

GANGRENE

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Objectives

- Learn what gangrene is
- What causes gangrene
- Who is at risk
- The different types
- Complications and how we treat
- Prevention

What is Gangrene?

- Gangrene is characterized by tissue necrosis (cell death), caused by either infection or ischemia to a certain region of the body. Most commonly the extremities, but could even be the organs.

Causes

- Lack of blood flow to a region of the body.
 - Thrombosis
 - Peripheral vascular disease - Atherosclerosis
 - Diabetes - Causing damaged blood vessels

Causes cont..

- Severe injury- swelling
- Any immune disorder that reduces the bodies ability to fight infection. (HIV)
- Frostbite

Frostbite impairs circulation in the affected region

- Infection

Who is at risk?

- Elderly
 - Immune deficiency
 - Atherosclerosis
- Diabetics
 - Damaged blood vessels causing poor perfusion
- Persistent tobacco users causing blood vessel damage.
- Immunosuppressed
- Recent surgery

Types of Gangrene

- 1) Dry gangrene
- 2) Wet gangrene
- 3) Gas gangrene

Dry Gangrene

- Most commonly caused by an interruption of blood flow for a prolonged period of time.
- Commonly starts in the distal ends of the limbs (toes and fingers)
- People with impaired blood flow to the extremities such as diabetics are at greater risk of getting it.
- Characterized by dry shriveled skin with brown, purplish blue or black color.
- Black coloration is a product of pooled blood.

Dry Gangrene cont..

- Early signs of this form include-
 - A dull ache and cool sensation at the affected area
 - Pallor of the flesh (pale skin)



WET GANGRENE

- Usually starts in moist areas of the body such as the lungs, bowel, cervix or mouth, but can also be found in other places as well.
- What is it?
 - The tissue is infected by a saprogenic microorganism causing swelling of the tissue.
 - Usually rapid onset due to blockage of venous and or arterial blood.

Wet Gangrene cont..

- Affected region becomes saturated with stagnant blood promoting rapid growth of bacteria.
- Bacteria produces toxic products that can cause one to become septic.



Gas gangrene

- Very deadly form of Gangrene
- Usually caused by *Clostridium perfringens* bacteria.
- Infection spreads quickly due to the gas production by the bacteria, rapidly contaminating tissue nearby
- Rapidly spreads through the body
- Toxins will cause tissue death and sepsis very quickly

Gas Gangrene cont..

- Where and how can bacteria be obtained?
 - Most likely found in soil
 - Enters through an open wound

Gas Gangrene cont..

- Appearance-
 - Pale skin evolving to purplish-red or grey in color
 - Skin may have crackling sound when pressed on similar to subcutaneous emphysema



Types of Gangrene cont..

- **Internal Gangrene-**
 - Hernias left untreated causing poor perfusion of the affected tissue.
 - Can lead to death
- **Signs**
 - Fever and severe pain
 - Sepsis

Possible Complications

- Tissue necrosis
- Loss of a limb
- Sepsis
- Death

What will we see?

The common symptoms appearing that would be discussed now

- Pt complaining of severe pain
- Fever
- Upon assessment you may find discoloration of overlying skin
- Pain may appear to be more drastic than what you see in the affected region
- Difficulty in walking if the lower limbs are affected
- Discharge from the burst inflammatory ulcers

Pre Hospital Treatment

- Treat for Septic Shock
 - Oxygen
 - IV fluids
 - Consider dopamine to correct hypotension
- Administer anti-inflammatory and analgesic drugs if required

Signs of Septic Shock

- Fever or low temp (hypothermic)
- Increased cardiac output
- Low BP
- Shortness of breath
- Possible altered mental status

Hospital Treatment

- Surgical intervention to renew blood flow sometimes used to treat dry gangrene
- Antibiotics for all types (both effective on aerobes and anaerobes)
- Correct hydration and electrolyte imbalances
- Operation to remove affected tissue (common with wet gangrene)

Hospital Treatment cont..

- Complete amputation may be required in emergency cases
- Hyperbaric oxygen therapy
 - Forcing oxygen rich blood into the dying tissue
 - Kills off the bacteria that thrive only in an oxygen free area.
 - Used to treat early stage gas gangrene



Prevention

- Keep open wounds clean
 - Especially diabetics and people who are immunosuppressed
 - Watch for infection
- Diabetics should control their blood sugar
 - High blood sugar over time damages blood vessels and reduces perfusion
- If frostbite occurs seek medical attention

THANK YOU