

PUTREFACTION



Introduction

- Final stage after death, produced mainly by the action of bacterial enzymes (anaerobic organisms of intestines)
- Chief bacterial agent is **Clostridium Welchi** which produce lecithinase that hydrolyses lecithin present in cell membrane.
- Causes marked hemolysis, liquefaction of clots, disintegration of tissues and gas formation in the blood vessels and tissue spaces.
- Other organisms are Streptococci, Staphylococci, B.Proteus, B.Coli, B.Aerogenes.
- There is progressive breakdown of soft tissues and alteration of their proteins, carbohydrates and fat.
- Proteins are converted to amino acids, carbohydrates to CO_2 and water, lipids to

Gases produced

• During this process foul smelling gases are produced. They are:-

1. Hydrogen sulphide
2. Sulphur dioxide
3. Phosphorated hydrogen
4. Ammonia
5. Methane
6. Mercaptans
7. Carbon dioxide
8. Carbon monoxide

EFFECTS OF GASES PRODUCED

- Produces a nauseating and disagreeable ammoniacal odour.
- **Postmortem Purging**:- Due to the gas formation, blood stained frothy fluid and gastric contents will come out through mouth and nostrils.
- Abdomen will distend, face will be bloated up, scrotum and penis will bulge and female breasts will engorge.
- On opening the abdomen the gas in the peritoneal cavity escapes with a loud hissing voice.
- Eyes will bulge out from their sockets and tongue will be protruded.
- **Postmortem vesicles** will be formed with gas. They will increase in size and will rupture on slight touch.

Face bloated, eyes bulging out from their sockets and tongue protruded



Postmortem vesicles

- Gas bubbles accumulate in tissues causing crepitant sponge like feeling.
- **Gas rigidity**:- Formation of gas in the joints. Limbs are seen in abducted and slightly flexed position. This is formed by about 48 to 72 hours
- Cuticle may peel off easily when the vesicles burst.
- Hair will be loosened by 72 hours.
- **Degloving**:- Skin of both hands and feet will be detached.

Scalp hair peeled off and tongue protruded



Detachment of skin of foot



Degloving of hand



Coffin Birth



- Also known as postmortem delivery.
- Due to the pressure of decomposition gases, the fetus in the uterus along with placenta will be expelled out.
- Occurs 2-3 days after death
- In postmortem expulsion, the placenta and cord along with the fetus will be intact without injuries.
- Rigor mortis of the uterine musculature cannot expel the fetus and coffin birth does not occur due to rigor mortis.

Colour Changes

- First decomposition change seen externally is the greenish discolouration on the **right iliac fossa**.
- Because that area is fairly superficial and at close proximity to caecum which has high bacterial content.
- Changes maybe seen by 18 hours after death.



Marbling of skin

- Blood vessels provide an important route through which the bacteria can spread throughout the body.
- Bacterias involved are Streptococcus, Staphylococcus, Diphtheroids, Clostridium Welchi and Proteus.
- They produce **hydrogen sulphide** as decomposition gas.
- Hemoglobin will be converted to methemoglobin, H_2S will combine with methemoglobin to form **sulphmethemoglobin**.
- Sulphmethemoglobin stains the superficial vessels greenish.
- This is seen as linear branching patterns and gives a marbled appearance of the skin.

Bloating up of breasts and abdomen is present.
Major joints show gas rigidity.



Areas where marbling is visible

- First appears on shoulders, upper aspects of limbs, thighs and lateral aspects of trunk.
- First decomposition change seen internally is the staining of the intima of aorta.
- Discolouration on the under aspect of liver is seen due to the proximity of transverse colon.
- Reddish brown discolouration of the mucous membrane of larynx and trachea.



- As time advances, whole body shows greenish, greenish black and brownish black discolourations.
- Black discolouration is due to the formation of **ferric sulphide** by the combination of ferric ions in the hemoglobin with H_2S .
- Putrefactive effusion of foul smelling reddish brown fluid usually occurs in the pleural cavities after 36 hours. Such effusions will not exceed 60-100 ml unless death is due to drowning.



Scrotum bulged, penis distended, abdomen bloated up, tongue protruded, and reddish-brown, greenish black and brownish black discolouration.

Discolouration

Greenish discolouration of right iliac fossa due to sulphmethemoglobin, marbling, discolouration under surface of liver, staining of aorta, blackish discolouration of skin due to formation of ferric sulphide

Distension

Abdomen, breasts, penis, scrotum, bloated face, eyes bulged out from sockets, gas rigidity, crepitus felt on soft tissues due to gas formation

Discharges

Purging, fecal discharge, postmortem delivery of fetus

Detachment

Peeling of skin, loosening of tissues, hair

Degloving

Of hands and feet

Colliquative putrefaction

- After attaining maximum swelling due to gas formation, body begins to shrink due to escape of gases.
- Starts from 5-7 days after death.
- Happens due to liquefaction of tissues.
- Lungs will collapse. Heart and other soft tissues in the thorax will be softened.
- Joints will become loose due to absence of gas rigidity.
- Shrinkage of abdomen due to escape of gases.
- Liver, spleen, kidneys, intestines and other soft tissues become soft, loose and are converted to semisolid pulsataceous mass.
- **Pink teeth**:- Teeth may be coloured pink in putrefied body



Conditions affecting putrefaction

- **Temperature:-** Rate of putrefaction is high in the temperature between 21°C and 38°C. It is arrested below 0°C and above 48°C.
- **Moisture:-** It is necessary since rapid drying arrests putrefaction.
- **Clothing:-** Coverings on the body hastens putrefaction by maintaining body temperature.
- **Condition of the body:-** Fatty and flabby bodies decompose faster than lean bodies due to larger amount of fat and fluid and greater retention of heat.
- **Cause of death:-**
 1. Bodies of person dying from septicemias, peritonitis, inflammatory and septic conditions decompose rapidly.
 2. Putrefaction occurs rapidly in infection due to *Clostridium Welchii*, e.g. acute intestinal obstruction.
 3. Poisons like carbolic acid, strychnine and datura delay putrefaction because of their preservative action.

Thank

You