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

3.5 mm solitary tender pustule
24 year-old, healthy female
Which is an emergency?

**Gonococcemia: Sepsis**
- 3.5 mm solitary tender pustule
- 24 year-old, healthy female

**Benign lipoma**
- 25cm² 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

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**Emergent Infections (With Skin Manifestations)**

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

- Chagas disease
- Amebiasis
- Mucocutaneous Leishmaniasis
- Onchocerciasis
- Schistosomiasis
- Loxoscelism
- Lepidopterism
- Dog, Cat & Snake bites

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**Pattern Recognition**

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

“The Eschar”:

Diabetic
• Leukemia
• Neutropenic
• Cardiac Cath
• ESRD on Dialysis

“The Eschar”: CONTEXT VERY IMPORTANT
"The Eschar": CONTEXT VERY IMPORTANT

Febrile

Mucormycosis
Ecthyma gangrenosum
Cholesterol emboli
Calciphylaxis

Afebrile

Febrile

Painful

Ecthyma gangrenosum
Cholesterol emboli
Calciphylaxis

Afebrile

Tender

Very Painful

Is this an emergency?

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- Rheumatoid arthritis
- Rx: infliximab 5mg/kg
- Arthritis controlled
- Develops fever (102.4°F)
- Shaking chills
- Nausea, vomiting
- Solitary painless skin lesion
- Pseudomonas sepsis
- Dead 32 hours later

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
Deceptively Simple Looking!

- 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%)

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)

Mucormycosis: Fatal cases

- Fournier’s Gangrene
- Mucormycosis
- Snake or Spider bite

<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>Ecthyma</td>
<td>Adults</td>
<td>Few</td>
<td>No</td>
<td>CV history</td>
</tr>
<tr>
<td>Mucormycosis</td>
<td>Adults</td>
<td>One area</td>
<td>Yes</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Fusgal sepsis</td>
<td>Any</td>
<td>Few</td>
<td>Yes</td>
<td>History</td>
</tr>
<tr>
<td>Bacterial sepsis (EG)</td>
<td>Any</td>
<td>Few</td>
<td>Yes</td>
<td>History</td>
</tr>
<tr>
<td>Miscellaneous Infections</td>
<td>Any</td>
<td>One to Many</td>
<td>Typically</td>
<td>Travel History</td>
</tr>
<tr>
<td>Anticoagulant</td>
<td>Adults</td>
<td>One</td>
<td>No</td>
<td>History</td>
</tr>
<tr>
<td>Calciphylaxis</td>
<td>Adults</td>
<td>One to Few</td>
<td>No</td>
<td>Renal disease</td>
</tr>
<tr>
<td>Fournier’s Gangrene</td>
<td>Older Adults</td>
<td>Large area</td>
<td>Yes</td>
<td>Recent GI/GU Procedures</td>
</tr>
<tr>
<td>Snake or Spider bite</td>
<td>Any</td>
<td>One</td>
<td>Maybe</td>
<td>History</td>
</tr>
</tbody>
</table>

Revised 26/10/2013

Mucormycosis
- Due to one of several non-septate fungi
- Mucor, Rhizopus, Absidia
- Acute onset pain and swelling on or near eye or nose (sinus)
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- Rx: Amphotericin-B (7-10mg/kg, high dose)
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Case History

- 75 year old diabetic
- ESRD + hemodialysis
- PICC line 8 weeks for cellulitis
- CAD, mechanical aortic valve in place
- Chills, anorexia x 3 weeks
- Temp 96.9°F
- Anemic, Azotemic, WBC >19,000

IV Broad Spectrum, Potent Antibiotics (?Urinary Tract Sepsis)
BUT.....Hypothermia persists, and more lesions!
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**
### 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>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>C. tropicalis</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>C. parapsilosis</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
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<td>S</td>
</tr>
<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>
</tr>
<tr>
<td>C. krusei</td>
<td>S to I</td>
<td>R</td>
<td>S to R</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>C. lusitaniae</td>
<td>S to R</td>
<td>R</td>
<td>S to R</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Other species</td>
<td>All</td>
<td>Testing Required</td>
<td>Variable</td>
<td>All</td>
<td>Testing Required</td>
<td>Variable</td>
</tr>
</tbody>
</table>

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### Recluse spiders: Range, USA

- **Loxoceles reclusa** (Brown recluse)

- **Spider Bite: Brown Recluse**
  - *Loxoceles 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

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*Dan Med J. 2013;60(11):B4698*
*Swiss Med Weekly 2006;136:447-463*
*Ann Emerg Med 44:608, 2004*
*Toxicon 44:693, 2004*
*J Emerg Med 41:e31, 2011*
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

Jessica L. Rosan, MD, Jon K. Durbin, MD, Emily W. Langley, MD, Christy A. NucatolaOliver, MD

From the Vanderbilt University Medical Center, Department of Emergency Medicine, Nashville, TN (Rosan, Durbin), the Monroe Carell Jr. Children’s Hospital at Vanderbilt, Department of Pediatrics, Nashville, TN (Langley) and the Vanderbilt Children’s Hospital at Legacy, Florida, Oregon Health Sciences University, Division of Pediatric Emergency Medicine, Portland, OR (Oliver)

Systemic Loxoscelism is a constitutional illness resulting from the bite of the brown recluse spider. In severe form, it may cause hemolytic, acute renal failure, and disseminated intravascular coagulopathy. 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)
### Plague

- **Highly contagious**: Rx before lab results
- **Streptomycin** or **Gentamicin** primary Rx
- After afebrile: Tetracycline / Doxycycline
- **Alternate agents**: Fluoroquinolones
- **Prophylaxis** following rodent contact in endemic area: Levofloxacin, Doxycycline
- **MDR Plague**: Madagascar
- **Subunit vaccine in development** (capsular antigens)

**MMWR 2015;64:918 - 919**

**Emerging Infect. Dis 2001; 7, 43 - 48**

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**WHAT DOES HE HAVE?**

Eight days after bite
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
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!

• I hope you enjoyed this talk
• I hope you picked up a few practical pearls
• If not.....

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