Dr

Lec 2
Gangrene

GANGRENOUS NECROSIS

- Gangrene is the necrosis of tissue with superadded putrefaction (enzymatic decomposition).

- Gangree= Necrosis + infection + putrefaction

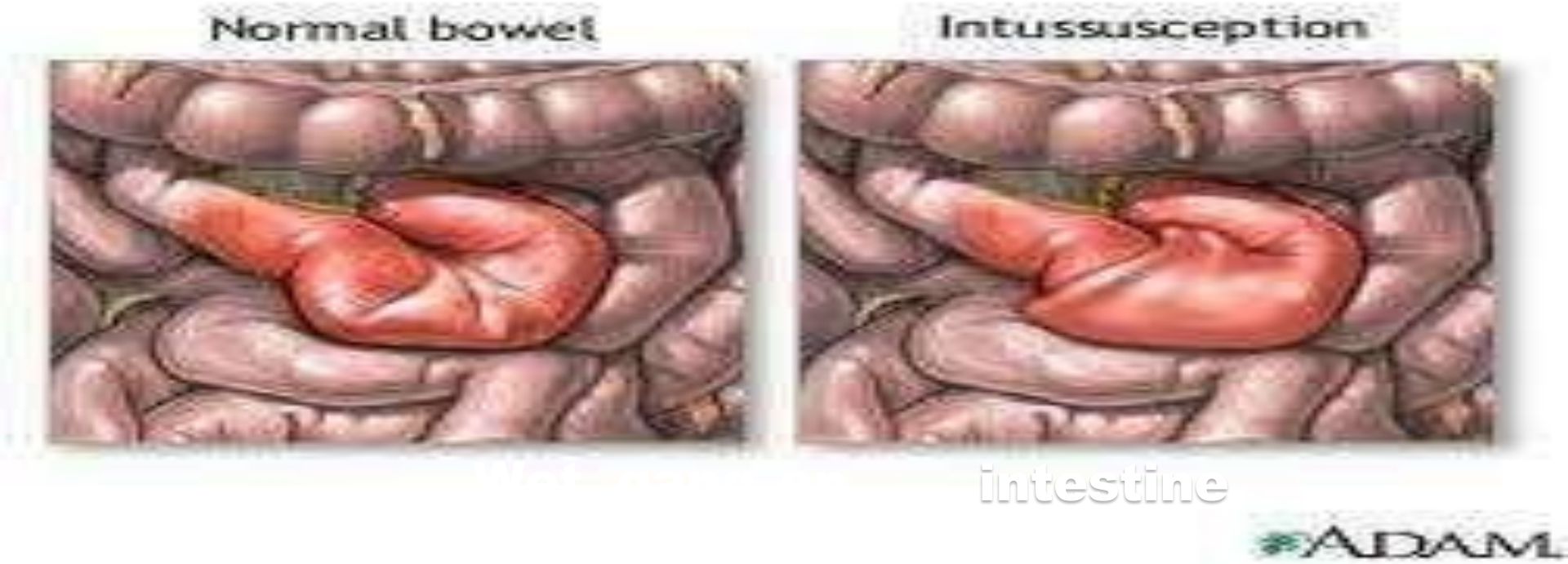
Clean wound

Gangrenous wound

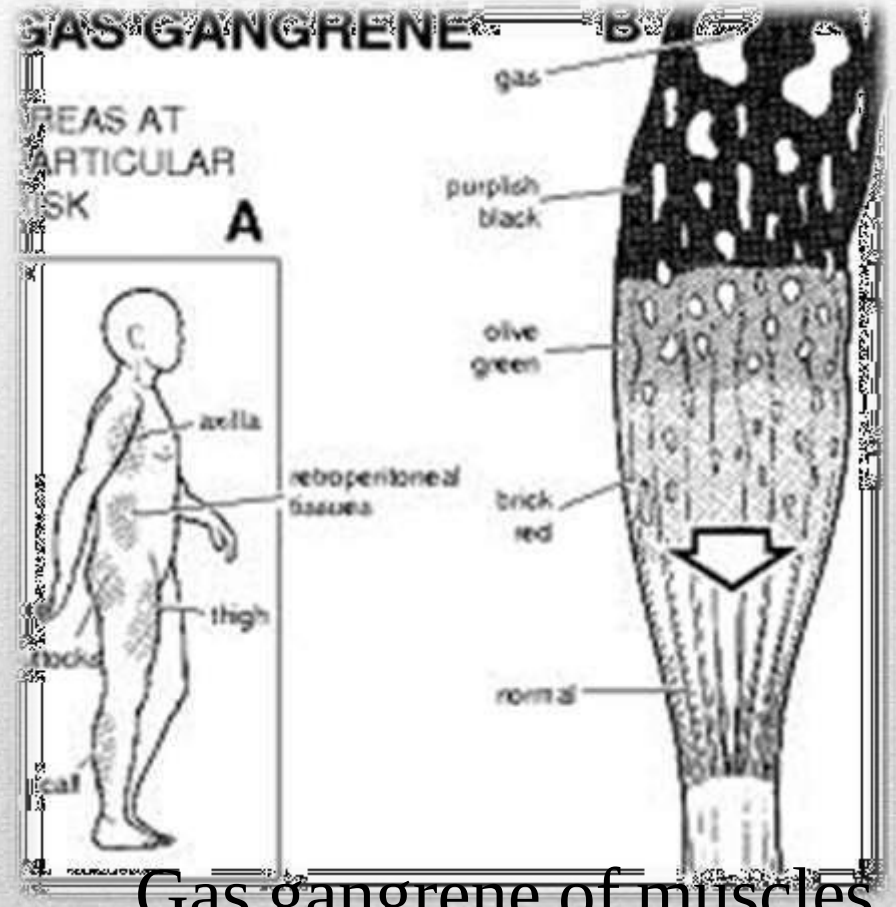
Types of gangrene

- Dry gangrene
- Wet gangrene
- Gas gangrene

Dry gangrene of foot



Wet gangrene of appendix



Gas gangrene of muscles

Gas gangrene of Liver

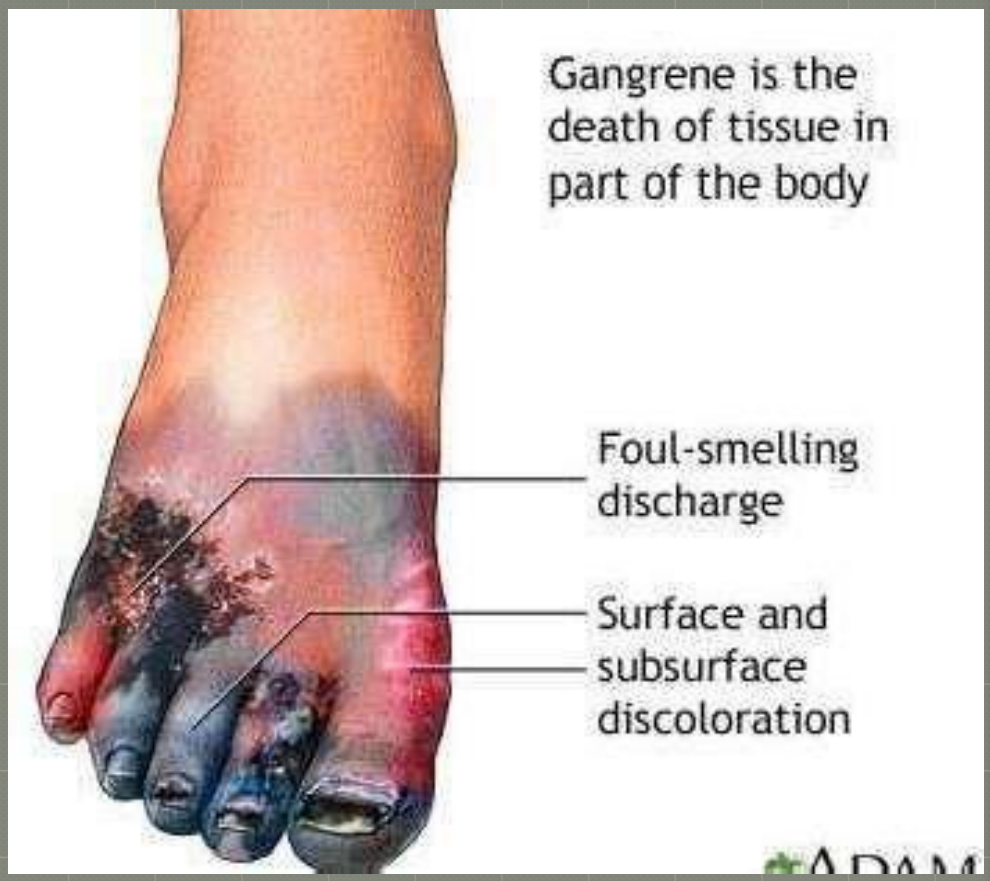
Gangrene

- A form of necrosis of tissue with superadded putrefaction.
- Here the necrosis undergoes liquefaction by the action of putrefactive bacteria.
- It may be caused either **ischemic** or **inflammatory**
- **Gangrenous or necrotising inflammation:** primarily inflammation by virulent bacteria resulting in massive tissue necrosis.

Types of Gangrene

- 2 main forms of gangrene
- **Dry gangrene**
- **Wet Gangrene**

– **Gas gangrene**: a kind of wet gangrene



Dry Gangrene

- Begins in the distal part of a limb due to ischaemia.
- The gangrene spreads slowly upwards until it reaches a point where the blood supply is adequate to keep the tissue viable.
- A ***line of separation*** is formed at this point between the gangrenous part and the viable part.

Dry Gangrene

Grossly

- the affected part is dry, shrunken and dark black, resembling the foot of a mummy.
- It is black due to liberation of haemoglobin from haemolysed red blood cells which is acted upon by

hydrogen disulfide (H_2S) produced by bacteria resulting

in formation of black iron sulfide.

- The line of separation usually brings about complete separation with eventual falling off of the gangrenous tissue if it is not removed surgically

Histologically

- Necrosis of the tissue.
- The line of separation consists of inflammatory granulation tissue

Wet Gangrene

- Naturally moist tissues and organs such as the mouth, bowel, lung, cervix,
- develops rapidly due to blockage of venous, and less commonly, arterial blood flow from thrombosis or embolism.
- The affected part is stuffed with blood which favours the rapid growth of putrefactive bacteria.
- The toxic products formed by bacteria leads to septicaemia, and finally death.

Wet Gangrene

- **Diabetic foot**
  - high sugar content in the necrosed tissue which favours growth of bacteria.
- **Bed sores**
  - bed-ridden patient due to pressure on sites like the sacrum, buttocks and heels

MORPHOLOGIC FEATURES

- ***Grossly,***
  - the affected part is soft, swollen, putrid, rotten and dark.
  - The classic example is gangrene of bowel, commonly due to strangulated hernia

Contrasting Features of Dry and Wet Gangrene

Feature	Dry Gangrene	Wet Gangrene
Site	Commonly limbs	More common in bowel
Mechanisms	Arterial occlusion	More commonly venous obstruction, less often arterial occlusion
Macroscopy	Organ dry, shrunken and black	Part moist, soft, swollen, rotten and dark
Putrefaction	Limited due to very little blood supply	Marked due to stuffing of organ with blood
Line of demarcation	Present at the junction between healthy and gangrenous part	No clear line of demarcation
Bacteria	Bacteria fail to survive	Numerous present
Prognosis	Generally better due to little septicaemia	Generally poor due to profound toxaemia

GAS GANGRENE

- Special form of wet gangrene caused by gas-forming **clostridia** (gram-positive anaerobic bacteria).
- Bacteria gain entry into the tissues through open contaminated wounds,eg. road traffic accident
- Results in myonecrosis i.e. necrosis of muscles.
- It produce various toxins which produce necrosis and oedema locally

MORPHOLOGIC FEATURES

- **Grossly**
  - the affected area is swollen, oedematous, painful and crepitant due to accumulation of gas bubbles within the tissues.
  - Subsequently, the affected tissue becomes dark black and foul smelling.
- **Microscopically**
  - the muscle fibres undergo coagulative necrosis with liquefaction
  - Large number of gram-positive bacilli can be identified.


Thank You