Abscess: Incision and Drainage

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Objectives

- Recognize clinical manifestations and differential diagnosis of cellulitis vs. abscess
- Comprehend general management of abscess including antimicrobial therapy and operative indications
- Discuss procedural approach to I&D of abscess
- Outline importance of after care and patient education following abscess I&D
Skin and Soft Tissue Infection (SSTI)

- Collections of pus/debris within the dermis and deeper skin tissues
- Prior abrasion, bug bites, diaper rash, epidermal barrier breakdown
- Inflammatory response
  - Most common manifestation is abscess
- Third-highest, non-cardiac, surgical cost driver at TCH in 2011 behind ECMO and appendicitis
- 2 months- 3 years old
Diagnosis

• CLINICAL!!!!
  • Physical examination: erythema, tenderness, pain, warmth, induration/edema, fluctuance

• Rarely, US: assess for fluid collection
  • Only when diagnosis is equivocal

• Do not routinely obtain blood cultures in children with SSTI
Clinical Manifestations

- **Cellulitis**
  - Skin erythema, edema, warmth

- **Abscess:**
  - Painful, fluctuant, erythematous nodule +/- surrounding cellulitis
  - Fever
  - Active drainage

- **Mark wound borders**
Differential Diagnosis

- Contact dermatitis
- Thermal injuries
- Insect bite, snake bites
- Folliculitis
- Hidradenitis suppurativa
- Necrotizing fasciitis: erythematous, swollen, warm and exquisitely tender; pain out of proportion
Microbiology

• Cellulitis:
  • Beta-hemolytic streptococci: group A *streptococcus* or *S. pyogenes*

• Skin abscess:
  • *S. aureus* (MSSA or MRSA): up to 75% of cases
    • *Among S aureus causing SSTI at TCH, approx 50% are MRSA causing SSTI, approx 17% are clinda- resistant*
<table>
<thead>
<tr>
<th>Antibiotic Table</th>
<th>Age restriction</th>
<th>Dose and frequency</th>
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</thead>
<tbody>
<tr>
<td><strong>Trimethoprim (TMP) and Sulfamethoxazole (SMX)</strong>&lt;br&gt;Simple SSTI</td>
<td>Children &lt; 2 months</td>
<td>Oral: 8-12 mg TMP/kg/DAY divided every 12h&lt;br&gt;&lt;b&gt;MAX&lt;/b&gt;: 160mg TMP/dose</td>
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<tr>
<td><strong>Doxycycline</strong>&lt;br&gt;Simple SSTI if suspect CA-MRSA</td>
<td>Children &lt; 8 years</td>
<td>Oral: 2-4mg/kg/DAY divided every 12-24h;&lt;br&gt;&lt;b&gt;MAX&lt;/b&gt;: 100 mg/day</td>
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<tr>
<td><strong>Clindamycin</strong></td>
<td>None</td>
<td>Oral: 5-10mg/kg/dose every 8h&lt;br&gt;IV: 10-13 mg/kg/dose every 8h</td>
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<tr>
<td><strong>Cephalexin</strong></td>
<td>None</td>
<td>IV: 100-150 mg/kg/DAY divided every 6h</td>
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<tr>
<td><strong>Vancomycin</strong>&lt;br&gt;(for suspected/ confirmed MRSA requiring IV therapy)</td>
<td>None</td>
<td>IV: 15 mg/kg/dose every 8h;&lt;br&gt;&lt;b&gt;MAX&lt;/b&gt;: 1 g/dose</td>
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Clinical Algorithm

TCH Evidence-Based Outcomes Center
Clinical Algorithm for Skin & Soft Tissue Infection

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Begin*

Patient presents with ≥1 sign
Symptom of SSTI: erythema, warmth, induration/edema, pain/tenderness, fluctuance/discharge

OFF Algorithm: Manage as appropriate to clinical findings

Suspected deeper infection (at fascia or deeper)

Yes

OFF Algorithm: Refer to acute hematogenous osteomyelitis or septic arthritis clinical standard, if appropriate

No

Cellulitis (non-purulent)

Concern for underlying abscess (purulent) but diagnosis equivocal

Obtain ultrasound

Definite abscess

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Inclusion Criteria
- Age >2 months

Exclusion Criteria
- Periorbital or perianal cellulitis, chronic wound, impetigo, folliculitis or deeper infection, lymphadenitis, diabetes, immunocompromise, sepsis, postoperative wound infection, infected animal bite, dental abscesses, pregnancy

"Septic Shock Criteria"
- If patient is ill-appearing, toxic-appearing, has abnormal vital signs suggestive of septic shock, and/or signs and symptoms of septic shock, refer to Septic Shock Guideline.
Clinical Algorithm

- Admission Considerations
  - Systemic symptoms (significant fever, SIRS)
  - Rapidly expanding or large lesion (>3 cm)
  - Age <3 months
  - Concern for inadequate drainage of large abscess
  - Abscess location that requires subspecialty consult
  - Unable to tolerate oral antibiotics
  - Significant pain
  - Failed treatment with 48 hours of appropriate antibiotics
  - Follow-up concerns

- Review admission considerations
- Admission required
  - Yes
    - Begin empiric IV antibiotic therapy
    - Admit to IP
  - No
    - Consider administering PO clindamycin (no age restriction) or doxycycline (children ≥8 years only)
    - Prevention education
    - Discharge home
    - Fill with PCP
- I & D in OR required
  - Yes
    - I & D using appropriate procedural pain management
    - Review admission considerations
  - No
    - Admission required
      - Yes
        - Begin empiric IV antibiotic therapy, if not already started
        - Admit to IP
      - No
        - Perform daily re-evaluation. If improvement, prepare for discharge. If inadequate improvement or concern for new fluctuation involving abscess, consider additional imaging, reassessment of diagnosis, and/or modification of antibiotic therapy.

- Dranable collection
  - Yes
    - Make NPO
    - Prepare for OR
    - Administer empiric IV antibiotic
    - OFF algorithm
    - Manage as appropriate to clinical findings

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Drainable Collection?

- **No: Admission vs. Discharge**
  - Admission required? → Begin empiric IV abx therapy
  - Safe for discharge? → PO clindamycin, prevention education, f/up with PCP

- **Yes: OR vs Mobile Sedation**
  - Empiric IV abx therapy
Incision and Drainage

• Operating Room
  • Incision over affected area
  • Vessel loop
  • Packing open wound with kerlix/ iodoform gauze

• Mobile Sedation
Sedation and Analgesia

- Local anesthesia (Bedside)
  - 0.25% Marcaine
  - Local infiltration: Children: \( \leq 2.5 \text{ mg/kg of 0.25\%} \); maximum: 2.5 mg/kg/dose not to exceed 175 mg/dose (plain); 225 mg/dose (with epinephrine 1:200,000); up to a maximum of 400 mg/DAY
  - One puncture inserted into dome of abscess with syringe parallel to skin and rotate to distribute circumferentially
- Procedural sedation (OR): young children, pilonidal disease, multiple/large abscesses
Equipment/ Supplies

- Sterile gloves, surgical drape, multiple 4x4 gauze
- Eye protection: surgical mask with visor
- Povidone- iodine solution
- Local anesthetic: 1 or 2% lido
- Syringe and needle (25, 27, or 30 gauge)
- Culture swab

- Number 11 or 15 blade
- Curved hemostats
- Irrigation: isotonic saline solution
- Packing material: iodoform
- Vessel loop
- Dressing of choice
Procedure

1. Appropriately prep and drape patient using sterile procedure
2. Identify area of maximal fluctuance
3. Using an 11 or 15 blade scalpel make incision over point of max fluctuance (Langers lines)
4. Culture purulent fluid
5. Probe with curved hemostat to break up loculations
6. Vessel loop placement
7. Closure: secondary intention
8. Antibiotic therapy if indicated
9. Tetanus ppx if indicated
Vessel Loop

• Placed intraoperatively, allows for continued passive drainage postoperatively
Complications

- Recurrence
- Bacteremia
- Sepsis
Wound Care and Discharge Instructions

- Sitz baths in warm, soapy water TID, warm compresses
- Continue abx therapy, transition to PO
- F/up in 7-10 days for wound check and f/up cultures

- Vessel loop:
  - warm sitz baths TID, especially after BM to prevent contamination
  - Keep area clean and dry
  - F/up in 1 week in drain removal clinic - removed at bedside

- Return/ ER precautions:
  - Fever/chills, re-accumulation of pus, increased pain or redness, swelling, streaking (!!!)
References