Visual Diagnoses in Infectious Diseases

Welcome to

to See and Say

Sarah S. Long, M.D.

Professor of Pediatrics
Drexel University College of Medicine

Chief, Section of Infectious Diseases
St. Christopher's Hospital for Children
Philadelphia, Pennsylvania

Disclosure: Dr. Long is an associate editor of the *Red Book* 2018-2021 and *The Journal of Pediatrics*

A previously healthy 9 yo boy has sudden onset of generalized tonic clonic seizures followed by persistent stupor. CBC, metabolic panel and CSF are normal. He is afebrile. Exam reveals no focal neurologic abnormalities. A 5 x 6cm tender lymph node is palpable in the right axilla.

The most likely diagnosis is:

A. Staphylococcal toxin-mediated disease

✓ B. Cat scratch disease

C. CNS Tuberculosis

D. CNS toxoplasmosis

Cat-scratch disease encephalopathy: A cause of status epilepticus in school-aged children

Carlos E. Armengol, MD, and J. Owen Hendley, MD

We describe 6 school-aged patients who presented with status epilepticus (SE) secondary to cat-scratch disease (CSD) encephalopathy to alert clinicians to this distinctive clinical entity. The hospital database for admissions during 1 year was reviewed for patients presenting with SE; 4 of 5 previously healthy school-aged children with SE had CSD encephalopathy based on elevated indirect fluorescent antibody titers to *Bartonella henselae*. CSD encephalopathy should be included in the differential diagnosis of school-aged children presenting with SE. (J Pediatr 1999;134:635-8)

Rx: **Encephalopathy resolves spontaneously**
Azithromycin for LAD
Rifampin + amino, quinolone or azithro for dissem

Localized lymphadenopathy
FUO ± hepatosplenomegaly
Erythema nodosum
Unusual/multiple sites
osteomyelitis

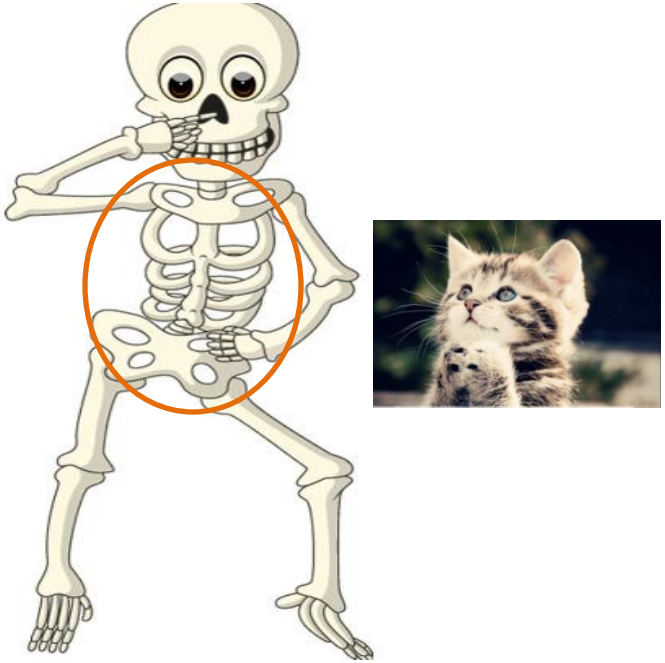
Microscopic = granuloma with stellate microabscesses

Cat	Bartonella
Rabbit	Tularemia
Boyfriend	LGV

Clinical and Radiologic Manifestations of Bone Infection in Children with Cat Scratch Disease

Guliz Erdem, MD[1,2], Joshua R. Watson, MD[1,2], W. Garrett Hunt, MD, MPH, DTM&H[1,2], Cody Young, DO[2,3], Cristina Tomatis Souverbielle, MD[1,2], Jonathan R. Honegger, MD[1,2], Kevin A. Cassady, MD[1,2], Megan Ilgenfritz, MD[1,2], Stephanie Napolitano, MD, MPH[1,2], and Katalin Koranyi, MD[1,2]

J Pediatr 2018;201:274



Cat scratch diseases with bone involvement

13 cases in 12 years at Nationwide, Columbus, OH

64 cases from the medical literature

- Mean age 7 years
  Symptoms 7-10 days
  Fever alone or fever/hx + pain
- Flat bones (pelvis and vertebrae)
  Multiple sites
- Hx kitten contact ± scratch site/node
- Mild ↑inflammatory markers
- No lytic lesions
- Bone scan or MRI +
- Dx: Hx + serology, Bx histology/PCR
- Outcomes are good

✓ There are treatment options
✓ Experiential preference:
Fluoroquinolone + rifampin ~3 weeks

A 12 yo previously healthy girl is seen in your office because of the acute onset of a tender, erythematous lesion on her back that becomes ulcerated. There are no other exam findings. She has not responded to clindamycin therapy. Culture of the lesion grows *Pseudomonas aeruginosa*.

She has been active in 4-H, lives in rural Arizona. She doesn't even know what a hot tub is.

Which of the followed tests should be performed immediately?

A. CBC
B. Fungal direct stain
C. Wood's lamp exam
D. Deeper "protected" culture
E. Biopsy

Ecthyma Gangrenosum

- It's all about neutrophils
  - Don't have enough
  - Don't work right

Congenital neutropenia

Chronic granulomatous disease

- Pseudomonas skin lesions w/o WBC abnormality
  - It's a water connection

Invasive Pseudomonas infection in two healthy children following prolonged bathing.
Meislich D, Long SS. Am J Dis Child. 1993 Jan;147(1):18-20

- Ecthyma gangrenosum in immunosuppressed:
  - Also consider staph, strep, fungi, herpesviruses

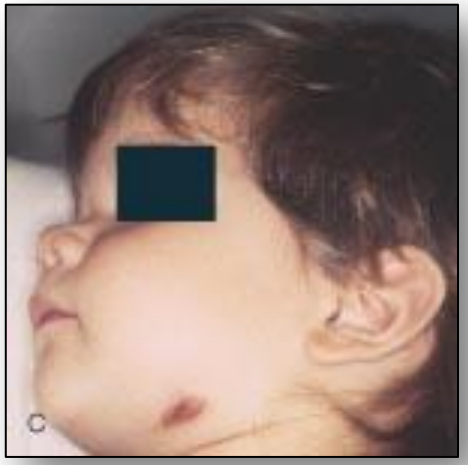
A healthy 2 yo girl had a lump noted under her jaw 3 weeks ago. It has progressed despite TMP-SMX therapy. She otherwise is well and afebrile. CBC is normal. The mass is not tender. There are no unusual exposures.

The next step is to

A. change antibiotic
B. incise and drain
C. aspirate & biopsy
D. excise

Because the most likely infectious etiology is…

A. *Staphylococcus aureus* (MRSA)
B. *Streptococcus pyogenes*
✓ C. *Mycobacterium* non-TB
D. *Bartonella henselae*



A 6 yo from south of Phoenix is suddenly noticed to have a rash on the face. There has been no illness or recognized unusual exposure.

The next step is to

A. Prescribe amoxicillin

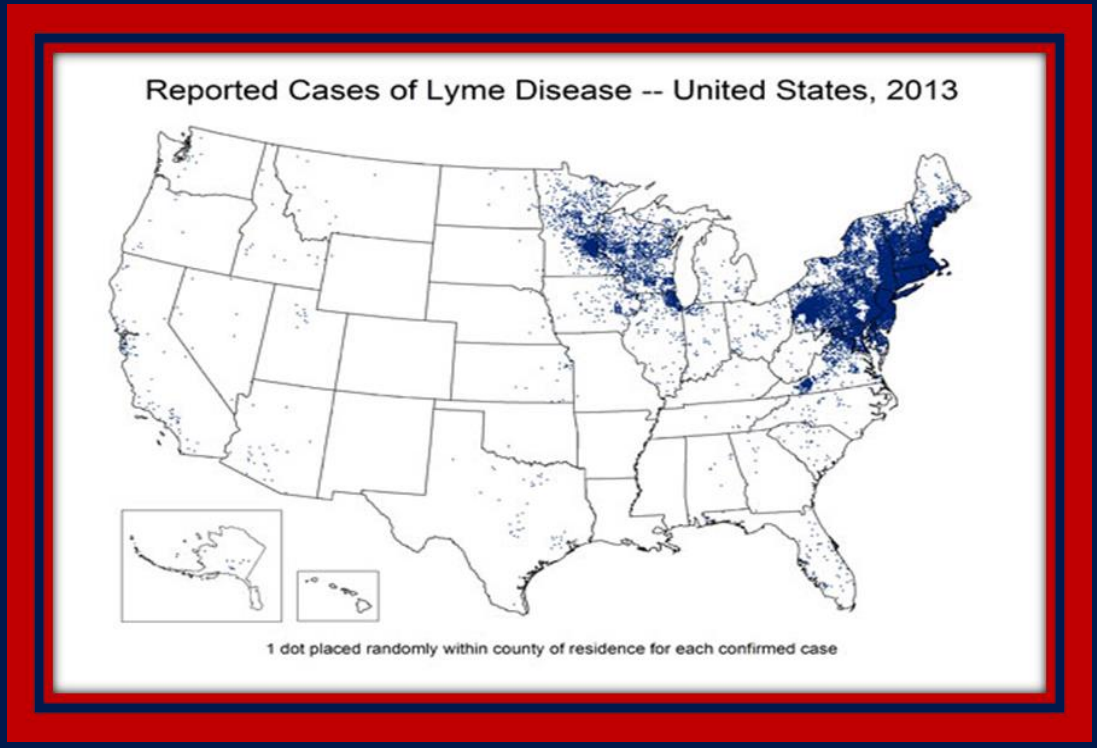
B. Perform a blood culture

C. Perform a serum Ab test

D. Perform CSF exam

Know your lesions

Know your map



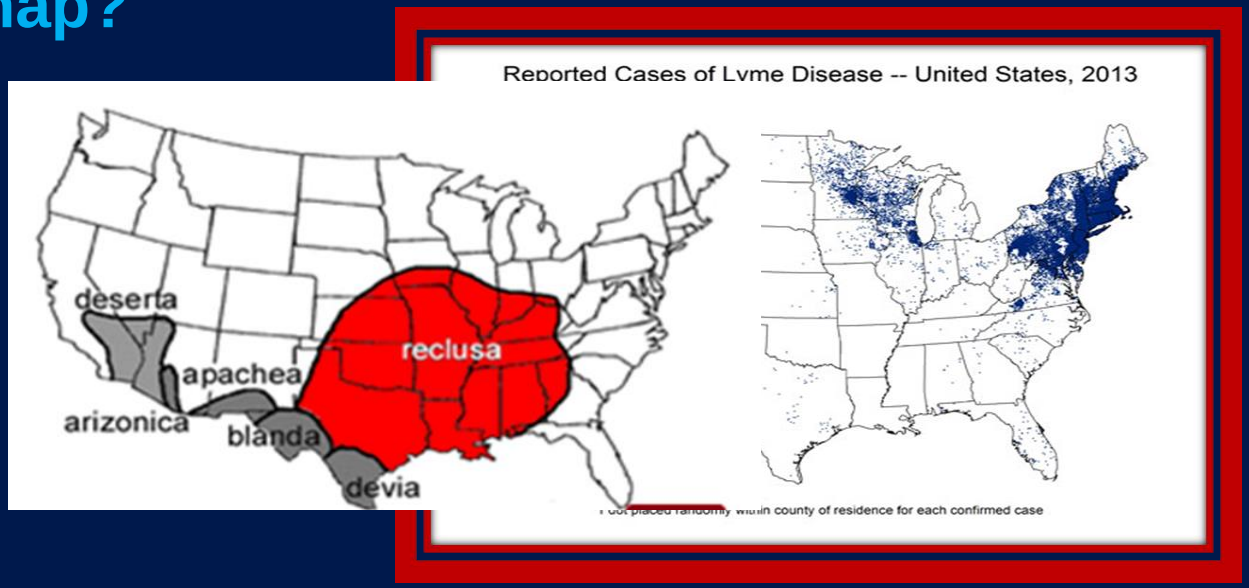
What You Should Know About Lyme Disease in Children

It's a simple infectious disease
Treatable with antibiotics
Amoxicillin < 8 yrs Doxycycline ≥ 8 yrs

Treat EM without serum Ab test (ever)

Most ED misdiagnoses – brown recluse spider bite

Remember your map?



What You Should Know About Lyme Disease in Children

It's a simple infectious disease
Treatable with antibiotics
Amoxicillin < 8 yrs Doxycycline ≥ 8 yrs

Treat EM without serum Ab test (ever)

Most ED misdiagnoses – brown recluse spider bit

Arthritis clue = Effusion >>>> disability

CNS Rule of 7s (Cranial n.VII, hx ≥7 days
WBC CSF ~ 70/mm^3 + ≥70% mono)

Don't perform serology for nonspecific
Don't perform o
Don't prescribe

Concerns Regarding a New Culture Method for *Borrelia burgdorferi* Not Approved for the Diagnosis of Lyme Disease

Christina Nelson, MD[1], Sally Hojvat, PhD[2], Barbara Johnson, PhD[1],
C. Ben Beard, PhD[1], Lyle Petersen, MD[1], Paul Mead, MI

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 63 / No. 15
April 18, 2014

A 4-month old infant is evaluated because of a finger lesion. He has had fever to 101.6^0 and fussiness when the finger is touched but otherwise feeds normally and is active. He has been treated with clindamycin without effect. A surgeon performed an I & D 2 days ago; Gram stain was negative. Culture is pending. CBC is normal.

Mother should be asked

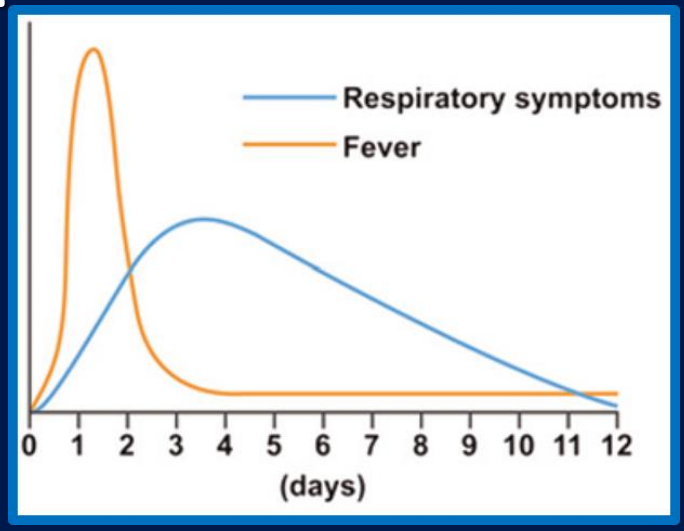
A. about a crush injury to the finger
B. about staphylococcal infections in the family
C. whether she soaked the baby's hand in tap water
D. whether she bites the baby's nails to trim

When assessing children with fever and mucocutaneous findings, the details of everything matter

FEVER / CADENCE OF SYMPTOMS

Fever

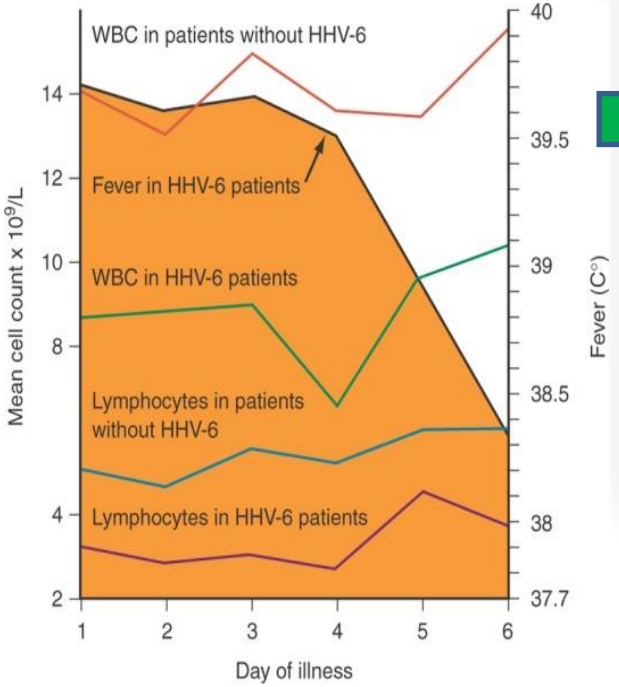
- Height?
- Duration?
- Singular or other symptoms?
- Toxicity?
- Crankiness?



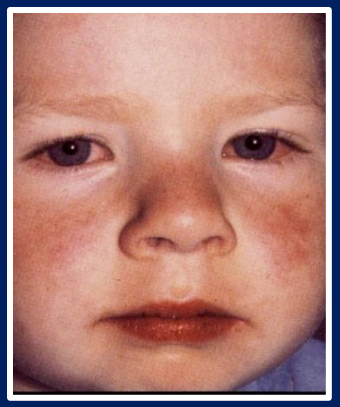
A 14 mo girl has fever >102^{0}F daily for 3 days and fussiness. She was seen by her pediatrician who found no focal signs/sites of infection. She is afebrile and improved on day 5 when this rash appears.

The most likely diagnosis is

A. Kawasaki disease
B. Measles (rubeola
C. Parvovirus B19
D. Roseola (HHV-6)
E. Toxic shock



THE CONJUNCTIVA

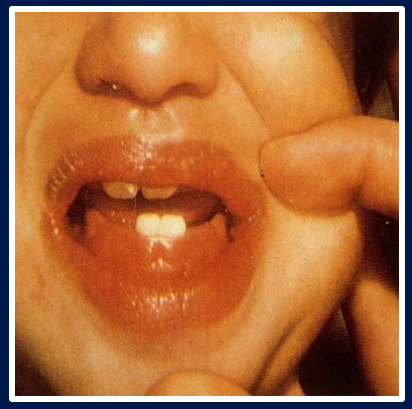


Bilateral bulbar hyperemia =
Kawasaki
Staph toxic shock

Bilateral purulent =
Virus (Measles, adeno)
Bacterial
Stevens-Johnson
RMSF

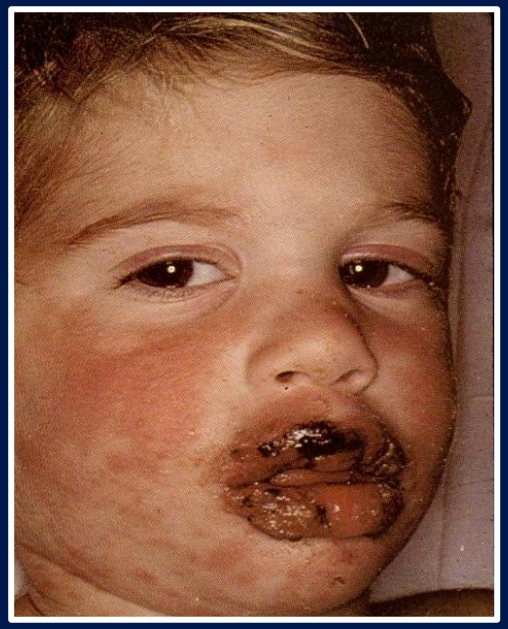
Sparing of conjunctiva =
Other viruses
Streptococcal scarlet fever

THE LIPS



Red cracked lips =
Kawasaki
High fever virus

Denuded bleeding lips =
Stevens-Johnson syndrome

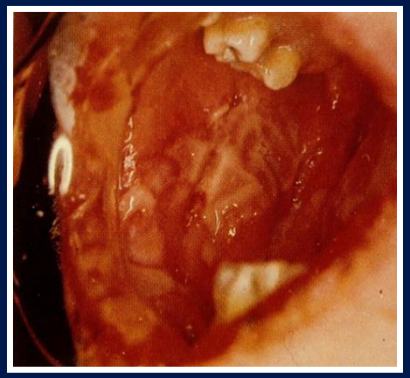


THE OROPHARYNX

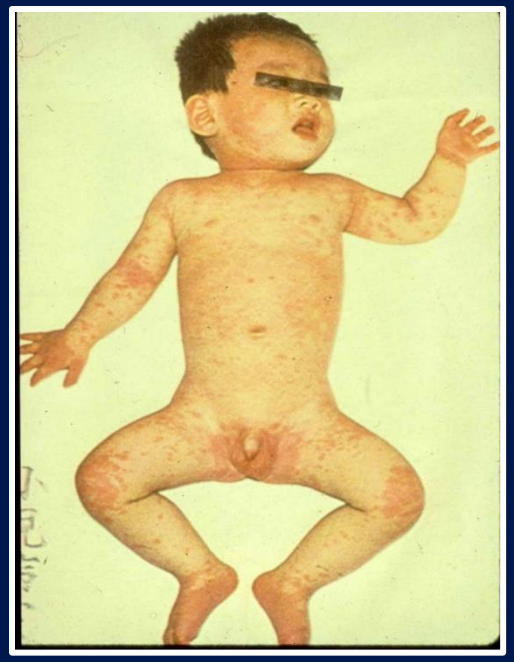
Palatal petechiae =
Group A strep
EBV

Strawberry tongue =
Group A strep
Staph toxic shock
Kawasaki

Specific site vesicles =
HSV (anterior)
Enterovirus (palate/buccal)
Stevens-Johnson (denuded)

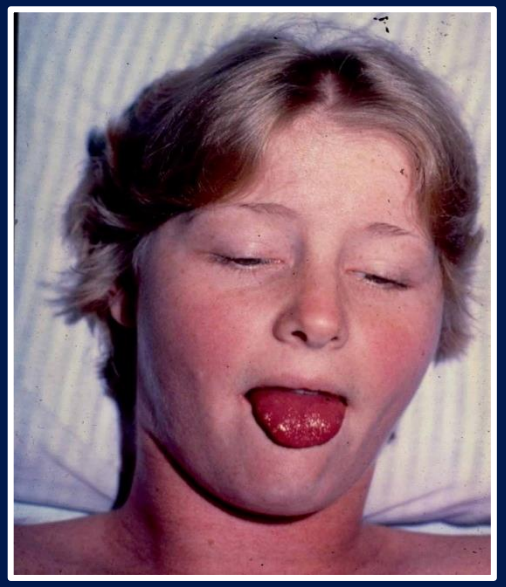


THE SKIN

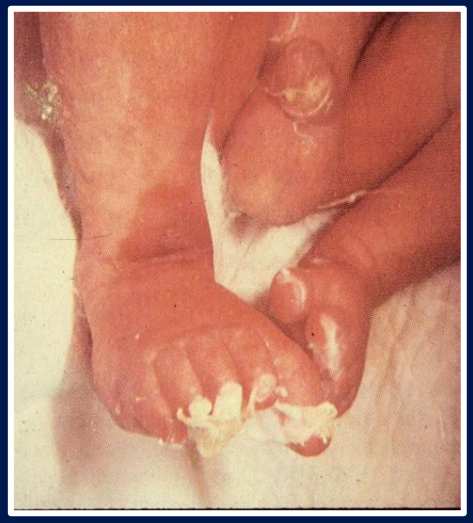


Polymorphous, symmetrical, hands/feet, especially groin = Kawasaki

Erythroderma = STSS



Desquamating while escalating = Staph exfol toxin/scalded skin

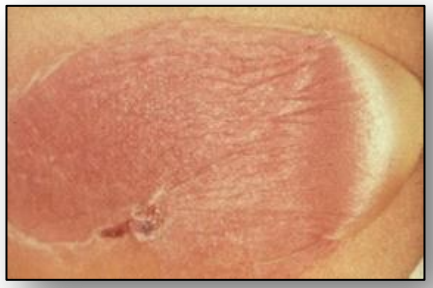


THE TIMING OF SKIN FINDINGS

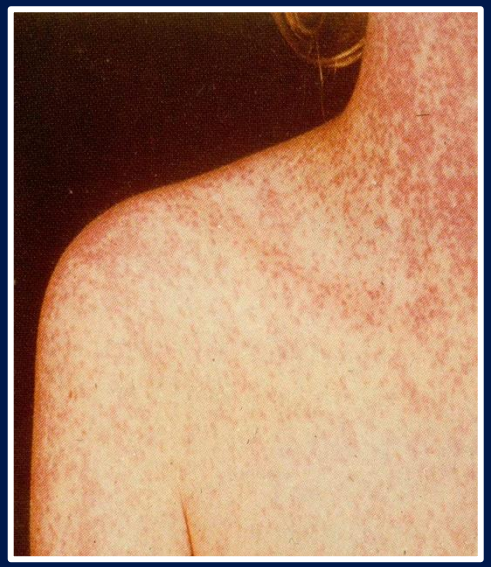
15 mo previously healthy, immunized boy with fever and lassitude, with rapidly progressive rash.

The most likely diagnosis is

A. Kawasaki disease
B. Grp A strep
C. Staph exfoliative toxin
D. Stevens-Johnson syndrome



DETAILS DETAILS DETAILS



EDEMA? WHERE?

A 7-year old previously healthy, immunized girl with fever and rhinorrhea for 3 days and now this. She is not ill appearing.

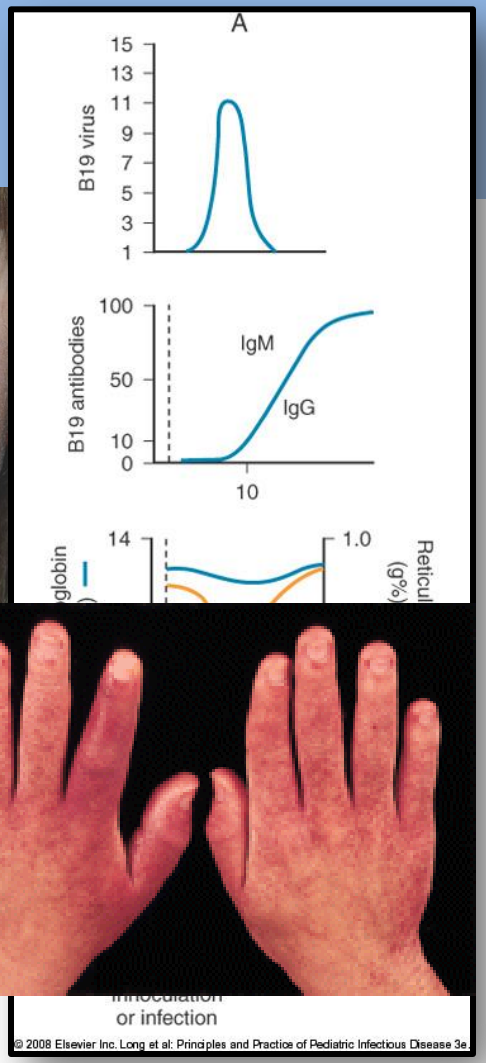
Most likely diagnosis is

A. Kawasaki disease

B. Measles

C. Enterovirus

D. Parvovirus



Yoshii. JPediatr 2018;202:327

THE DAY OF ILLNESS AND CONSTELLATION S/S MATTER

15 mo previously healthy, immunized boy with fever and irritability on day 5 of illness. No rhinorrhea, cough, or diarrhea.

Most likely diagnosis is

A. Kawasaki disease

B. Measles

C. Enterovirus

D. Adenovirus

Lymph-Node-First Presentation of Kawasaki Disease Compared with Bacterial Cervical Adenitis and Typical Kawasaki Disease

John T. Kanegaye, MD[1,2], Elizabeth Van Cott, BS[3], Adriana H. Tremoulet, MD, MAS[1,2], Andrea Salgado, MD[4], Chisato Shimizu, MD[1], Peter Kruk, MD[2,5], John Hauschildt, MD[2,5], Xiaoying Sun, MS[6], Sonia Jain, PhD[6], and Jane C. Burns, MD[1,2]

2013;162:1259

What We Knew

Cervical adenopathy is the least reported component of KD
50-75% cases Japan 42-53% cases US 24% cases China

Adenopathy + fever alone as presenting KD S/S unrecognized/late dx

The Study

Prospective cases 2003-2010 → Treated for acute KD in Rady, San Diego
vs Hosp bact. cervical lymphadenitis (BCL)

NFKD = 1st med encounter for fever and adenopathy alone

BCL = fever + unilat mass >1.5 cm + pus by I & D or resolution w abx

The Findings

The Findings

	NFKD (n=57)	BCL (n=78)
Median age	4.2 yrs	1.6 yrs
Median node size	3 cm	5 cm
Platelet Count	383,000	433,000
Illness day @ present.	2	2
Illness day @ dx	27	15
Admission dx = BCL	33%	100%
Imaging – solid node	91%	28%
Imaging – suppuration	9%	72%

Blinded independ review of imaging by 2 radiologists

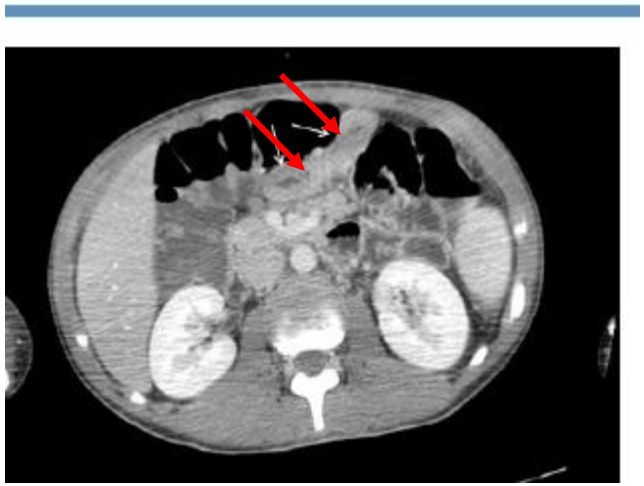
- ☑ Although both to med attention @ 2 days, NFKD not correctly diagnosed until 6 days
- ☑ One-third with final dx NFKD initially dx/rx with IV Abx for BCL
- ☑ Of those with NFKD with imaging (n=12), almost all had solid appearing node(s)
- ☑ Laboratory tests not highly discriminating
- ☑ If treated by day 10 fever, NFKD had same cor art Z scores/IGIV R as typical KD

Intestinal Involvement in Kawasaki Disease

Claudia Colomba, MD[1], Simona La Placa, MD[1], Laura Saporito, MD[1], Giovanni Corsello, MD[1], Francesco Ciccia, MD[2], Alice Medaglia, MD[1], Benedetta Romanin, MD[1], Nicola Serra, PhD[3], Paola Di Carlo, MD[1], and Antonio Cascio, MD[1]

J Pediatr 2018;202:186

Kawasaki disease with intestinal involvement
Case report (Italy) +
Literature review 48 additional cases



- Fever, abdominal pain, vomiting (29% w diarrhea)
- Intestinal S/S before typical KD S/S (29% incomplete KD w only GI)
- Pseudo-obstruction on GI imaging (thickening of intest wall common) (small bowel > colon)
- 52% underwent GI surgery (ischemia, inflam, 10% appendicitis)
- 43% coronary aneurysm or dilatation
- 61% received IGIV ± aspirin (When?)
- 8% died; 14% had persistent CAA
- Age mean/med 3 yrs (20% < 1 yr)

Conclusion

✓ Consider Kawasaki disease among diagnoses in young children with fever, abdominal symptoms and pseudo-obstruction

Clinical Perineal Streptococcal Infection in Children: Epidemiologic Features, Low Symptomatic Recurrence Rate after Treatment, and Risk Factors for Recurrence

Herbert William Clegg, MD[1], Peter Michael Giftos, MD[1], William Edward Anderson, MS[2], Edward Lawrence Kaplan, MD[3], and Dwight Richard Johnson, BS[3]

JPediatr 2015;167:687

Pruritis, pain and erythematous rash ± perianal/vag bleeding ± vulvovaginitis
Associated pharyngitis only occasionally
Metaanalysis 8 studies/123 patients → 37% recurrence

Methods

Single-site, 9-pediatrician practice with complex CLIA lab
Log of GAS$^+$ vag/perianal/penile cultures over 9 years
Rapid antigen test perineal + culture pharynx
Clinical findings/sibs/follow-up >2 years
Case-control substudy of recurrence vs none

Findings

Total perineal cultures = 660 GAS$^+$ = 157 (24%)
Disease perianal in 86% boys and perivaginal in 62% girls
Age 2-7 years in 80% (range 18 days – 12.5 years)
Seasonality as of GAS pharyngitis
Throat culture GAS$^+$ in 95% (only 10% clinical pharyngitis)
Amoxicillin therapy → 12% recurrence
Recurrence assoc w sibling w perineal & longer time to 1st Rx