

Putrefaction



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Classification of Postmortem Changes



- 1) Immediate changes
- 2) Early changes
- 3) Late changes

Late Changes



These follow after about 24 hours after death and represent decomposition or decay (**putrefaction**), or a modification of this process by **adipocere formation and/mummification**.

Decomposition / Putrefaction

- Last stage in the resolution of the body, from the organic to the inorganic state, is a certain sign of death.

AUTOLYSIS

- Rise of enzyme levels in the tissue cells after death.
- Softening & liquefying of the body tissue.
- Starts 3-4 hrs after death and continues for 2-3 days.

BACTERIAL ACTION

- Action of bacterial enzymes on tissue components – carbohydrates/fat/proteins.
- Bacterial growth – warmth, moisture are conditions favourable.
- Clostridium welchii, streptococci, E coli, B proteus.

Sequence of Putrefactive Changes



- 1) Color changes
- 2) Development of foul smelling gases
- 3) Pressure effects of putrefactive gases
- 4) Appearance of maggots
- 5) Other sequelae

CHARACTERISTIC FEATURES

COLOUR CHANGES

- Greenish discoloration of skin over caecum and flanks after death appears 18-24 hrs.
- Greenish to black discoloration-
'Sulphmethaemoglobin' formed by H_2S due to microorganisms in the large intestine.
- Appears early in summer & delayed in winter.

- Discoloration spreads- front of abdomen, external genitals, chest, neck, face, arms and legs – spreads whole body in 24-36 hrs.
- Discoloration of vessel walls due to pigmentation from decomposed blood over the shoulder and groin. **Arborescent pattern- 'Marbling'**

GASES OF PUTRIFACTION

- Development of gases under the skin and hollow viscera 18-36 hrs. 24-48 hrs in solid viscera.
- H₂S, ammonia, phosphated hydrogen, CO₂ and methane.
- Causes pseudo rigidity, exerts pressure.
- More gases accumulation, body floats in water.

PRESSURE EFFECTS OF PUTREFACTIVE GASES

- Displaces the diaphragm upwards.
- Discolored fluid and liquefied tissue mixes with gases producing froth.
- Bloating of the features.
- Shifting of the area of hypostasis.
- Changes in skin, hair and wound.
- Extrusion of fluid from the mouth and nose.
- Emptying of the heart.
- Changes in appearance of genitals.

APPEARANCE OF MAGGOTS

- Flies lay eggs over the decomposed body-nose, mouth, vagina and anus in 18-36 hrs.
- After 24-36 hrs eggs hatch into larvae or maggots, enter the body and destroy the tissues.
- After 4-5 days develop into pupae.
- After 7-8 days into adult fly.

OTHER SEQUAE

- Fall of teeth
- Separation of skull sutures
- Liquefied brain matter oozes out.
- **‘Colliquative putrifaction’** – this process takes place between 7-14 days.

INTERNALLY

STOMACH

- Dark red patches over the walls
- Perforation due to autolysis

LIVER

- Softens and flabby
- Becomes spongy '**Foamy liver**'

- Early putrefaction 24-48hrs

Larynx, trachea, brain of infants, stomach, intestines, spleen, omentum and mesentery, liver and adult brain.

- Late putrefaction 2-3 weeks

Heart, lungs, kidneys, bladder, esophagus, pancreas, diaphragm, blood vessels, prostate, testis and non gravid uterus, ovaries.

FACTORS MODIFYING PUTREFACTION

■ ***EXTERNAL***

Warmth and clothing

- Putrefaction begins at 10°C and occurs rapidly at 37°C.
- Freezing point – bacterial growth inhibited and putrefaction will not occur.
- Clothing hastens putrefaction initially and protects against flies and insects.

Moisture

- Help in rapid multiplication of organisms.
- Bodies recovered from water if left in air, decomposes rapidly.

Air

- 1 week in air = 2 weeks in water = 8 weeks buried – ‘Casper dictum’

Manner of burial

- In air tight coffins, very little change of body for long periods.
- Without coffins, putrefaction is very rapid.
- Bodies in deep graves putrefy very slow.
- Bodies buried in lime, decomposition is retarded.
- Bodies in sandy and porous soils are conducive to mummification.

INTERNAL FACTORS

- Age and condition of the body
- Sex
- Mode of death

Medicolegal
Importance of

Putrefaction

Medicolegal Importance



- 1) It is a reliable sign of death
- 2) Time since death can be estimated from the stage of putrefaction
- 3) Advanced decomposition obliterates identity
- 4) Advanced decomposition also obliterates cause of death
- 5) Place of burial can be determined

THE END.

