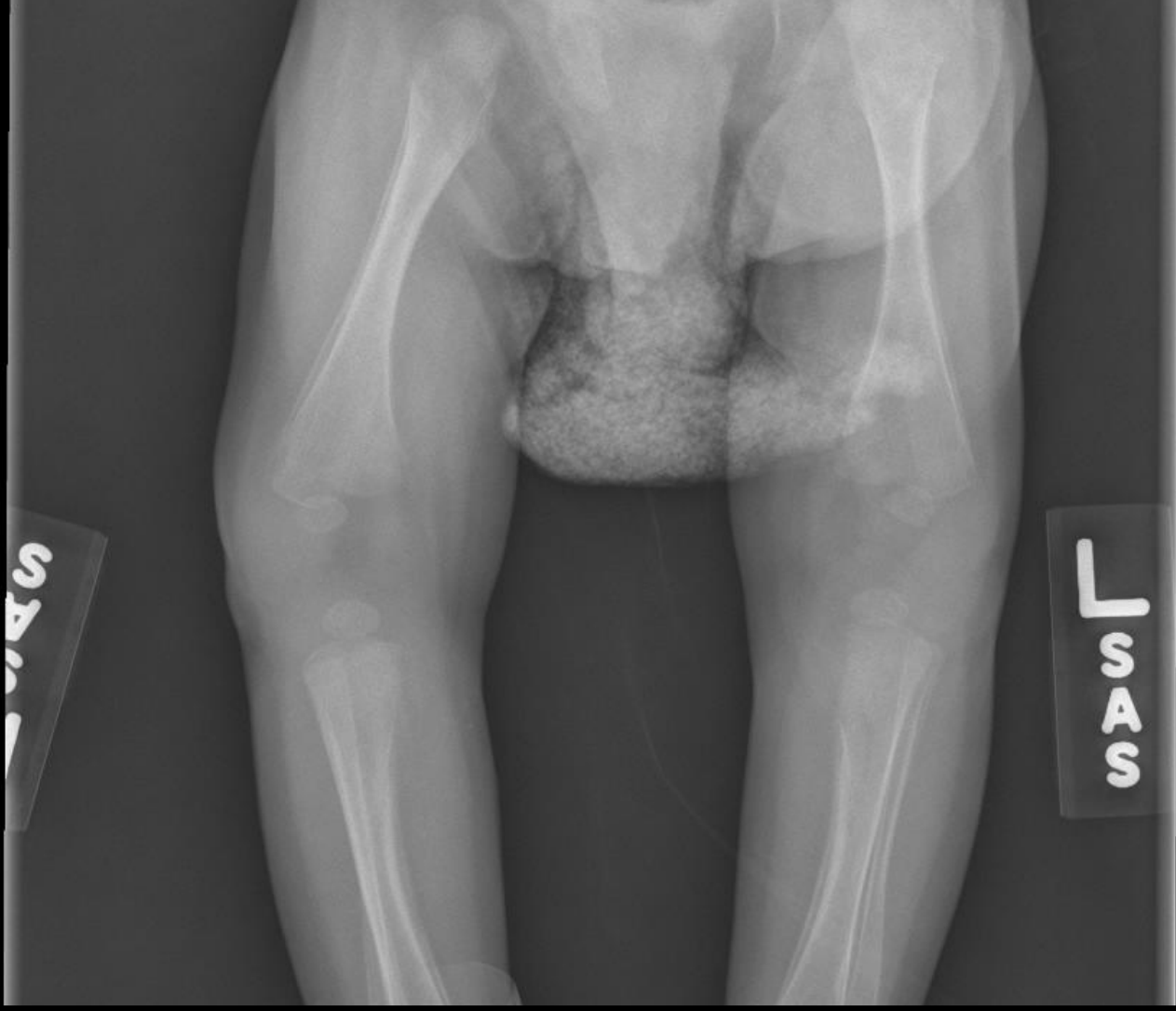
2.) Paralysis in a Neonate: Labs

- CBCD, chemistry panel normal





Thoughts? Additional Testing?



Diagnosis?

Diagnosis?

- RPR elevated at 1:128, reactive T_pab
 - **Congenital Syphilis, with presentation of Pseudoparalysis of Parrot**
- Mother not screened for syphilis while pregnant (RPR obtained during this admission was reactive)

Congenital Syphilis Rates* by Ethnicity, United States 2003-2008

Ethnicity	2003	2004	2005	2006	2007	2008
Caucasian	1.5	1.8	1.3	1.7	2.3	2.8
African-American	34.7	28.8	26.6	24.3	30.7	34.6
Hispanic	18.2	15.3	12.6	14.5	13.9	12.8
Native American	5.1	5.0	12.2	11.7	18.7	14.0

Rates are per 100,000 live births per year

Take Home Points

- F/u 'routine' maternal labs
- Extremely varied presentations of syphilis in newborns
- Basic, non-invasive testing sufficient (plain films and RPR) to establish diagnosis

3.) Persistent Arm Pain in a Toddler

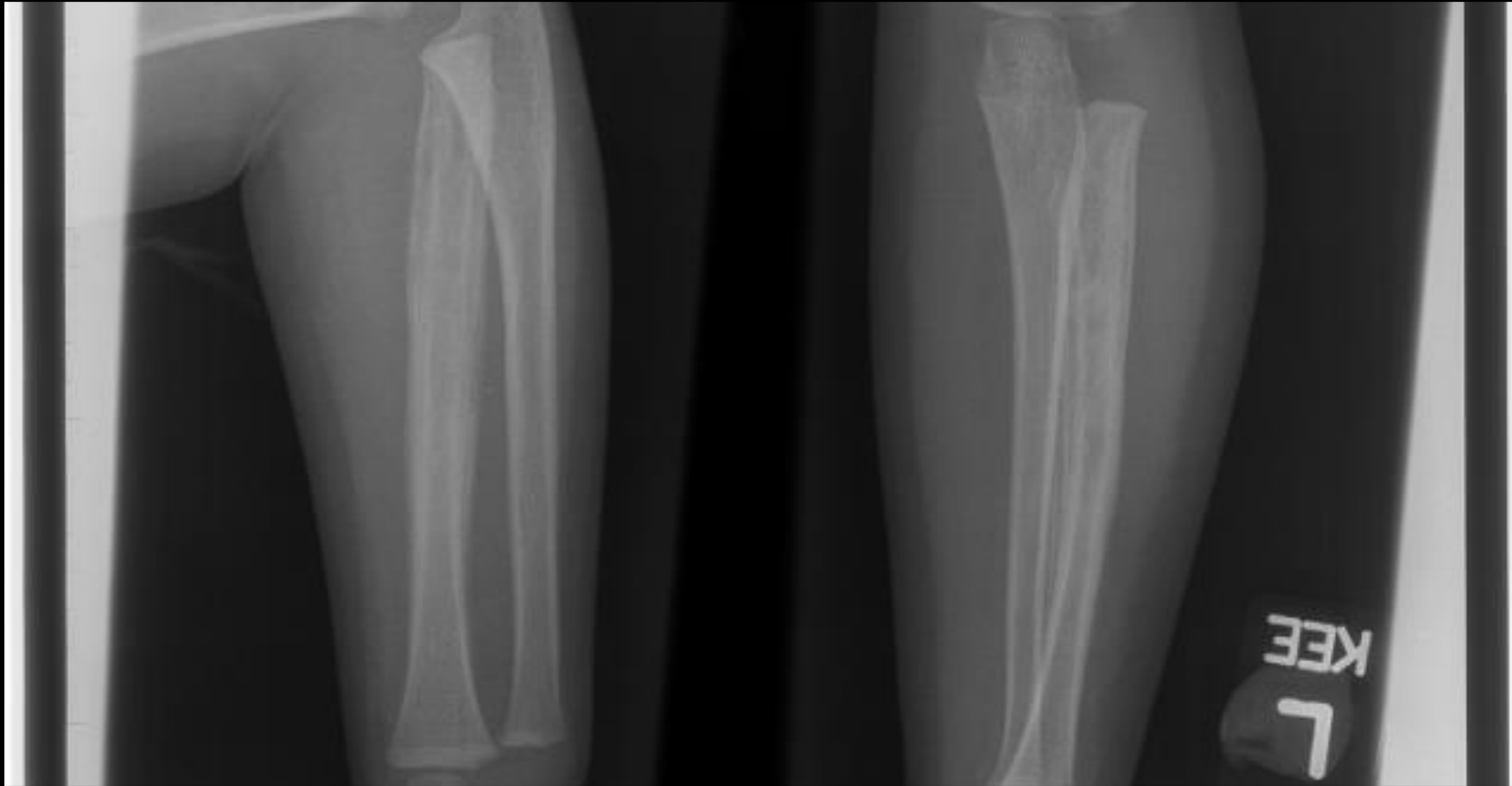
June, 2011

- **3 yo previously healthy boy**
 - 2-3 month history of left arm pain
 - Decreased use of left arm
 - Swelling of left arm

June, 2011

- **3 yo previously healthy boy**
 - Afebrile
 - No erythema
 - No trauma
 - Appetite, sleep patterns, energy levels all normal
 - Inflammatory markers normal

June, 2011



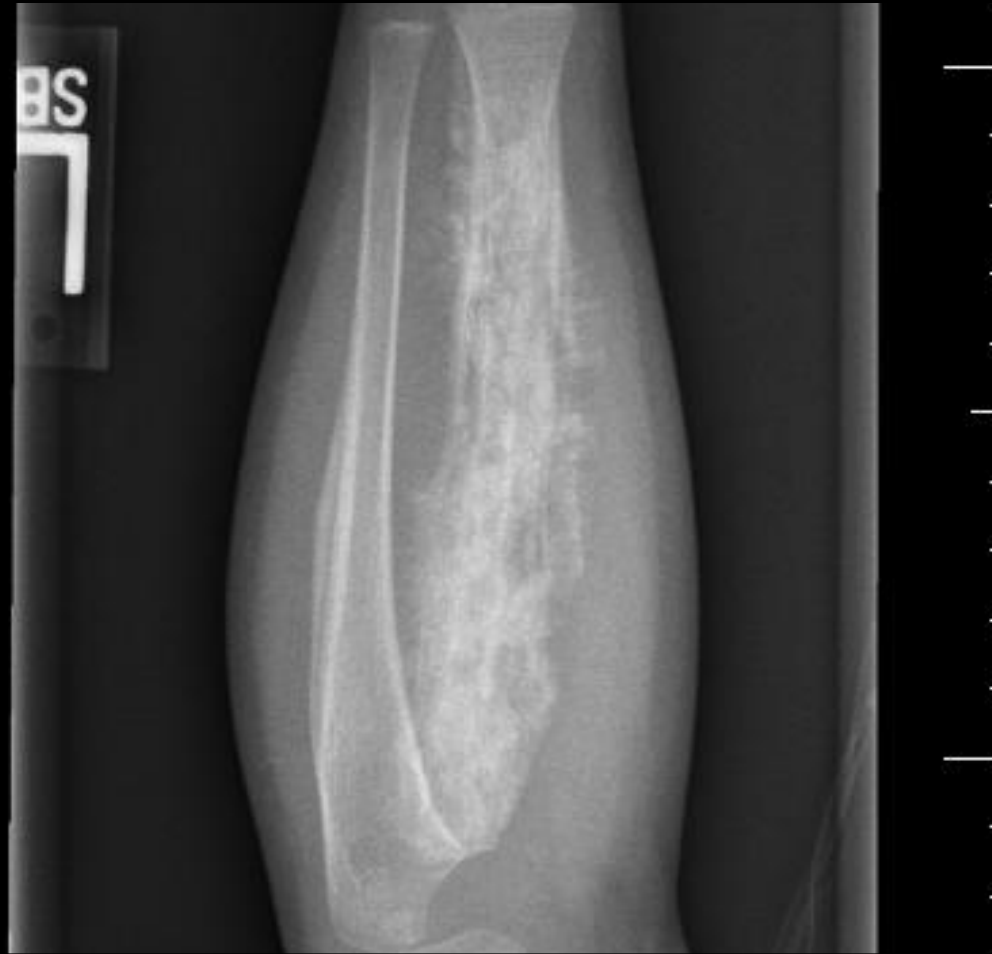
June 2011

- Biopsy performed
 - Myxoid appearing tissue with reactive bone marrow
 - Bone normal appearance per Orthopedics, but contiguous muscle grey in appearance
 - No evidence on histopathology of infection or malignancy
 - AFB/Fungal/Bacterial cultures from biopsy no growth with negative stains
 - Treated empirically for chronic osteomyelitis

July 2011



MS, August 2011



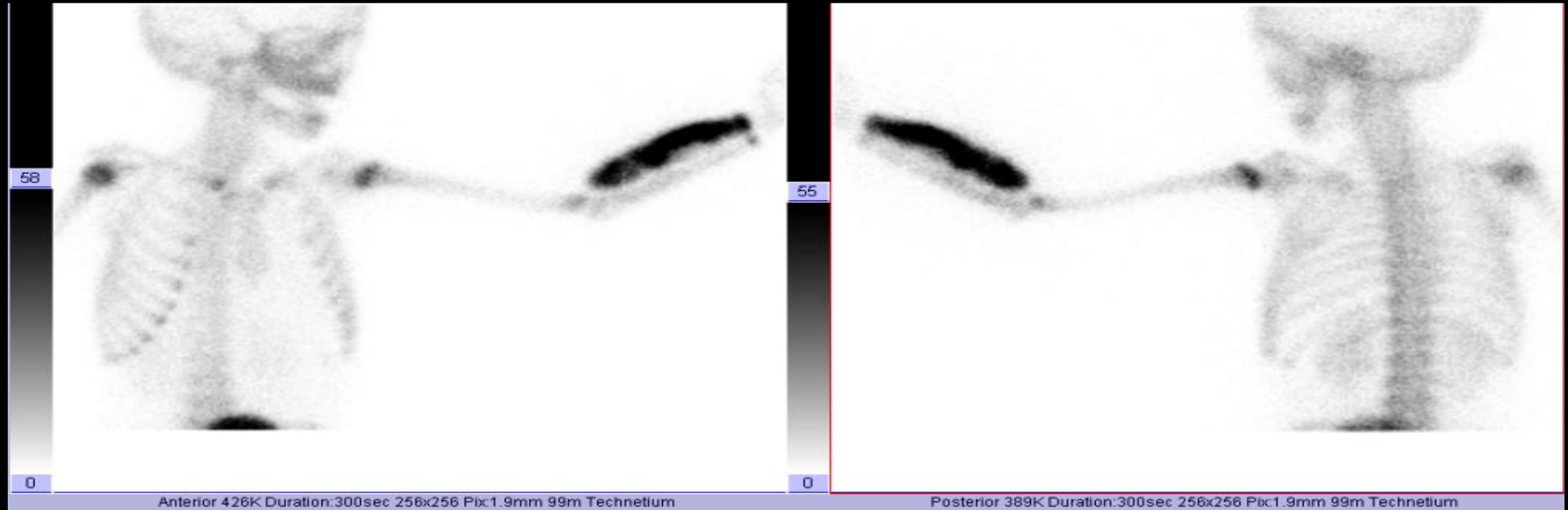
Repeat Biopsy, August 2012

- Diagnosis?

August 2012

- Biopsy in August with Ewing's Sarcoma (different surgeon)
- Metastasized to lungs
- Arm amputated below elbow

September 2011



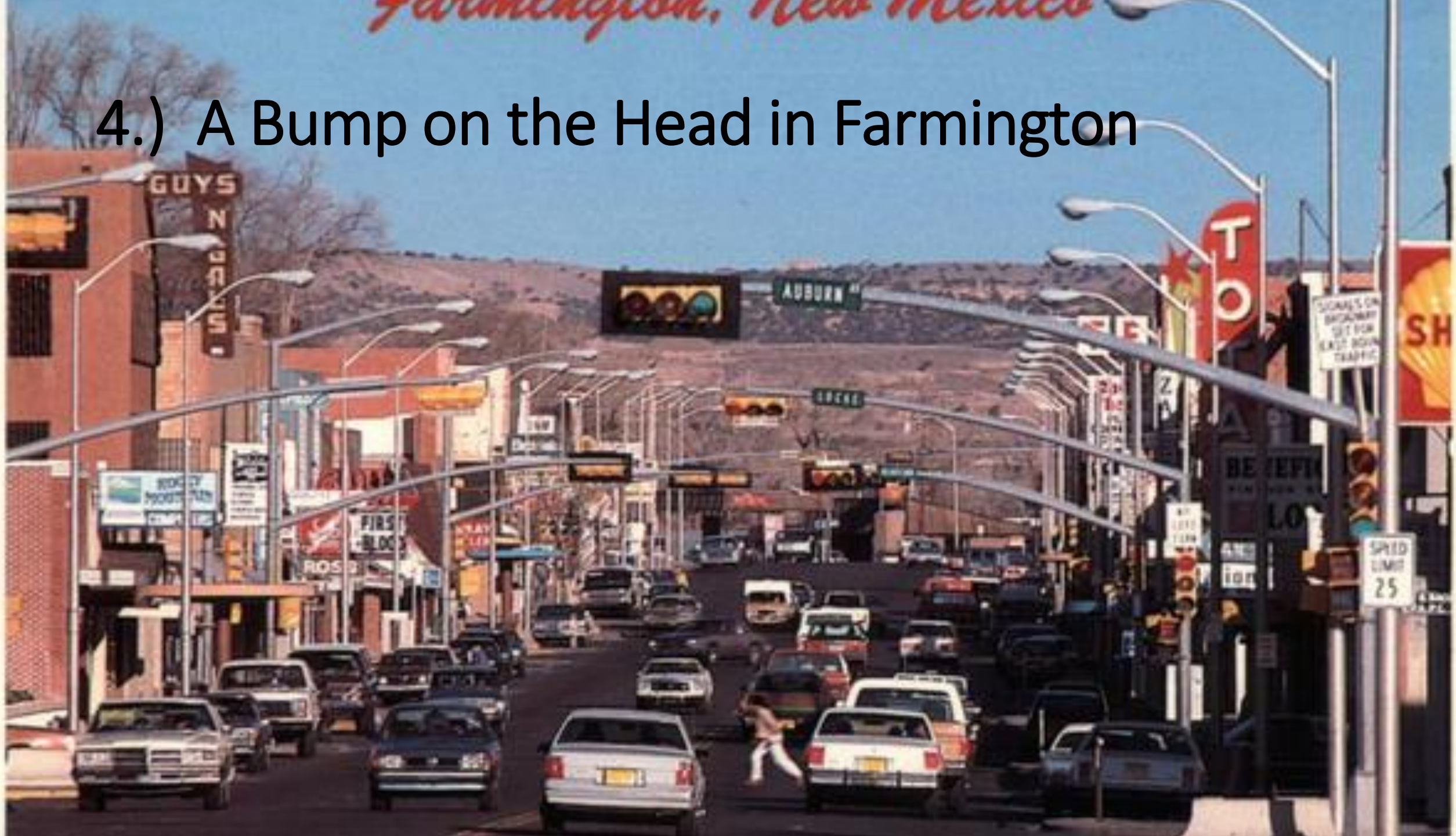
Chest CT



Take Home Points

- What to do when the 'gold standard' is inconclusive? Go with the 'gut instinct'?
- 'Throwing antibiotics' at an illness not always successful

4.) A Bump on the Head in Farmington



History of Present Illness

- Previously healthy 10 yo girl from Farmington
- Was wrestling with her sister when she hit her head on her bunk bed in August

History of Present Illness

- Her parents noted an erythematous, swollen and tender mass over the scalp
- They were unsure if it had been present prior to the accident, but assumed it was from hitting the bed

History of Present Illness

- Over the next 2 months, the lesion persisted
- Afebrile
- Normal appetite
- Normal activities
- No associated symptoms

History of Present Illness

- By February, the lesion had enlarged and was more erythematous and tender
- She otherwise remained well
- No HA, neck pain, neurological abnormalities

Social History

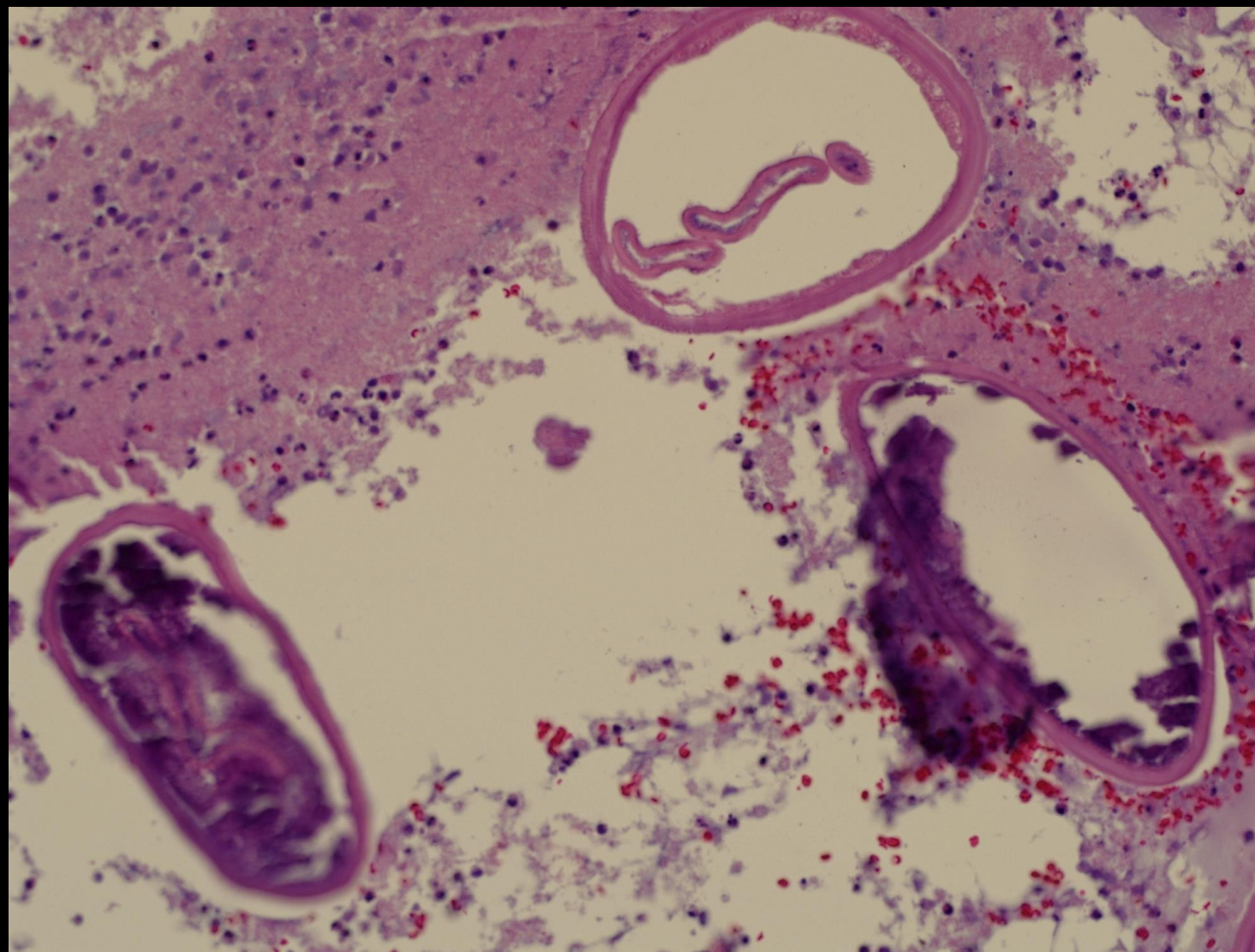
- Travel only in Northern NM and in CO
- Reportedly was bitten on the scalp by a flying insect while boating on Navajo lake 2 years prior to discovering the lesion
- 2 healthy dogs (outside)
- Parents, 2 sisters, 1 brother otherwise well





History of Present Illness

- Referred to surgery for excision in February
- Received a phone call from an excited surgeon that afternoon, reporting that a '...long, folded, strand-like material' was found in a cyst-like cavity
- Yellow, 0.7 mm thick and 'quite long' and 'looks like a parasite of some sort'
- Sent to Tricore Pathology for analysis



Diagnosis?

Diagnosis

- Preliminary reading from Tricore consistent with an *Onchocerca* species
- Sent to CDC where PCR testing confirmed *Onchocerca lupi*

Follow-Up

Follow-up examination in the ID clinic several months after excision

---Remained well

---Normal examination

---Formal Ophthalmologic examination normal



O. lupi Infections



Available online at www.sciencedirect.com



Veterinary Parasitology 151 (2008) 1–13

**veterinary
parasitology**

www.elsevier.com/locate/vetpar

Review

Onchocercosis: A newly recognized disease in dogs

Tamás Sréter^{*}, Zoltán Széll

*Laboratories for Parasites, Fish, Bee and Wildlife Diseases, Veterinary Diagnostic Directorate,
Central Agricultural Office, H-1149 Budapest, Tábornok u. 2, Hungary*

Received 3 July 2007; received in revised form 26 August 2007; accepted 7 September 2007

Distribution of *Onchocerca* Infections



- The San Juan River valley and the rivers flowing into the Canyon de Chelly reportedly have the potential to be breeding sites for blackflies (suspected vector for *O. lupi*)



Email communication, Paul Canty, 9-23-14

- Veterinarians on the Navajo Nation and in the Farmington area have reported finding numerous dogs with ocular *Onchocerca* infection



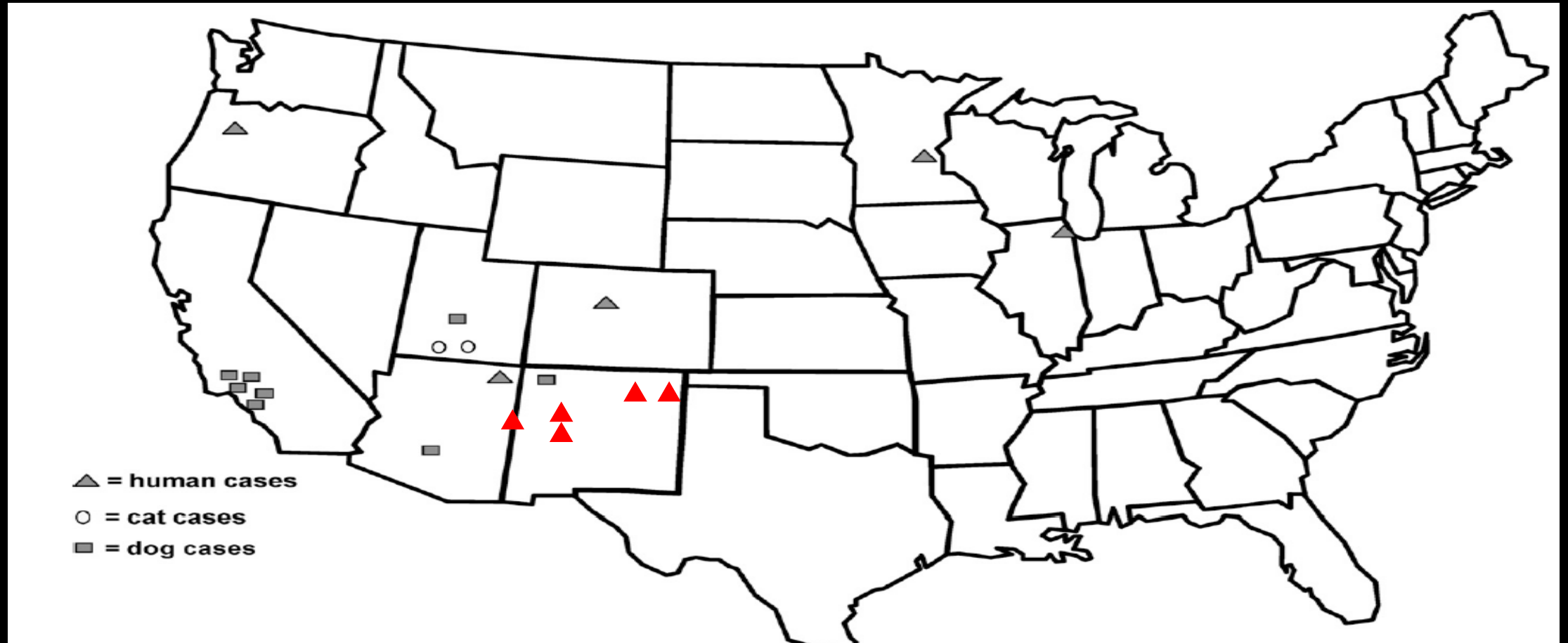
Email communication, Paul Canty, 9-23-14

Verbal Communication, Paul Ettestadt, 8-13-14

Recently published Cases of *O. lupi* Infection, United States

Residence	Ethnicity	Age	Location
Farmington	NS	NS	Spinal Cord
Phoenix	NS	NS	Forearm
Farmington	Caucasian	10 yo	Scalp
Chinle	Native American	NS	Spinal Cord
Chinle	Native American	NS	Spinal Cord

Distribution of *Onchocerca* Infections



Take Home Points

- Exotic infection, but may be seen in New Mexico (alongside Plague and Hantavirus)
- May see more of this in coming years

5.) The Dangers of 4-H



History

- 12 year old previously healthy girl presents to the UNM Children's hospital ED with a 7-10 day history of a 'sore finger'

History

- Lesion initially appeared as a red papule at the lateral aspect of the left 2nd MCP joint
 - Progressed into an ulcerative lesion with a rim of surrounding erythema
 - No regional adenopathy
 - Afebrile







History

- She was otherwise well
 - Normal appetite
 - Normal activity levels
 - Afebrile

- Primary complaint: unable to play softball

History

- She has been involved in 4 H, and raises lambs for this organization
- She had been at a livestock show in Colorado a week or so prior to the onset of her lesion

History

- She reports cutting her left 2nd finger on a wire hook used to hang water bottles for the lambs, but continuing to care for the lambs the rest of the weekend
- None of the livestock was reported to have been ill or have any abnormal lesions

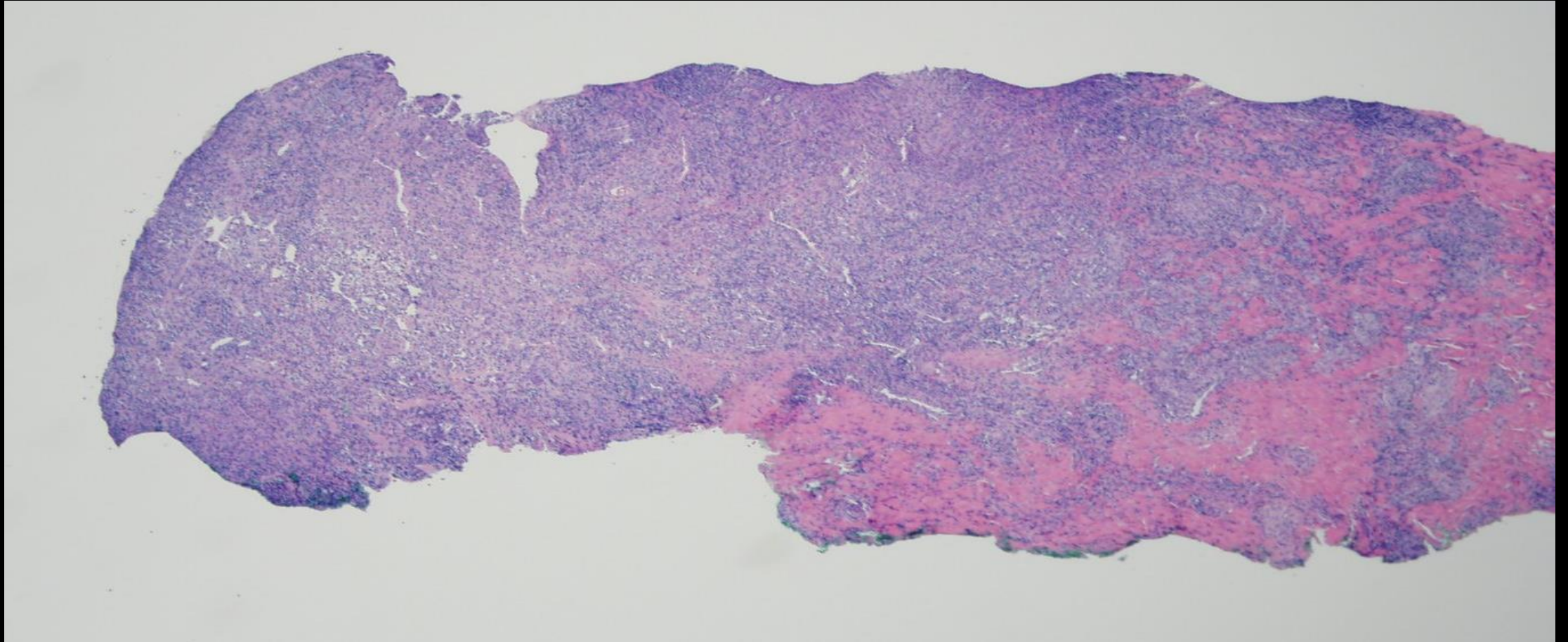
History

- No response was seen to empiric cephalexin begun by the Emergency Department physicians

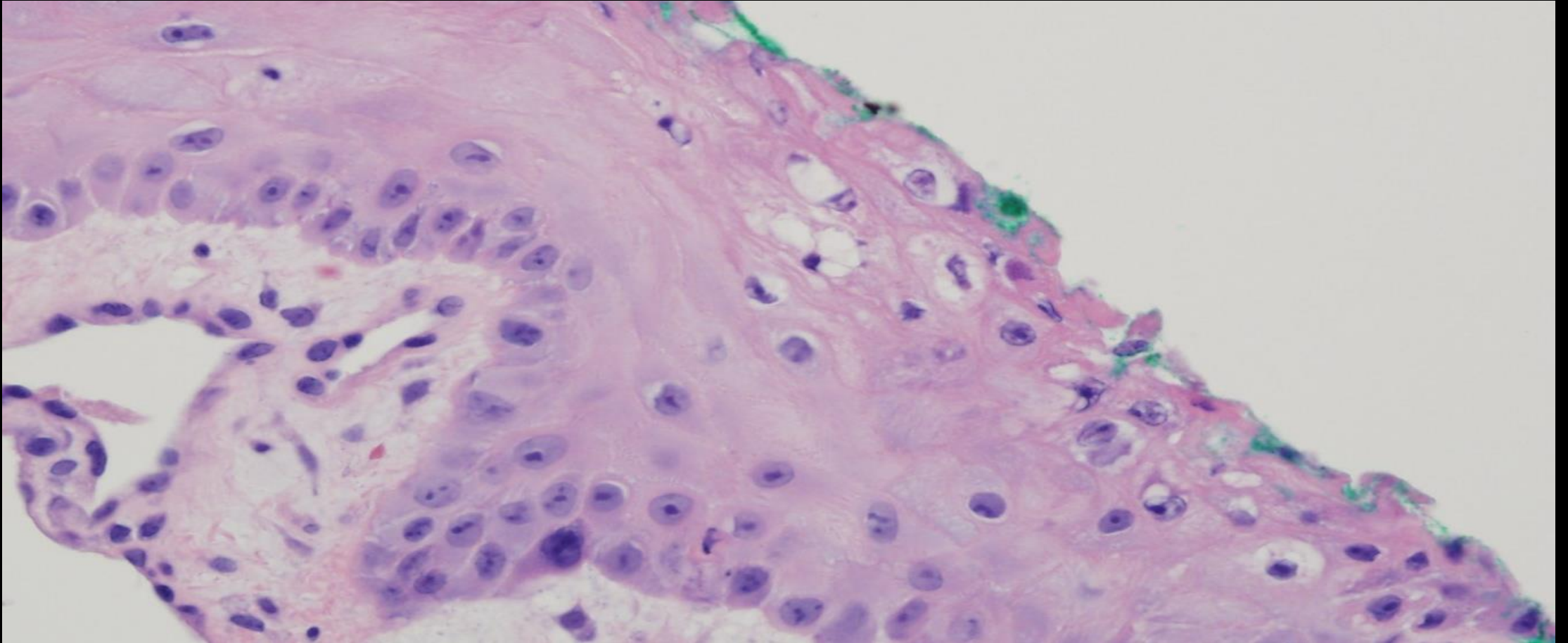
History

- Her lesion was biopsied by the Dermatology team
 - Epithelial vacuolization
 - Chronic inflammatory changes

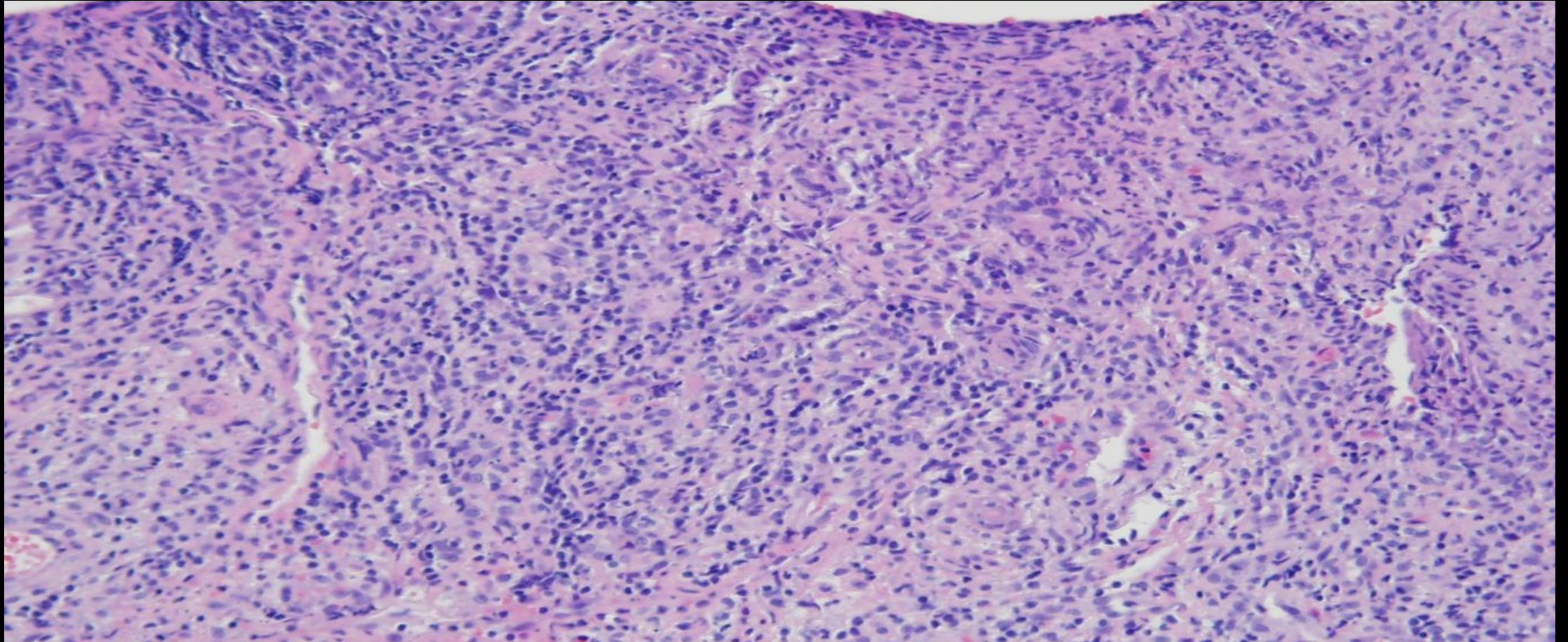
Epidermis---Overview



Vacuolization (40x)



Chronic Inflammatory Changes, 10x



History

- Bacterial, AFB and fungal cultures from the biopsy were no growth with negative stains
- She eventually made a full recovery, and returned to softball practice

Diagnosis?

Diagnosis

- Parapox virus infection, likely ORF

ORF Virus: Terminology

In Humans:

- Milkers' nodule (parapoxvirus bovis 2, associated with cows)
- ORF virus (parapox virus ovis or ORF virus, associated with sheep and goats)
- Pseudocowpox (parravaccinia/parapoxvirus bovis 2; synonym for Milker's nodule)
- Farmyard pox (generic term for parapoxvirus lesions)

In Livestock:

- Scabby mouth
- Sore mouth disease
- Ovine pustular dermatitis
- Contagious ecthyma

Uzel, et al. Epidemiol Infect. 2005;133:653-657

Muron, et al. Clin Infect Dis. 1994;19(2):344-350

Buttner, et al. J Vet Med. 2002;49:7-16

Mondal, et al. Veter Res Comm. 2006;30:531-539

Shelley, et al. Br J Dermatol. 1983;108(6):725-7

First Modern Published Case Description



SORE MOUTH IN SHEEP TRANSMISSIBLE TO MAN*

*By I. E. NEWSOM and FLOYD CROSS
Colorado Agricultural Experiment Station
Fort Collins, Colo.*

November, 1933

Fort Collins, Colorado

- A sheep feeder and his ranch hands spend 3 days caring for and hand feeding his flock of sheep suffering from 'sore mouth'
- The wool of the sheep was noted to be covered with 'cockleburs', leading to frequent cuts and scratches on the hands of the workers

November, 1933

Fort Collins, Colorado

- 4 days after feeding the sheep, numerous vesicles appears on the hands of the farmer



November, 1933

Fort Collins, Colorado

- One by one, the ranch hands came down with the same presentation





Research

Open Access

Characterisation of parapoxviruses isolated from Norwegian semi-domesticated reindeer (*Rangifer tarandus tarandus*)

Joern Klein^{1,2} and Morten Tryland^{*1,3}

Journal of General Virology (2004), 85, 1413–1418

DOI 10.1099/vir.0.79781-0

Short
Communication

Recent isolates of parapoxvirus of Finnish reindeer (*Rangifer tarandus tarandus*) are closely related to bovine pseudocowpox virus



Epidemiology

- Some activities of children may increase exposure risk
 - More likely to
 - Pester an animal and be bitten
 - Nuzzle a lamb
 - Not wear protective equipment
 - Not wash their hands



Epidemiology

- Infections more common in the spring and summer months (lambing season)



Clinical Presentation

- Infection progresses over 4-8 weeks
 - Papule
 - Vesicle
 - Ulcer
 - Scab
 - Healed skin (minimal scarring)

Clinical Characteristics

- May be confused with
 - Anthrax
 - Paronychia
 - Herpetic whitlow
 - Cutaneous Mycobacterial infection

...among other entities

Lederman, et al. *Pediatr Infect Dis J.* 2007;26(8):740-745

Muron, et al. *Clin Infect Dis.* 1994;19(2):344-350

Uzel, et al. *Epidemiol Infection.* 2005; 133:653-657

Delayed Diagnosis of Orf Virus Infections

Year	Age (years)	History/Exposure	Time to Diagnosis*
2004	16	Sheep wrangler	3 weeks
2004	51	Bottle fed goat	3 weeks
2005	11	Cut finger on lamb harness	5 days
2006	10	Bottle feeding ill lamb	2 weeks
2006	17	Bottle feeding lambs for 4 H	3 weeks
2006	4	Bottle feeding goat	3 weeks

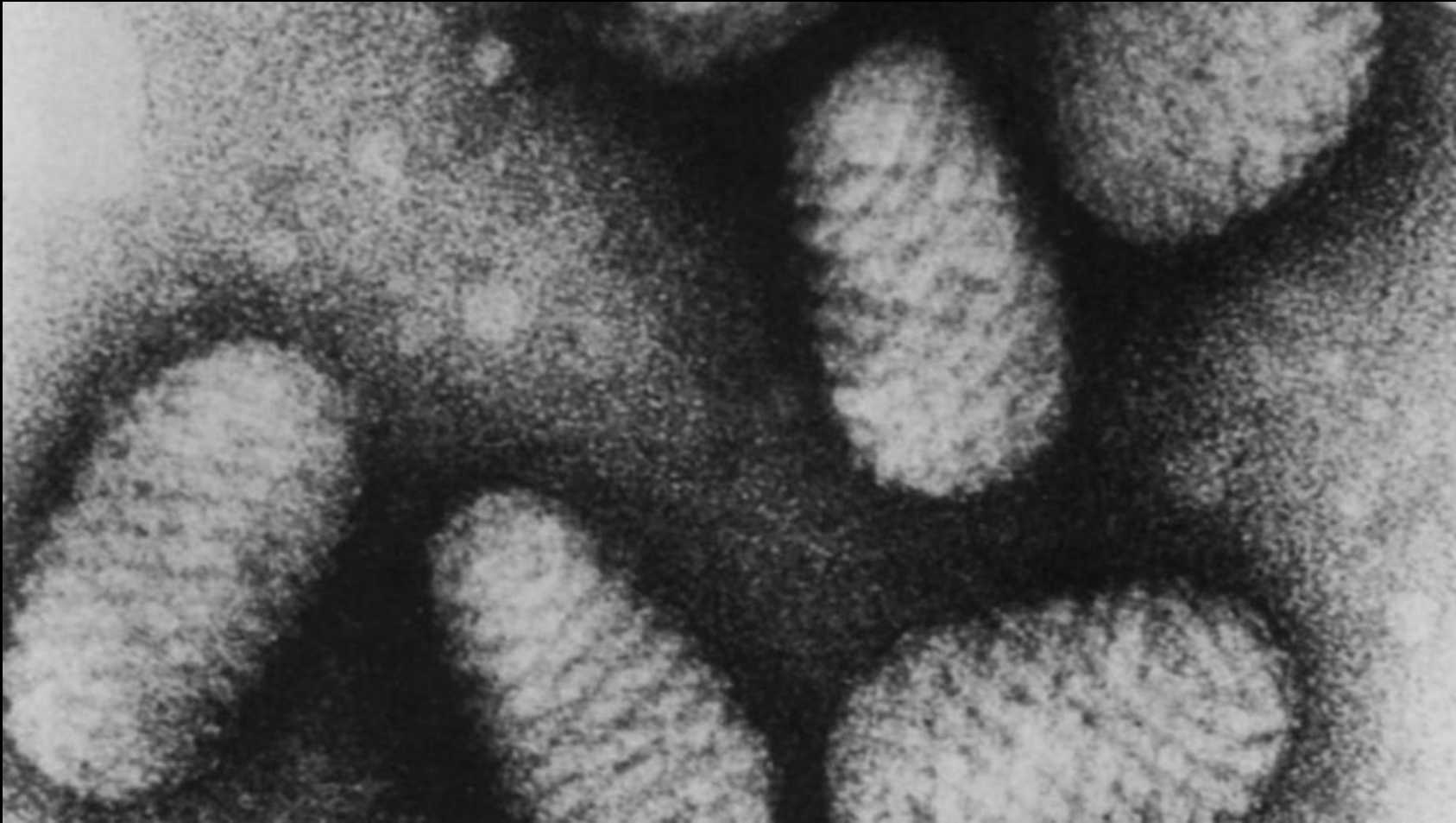
* From time lesion first noted

Adapted from: Lederman, et al. Pediatric Infect Disease Journal. 2007;26(8): 740-745
CDC MMWR. 2006;55(3):65-68

Diagnosis

- Typically clinical
- PCR available from CDC
- Electron microscopy (cross-hatched virions---seen with parapox viruses but not specific to ORF)
- Biopsy with suggestive features (intracytoplasmic inclusions, e.g.)

Electron Micrograph---Parapox virus (from lamb)



Treatment

- Most infections are self-limited
- Anecdotal reports of imiquimod, cidofovir, surgical excision, cryotherapy in immunosuppressed patients

Take Home Points

- You may not have seen ORF, but ORF may have seen you
- Probably more common than we think given difficulty in diagnosing infection
- More common in rural, agrarian areas

6.) Unexplained Weight Loss in a Toddler: History

- 3-year-old previously healthy boy presenting with a 3-month history of weight loss, anorexia and abdominal pain
- 5-7 lb weight loss
- No emesis
- Loose stools
- Mild diffuse abdominal pain

6.) Unexplained Weight Loss in a Toddler: History

- No fevers
- No ill-contacts
- No travel out of state
- No rash
- No joint pains
- Otherwise asymptomatic

6.) Unexplained Weight Loss in a Toddler: Labs

- WBC=3.1, Hgb=9.6, Plt=142, PMN=75%, Lymph=2%, Mono=20%, Baso=3%
- LFTS: ALT=100, AST=101, tbili=normal
- Albumin=1.8
- Total protein: 14.0

6.) Unexplained Weight Loss in a Toddler: Radiological Studies

- Abdominal plain film: Normal

6.) Unexplained Weight Loss in a Toddler: Radiological Studies

- Thoughts? Additional information/testing?

6.) Unexplained Weight Loss in a Toddler: Radiological Studies

- **PPD:**
 - 0 mm induration
- **Abdominal CT scan:**
 - Multiple, diffuse enlarged mesenteric lymph nodes

6.) Unexplained Weight Loss in a Toddler: Radiological Studies

- **Biopsy of mesenteric nodes:**
 - Granulomatous changes
 - Positive AFB stain

6.) Unexplained Weight Loss in a Toddler: Radiological Studies

- **Final Diagnosis:**
 - HIV infection with AIDS
 - Viral load >1 million
 - CD4 count <10
 - *Mycobacterium avium* mesenteric adenitis

6.) Take Home Points

- **Congenital HIV may present as late as elementary school age in children**
- Low albumin and high protein=poor man's HIV testing
- HIV rare in children, but does occur
- Mother never tested during pregnancy

7.) Altered Mental Status in an Elementary School Child

- 8 year-old otherwise healthy boy
- Taken to the urgent care clinic after he was sent to the nurses office with altered mental status

7.) Altered Mental Status in an Elementary School Child

- Parents report a 2-3 day history of antecedent left hip pain (without trauma) and fevers to 101 degrees
- No known ingestions/substance abuse

7.) Altered Mental Status in an Elementary School Child

- **Past Medical History**

- Innocent cardiac murmur diagnosed 5-6 years ago
- Otherwise well

7.) Altered Mental Status in an Elementary School Child

- **Pertinent findings on exam:**

- Temp=39.2 deg, not septic appearing
- No nuchal rigidity
- No rash
- 2/6 systolic cardiac murmur at the left upper chest border
- Restricted range of motion of the left hip
- Cannot answer simple questions or follow commands

7.) Altered Mental Status in an Elementary School Child

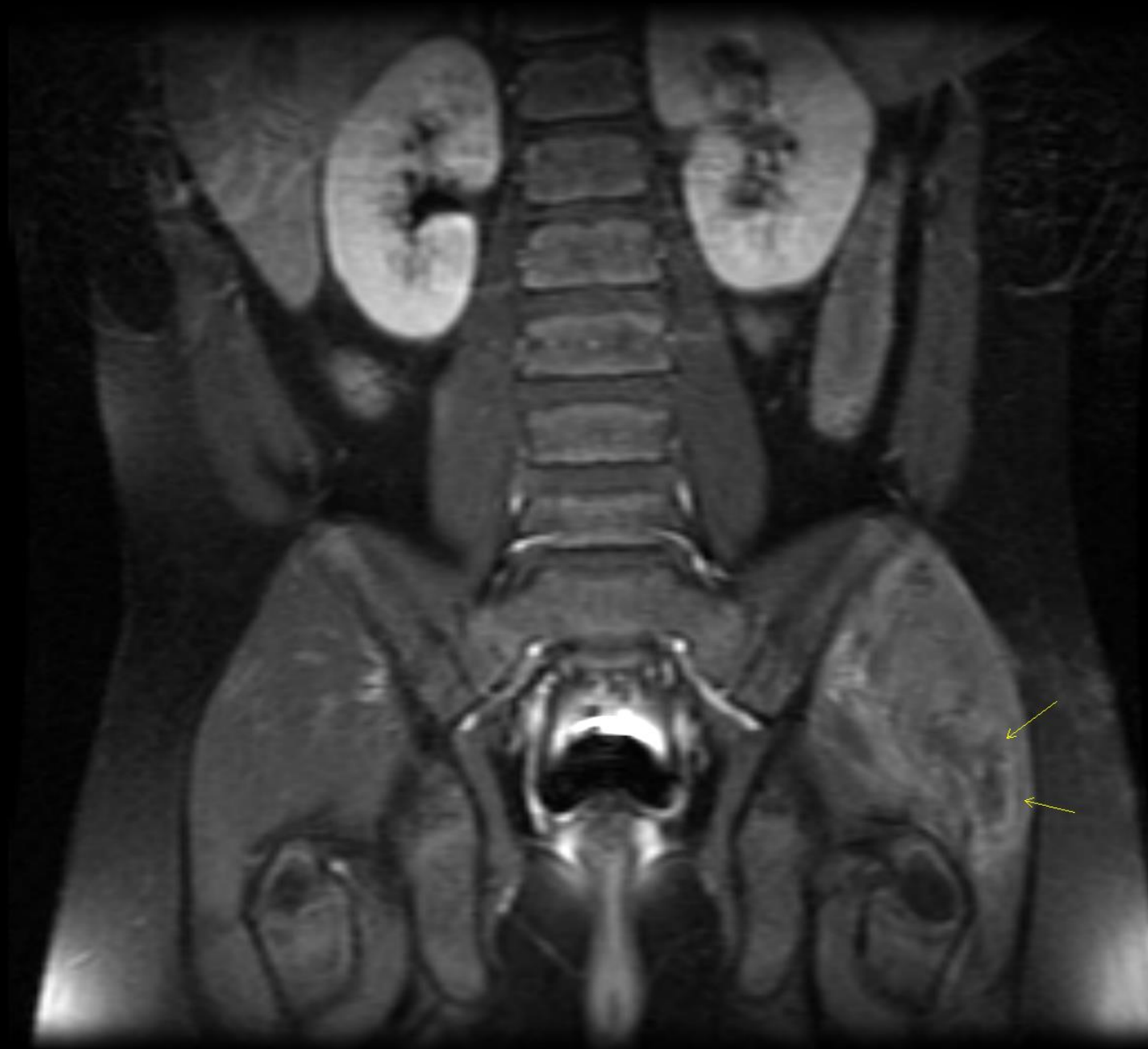
- **LP**

- CSF WBC=2, RBC=1, Glc=78, Protein=35
- CSF HSV PCR negative
- CSF Enterovirus PCR negative

- **Labs**

- WBC=24,000 with a left shift
- Normal chemistry panel
- Negative urine drug screen
- Normal LFT's
- CRP=23.8

Thoughts? Additional Testing?





Additional Testing

- **Blood culture**
 - MSSA
- **Transthoracic echocardiogram**
 - 1 cm vegetation on the mitral valve

Final Diagnosis

- **MSSA mitral valve endocarditis with metastatic embolization to the brain and left hip musculature presenting as altered mental status**

Take Home Points

- Native valve endocarditis very rare in children, but can happen
- Metastatic potential in endocarditis may lead to varied presentations
- Beware the diagnosis of an 'innocent murmur' in such a patient