Skin and Soft Tissue Infections Made Simple

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Current SSTI Categorization

Abscess | Purulent cellulitis | Nonpurulent cellulitis | Necrotizing Skin & Soft Tissue Infection

Bugs
Drugs

Not: bite wounds, water-related infections, surgical/hospital-acquired infections

Abscess

Purulent Cellulitis
Nonpurulent Cellulitis

Necrotizing Skin & Soft Tissue Infection (NSTI)

Diagnostic approach to the undifferentiated SSTI

Utility of ED ultrasound

- Diagnosis: unsuspected pus
- Procedural assistance: localize pus for I&D
Nonpurulent cellulitis
Purulent cellulitis
Abscess
Necrotizing Skin & Soft Tissue Infection

Bugs
Drugs

Nationwide rise in ED visits for skin & soft tissue infections 1993-2005

Prevalence of CA-MRSA in cultureable SSTIs (422 ED pts, August 2004)

CA-MRSA
Abscess

- Bugs
  - *Staph. aureus (~½ CA-MRSA)
  - Caveats:
    - Abscesses due to IDU can be polymicrobial: oral flora (*Strep. milleri*, anaerobes), *S. aureus*

- Perirectal/perianal abscess: GNRs

Abscess

- Drugs
  - Antibiotics not necessary in uncomplicated abscesses
  - Antibiotics reserved for purulent cellulitis & complicated abscesses

Purulent cellulitis? Antibiotics needed?

NO

NO

Maybe

Yes
Loop drainage...or no packing at all

Purulent cellulitis (culturable)

- Associated with abscess (incl. just a pustule), ulcer, purulent wound
- Purulent focus can, and should, be opened and cultured

Jeng. Medicine 2002
Purulent cellulitis

- **Bugs**
  - *Staph. aureus* (~ 1/2 MRSA)
  - Strep. species almost never produce purulence, so Strep. coverage is not needed

- **Drugs**
  - TMP/SMX PO
  - Vancomycin IV
  - Doxycycline is a PO option
  - Clindamycin is second line

Stevens. CID 2005  
Talan. NEJM 2006  
Jeng. Medicine 2002

Ultrasound in purulent cellulitis can be misleading
Purulent cellulitis

Purulent cellulitis

Nonpurulent cellulitis

Abscess

Necrotizing Skin & Soft Tissue Infection

Bugs

Drugs

Bugs

Drugs

Bugs

Drugs
Nonpurulent cellulitis (non-cultureable or diffuse)

- Bugs
  - β-hemolytic strep.
    - *S. pyogenes* (Group A Strep)
    - Group B, G, C Strep
  - *Staph. aureus* is uncommon (up to 11-25%)
    - MRSA ~ 1%

Jeng. Medicine 2010
Stevens. CID 2005
Siljander. CID 2008

Nonpurulent cellulitis

- Drugs
  - 1st generation cephalosporins
    - Cefazolin (Ancef) IV
    - Cephalexin (Keflex) PO
  - Anti-Staph penicillins
    - Nafcillin IV
    - Dicloxacillin PO
  - No need for MRSA coverage

Jeng. Medicine 2010
Stevens. CID 2005

Erysipelas: a superficial, nonpurulent cellulitis, typically toxic

Habif. Clin Derm 1996
Nonpurulent cellulitis

...I think

Nonpurulent cellulitis

Review

Abscess  Purulent cellulitis  Nonpurulent cellulitis  Necrotizing Skin & Soft Tissue Infection

Nonpurulent cellulitis

Abscess + purulent cellulitis
Nonpurulent cellulitis

Purulent cellulitis

Abscess

Necrotizing Skin & Soft Tissue Infection

Drugs

Bugs

Diabetic foot ulcer... potentially gone bad

Perineal infections (esp in ♂️)

NSTI diagnosis

• High clinical suspicion
• Pattern recognition
• CT
• → OR
SSTIs in IDU

Black tar heroin

Unexplained musculoskeletal pain...potentially gone bad

Strep. pyogenes NSTI
NSTI imaging

Definitive diagnosis & definitive treatment are the same
### NSTI

**Bugs**
- **Monomicrobial**
  - *Strep. pyogenes* (Group A Strep.)
  - *Clostridium – perfringens,…novyi, sordelli*
  - *Vibrio vulnificus*
  - CA-MRSA (USA 300)
- **Polymicrobial / synergistic**
  - Staph. of all kinds
  - Strep. of all kinds
  - Anaerobes of all kinds
  - Gram negatives

**Drugs**
- Pipercillin/tazobactam (Zosyn)
- + Vancomycin
- + Clindamycin

### Antibiotic Review

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>β-strep</th>
<th>MSSA</th>
<th>MRSA</th>
<th>Mean MRSA susceptibility (range)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin</td>
<td>✓</td>
<td>X</td>
<td>X</td>
<td>0</td>
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<tr>
<td>Unasyn, Zosyn IV</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>0</td>
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<tr>
<td>Augmentin PO</td>
<td>✓</td>
<td>X</td>
<td></td>
<td>0</td>
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<tr>
<td>Methicillin</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>0</td>
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<tr>
<td>Nafcillin IV, dicloxacillin PO</td>
<td>✓</td>
<td>✓</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cefazolin IV</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td>Cephalexin PO</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Doxycycline</td>
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<td>✓</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>88 (89-91)</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>87 (89-91)</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>100 (99-100)</td>
</tr>
<tr>
<td>Linezolid</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>96 (92-100)</td>
</tr>
</tbody>
</table>

*Inducible clinda MRSA resistance (+ D-test); TID dosing; expensive

1 DS TMP/SMX usually sufficient

**β-lactams**

- Inducible clinda MRSA resistance (+ D-test); TID dosing; expensive

**Notes:**
- Fridkin. NEJM 2006.