

EMBALMING

EMBALMING

- **Definition:** It is a process of preservation of dead body by treating it with antiseptic and preservatives to prevent putrefaction.
- By this process,
 1. Protein are coagulated
 2. Tissues are fixed
 3. Organs are bleached and hardened
 4. Blood is coagulated and transformed into a pinkish brown mass

- Embalming produce a chemical stiffening similar to rigor mortis but normal rigor does not develop.
- Rigidity in case of embalming is permanent.
- To get desired effect- embalming to be done within 6 hrs. of death.
- If done several hrs. of death, the body will show mixture of bacterial decomposition and mummification and will disintegrate in few months.

Embalming is done in:

- Medical College to preserve dead body for the purpose of education and dissection.
- When the dead body has to be taken from one country to other or in same state for last rituals.
- Embalming is done by injecting embalming fluid in the body.

EMBALMING CHEMICALS

- Variety of preservatives, sanitizers, disinfectants & additives used
- The purpose is to temporarily delay decomposition & restore a natural appearance for viewing a body after death
- A mixture of these chemicals is known as embalming fluid & is used to preserve deceased, sometimes only until the funeral, other times indefinitely
- Typical embalming fluid contains a mixture of formaldehyde, gluteraldehyde, methanol, ethanol & other solvents
- The formaldehyde ranges from 5 to 35 % & ethanol range from 9 to 56 %

Composition of an ideal embalming fluid

- Formaline(preservstive) • 1.5 liters
- Sodium borate(buffer) • 600grms
- Sodium citrate(antocoagulant) • 900grm
- Glycerine(wetting agent) • 600ml
- Sodium chloride(controle ph) • 800gm
- Eosin(1%)(cosmetic) • 30ml
- Soluble winter green(perfume) • 90ml
- Water(vehicle) • Upto10 lit

Types of embalming

1. Arterial embalming
2. Cavity embalming
3. Hypodermic embalming
4. Surface embalming
5. Embalming of autopsied body
6. Embalming of AIDS body

ARTERIAL EMBALMING

- The injection of embalming chemicals into the blood vessels, usually via the right common carotid artery
- Blood is displaced from the right jugular vein.
- The embalming solution is injected with a centrifugal pump/Hand/ foot pump /Stirrup pump/Bulb syringe/Motorised injectors
- In case of poor circulation, other injection points are used
- On completion the vessel should be ligated to prevent leakage of embalming fluid.

CAVITY EMBALMING

- The suction of the internal fluids of the corpse & injection of embalming chemicals into body cavities, using an aspirator & trocar
- A small incision just above the navel & pushes the trocar in the chest & stomach cavities to puncture the hollow organs & aspirate their contents
- Then fills the cavities with concentrated chemicals that contains formaldehyde
- The incision is either sutured or a “trocar button” is screwed into place

HYPODERMAL EMBALMING

- Suitable for embalming isolated limbs, body parts following bomb blast, air crush, railway injuries
- Embalming fluid injected subcutaneously.

SURFACE EMBALMING

- Which supplements the other methods, especially for visible, injured body parts
- Suitable for burn injury cases.
- Whole body is packed with cotton soaked in embalming fluid

Embalming of autopsied body

- Before stitching up ,thoraco-abdominal and cranial cavity is sponged with embalming fluid
- Then viscera properly treated with embalming fluid, covering and packing with embalming fluid
- soaked cotton placed within the body cavity and stitched up.
- If body is already stitched up, removed and restitched

Embalming of AIDS bodies

- Concentration of arterial and cavity embalming fluid is increased.
- Recommended precaution to be taken during handling the body

MEDICOLEGAL ASPECTS OF EMBALMING

1. Embalming should never be allowed **before autopsy**, it may induce artefacts and poses difficulty in interpreting the finding.
2. Embalming provides chemical stiffening similar to rigor mortis, so difficulty arise in estimating time since death.
3. Embalming alter the appearance of body so interpretation of injuries become difficult
4. Embalming destroys cyanide, alcohole, opiates, carbon monoxide thus toxicological analysis become useless or difficult.
5. Embalming kills bacteria so bacteriologic evaluation become useless.
6. Due to embalming blood group cannot be made out.
7. Detection of thrombus or embolism are not possible.

- Starvation

Starvation

- **Starvation (Protein calorie deficiency)**-It results from total / partial deprivation of food or taking of food which is lacking of proteins & vitamins.
- Calorie requirement for Avg. person: 1800-2000cal/day.
- Avg. person survive:
- Without food & water: upto 10 days
- With water only: upto 60 days

Starvation

- Type:
 - 1. Acute:** total deprivation of food for a continuous period.
 - 2. Chronic:** partial deprivation of food or taking of food which is lacking of proteins & vitamins.
- C/f:
 - Initially hunger,
 - followed by hunger pain, thirst, weakness &
 - lack of concentration are the chief features.

Starvation

- Factors affecting starvation:
 - Age:
 - Sex:
 - Built:
 - Body fat:
 - Cold: precipitate d/t $\uparrow$ BMR.

Autopsy findings

- Externally:

- Emaciated d/t loss of subcutaneous fat.
- Body: pale d/t nutritional anaemia.
- Skin: dry, pale, wrinkled, thin & parchment like
- Hair: dry, brittle & lusterless
- Sunken eyes, cheeks & abdomen d/t loss of subcutaneous fat.
- Lips: dry & cracked.
- Tongue: dry & coated.
- Nail: dry & ridged.
- Muscles: flabby.
- Oedema over lower limbs d/t hypoproteinemia.
- Bones & joints become prominent.

Autopsy findings

- Internally:
- Loss of body fat & atrophy of muscles
- Stomach & intestine: contracted & transparent.
- Gall bladder: distended & contains bile.
- All organs except brain: shrunken.
- Brain: edematous

Cause of death

- Circulatory failure
- Intercurrent infection
- **Note**: Before certifying starvation as COD, autopsy surgeon must exclude any mental / physical illness (such as TB, cancer, pernicious anaemia, chronic diarrhoea, stricture / malignancy of alimentary canal).

Medico-legal importance

1. Starvation may be manifestation of self neglect
2. Diseases causing loss of weight
3. Starvation may homicidal, victim is usually infant, or aged
4. **Baby-farmer** is a condition in which children starved by their parents or guardians
5. Starvation may be accidental if person is caught/entombment in mines, earthquake, or landslides
6. Sign of neglect and emaciation may be seen in drug addicts, where the desire for drug is more than desire for food
7. Starvation may suicidal, person fast voluntarily for the purpose of exhibition, public attention