Pictures to Ponder: Pediatric Visual Diagnosis

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Objectives
- Deadly rashes
  - Identify skin manifestation of systemic disease
- Treat or street?
  - Recognize common pediatric dermatologic conditions that may mimic life-threatening etiologies
- Pediatric Radiographs
  - Identify pitfalls in interpreting pediatric radiographs.

Life-threatening rashes
- Characteristics
  - Altered LOC
  - Mucous membrane involvement
  - Extensive blisters or desquamation
  - Pain out of proportion to exam
  - Petechiae or purpura

Life-threatening rashes
1. Palms/Soles
   - MRS TECK
2. Blistering/mucosal involvement
3. Purpura/Petechiae

“Palms and soles” MRS TECK
- Meningiococcemia
- Rocky Mountain Spotted Fever
- Syphillis, SJS, SSSS
- Toxic shock syndrome, TEN
- Erythema multiforme
- Coxsackie
- Kawasaki

Kawasaki Disease
Kawasaki Disease

- Fever plus 4 of 5 characteristics
- C 1. Bilateral conjunctival injection without exudate
- R 2. Rash of various forms (maculopapular, erythema multiforme, scarlitoform) especially in groin
- A 3. Nonsuppurative cervical LAD, unilateral, >/= 1.5cm
- S 4. Erythema of oral & pharyngeal mucosa, strawberry tongue, dry/cracked lips
- H 5. Edema & erythema of hands & feet

Kawasaki Disease - Labs

- No diagnostic test
- Elevated ESR and/or CRP
- Anemia (NC, NC)
- Normal platelet count until 2nd–3rd week, then thrombocytosis (>1 million)
- Normal to slightly elevated WBC count
- Sterile pyuria
- Mild transaminitis

Scarlet Fever

- Fever + rash + pharyngitis
- Sandpaper rash
- Strawberry tongue
- Full course of antibiotics to prevent complications

Staphylococcal Scalded Skin Syndrome

- Malaise
- Fever
- Irritability
  - Infants cry when handled
- Sunburn rash
  - Intense around neck, intertriginous areas, periorifically
  - Nikolsky’s sign
- No mucous membrane involvement

Stevens Johnson Syndrome

- Mucous membranes
- Adverse reaction meds
  - NSAIDS
  - Penicillins
  - Sulfonamides
  - Anticonvulsants
- Rx: IVF
  - Burn center
  - ?IVIG
Henoch Schonlein Purpura
- Vasculitis of small vessels
- Nonthrombocytopenic purpura
  - "palpable purpura"
- Edema in dependent regions
- Arthritis
- Abdominal pain/ GI bleed
  - Intussusception
- Renal involvement

Idiopathic Thrombocytopenic Purpura

Rocky Mountain Spotted Fever
- Fever + petechial rash + headache
- Tick-borne illness
- Clinical diagnosis
- Spreads inwards
- Rx: Doxycycline or chloramphenicol

Meningococcemia
- Fever + petechial rash
  - Rapid progression to purpura
- Transmission in close quarters
- URI prodrome
- Fulminant shock

Life-threatening rashes
1. Palms/ Soles
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2. Blistering/ mucosal involvement
3. Purpura/ Petechiae
**Eye Discharge**

**Conjunctivitis**
- 12 to 24 hours
  - Irritant conjunctivitis develops from eye prophylaxis
- 2 to 5 days of life
  - Gonorrhea
- 1 to 2 weeks of age
  - Chlamydia
- Refer to Ophthalmologist

**White Tongue**

**White Tongue and Lips**

**Thrush**
- White plaques on gingiva and tongue
- Does not wipe off
- Present before and after feeding
- May have mouth soreness
- Management:
  - Nystatin for baby and mother (if breastfeeding)
  - All artificial nipples must be sterilized!

**Stiff Neck**
**Torticollis**
- Fibrosis and shortening of sternocleidomastoid muscle
- Abnormal intrauterine position or birth trauma
- Head tilts to affected side with chin away
- Management: passive neck stretching and positioning

**Corneal abrasion**

**Congenital glaucoma**

**Herpetic Keratoconjunctivitis**
- Presentation of primary HSV
  - Fever
  - Fatigue
  - Myalgias
  - Headache
- HSV-1 or -2
- Classic: dendritic lesions on fluorescein exam

**7 yo “eye looks funny”**
Outline

- Cervical spine
- Soft tissue neck
- Chest radiograph
- Upper extremity
- Lower extremity

C-spine: NEXUS in kids

- Obtain imaging if:
  - Painful distracting injury
  - Altered mental status
  - Intoxication
  - Neurologic abnormality
  - Tenderness cervical midline

Leonard et al, abstract presented at Pediatric Academic Societies meeting, 2008

C-spine: NEXUS in nonverbal kids

- High-risk mechanism:
  - High speed MVC
  - Fall > 8 ft
  - Spearing or loading injuries
  - Neurologic abnormality at time of injury
  - Distracting injury
C-spine: Pseudosubluxation

Line of Swischuk

C-spine: Pseudosubluxation?

Pseudosubluxation in extension = injury

C-spine: Atlanto–axial subluxation

- Down’s
- JRA

15 mo high fever, barky cough

Epiglottitis

Muffled speech/ Stridor

- Labs: not useful
- Imaging:
  - 7 mm at C2
  - 5 mm at C3, C4
  - 14 mm at C6
  - (>22 mm in adults)
- CT if stable

Foreign body

Retropharyngeal Abscess
6 mo with vomiting
Diaphragmatic hernia

2 yo fever and abdominal pain
Intussusception and appendicitis
Malrotation with volvulus until proven otherwise

Malrotation

21 mo with hematuria
Wilms tumor
SALTR 4

Salter-Harris Epiphyseal Fracture Classification
*Physis (growth plate) is highlighted in blue. Fracture line is black or red.*

Ossification centers of elbow

- Capitellum: 1 yr
- Radial head: 3 yr
- Internal condyle (medial): 5 yr
- Trochlea: 7 yr
- Olecranon: 9 yr
- External condyle (lateral): 11 yr

12 yo with knee pain

Normal
9 yo with limp

Legg-Calve-Perthe Disease
- Aseptic necrosis of femoral head
- Age 2 – 14 (peak 5y)
- 10% bilateral
- ♂ > ♀

13 yo obese male with hip pain

Slipped Capital Femoral Epiphysis (SCFE)

2 mo with respiratory distress
1 week old with “bump”

6 mo crying, refusing to crawl
Classic metaphyseal lesion

2 yo with limp
Toddler’s fracture

5 mo vomiting and lethargy

Non accidental trauma (NAT)
- Inconsistent story
- Vague description
- Developmental milestones

Until proven otherwise...
- Point tenderness in pre-adolescent...
  - Salter 1 fracture
- Posterior fat pad...
  - Supracondylar fracture
- Posterior rib fracture...
  - Abuse
- Spiral fracture, nonambulatory child...
  - Abuse
Dosing by imaging study
- 1 millirad = background radiation
- Largest additional exposure from diagnostic radiology studies
  - CT head: 6 rads
  - CT abdomen: 3 rads
  - CXR (2 view): 10-20 millirads
  - KUB (1 view): 50-100 millirads

Radiation Risk
- Age at FIRST exposure
- Most sensitive: thyroid, breast, gonads
- Cumulative risk
- Current CT doses overlap atomic bomb survivors

Radiation Risk
- Lethal malignancy risk from CT Head 1:5000
  - Infants (< 1 year) risk 1:1500

Bottom line
- Judicious use of radiology

Pearls
- When in doubt, splint!
- “Clinically correlate”
- Consider disorders of hip for knee pain
- Caution when diagnosing “sprains”
- Consider risk of radiation

Resources
- www.pediatricimagingonline.com
- www.learningradiology.com
- www.med-ed.virginia.edu/courses/rad/peds/
- www.cchs.net/onlinelearning/cometvs10/pedrad/default.htm
- www.hawaii.edu
  - Search: pemxray

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