ABSCESS

Dr Aaron VUNDA
DEFINITION:

An abscess is a collection of pus (that has accumulated within a tissue because of an inflammatory process) in response to either:
- an infectious process (usually caused by bacteria or parasites) or
- foreign materials (e.g., splinters, bullet wounds, thorns plant or injecting needles).
**DEFINITION:**

**Abscess** is a defensive reaction of the immune system in the tissue to prevent the spread of infectious materials to other parts of the body.
**DEFINITION:**

**PUS** is a thick creamy fluid, usually yellow or greenish in color, that forms at the site of (abscess) infection.

Pus consists of:

- **Microorganisms** \(\leftarrow\) causing the infection
- **Immune-system cells** \(\leftarrow\) fighting the infection
- **Body cells** \(\leftarrow\) died in the struggle
Abscess

CLINICAL PRESENTATION:

- A localized area of
  - pain (dolor)
  - erythema (rubor)
  - warmth (calor)
  - edema (tumor)

  ➞ Fluctuance +/- spontaneous drainage

*COLD ABSCESS* is a specific painless abscess without warmth, usually caused by *mycobacteria* (e.g. BCG vaccine)
LOCALISATION:

Abscess - affects people of all ages
- any part of the body

1. **Internal abscess**: lung, kidney, liver, brain, bone...

2. **External abscess**: under the skin, often surrounded by red, swollen tissue
TREATMENT of external abscess:

- Surgical drainage (+ microbiological evaluation)
- Needle aspiration of pus
- Antibiotic therapy
- Follow up care
Abscess

TREATMENT:

- A number of abscesses may heal spontaneously

- Refrain from surgery in “cold abscesses”!
COMPLICATIONS:

- Spread of infection in the same area
- Spread of the infection in the blood and throughout the body → Bacteremic dissemination → sepsis.
- Tissus death and gangrene
Abscess at injection site is a localized soft tissue (subcutaneous, fat, fascia, muscle) collection of material, occurring at the site of immunization.

- Rare adverse event
- Clinical diagnosis
CLINICAL DIAGNOSIS:

- Presence of a **mass** (fluctuant if there is collection) with signs of localized inflammation
- Drainage spontaneously or surgically of the skin mass
- Fever and locoregional lymphadenopathy (if septic abscess)
- Abscess regression while on antibiotic therapy (after sampling)
PATHOPHYSIOLOGY:

- Infectious
  or
- Non infectious etiology = sterile abscess

- Hot abscess
  or
- Cold abscess
Differential Diagnosis:

- Cyst
- Necrosing or Hemorrhagic tumor
COMPLEMENTARY EXAMINATION:

° Needle puncture/aspiration of the mass ➔ presence of purulent fluid on gross examination

° Laboratory confirmation (Gram stain, culture or other): microbiologic organisms +++ (if abscess of infectious etiology)

° The liquid nature of the mass usually can be verified by ultrasound
Injection site Abcess

COMPLEMENTARY EXAMINATION:

- Blood
- CSF
- Urine
- Stools

Not applicable
Injection site Abscess

Identifying Adverse Events of Special Interest (AESI) in infants and young children

Job Aid

Medical and paramedical personnel

GSK GlaxoSmithKline Vaccines
Adverse Events of Special Interest

Injection site Abscess

Nerves and Central Nervous System
- Acute disseminated encephalomyelitis (ADEM)
- Encephalitis
- Guillain-Barre Syndrome
- Meningitis
- Generalized seizures
- Hypotonic-hyporesponsive episode

Gastrointestinal and Urinary System
- Diabetes Mellitus type 1
- Hepatic insufficiency
- Renal insufficiency
- Intussusception

Skin and Mucous Membranes & Bones and Joints
- Juvenile Chronic Arthritis (ACJ)
- Stevens - Johnson syndrome
- Injection site abscess
- Kawasaki disease
- Henoch-Schönlein purpura

Cardiovascular System
- Anaphylaxis
- Thrombocytopenia
### Injection site Abscess

<table>
<thead>
<tr>
<th>Signs</th>
<th>Symptoms</th>
<th>AESI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arthralgia or arthritis mainly in lower limbs</td>
<td>Henoch-Schönlein purpura</td>
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<tr>
<td></td>
<td>Atypical target lesions</td>
<td>Syndrome Stevens-Johnson</td>
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<tr>
<td></td>
<td>Bilateral edema in the lower extremities, white, leaving a finger imprint when pressed</td>
<td>Renal insufficiency</td>
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<td></td>
<td>Buccal lesions or ulcers</td>
<td>Stevens - Johnson syndrome</td>
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<tr>
<td></td>
<td>Bullae</td>
<td>Stevens - Johnson syndrome</td>
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<tr>
<td></td>
<td>Cervical lymphadenopathy</td>
<td>Kawasaki disease</td>
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<td></td>
<td>Classically, a rose colored eruption can be seen on the trunk and thighs</td>
<td>Juvenile Chronic Arthritis</td>
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<tr>
<td></td>
<td>Clinical examination finds purpura</td>
<td>Thrombocytopenia</td>
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<tr>
<td></td>
<td>Edema of the hands and feet</td>
<td>Kawasaki disease</td>
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<td></td>
<td>Epistaxis</td>
<td>Thrombocytopenia</td>
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<td></td>
<td>Erythema of the lips and oral mucosa</td>
<td>Kawasaki disease</td>
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<tr>
<td></td>
<td>Frequent and recurring inflammation</td>
<td>Diabetes Mellitus type I</td>
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<tr>
<td></td>
<td>Generalized rash</td>
<td>Anaphylaxis</td>
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<tr>
<td></td>
<td>Generalized tingling sensation without skin rash</td>
<td>Anaphylaxis</td>
</tr>
<tr>
<td></td>
<td>Generalized urticaria</td>
<td>Anaphylaxis</td>
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<tr>
<td></td>
<td>Gingival hemorrhage</td>
<td>Thrombocytopenia</td>
</tr>
<tr>
<td></td>
<td>Icterus of the skin and mucous membranes</td>
<td>Hepatic insufficiency</td>
</tr>
<tr>
<td>Localized warmth to the touch at the injection site</td>
<td>Injection site abscess</td>
<td></td>
</tr>
<tr>
<td>Localized injection site urticaria</td>
<td>Anaphylaxis</td>
<td></td>
</tr>
<tr>
<td>Macular eruption appears, rapidly transforming into confluent bullae</td>
<td>Stevens - Johnson syndrome</td>
<td></td>
</tr>
</tbody>
</table>

1. **Localized warmth to the touch at the injection site**

2. **Regional lymphadenopathy of the affected extremity**
Abscess at injection site is:

- a localized soft tissue collection of material

- occurring at the site of immunization

Defined by 2 levels of diagnosis certainty
Injection site Abscess

**CASE DEFINITION**

**Abscess of infectious etiology**
May be accompanied by fever and/or regional lymphadenopathy

**Sterile Abscess**
Is typically not accompanied by fever and/or regional lymphadenopathy
Abcess of infectious etiology

Level 1 of diagnosis Certainty

° Spontaneous or surgical **drainage of the mass contents**

AND

° **Laboratory confirmation** (Gram stain, culture or other tests) of microbiological organisms with or without altered polynuclear neutrophils in the drained fluid
Injection site Abcess

CASE DEFINITION

Abcess of infectious etiology

Level 2 of diagnosis Certainty

In situations where:

- Microbiologic confirmation was not performed

- Or Microbiologic confirmation was performed after the start of antibiotic therapy, or was not ordered
Injection site Abcess

Abcess of infectious etiology

Level 2 of diagnosis Certainty

- Spontaneous or surgical drainage of the mass contents
OR
- Mass collection diagnosed by imaging technique (US, CT scan, MRI or other) or the mass is fluctuant
AND
  1. Signs of localized inflammation (at least one of the following aspects: erythema, pain on light palpation, warmth to the touch at the injection site)
    2. Resolution of symptoms after antibiotic therapy
**Sterile Abscess**

**Level 1 of diagnosis Certainty**

- Spontaneous or surgical drainage of the mass contents

**AND**

Drainage liquid obtained before beginning of antibiotic therapy and no infectious pathogen found on examination (Gram stain, culture or other tests)
Injection site Abcess

Sterile Abcess

Level 2 of diagnosis Certainty

In situations where:

- Microbiologic confirmation was not performed

- Or Microbiologic confirmation was performed after the start of antibiotic therapy, or was not ordered
Injection site Abcess

CASE DEFINITION

Sterile Abcess

Level 2 of diagnosis Certainty

° Spontaneously or surgically drained non purulent fluid from the mass
OR
° A collection of material, such as fluid, is diagnosed by imagery (US, CT scan, MRI or other modalities) or there is fluctuance on palpation
AND
1. Absence of signs of local inflammation: erythema, pain on light palpation, warmth to the touch at the injection site)
OR
2. No improvement following a course of an antibiotic treatment.
In Summary:

An injection site abscess is confirmed by a clinical diagnosis responding to the case definition
Injection site Abscess

INJECTION SITE ABSCESS

- Pain at the injection site, redness, palpable mass (lump) under the skin
- Spontaneous or surgical drainage of the mass contents

**Microbiologic examination** (Gram stain, culture or other)

**Antibiotic therapy** has NOT been started

- Presence of bacteria with or without altered polymorphonuclear neutrophils
- Absence of infectious pathogen

**ABSCESS OF INFECTIOUS ETIOLOGY:**
- Level 1 diagnostic certainty

**STERILE ABSCESS:**
- Level 1 diagnostic certainty

**ABSCESS OF INFECTIOUS ETIOLOGY:**
- Level 2 diagnostic certainty

**STERILE ABSCESS:**
- Level 2 diagnostic certainty

**Antibiotic therapy**

- Resolution of symptoms after antibiotic therapy
- No improvement over time

**Antibiotic therapy**

- Resolution of symptoms after antibiotic therapy
- No improvement over time

**AND ≥ 1 of the signs below**
- Erythema (rash)
- Pain on light palpation
- Warmth to the touch at the injection site

**AND the absence of the sign below**
- Erythema (rash)
- Pain on light palpation
- Warmth to the touch at the injection site

**AND the absence of the sign below**
- Erythema (rash)
- Pain on light palpation
- Warmth to the touch at the injection site

**AND the absence of the sign below**
- Erythema (rash)
- Pain on light palpation
- Warmth to the touch at the injection site

**No microbiologic examination**

- Skin and mucous membranes

**Antibiotic therapy**

- Resolution of symptoms after antibiotic therapy
- No improvement over time

**Antibiotic therapy**

- Resolution of symptoms after antibiotic therapy
- No improvement over time

**AND ≥ 1 of the signs below**
- Erythema (rash)
- Pain on light palpation
- Warmth to the touch at the injection site

Note:
- Abscess of infectious etiology: Can be accompanied by fever and/or locoregional lymphadenopathy.
- Sterile abscess: Typically are not accompanied by fever and/or locoregional lymphadenopathy.
Injection site Abscess

**INJECTION SITE ABSCESS**

- Pain at the injection site, redness, palpable mass (lump) under the skin
- Spontaneous or surgical drainage of the mass contents

**Microbiologic examination**
(Gram stain, culture or other)

**Antibiotic therapy**
- Has NOT been started
- Presence of bacteria with or without altered polymorphonuclear neutrophils
- Absence of infectious pathogen

- IF Antibiotic therapy has ALREADY been started
- AND ≥ 1 of the signs below
  - Erythema (rash)
  - Pain on light palpation
  - Warmth to the touch at the injection site

**ABSCESS OF INFECTIOUS ETIOLOGY:**
- Level 1 diagnostic certainty

**STERILE ABSCESS:**
- Level 1 diagnostic certainty

**ABSCESS OF INFECTIOUS ETIOLOGY:**
- Level 2 diagnostic certainty

**STERILE ABSCESS:**
- Level 2 diagnostic certainty
Injection site Abscess

No microbiologic examination

Skin and mucous membranes

AND ≥ 1 of the signs below
- Erythema (rash)
- Pain on light palpation
- Warmth to the touch at the injection site

AND the absence of the sign below
- Erythema (rash)
- Pain on light palpation
- Warmth to the touch at the injection site

Antibiotic therapy

Resolution of symptoms after antibiotic therapy

ABSCESS OF INFECTIOUS ETIOLOGY:
Level 2 diagnostic certainty

Sterile Abscess:
Level 2 diagnostic certainty
Checklist for Data Collection

A. Identify the person recording
   - Provide contact informations

B. Vaccine/control description
   - Demography, clinical/immunization history, any medication, recurrence of the event

C. Details of the Immunization
   - Timing, vaccine details, administration details for each vaccine

D. The adverse event
   - Detailed description, history, timing, anatomical site of abscess, treatment, follow up, outcome
Checklist for Data Collection

Data Collection Templates are available for use in study protocols and in surveillance systems *

* Abscess at injection site: Case definition and guidelines for collection, analysis, and presentation of immunization safety data
  
  K.S. Kohl et al.
  
  Vaccine 25(2007) : 5821 - 5838
Injection site Abscess
Injection site Abscess
Thank you

Dr Aaron VUNDA
SUGGESTED READING:

- Abscess at injection site: Case definition and guidelines for collection, analysis, and presentation of immunization safety data
  K.S. Kohl et al.
  Vaccine 25(2007) : 5821 - 5838

- Vaccination-induced myositis with intramuscular sterile abscess formation
  Kartz L D

- Recurrent sterile abscess following aluminium adjuvant-containing vaccines
  Klein NP et al.