

LEC. 15



SURGERY

Dr. Aqeel Shakir

Lec. 1

GANGRENE

Tues. 24 / 2 / 2015



DONE BY : Ali Kareem

2014 - 2015

مكتب اشور للاستشارات

GANGRENE

Origin of Gangrene

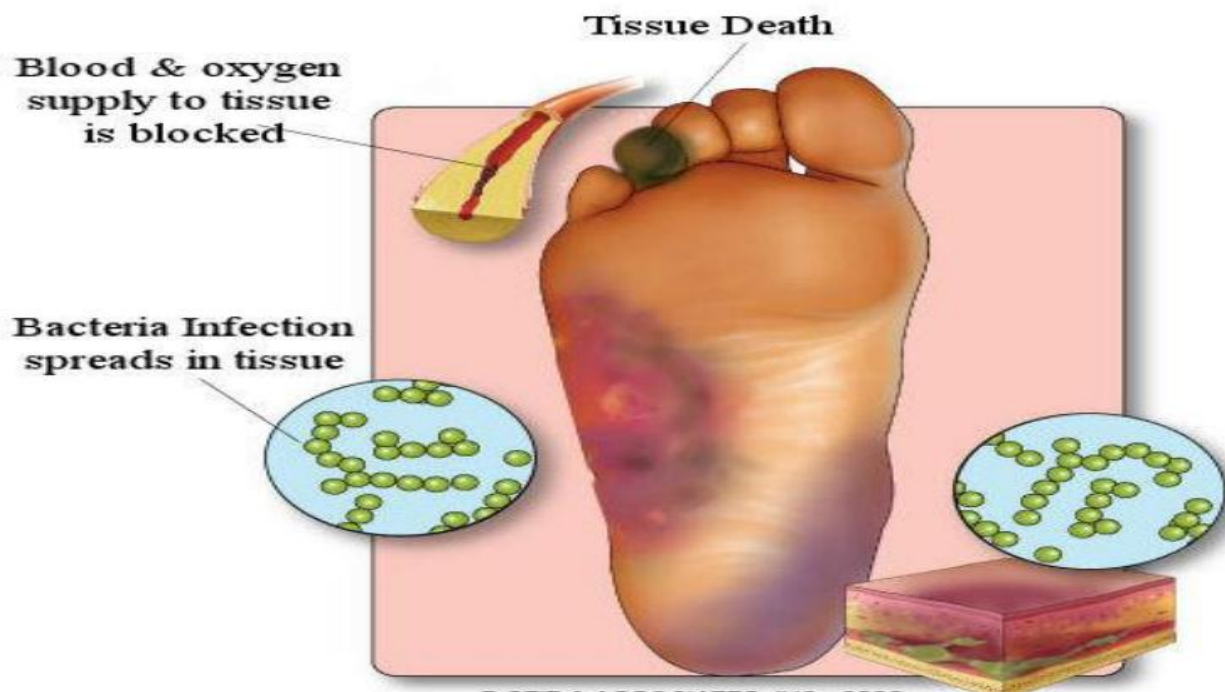
- The word "gangrene" comes from the Greek "gangraina" denoting "an eating sore that ends in mortification".

MEDICAL DEFINITION :

Gangrene : The death of body tissue due to the loss of blood supply to that tissue, sometimes permitting bacteria to invade it and accelerate its decay.



GANGRENE



- ✓ *Gangrene is a complication of necrosis “cell death” characterized by the decay of body tissues, which become black and appearing “rotten”.*
- ✓ *It is caused by infection or ischemia.*
- ✓ *It is usually the result of critically insufficient blood supply.*
- ✓ *Often associated with diabetes and long-term smoking.*
- ✓ *Condition is most common in the lower extremities.*

- *Blood supply when cut off → Tissues will die*

Classification

It can be classified into two types according to the cause of the tissue necrosis :

- *Primary gangrene*
- *Secondary gangrene*

Primary gangrene

It is brought by infection with pathogenic bacteria which both

- ✓ *kill the tissue by secreting exotoxins and*
- ✓ *Then invade & digest the dead tissue.*

Gas Gangrene

Secondary gangrene

- *This type of gangrene is characterized by necrosis due to some other causes, usually loss of blood supply from vascular obstruction or tissue laceration and saprophytic bacteria then digest the dead tissue,*
- *There are two types :*
 - *Dry gangrene*

- Wet gangrene

DRY GANGRENE

- ✓ Dry gangrene begins at the distal part of the limb due to ischemia and often occurs in the toes and feet of elderly patients due to arteriosclerosis.
- ✓ Dry gangrene spreads slowly until it reaches the point where the blood supply is inadequate to keep tissue viable.
- ✓ The affected part is dry, shrunk and dark black, resembling mummified flesh.
- ✓ People with impaired peripheral blood flow, such as diabetics, are at greater risk of contracting dry gangrene.
- ✓ The early signs are a dull ache and sensation of coldness in the affected area.
- ✓ If caught early, the process can sometimes be reversed by vascular surgery.
- ✓ If necrosis sets in, the affected tissue must be removed and treated like a case of wet gangrene.
- ✓ Due to gradual cut of blood supply.
- ✓ The line of demarcation between dead and living tissue is clear.
- ✓ The lesion remains localized.
- ✓ affects bodies extremities
 - arteries get blocked= tissue slowly dies
 - Affected body parts feel cold and turn dark, it will dry and eventually falling off
 - Mostly affects extremities such as fingers and toes



WET GANGRENE

- It occurs in internal organs where moisture and temperature are favorable for bacterial growth
- Death occurs rapidly from septicemia, toxemia and shock
- Wet gangrene occurs in naturally moist tissue and organs such as the mouth, bowel, lungs, cervix, and vulva.
- In intestine :
 - Gangrene occurs due to malpositions e.g. volvulus, hernia and intussusceptions
 - Necrosis is due to venous obstruction and congestion
 - Presence of bacteria in the intestinal ingesta allows rapid spread of moist gangrene
- ✓ Bedsores occurring on body parts such as the sacrum, buttocks and heels (not in “moist” areas) are also categorized as wet gangrene infections.
- ✓ The toxic products formed by bacteria are absorbed causing systemic manifestation of bacteremia and finally death.
- ✓ The affected part is soft, putrid, rotten and dark.
- ✓ The darkness in wet gangrene occurs due to the same mechanism as in dry gangrene.
- ✓ The infected tissue are edematous due to large amount of subcutaneous fluid.
- ✓ The demarcation between dead and living is **indistinct**.
- ✓ May **extend** proximally beyond the site of infection. Wet gangrene is seen in the bowel due to mesenteric vascular occlusion and in diabetic limb.
- ✓ occurs with injury and infection
 - Injury restricts blood flow to the certain area
 - Blood cant flow to tissue so can't fight infection= infection sets in,
 - Swelling from infection= even less blood flow= fast spreading gangrene=life threatening
 - Become swollen, discolored, and smelly.





GAS GANGRENE

- ✓ Gas gangrene is a bacterial infection that produces gas within tissues.
- ✓ It is a deadly form of gangrene usually caused by bacteria.
- ✓ Infection spreads rapidly as the gases produced by bacteria expand and affect healthy tissue.
- ✓ Gas gangrene is caused by an environmental bacteria.
- ✓ These bacteria are mostly found in soil.
- ✓ These environmental bacteria enter the muscle through a wound and cause necrosis of tissue and powerful toxins.
- ✓ These toxins destroy nearby tissue, generating gas at the same time.
- ✓ Gas gangrene can cause necrosis, gas production, and sepsis.
- ✓ Progression to toxemia and shock is often very rapid.
- ✓ Because of its ability to quickly spread to surrounding tissues, gas gangrene should be treated as a medical emergency.
- ✓ These are fatal disease conditions caused by different species of spore-forming bacteria- *Clostridium* (*C. septicum*, *C. perfringens*)
- ✓ These organisms are anaerobic, spore-forming, soil inhabitants and cause diseases as wound infections.
- ✓ Under anaerobic conditions the organisms multiply, produce toxins causing tissue digestion like lecithinase and collagenase
- ✓ The organisms produce edema and gas in the affected tissues and spread to surrounding tissues



SPECIFIC GANGRENES

- ✓ *Noma* is a gangrene of the face.
- ✓ *Necrotizing fasciitis* affects the deeper layers of the skin.
- ✓ *Fournier gangrene* usually affects the male genitals.

NOMA

- ✓ Is a gangrenous disease leading to tissue destruction of the face, especially the mouth and cheek.
- ✓ Risk factors include severe protein mal nutrition and unsanitary conditions.



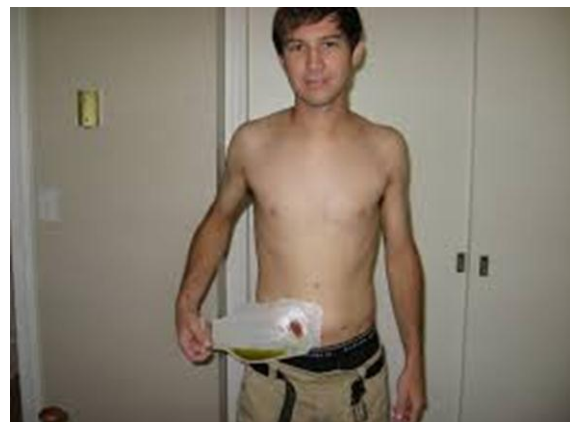
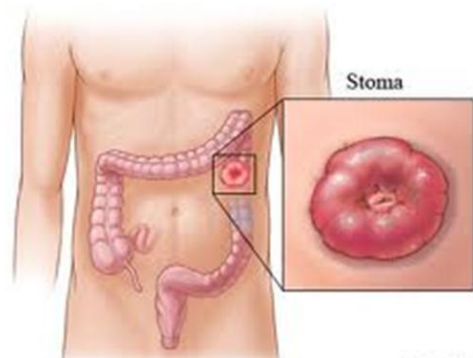
NECROTIZING FASCIITIS

- ✓ Commonly known as *flesh-eating disease* or *flesh-eating bacteria*.
- ✓ Rare infection of the deeper layers of skin and easily spread within the subcutaneous tissue



FOURNIER GANGRENE

- ✓ A type of necrotizing infection usually affecting the male genitals.
- ✓ In the majority of cases it is a mixed infection caused by both aerobic and anaerobic bacteria



TREATMENT

- ✓ *Usually surgical with amputation necessary in many cases.*
- ✓ *Antibiotics alone are not effective because they do not penetrate ischemic muscles sufficiently.*



- ✓ *The best treatment for gangrene is revascularization and restoration of blood flow to the affected area.*
- ✓ *Can reverse some of the effects of necrosis and allow healing.*
- ✓ *The method of treatment is generally determined depending on location of affected tissue and extent of tissue loss.*

Results of necrosis and gangrene

Necrosis may terminate in several ways :

- 1- Liquefaction and removal by neutrophils, lymph or blood- (small areas)*
- 2- Liquefaction and cyst formation- (large areas). Fibrous capsule may be formed*
- 3- Liquefaction , abscess formation and discharge- (invasion by pyogenic bacteria)*
- 4- Encapsulation without liquefaction- (coagulation and caseous necrosis)*
- 5- Sloughing and desquamation- (on external surfaces)*
- 6- Organization of necrotic tissue*

7- Dystrophic calcification

8- Death of the human – usually in case of moist gangrene

#END

DONE BY

Ali Kareem