Dermatological Emergencies
“The Eschar”

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Conflict of Interest Disclosure

• Red Flags and Emergencies in Dermatology F084
• I do not have any relevant conflicts of interest to disclose related to this presentation

REALITY CHECK!

What Constitutes Emergency?

• Objective characteristics of emergency
• Acute onset usual
• Associated with symptoms typically
• Risk of morbidity and/or mortality
  - Morbidity (impaired normal function)
  - Mortality (death)
• Requires timely diagnosis to avoid serious morbidity or mortality; a sense of immediate necessity for intervention

Unka Teddy's Rules

• The severity of visible pathology (deviation from normal) does not always correlate with the degree of seriousness of disease process
• Given pathology of similar visible severity, you may need ancillary information to decide what is or is not life-threatening
• Given truly life-threatening disorders, the real need for rapid intervention may differ greatly
• You don’t always need to know the precise diagnosis immediately, but a skilled clinician can identify emergent situations

Which is an emergency?

3.5 mm solitary tender pustule
24 year-old, healthy female

25 cm² deep-seated nodule
30 year-old, healthy female

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Emergent Infections (With Skin Manifestations)

- Gr+ sepsis (Staph, Strep)
- Gr- sepsis (enteric microbes)
- Meningococcemia
- SSSS, TSS
- Spotted fevers (RMSF, MSF)
- Anthrax, Tularemia, Plague
- Vibrio vulnificus
- Typhus
- Necrotizing fasciitis

- Disseminated VZV, HSV
- Hemorrhagic fevers (Ebola, Lassa, Marburg)
- Smallpox
- Rubella, Rubeola
- CMV
- Arboviruses
- HIV
- HHV-8

Emergent Infections (With Skin Manifestations)

- Candidemia
- SA and NA Blastomycosis
- Histoplasmosis
- Cryptococcosis
- Coccidioidomycosis
- Disseminated sporotrichosis
- Zygomycoses
- Fusariosis
- Aspergillosis

- Chagas disease
- Amebiasis
- Muco-cutaneous Leishmaniasis
- Onchocerciasis
- Schistosomiasis
- Loxoscelism
- Lepodopterism
- Dog, Cat & Snake bites

Pattern Recognition

2 2 3 3 4 4 5 5

- Input
- Sensing
- Segmentation
- Feature extraction
- Re-synthesis and Classification
- Post-Processing Adjustment (context)
- Decision / Recognition

Is this an emergency?

- 53 year-old male
- Rheumatoid arthritis
- Rx: infliximab 5mg/kg
- Arthritis controlled
- Develops fever (102.4°F)
- Shaking chills
- Nausea, vomiting
- Solitary painless skin lesion
- What to think about?
“The Eschar”

- Cutaneous necrosis
- Characterized by the formation of a black, adherent crust
- Even though may be localized at time of presentation, represents a systemic (or potential for systemic) disorder
- Often infectious in nature, but may be toxic, embolic, vasculitic
- Context is important in decision making
Disease | Age | # Lesions | Fever | Notes
--- | --- | --- | --- | ---
Flap Necrosis | Adults | One area | No | Post-operative
Embolia | Adults | Few | No | CV History
Mucormycosis | Adults | One area | Yes | Diabetes
Fungal sepsis | Any | Few | Yes | History?
Bacterial sepsis (GI) | Any | Few | Yes | History?
Miss infections | Any | One to Many | Typically | Travel History
Anticoagulent | Adults | One | No | History
Calciphylaxis | Adults | One to Few | No | Renal Disease
Necrotizing Fasciitis | Older Adults | Large area | Yes | Recent Trauma
Fournier’s Gangrene | | | | GI/GU Procedure
Snake or Spider bite | Any | One | Maybe | History

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- 53 year-old male
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- Rx: infliximab 5mg/kg
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- Develops fever (102.4°F)
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- Solitary painless skin lesion
- Pseudomonas sepsis
- Dead 32 hours later

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**Ecthyma Gangrenosum**
- Manifestation of bacterial sepsis
- *Pseudomonas*, Klebsiella, E. Coli, Serratia, rarely S. Aureus
- Solitary, painless, red swelling, may develop bulla, but rapidly forms painless eschar-covered ulcer
- Process only takes 12-24 hours
- Patient febrile and toxic-appearing
- IMMUNOCOMPROMISED, NEUTROPENIC
- IV antibiotics for presumed *Pseudomonas*
- Culture skin, culture blood, look for focus of infection

**Ecthyma Gangrenosum Revisited**
- Meta-analysis of 167 cases in literature 1975-2014
- *Pseudomonas* 73.65%
- Other bacteria 17.35%
- Fungi 9%
- Sick but not immunocompromised (55/167 = 33%)
- May be totally healthy (7/167 = 4.2%)

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**Mucormycosis**
Mucormycosis

- Due to one of several non-septate fungi
- Mucor, Rhizopus, Absidia
- Acute onset pain and swelling on or near eye or nose (sinus)
- **DIABETES**
- Develops ischemia, then eschar
- Rx: Amphotericin-B (7-10mg/kg, high dose)
- Posaconazole (400mg BID, PO or IV)
- Isavuconazole Available PO or IV (372mg BID x 2 days, then QD)

**Case History**

- 75 year old diabetic
- ESRD + hemodialysis
- PICC line 6 weeks for cellulitis
- CAD, mechanical aortic valve in place
- Chills, anorexia x 3 weeks
- Temp 96.9°F
- Anemic, Azotemic, WBC >19,000

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**IV Broad Spectrum, Potent Antibiotics (?Urinary Tract Sepsis)**

BUT……Hypothermia persists, and more lesions!

**NEW Lesions!**

**Disease** | **Age** | **# Lesions** | **Fever** | **Notes**
--- | --- | --- | --- | ---
Flap Necrosis | Adults | One area | No | Post-operative
Embolic | Adults | Few | No | CV history
Mucormycosis | Adults | One area | Yes | Diabetes
Fungal sepsis | Any | Few | Yes | History?
Bacterial sepsis (EG) | Any | Few | Yes | History!
Myc infections | Any | One to Many | Typically | Travel History
Anticoagulant | Adults | One | No | History
Clostridiosis | Adults | One to Few | No | Renal disease
Fournier’s Gangrene | Older Adults | Large area | Yes | Recent SEGU Procedure
Snake or Spider bite | Any | One | Maybe | History
### Serum 1,3-β-D-Glucan Assays

- **Sensitivity** 98-100%, **Specificity** 97-98%
- Detects serum 1-3-β-D-glucan (fungal cell wall)
  - Normal in human serum = 10-40 pg/ml
  - Negative < 60 pg/ml
  - Indeterminate 60-80 pg/ml
  - Positive >80 pg/ml
- Test requires only one hour
- Detects: Candida spp, Acremonium, Aspergillus, Fusarium, Histoplasmosis, Coccidioidomycosis, Sporothrix schenckii
- **Does NOT detect:** Cryptococcus, Zygomycetes

**This patient:** + at 800 pg/ml

### Biopsy (GMS)

**Culture:** Candida dublinensis
Candida Sepsis

<table>
<thead>
<tr>
<th>Candida species</th>
<th>Amphotericin</th>
<th>Fluconazole</th>
<th>Itraconazole</th>
<th>Voriconazole</th>
<th>Posaconazole</th>
<th>Caspofungin</th>
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</thead>
<tbody>
<tr>
<td>C. albicans</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
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<td>C. tropicalis</td>
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<tr>
<td>C. parapsilosis</td>
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<tr>
<td>C. glabrata</td>
<td>S to I</td>
<td>S to R</td>
<td>S to I</td>
<td>S to R</td>
<td>S to R</td>
<td>S to R</td>
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<tr>
<td>C. krusei</td>
<td>S to I</td>
<td>R</td>
<td>S to R</td>
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<td>S to R</td>
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<tr>
<td>C. lusitaniae</td>
<td>S to R</td>
<td>S</td>
<td>S to R</td>
<td>S</td>
<td>S to R</td>
<td>S</td>
</tr>
</tbody>
</table>

Other species: All Variable Testing Required

Spider Bite: Brown Recluse

- *Loxocel reclusa* (and related species)
- Painless; 8 hours later pain, erythema, swelling; progresses to ischemia and then eschar; sloughs forming ulcer
- 67-90% remain localized phenomenon
- Viscero-cutaneous form in 10-30%
  - 2-4 days after bite: Sequential Signs/Sx
  - Morbilliform rash, fever, nausea, vomiting
  - Hemolysis, thrombocytopenia, hematuria
  - Shock, DIC, acute renal failure: DEATH

Brown Recluse Bite

10-20 days after bite
Brown Recluse Bite

• Rest, elevation, ice packs (NOT HEAT)
• NSAIDs to relieve pain and swelling
• ? Tetanus prophylaxis (debatable)
• Antibiotics: not typically appropriate
• ? Nitroglycerin patch: conflicting data
• Systemic steroids: only severe cases
• Dapsone: Variable benefit; may prolong healing time and worsen scar formation
• ? Anti-venom (contact local zoo)
• Surgery: Only late, as reconstruction

Case History

• 59 year-old welder
• Attempted to pull mouse out of cat’s mouth because the pet was choking
• After extraction, cat bit owner
• 48 hours later, developed “flu” like Sx
  Fever (104.1°F) Mild cough, Myalgia, Arthralgia
• Axillary adenopathy: Size of “lemons”
• SOB, productive cough
• Hands and feet turn grey, then black

Emergency Department Death From Systemic Loxoscelism

Jacques L. Reiner, MD; Jim K. Damby, MD; Emily W. Langley, MD; Christy A. Mozak Grimer, MD
From the Vanderbilt University Medical Center, Department of Emergency Medicine, Nashville, Tenn; Eliezer Damby, MD, The Children’s Hospital at Vanderbilt, Department of Pediatrics, Nashville, Tenn; Luigi V. Lutgens, MD, The Children’s Hospital at Vanderbilt, Nashville, Tenn; Oregon Health Sciences University, Division of Medical Emergency Medicine, Portland, OR (present).

Systemic loxoscelism is a constellation of illness resulting from the bite of the brown recluse spider. It is a severe form, it may cause hemolysis, acute renal failure, and disseminated intravascular coagulation. More rarely, it may result in death. We report an unusual case of systemic loxoscelism resulting in death less than one day following envenomation. We also discuss screening algorithms and contemporary management of systemic loxoscelism. (J Emerg Med. 2013;45:814-817.)

The “ULTIMATE” Eschar
<table>
<thead>
<tr>
<th>Disease</th>
<th>Age</th>
<th># Lesions</th>
<th>Fever</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>flap necrosis</td>
<td>adults</td>
<td>one area</td>
<td>no</td>
<td>post-operative</td>
</tr>
<tr>
<td>embolism</td>
<td>adults</td>
<td>few</td>
<td>no</td>
<td>cv history</td>
</tr>
<tr>
<td>macromycosis</td>
<td>adults</td>
<td>one area</td>
<td>yes</td>
<td>diabetes</td>
</tr>
<tr>
<td>fungal sepse</td>
<td>any</td>
<td>few</td>
<td>yes</td>
<td>history</td>
</tr>
<tr>
<td>bacterial sepsis (es)</td>
<td>any</td>
<td>few</td>
<td>yes</td>
<td>history</td>
</tr>
<tr>
<td>meningococcal</td>
<td>any</td>
<td>one to many</td>
<td>typically</td>
<td>旅行历史</td>
</tr>
<tr>
<td>anthrax, tularemia</td>
<td>any</td>
<td>one to many</td>
<td>typically</td>
<td>旅行历史</td>
</tr>
<tr>
<td>Fournier’s gangrene</td>
<td>adults</td>
<td>one to few</td>
<td>no</td>
<td>renal disease</td>
</tr>
<tr>
<td>calciphylaxis</td>
<td>adults</td>
<td>one to few</td>
<td>no</td>
<td>history</td>
</tr>
<tr>
<td>snake or spider bite</td>
<td>any</td>
<td>one</td>
<td>maybe</td>
<td>history</td>
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**Case History**

- 53 year-old male
- Alcoholic w/ history alcoholic hepatitis
- Drinking beer and fishing in Galveston
- Knocks his hand on needle of lure
- Hand swollen by that evening
- In 48 hours skin blisters
- In 72 hours: eschar formation
Vibrio Vulnificus Infection

- Most virulent food-borne infection in USA
- Consumption of raw or under-cooked oysters or shellfish from Gulf of Mexico (> during Summer)
- Also occurs with skin wound exposed to contaminated water or related to injury by contaminated marine life (shrimp, fish)
- **LIVER INSUFFICIENCY** predisposes!
- Most common in summer (more microbes)
- Ceftriaxone + Doxycycline or Minocycline
- Debridement if indicated

Fatality rates: >50% food-borne; 20% for wound related
- Hemorrhagic bullae and fever and history
- Progresses rapidly to necrotizing fasciitis
- Limb loss risk

Vibrio vulnificus

One More: Obvious; Tumor Necrosis

- Metastatic Bronchogenic Carcinoma
- Primary Squamous Cell Carcinoma
- Primary Basal Cell Carcinoma
Dermatological Emergencies

- Learn to recognize key sign and symptom patterns which signify emergency
- STOP and consider that patient more carefully; don’t put that patient off or wait for loads of lab tests
- Consider hospitalization, because many of these clinically deteriorate rapidly and unpredictably
- Such patients almost always require TEAM care!