Focus Session U029: Case Based Challenges in Pediatric Dermatology Hospital Consults

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DISCLOSURE OF RELEVANT RELATIONSHIPS WITH INDUSTRY

Marcia Hogeling, MD
Case Based Challenges in Pediatric Dermatology Hospital Consults

None
Objectives for this session

• Develop a differential diagnosis and order appropriate tests to manage challenging Peds Derm consults

• Identify genodermatoses presenting in children

• Recognize cutaneous manifestations of systemic disease, and treat severe Pediatric dermatoses
Case 1

- Derm consulted for a 1 week old term female infant
- diaper rash, painful
- not responding to topical barrier creams
- bacterial and viral cultures negative
What is your diagnosis?

A. Jacquet diaper dermatitis
B. Ulcerated infantile hemangioma
C. Neonatal Candidiasis
D. Langerhans cell histiocytosis
What is your diagnosis?

A. Jacquet diaper dermatitis

B. Ulcerated infantile hemangioma

C. Neonatal Candidiasis

D. Langerhans cell histiocytosis
Complete Physical Exam

- Asymmetry of vulva with right > left
- Deviated gluteal cleft
- Large superficial segmental infantile hemangioma extending from gluteal cleft to vagina, with multiple ulcerations
- Normal leg length
What initial workup would you order?

A. Ultrasound of spine
B. Ultrasound of pelvis
C. Ultrasound of abdomen
D. All of the above
What initial workup would you order?

A. Ultrasound of spine
B. Ultrasound of pelvis
C. Ultrasound of abdomen
D. All of the above
Diagnosis: LUMBAR Syndrome

- Lower body hemangioma and other cutaneous defects
- Urogenital anomalies, Ulceration
- Myelopathy
- Bony deformities
- Anorectal malformations, Arterial anomalies
- Renal anomalies
Hemangioma in lower half of body

< 3 mo

U/S + Doppler
spine, abd and pelvis

Regions B and/or C

no myelopathy

> 3 mo

myelopathy

MRI abdomen
and pelvis

MRI spine, abdomen
and pelvis

MRA/MRV of abd, pelvis
and affected limb

Xray of lower extremities

LUMBAR Syndrome

Pelvis
- Perineal hemangioma
- Ext genitalia malformations
- Lipomyelomeningocele
- Vesicorenal abnormalities
- Imperforate anus
- Skin tag

Lumbar
- Lower body hemangioma
- Lipoma or other cutaneous anomalies
- Urogenital anomalies
- Myelopathy
- Bony deformities
- Anorectal anomalies
- Arterial anomalies
- Renal anomalies

Sacral
- Spinal dysraphism
- Anogenital anomalies
- Cutaneous anomalies
- Renal and urologic anomalies
- Angioma in lumbosacral area

The LUMBAR acronym includes findings described with both the PELVIS and SACRAL acronym.

Ulceration

- Occurs in 10-15% of hemangiomas
- More common in Segmental infantile hemangioma
- Early whitening sign
- High risk sites: lip, groin, buttock
“Early White Hemangioma” and Ulceration
Treatment of Ulceration

• Pain Relief
  • Lidocaine 5% ointment
    • A pea sized amount 3-4 times per day for pain
  • Acetaminophen or Acetaminophen with hydrocodone

• Local Wound Care
  • Compresses to debride crust
  • Petroleum Jelly
  • Occlusive dressings
    • Aid healing, decrease pain
Treatment of Ulceration

- Prevent infection:
  - Topical metronidazole gel
  - Topical mupirocin

- Oral Propranolol in certain cases (low dose)

- Other:
  - Pulsed Dye Laser
  - Becaplermin gel
  - Surgical Excision
LUMBAR Syndrome

- ulcerations healed with wound care and low dose propranolol
Case 2
History

• 2 year old boy
• admitted 1 month ago with liver failure
• CMV induced hemophagocytic lymphohistiocytosis
• bone marrow positive for hemophagocytosis
• genetic testing negative, whole exome sequencing pending
• immunocompromised, neutropenic
• receiving chemotherapy with etoposide
• positive blood culture for candida tropicalis being treated with caspofungin 1 week prior
• 2 day history of progressive purplish plaque over nasal bridge with central necrosis
• patient had scratched his face but no other trauma at the site
• Additional physical exam revealed several purpuric plaques on sacrum and upper back

• Sites of bone marrow biopsy and had received injections at outside hospital
Differential diagnosis

- Mucormycosis
- Aspergillosis
- Echthyma gangrenosum
- Deep fungal infections
- Other soft tissue infections
- Pyoderma Gangrenosum
- Vasculitis
Biopsies from face
Photos courtesy of Gregory Gates, MD
What is your diagnosis?

A. Aspergillus
B. Mucormycosis
C. Angioinvasive candida
D. Echthyma
What is your diagnosis?

A. Aspergillus

B. Mucormycosis

C. Angioinvasive candida

D. Echthyma
Diagnosis: Zygomycosis/Mucormycosis

- genera Mucorales cause most human infection - ubiquitous in nature, on decaying vegetation and soil, airborne spores
- most common types causing human infection are Rhizopus, Mucor, Rhizomucor,
  - Cunninghamella, Absidia, Saksenaea and Apophysomyces are less common
- distinct hyphae allow for presumptive identification, fungal culture may have no growth
- diabetes mellitus most common risk factor, followed by hematologic malignancies, and solid or hematopoietic cell transplantation
- present with infarction and necrosis of host tissues from invasion of vasculature by hyphae
- cutaneous mucormycosis usually associated with trauma or wounds, including injection sites and IV catheters
- other major forms include pulmonary involvement and rhino-orbital-cerebral infections
- prognosis is poor
Which of the following is the most appropriate systemic anti fungal agent to use?

A. Voriconazole

B. Amphotericin B

C. Caspofungin

D. Fluconazole
Which of the following is the most appropriate systemic anti fungal agent to use?

A. Voriconazole

B. Amphotericin B

C. Caspofungin

D. Fluconazole
Antifungal therapy

• Liposomal Amphoteracin starting at 5 mg/kg/day, up to 10 mg/kg/day

• if patients respond to therapy (weeks), can eventually switch to oral posaconazole or isavuconazole

• IV posaconazole or isavuconazole can be used as salvage therapy for patients who do not respond or cannot tolerate amphoteracin B
Treatment

- combination of surgical debridement of involved tissues and anti fungal therapy
- eliminate predisposing factors for infection (hyperglycemia, metabolic acidosis, deferoxamine administration, immunosuppressive drugs and neutropenia)
- surgical debridement by ENT was performed x 2
- antifungals switched from caspofungin to amphoteracin B and isavuconazole
- chemotherapy held, given G-CSF for neutropenia
Case 3

- 4 month old male
- near erythroderma
- recurrent staph impetiginization
- failure to thrive
What tests would you order for this erythrodermic child?

a. quantitative immunoglobulins
b. complete blood count
c. bacterial culture
d. liver function tests
e. all of the above
What tests would you order for this erythrodermic child?

a. quantitative immunoglobulins
b. complete blood count
c. bacterial culture
d. liver function tests
e. all of the above
Hospital Course

- Complete immunodeficiency panel ordered
- Pancytopenia
  \[9.9\]
  \[4.2\] >------< \[35\]
- Eosinophilia
  \[29.6\]
- Thrombocytopenia
  [13N 14M 23E 48L]
Hospital Course

• Additional history

• Maternal side with extensive history of Wiskott-Aldrich Syndrome and early death

• 6 grand uncles

• 3 male cousins
Hospital Course

- Additional history
- Maternal side with extensive history of Wiskott-Aldrich Syndrome and early death
- Testing confirms low leukocyte WAS Protein levels
Wiskott-Aldrich Syndrome

- X-linked recessive - affects boys

- Classic phenotype triad
  - Immunodeficiency --> susceptibility to infection
  - Thrombocytopenia
  - Eczema
Wiskott-Aldrich Syndrome

- WAS Protein
  - Only present in bone marrow derived cells
  - Functions in actin cytoskeleton remodeling
  - Essential to many necessary immune functions
    - T cell maturation and function
    - B cell activation
    - Neutrophil phagocytosis and chemotaxis
    - Platelet production and survival
Wiskott-Aldrich Syndrome

• Variable phenotype (and mutations)
• Morbidity and mortality
  • Infection
  • Failure to thrive
  • Autoimmune disease and lymphoreticular malignancy later in life
• Bone marrow transplant curative
DDx of Atopic Dermatitis: Rare diseases in infants

- **Metabolic, Nutritional & Genetic:**
  - Acrodermatitis enteropathica
  - Nutritional (biotin, essential fatty acid)
  - Netherton syndrome
  - Phenylketonuria
  - Omenn syndrome
  - Prolidase deficiency
  - Gluten sensitive enteropathy
  - Eosinophilic gastroenteritis

- **Immune disorders:**
  - Hyper IgE syndrome
  - Severe combined immunodeficiency syndrome
  - Wiskott-Aldrich syndrome
  - Agammaglobulinemia
  - Ataxia-telangiectasia
  - Neonatal lupus erythematosus
Case 3: Wiskott Aldrich

- bone marrow transplant
Significant improvement following BMT
Case 4

- mucositis
- several blisters on arm and mild conjunctivitis
- 1 week prior with cough, malaise, fever
What is your diagnosis?

A. Stevens Johnson Syndrome
B. Toxic Epidermal Necrolysis
C. Mycoplasma Induced Rash and Mucositis
D. Kawasaki disease
E. DRESS Syndrome
What is your diagnosis?

A. Stevens Johnson Syndrome
B. Toxic Epidermal Necrolysis
C. Mycoplasma Induced Rash and Mucositis
D. Kawasaki Disease
E. DRESS Syndrome
Reviewed 202 reported cases

Atypical Stevens Johnson Syndrome or Erythema Multiforme

Rename: *Mycoplasma-pneumoniae* Induced Rash and Mucositis (MIRM)
**Mycoplasma Induced Rash and Mucositis (MIRM)**

- Predominant mucosal involvement
- Minimal cutaneous involvement
- Patients young (mean age 11.9 years)
- Diagnosis: confirm with mycoplasma serology/PCR
- Treatment: no consensus
- Steroids, IVIG and supportive care
- Treating mycoplasma does not seem to alter course of skin disease, but important to treat pneumonia

avan et al J Am Acad Dermatol 2015;72(2) 239-45
Stevens Johnson Syndrome and Toxic Epidermal Necrolysis- more extensive cutaneous involvement than MIRM

- Skin is painful, dusky
- Skin sloughing, and dead skin in center of lesions
- Children have fever
- Children have worse prognosis than MIRM
- SJS: less than 10% BSA and 2 mucous membranes
- SJS/TEN: 10-30% BSA
- TEN: greater than 30% BSA
  - eyes, nose, throat, lungs, esophagus, anus, urethra
SJS/TEN etiology

MEDICATIONS:

• Anticonvulsants
  • Phenobarbital/Phenytoin/Carbamazepine (cross react)
  • Other: Lamotrigine, Zonisamide

• Antibiotics (many): Penicillins, Fluoroquinolones, Cephalosporins, Minocycline

• HIV medications: Nevirapine

• Sulfa medications: Sulfamethoxazole, Sulfasalazine

• Other: Allopurinol, Oxicam, NSAIDS, Azathioprine, Captopril….
Kawasaki Disease - criteria

- fever > 5 days and 4 out of 5 criteria:
  - bilateral conjunctival injection
  - changes of lips and oral cavity
    - (lips less hemorrhagic, strawberry tongue)
  - swelling of hands and feet
  - cervical lymphadenopathy
  - polymorphous rash (no bullae)

Circulation 2001
# DRESS Diagnostic Criteria

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<thead>
<tr>
<th>European (RegiSCAR)</th>
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<tr>
<td><strong>Reaction suspected to be drug related</strong></td>
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<tr>
<td><strong>Acute rash</strong></td>
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<tr>
<td><strong>Hospitalization</strong></td>
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<td><strong>Fever &gt; 38°C</strong></td>
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<td><strong>Enlarged lymph nodes ≥ 2 sites</strong></td>
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<td><strong>Involvement of ≥ 1 internal organ</strong></td>
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<td><strong>Blood count abnormalities</strong></td>
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<td><strong>Lymphocytes above or below normal limits</strong></td>
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<td><strong>Eosinophils above normal</strong></td>
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<td><strong>Platelets below normal</strong></td>
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