Rapid Fire Visual Diagnosis
Foresee Your Next Patient

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Faculty Disclosure

No Conflict of Interest!

I have no relevant financial relationships with the manufacturers(s) of any commercial product(s) ------

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Objective

At the conclusion of this presentation, participants will be able to

✓ Sharpen their diagnostic skills

✓ Reconsider diagnosis when physical examination, laboratory findings and/or patient course do not follow the expected pattern of diagnosis

Theme for Today

Name this Disease
Toddler with These Findings
H/o Chronic Constipation

Most likely diagnosis

1. Immersion Burn (Child abuse)
2. Laxative “Burn”
Chocolates Look-Alikes

- active ingredient in Ex-Lax is senna (anthraquinone laxative)
- diarrheal stools from ingestion of Ex-Lax in diaper leads to dermatitis

Laxative-Induced Dermatitis of Buttocks
Mimicking Scald Burn Injury
Leventhal et al. Pediatrics 2001

23-mo-old with ruptured bullae, diamond-shaped distribution
27-mo-old with bullae, diamond-shaped distribution
Laxative-induced Dermatitis ("Burn")

- Diapers appear to be a risk factor (erythema along buttocks forms a linear demarcation that closely aligns with inner absorbent pad of child's diaper)
- Dose of laxative does not correlate with severity of burn injury

Skin Breakdown and Blisters From Senna-Containing Laxatives in Young Children

Accidental, but initially Suspicious Injury
Jr of Pediatrics and Child Health 50(3); Dec 2013

Superficial partial thickness burn with diarrhea from senna laxative with prolonged contact in nappy. Note sparing of perianal skin

Immersion Burns

Sparing of buttocks (which contacted surface of bathtub & avoided being burned)  “Stocking” or “Glove” pattern Burns
Your Patient

She has been accused of
“daydreaming”
and
not paying attention during class!

✓ Normal birth, growth/development & neurological exam
Absence Seizures
Most common in children from age 4-14 yrs.

**Typical**
- Most common type
- Child suddenly stops all activity & may look like staring into space or has a blank look
- Eyes may turn upwards with eyelids fluttering
- Begin & end abruptly lasting only a few seconds *(hence often missed and may not be detected for months)*
- Several episodes/day

**Atypical**
- Starts with staring into space, with a blank look
- Usually a change in muscle tone & movement
  - Eye blinking / eyelids fluttering
  - Smacking lips/chewing movements
  - Rubbing fingers together or making other hand motion
- Lasts longer ~20 seconds or more
Typical Absence Seizures
3Hz Spike-and wave discharge on EEG

Absence Seizures v/s Daydreaming

Absence Seizures
- Can happen anytime, including during physical activity
- Usually comes on very suddenly, without warning
- Cannot be interrupted
- Ends on their own (typically within seconds)

Daydreaming
- More likely to happen when child is bored (e.g., during a long class at school)
- Usually comes on slowly
- Can be interrupted
- Tends to continue until something stops it (e.g., parent getting child’s attention)

Courtesy of Dr. Geetha Chari; SUNY Downstate
An adolescent with h/o of persistent purulent nasal discharge & daytime cough for past 12 days. Now 103° fever and severe headache

Shah BR et al.
Most likely diagnosis

1. Forehead cellulitis
2. Pott’s puffy tumor
3. Infected hematoma

Pott’s Puffy Tumor

- Either as a complication of frontal sinusitis or trauma
- Children & adolescents
- Headache, photophobia, fever, vomiting, lethargy
- Tender, fluctuant forehead swelling
  (subperiosteal collection of pus)
**Frontal Sinuses**
- Frontal sinus insinuates itself between inner & outer tables of frontal bone & becomes pneumatized at 6 yrs of age
- Sinus separated from frontal bone marrow cavity by only 100 -300 m
- Sinus mucosa, marrow cavity, and frontal bone have common venous drainage via valveless diploic veins

![CT (bone window) showing bony destruction of inner & outer table of frontal bone from sinusitis](image)

**Pott’s Puffy Tumor**
- Often misdiagnosed as a infected hematoma or soft tissue infection or neoplasm
Pott’s Puffy Tumor

- Consider in patient with forehead swelling & frontal sinusitis
- Exclude intracranial involvement (CT or MRI)

Shah BR et al.

Pott’s Puffy Tumor

Anterior extension of frontal sinusitis → frontal bone osteomyelitis & subperiosteal abscess
Pott’s Puffy Tumor

1. Polymicrobial (*Streptococcus* sp., *S. aureus*, *Bacteroides* etc)
2. Broad-spectrum antibiotics & surgical drainage
   (eg. Vancomycin and either ceftriaxone or ampicillin-sulbactam.
    Consider Metronidazole for anaerobes, if ceftriaxone)

Who Else Should Be Involved?

- If violation of posterior table
  → neurosurgery
- If erosion through lamina papryacea (into orbit) or any extraocular motor deficit/diplopia
  → ophthalmology
- Infectious disease

CT (parenchymal view) showing intracranial abscess formation
Your Patient

A 9 mo-old exclusively breast-fed, unimmunized infant (missed several appointments)

now presents with fever and this finding
Most likely Diagnosis

1. Child abuse
2. Congenital syphilis
3. Rickets
4. Scurvy

Vitamin D Deficiency Rickets
Risk Factors

- Exclusive breast feeding without vit D supplements
- Lack of exposure to sunlight
- Food faddism
- Lack of dairy products
- Metabolic bone disease
Vitamin D Deficiency Rickets
Clinical Features

- Bow-legs
- Prominent wrists
- Prominent ankles
- Rachitic rosary
- Craniotabes
- Frontal bossing
- Knock-knees
- Hypotonia
- Failure to thrive
- Hypocalcaemia
- Seizures
- Tetany
Vitamin D Deficiency Rickets

Serum
- Ca: low or normal
- PO4: low for age
- Alkaline phosphatase: elevated
- PTH: elevated
- Calcidiol: decreased
- Calcitriol: decreased, normal or elevated

Rickets: Radiologic Features
- Cupping (concave deformity [normally convex or flat appearance])
- Fraying (indistinct, shaggy borders) and Widening
Single-day Therapy for Nutritional Vitamin D-deficiency Rickets: A Preferred Method
Shah BR and Finberg L

Abstract
A single-day large dose of vitamin D (stosstherapy) was given to 42 patients with nutritional vitamin D-deficiency rickets. Stosstherapy is safe and effective, obviates problems with compliance, and by evoking a response in 4 to 7 days in nutritional rickets, becomes a valuable diagnostic aid for patients in whom initial findings do not clearly distinguish nutritional rickets from familial hypophosphatemic rickets.

Differential Diagnosis: Metaphyseal Lesions

- Rickets
- Child Abuse
- Wimberger sign

"Bucket handle" fractures
Next Patients

Name This Disease

An 11-mo-old infant with These Findings
Metastatic Neuroblastoma
Involvement Unilateral or bilateral (40%)

Red Flag!
“Raccoon eyes” without h/o of trauma

Neuroblastoma
Opsoclonus-Myoclonus Syndrome (OMS)

- “Dancing eyes-dancing feet syndrome”
  - Rapid, spontaneous, irregular eye movements
  - Rhythmic myoclonus involving limbs, trunk and/or ataxia
- Neuroblastoma
  - Most common malignancy associated with OMS in children
  - Almost 50% of children with OMS have underlying NB
  - ~ 2 to 3% of children with NB develop OMA
Neuroblastoma

- Most common solid tumor of infancy arising from sympathetic nervous system
- Most present ~ 2 yrs (75% birth-2 yrs, 25%>2 yrs)

Neuroblastoma

- ~ 75% of primary tumors occur in abdomen (majority from adrenal gland)
- Non-tender abdominal mass
- Fever, weight loss, anemia, bone pain, limp etc.
**Lesions learned!**

- A 6-yr-old child with excessive tearing, swelling & pain in right eye
- Treated for allergic conjunctivitis 2 days earlier

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**Rhabdomyosarcoma**

*Most common malignant orbital tumor in children*

- Median age: 7-8 yrs
- Rapid onset of painless, unilateral proptosis
- Globe displacement
- Edema & erythema of lids
- Chemosis
**Rhabdomyosarcoma**

- Arises from undifferentiated mesenchymal tissues of orbit
- Ophthalmology consult & multidisciplinary team
- Imaging studies (CT or MRI)
- Referral to pediatric cancer center

*Next Patient*
A Toddler with widespread, annular, itchy rash with fever. Receiving amoxicillin - 5\textsuperscript{th} day for “Strep throat”

**Most Likely Diagnosis**

1. Erythema multiforme  
2. Urticaria multiforme (*What ??*)  
3. Serum sickness-like reaction
Urticaria Multiforme
Acute Annular Urticaria

- Fever
- Peak = 4 mo - 4 yrs
- Recent viral or bacterial illness (67%)
- Recent antibiotic use (45%)
- H/o recent immunizations
- Hypersensitivity reaction

"Urticaria Multiforme": A Case Series and Review of Acute Annular Urticarial Hypersensitivity Syndromes in Children

Urticaria Multiforme

- A, Transient polycyclic and annular wheals.
- B, Urticarial lesions may sometimes appear dusky, resembling erythema multiforme, but there are no true target lesions and no blistering or necrosis.

"Urticaria Multiforme": A Case Series and Review of Acute Annular Urticarial Hypersensitivity Syndromes in Children
Urticaria Multiforme
Angioedema ~ 70% (face, hands, legs)
(arthralgias or arthritis - absent)

Dermatographism
(Induced wheal-and-flare reaction)
Urticaria Multiforme

"Urticaria Multiforme": A Case Series and Review of Acute Annular Urticarial Hypersensitivity Syndromes in Children
Erythema Multiforme
Symmetrical Involvement of Palms and Soles

- Shorter duration; may become recurrent
- Mucosal involvement: none or one (usually lips)
Erythema Multiforme

- Herpes Simplex Virus
  - Most common etiology  \((60\% \text{ of cases})\)
  - Preceding HSV labialis by 3-14 days
  - Recurrences of EM common with recurrences of HSV

Target Lesion (Hallmark) of EM

Central bullous or dusky, inner pale zone & outer erythematous border (Classic “bull’s-eye lesion”)
Erythema Multiforme

1. All lesions appear in first 72 hrs
2. Lesions fixed in location
3. *Does not progress to SJS or TEN*

Look-alikes

Urticaria Multiforme  v/s  Erythema Multiforme

- Target-like (no blistering or necrosis)
- Duration <24 hrs
- No MM invol
- Angioedema +

- True target
- Fixed lesions
- MM invol ~1 or none
- No angioedema
This ill-appearing 5-yr-old child with several-day h/o of fever, neck pain, sore throat, cough & stridor

Vaccinations UTD

Your Differential Diagnosis?
Upper Airway Obstruction
Your Differential Diagnosis

- Epilottitis
- Retropharyngeal Abscess
- Bacterial Tracheitis
- Foreign body Ingestion/aspiration

Diagnosis?
Deep Neck Spaces and Fascial Layers

Retropharyngeal space
- Potential space
- Base of skull to C7, T1
- Contains lymph nodes
  - LNs drain nasopharynx, ears, sinuses
  - LNs atrophy later in life

Retropharyngeal Abscess
- Fills space b/t anterior border of cervical vertebrae & posterior wall of esophagus

Retropharyngeal Abscess
- Children < 6 yrs olds
- Prior URI, pharyngitis s/s
  - High fever
  - Refusal to eat
  - Drooling
  - Stridor
  - Torticollis
  - Neck stiffness
  - Toxic appearance
    - Widening of RP space
    - Reversal of normal c-spine curvature
    - RP space widened if >7 mm at C2 or 14 mm at C6
Retropharyngeal Abscess
Etiology: Polymicrobial

- *S. pyogenes*
- *S. aureus* (MRSA)
- Anaerobes (*Prevotella, Fusobacterium spp.*)
- *Eikenella* species
- *H. influenzae*
- *H. parainfluenzae*

CT scan of Neck with Contrast
(*imaging modality of choice*)

- Detects cellulitis v/s mature abscess (central areas of lucency) and location & extent of abscess
Retropharyngeal Abscess

- ENT consultation / hospitalize
- IV antibiotics (clindamycin or ampicillin/sulbactam)
- Vancomycin, if MRSA concern
- Emergent surgical drainage, if airway compromised
- Antibiotics may prevent progression of cellulitis to abscess (need for surgery)

Next Patient
A child with This Finding

Most likely diagnosis

1. Accidental Fall with ecchymosis
2. Child abuse (inflicted injury)
3. Bleeding Disorder
Hair Pulling Subgaleal Ecchymosis

Subgaleal Hemorrhage or Hematoma

Bleeding in the potential space b/t the skull (periosteum) and the scalp (galea aponeurosis)
**Hair Pulling Subgaleal Injury**

Children predisposed to subgaleal bleeding due to a thinner scalp and more vascular subaponeurotic space than adults

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**Subgaleal Hematoma From Hair Combing**


- 9 –yr-old girl with thick hairs and tight braids
  - Fluctuant, tender swelling of entire scalp
  - No evidence of abuse / trauma
  - Coagulation work-up WNL
  - 530 ml blood surgically evacuated
- 4.5 yr old girl with “tight pony tail” - 200 ml blood evacuated
A 2-yr-old girl with “Head Swelling”

- Head circumference 64.5 cm [reference range: 44-51 cm])
- Subgaleal drains = 1500 mL of serosanguineous fluid
- Coagulopathies work-up – negative
- Fractures in various stages of healing

*Jr Am Osteopathic Association, Jan 2015*

**Subgaleal Hematoma**

**Bleeding Disorders**

*Look-alikes*
Images / References

- Leventhal et al. Pediatrics 2001 Laxative-Induced Dermatitis of Buttocks Mimicking Scald Burn Injury

Thank you!

“Let’s cultivate our powers of observation as we learn together”

If I can be of any help ----- Faculty E-mail binita.shah@downstate.edu