

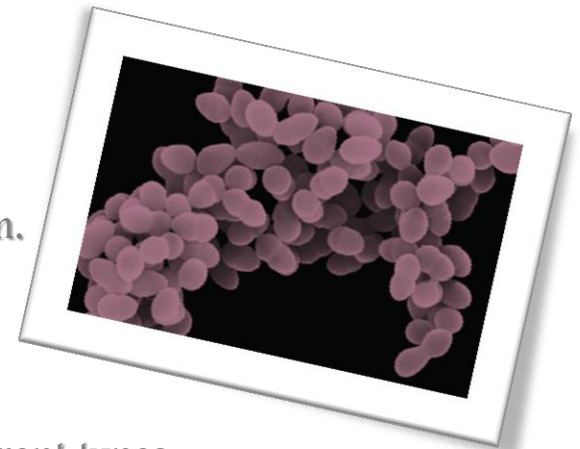


Lecture (3) Skin and Soft-Tissue Infections (SSII)

Objectives

OBJECTIVES

1. Describe the anatomical structure of skin and soft tissues.
2. Differentiate the various types of SSII and there clinical presentation.
3. Name bacteria commonly involved in SSII
4. Describe the pathogenesis of various types of SSII
5. Recognize specimens that are acceptable and unacceptable for different types
6. Describe the microscopic and colony morphology and the results of differentiating bacteria isolates in addition to other non-microbiological investigation
7. Discuss antimicrobial susceptibility testing of anaerobes including methods and antimicrobial agents to be tested.
8. Describe the major approaches to treat of SSII



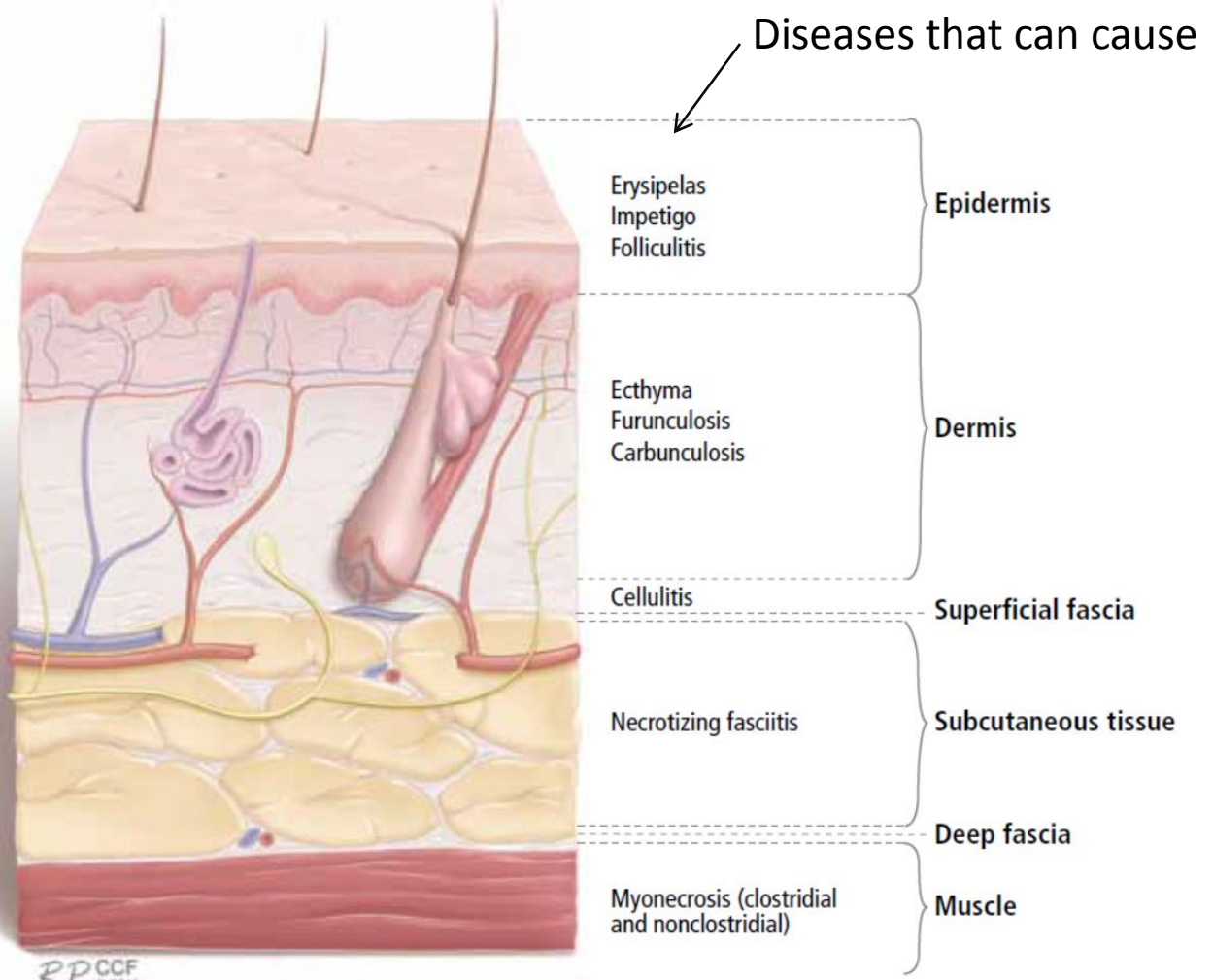
important things are highlighted in RED

Mind map

(Skin and Soft-Tissue Infections)

Are divided according to the skin layers that infected

Note:
Infection of the skin is distinguished from **dermatitis** (Skin inflammation)



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introduction

The Skin and Soft-Tissue Infections are :

- Common diseases
- It is Serious and Can lead to complications.
- Can be treated
- Most commonly caused by *Staphylococcus aureus* and then *Streptococcus pyogenes* (Group A streptococcus)
- Emerging antibiotic resistance among
Staphylococcus aureus (methicillin resistance)
Streptococcus pyogenes (erythromycin resistance)

Epidermis - Erysipelas

❖ Epidemiology :

- Infants, young children

❖ Organism :

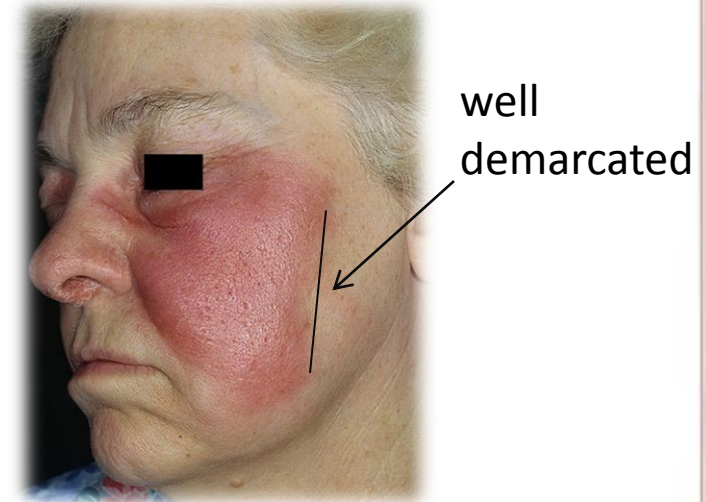
- *streptococci (group A)*

❖ Symptoms / signs :

- Redness, tender, painful plaque
- Affects the upper dermis (raised-clear line of demarcation)

❖ Treatment / management:

- Penicillin
(cause it is not resistant to streptococci)



Epidermis - Impetigo

Very superficial infection with blister common in pre-school children

❖ **Epidemiology :**

- Children 2–5 Year in tropical area and people with bad hygiene.

❖ **Organism :**

- It is caused by *Staphylococcus aureus*, and sometimes by *Streptococcus pyogenes*.

❖ **Symptoms / signs :**

- blister if it rupture, it's produce fluid (honey crust)
- Exposed areas of the body(face and extremities)
- Systemic symptoms are usually absent.

❖ **Treatment / management:**

- Penicillin



Epidermis - Folliculitis

(also known as "Hot Tub Rash") is the inflammation of one or more hair follicles.

❖ Epidemiology :

- All ages

❖ Organism :

- It is caused by *Staphylococcus aureus*, and by *Streptococcus pyogenes*.

❖ Symptoms / signs :

- Pimples or pustules located around a hair follicle
- Rash

❖ Treatment / management:

- Cloxacillin
- MRSA: vancomycin
- CA – MRSA: clindamycin



Community-associated

Dermis – Furunculosis (Abscess)

Furuncles (or “boils”) are deep infections of the hair follicle (folliculitis)

❖ Epidemiology :

- All ages

❖ Organism :

- It is caused by *Staphylococcus aureus*, and by *Streptococcus pyogenes*.

❖ Symptoms / signs :

- Boils الدمامل are bumpy, red, pus around a hair follicle
- tender, warm, and very painful.

❖ Treatment / management:

- Large furuncles require incision and **drainage**.

- Cloxacillin
- MRSA: vancomycin
- CA – MRSA: clindamycin



Dermis – carbuncles (multiple folliculitis)

is an abscess larger than a boil (Furuncles) which has a pus

❖ Epidemiology :

- All ages

❖ Organism :

- It is caused by *Staphylococcus aureus*, and by *Streptococcus pyogenes*.

❖ Symptoms / signs :

- The same as Furuncles but it is larger
- fatigue, fever

❖ Treatment / management:

- All carbuncles require incision and **drainage**.
- Cloxacillin
- MRSA: vancomycin
- CA – MRSA: clindamycin



Superficial fascia- cellulites

Acute spreading infection involves the deeper dermis and subcutaneous tissues.

❖ Epidemiology :

- All ages

❖ Organism :

- It is caused by *Staphylococcus aureus*, and by *Streptococcus pyogenes*.

❖ Symptoms / signs :

- Tenderness and redness that spreads to adjacent skin.
- may develop a fever, and sweats.

Treatment / management:

- Penicillin
- Cloxacillin
- cefazolin



Subcutaneous tissue- Necrotizing fasciitis (flesh-eating disease)

❑ It is a rare deep skin and subcutaneous tissues infection and fatal sometimes

❑ It can be :

• polymicrobial (Type I) :

Streptococcus group A

Clostridium perfringens

• monomicrobial (Type II) :

Streptococcus group A

❖ Symptoms / signs :

• **sever pain** with fever , chills (typical), Swelling , redness, hotness

• blister قرحة, **gas formation**, **gangrene** and necrosis

❖ Treatment / management: (even if you treat it 40% of patients will die)

• **Surgery and antibiotics**

- **Antibiotics are not a choice because of the dead tissue that can not reach it by blood**

❖ Pathophysiology :

Destruction of skin → exposure of bacteria (Streptococcal pyogenic) → releasing exotoxins to the blood → Superantigen bind to MHC-II to activate Non-specific T-cells → cytokines release → vasodilation → low BP → tachycardia → shock → death

* **For more information :** http://www.youtube.com/watch?v=QJZxV1kcS_w



Doctor`s notes

- ✓ SSII Can be treated by β - lactam, unless its **MRSA** : either by **vancomycin** or **clindamycin**
- ✓ Any abscess superficial can be caused by **staphylococcus aureus**
 - But deep abscess caused by **anaerobes**
- ✓ Antibiotics that treat **staphylococcus** and **streptococcus**:
- ✓ β - lactam , Penicillin (G) , cloxacillin (important for MSSA) , glycopeptide , erythromycin, Vancomycin (important for MSRA)) , cefeazolin (1st generation of cephalosporin)
- ✓ **Clindamycin** (important for CA-MSRA)
- ✓ Necrotizing fasciitis and myositis have a **microbiology important** (you have to take sample)
- ✓ **Blister** is a bad sign in Necrotizing fasciitis
- ✓ We added **Clindamycin** to the treatment of group A streptococcus for 2 reasons :
 - work on ribosomes \rightarrow inhibit protein synthesis \rightarrow suppress Superantigen
 - work on lactase of bacteria

MRSA Is a type of skin infection that usually start with injured area and when it is become to the community we called it :

CA-MRSA = **community acquired MRSA**

CELLULITIS وهو يعتبر احد اسباب المؤدية لـ

<http://infectiousdiseases.about.com/od/diseasesbyname/a/CA-MRSA.htm>

- Carry **Panton-Valentine leukocidin** gene (WBC lysis لا PVL gene المؤدي لأنه يعمل يعتبر خطير لأنه يعمل)
- More sensitive to antibiotics
- Can lead to sever skin and soft tissue infection or septic shock

Questions !!

What is the most common causing SSII?

- *Staphylococcus aureus*
- *Clostridium perfringens*
- *neisseria gonorrhoeae*

Patient presented to the hospital after trauma to the right thigh with a redness and he was in a **sever pain**?

- **Necrotizing fasciitis**
- Cellulites
- carbunculosis

What is the best approach (treatment) of Necrotizing fasciitis NF ?

- **Surgery and antibiotics**
- Surgery
- Antibiotics

