

Objectives

After completing this lecture, the student should be able to:

- Describe the morphology of common cutaneous bacterial infections.
- Discuss the bacterial etiologies of cellulitis and erysipelas.
- Become familiar with superinfection of resident normal flora
- Recommend initial steps for the evaluation and treatment of common cutaneous bacterial infections.

Natural defense of skin

- 1- Temperature more than 37c°
- 2- Dryness
- 3- Keratin & normal desquamation
- 4- Sebum with its low PH & high lipid content
- 5- Sweat with its low PH & high salt content
- 6- Skin associated lymphoid tissue
- 7- Resident microflora (mainly gram positive)



Resident microflora

- Millions of micro organisms, reside harmlessly on skin
- The total microbial cell count in and on our bodies is 10 times greater than the number of human cells.
- After the gut, there are more microorganisms on the skin than anywhere else in the body
- Bacterial species are the most numerous.
- Fungi, viruses and mites are also found on the normal skin
- Resident flora are found in the upper parts of the epidermis and congregated in and around the hair follicles. They include:
 - **Bacteria:** *Staphylococci*, *Micrococci*, *Diphtheroids*: *Corynebacterium*, & *Brevibacterium*
 - **Fungi:** *Candida albicans*, *Malassezia* & many other species
 - ❖ *Staph.epidermidis*+*aerobic diphtheroids* predominate on the surface.

Anaerobic diphtheroids deep in hair follicles

Transient bacteria

- *S. aureus* does not normally reside on the skin, but may be present transiently, inoculated from colonized sites such as the nares(30%), axillae & vagina

- This colonization is usually transient except in 10-20% where it becomes persistent, these are called staph carriers & are a hazard to the society.

Primary bacterial infections

- Impetigo & ecthyma
- Folliculitis
- Furuncles & Carbuncles
- Erysipelas
- Cellulitis

Secondary bacterial infection

Infection of previously damaged or diseased skin, such as

- Dermatitis
 - Herpes simplex
 - Burn
 - Scabies & pediculosis
- ❖ Any child presenting with recurrent impetigo of the scalp we should look for underlying pediculosis capitis.



Route of infection

- 1) Skin (pores, hair follicles).
- 2) Wounds (scratches, cuts, burns).
- 3) Insect & animal bites.



Impetigo

- Acute, contagious bacterial infection of the skin
- Of 2 types:
 - Bullous: caused by *S. aureus*
 - Non-bullous: mainly by group A *B hemolytic streptococci*
- Peak incidence aged 2-5 years, but can affect older children & adults
- M=F
- Can be primary or secondary

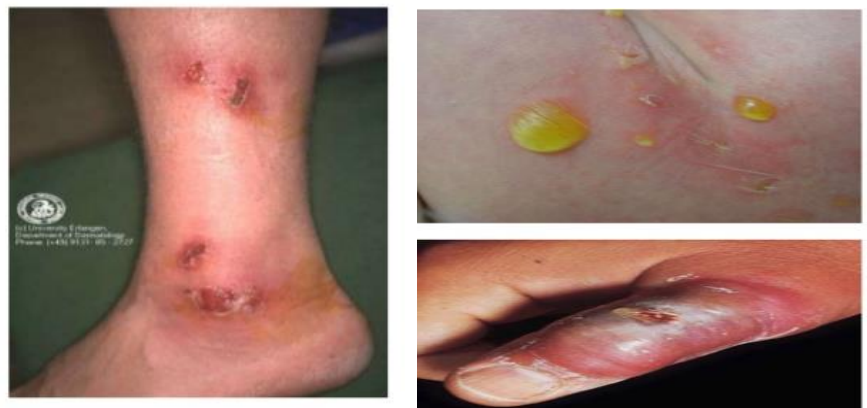
Non- bullous impetigo

- Caused by *strept.*, *staph.*, or usually a mixture of 2
- A thin walled vesicle on erythematous base, soon ruptures & a crust forms (yellowish brown= honey colored)
- Heals without scarring
- Regional adenitis & fever in severe cases
- Can affect any part, except palms & soles
- Mostly exposed parts, especially central face



Bullous impetigo

- Mostly caused by *s. aureus*
- Mostly in newborn
- Target area is the face, but can occur anywhere even palm & soles
- Bullae are larger, persist longer(2-3 days), contents are first clear then become turbid, then rupture forming thin varnish-like brownish crusts



Ecthyma

- A lesion of neglect, develops at site of old trauma
- Mostly elderly, diabetic, debilitated, or alcoholic patients (= vagabond's disease)
- Caused by *strpt. pyogenes*, & *staph*.
- Mostly on lower limbs
- Adherent crust, beneath which is a purulent irregular ulcer, delayed healing with scarring.



Complications

- lymphangitis, lymphadenitis.
- Staphylococcal scalded skin syndrome (SSSS).
- Post streptococcal acute glomerulonephritis, especially in cases due to *streptococcus pyogenes* M type 49

Treatment

- Wet compresses with antiseptic solution to remove crusts with topical antibiotics is enough in mild cases.

If severe or a nephritogenic strain of *strept* is suspected; then a systemic antibiotic is added as flucloxacillin, erythromycin or cephalixin.



Staphylococcal infections:

1- Superficial folliculitis:

- Inflammatory disease of the hair follicles, which may be infectious or non infectious
- The infection is superficial involving the ostium of the hair follicle
- Usually caused by staph aureus
- Common on scalp of children, beard, axillae, extremities, buttocks
- Heal spontaneously in 1 week, or become chronic
- In adults can progress to boils

Folliculitis

Can be:

- 1- infective: bacteria & yeast (pityrosporum)
- 2- Chemical: by mineral oils
- 3- physical: as after hair epilation



2- Deep folliculitis(=furuncles= boils)

- Staphylococcal infection of the hair follicles, similar to but deeper than folliculitis
- Start as firm, red, tender papule that becomes painful & fluctuant nodule, finally ruptures & discharges pus, leaving a scar
- Sites of friction & sweating; mostly neck, buttocks & ano-genital area due to staph. carriage at these areas
- Constitutional symptoms may be present
- Some have recurrent attacks (=chronic furunculosis)

Chronic furunculosis

- They may recur at intervals for no apparent cause, these patients are staph carriers (they carry s. aureus in their nostrils, axillae & groins)
- They may be treated by topical antibiotics applied to carrier sites
- Long courses of oral flucloxacillin
- Care about hygiene & predisposing factors



Carbuncle

- Collection of boils
- Swollen suppurating painful areas discharging pus from several points
- In areas of thick inelastic skin the infection spreads to subcutaneous fat such as nape of neck, back & thighs
- More painful & severe with constitutional symptoms
- More in diabetics
- Blood stream invasion may occur



Management of folliculitis

- Correction of underlying causes: diabetes, anemia, poor hygiene.
- Swabs for culture from lesions & carrier sites.
- Topical & systemic antibiotics.
- Incision of boils & carbuncle to speed healing.
- Recurrent boils need treatment of carrier states by b.d. topical antibiotics for 6 weeks+ improve patient's hygiene.

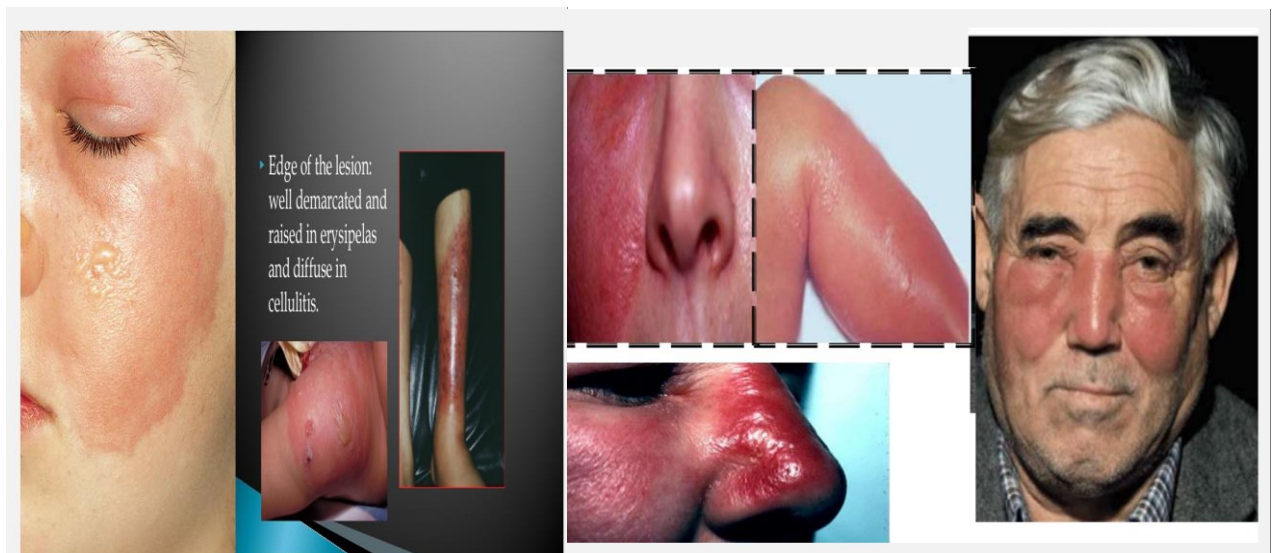
Streptococcal infections:

Erysipelas & cellulitis

- Cellulitis: infection of the subcutaneous tissue
- Erysipelas: infection of the dermis & upper part of subcutaneous tissue
- by group A *Streptococcus* hemolytic strept.

Erysipelas

- Minor cracks or wounds in the skin are the port of entry
- Starts with severe constitutional symptoms
- Followed by appearance of rapidly spreading painful erythematous plaque **with well defined margins.**
- May show hemorrhage or blistering
- 80% occur on the face
- Can be fatal if untreated



Cellulitis

Similar to erysipelas, with some differences

- 1- deeper level of skin involvement (subcutaneous tissue)
- 2- Other organisms than strept. can cause it, like *S. aureus*
- 3- more raised & swollen but **less well-defined border**
- 4- More on the lower limbs than the face



Complications

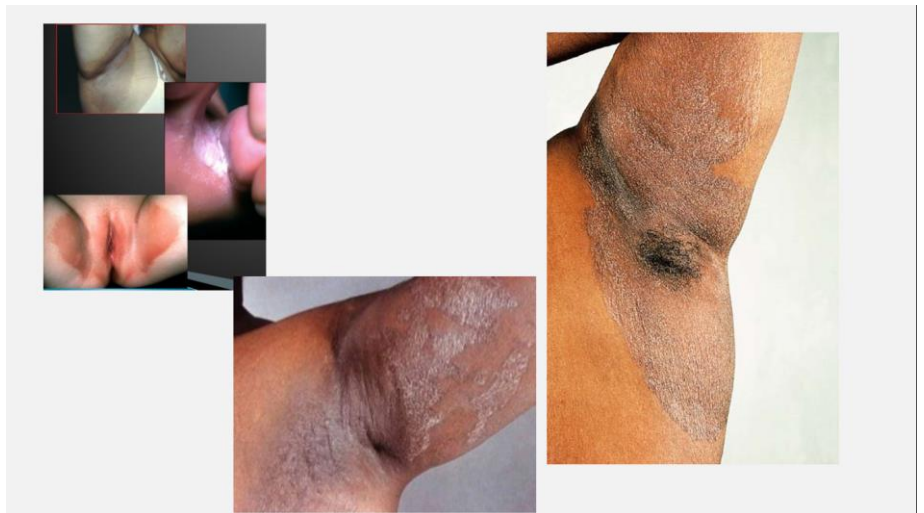
- 1- recurrences may lead to lymphedema
- 2- subcutaneous abscess
- 3- Septicemia
- 4- nephritis

Treatment

- Rest, analgesia
- Systemic antibiotics especially penicillin
- E.g: benzyl penicillin 600-1200 mg IV/6 hourly
- Or cephalosporin

Erythrasma

- Caused by corynebacterium minutissimum a member of resident flora
- Asymptomatic, well demarcated, scaly, reddish brown
- Body folds: axilla, groins, toe webs
- Coral red fluorescence with Wood's lamp
- Treated by topical antifungal, antibiotics, or sometimes systemic erythromycin



BACTERIAL			
	STAPH.	STREPT.	MIXED
SUPERFICIAL	FOLLICULITIS	ERYSIPELAS	IMPETIGO
DEEP	FURUNCLES & CARBUNCLES	CELLULITES	

