
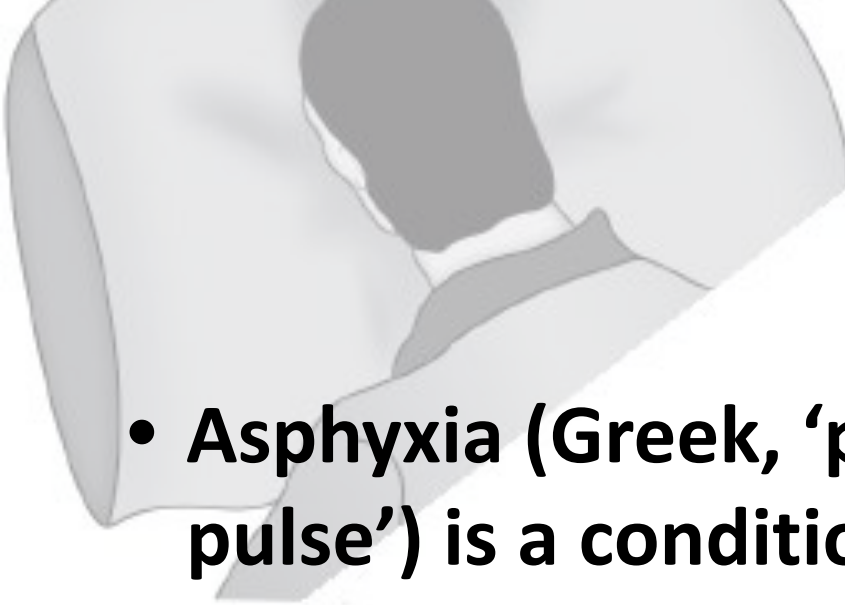
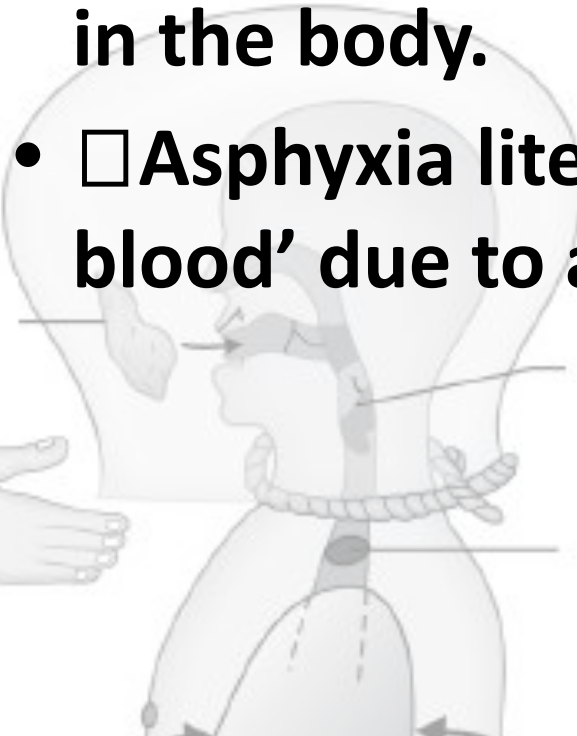



ASPHYXIA



- **Asphyxia (Greek, ‘pulselessness’ or ‘absence of pulse’) is a condition caused by interference with the exchange of oxygen and carbon dioxide in the body.**



- **Asphyxia literally means ‘defective aeration of blood’ due to any cause.**



Etiology of Asphyxia

- 1. Mechanical/violent**
- 2. Pathological**
- 3. Toxic or chemical**
- 4. Environmental**
- 5. Traumatic**
- 6. Positional/postural**
- 7. Iatrogenic**

HANGING

Hanging

- Hanging is a form of asphyxia caused by suspension of the body by a ligature which encircles the neck, the constricting force being at least part of the weight of the body.

Classification

- On the basis of position of the knot

- A. **Typical hanging:** When the point of suspension is placed centrally over the occiput, i.e. the knot is at the nape of neck on the back.
- B. **Atypical hanging:** Knot of ligature is anywhere other than on the occiput.

- On the basis of degree of suspension

- A. **Complete hanging:** Body is fully suspended and no part of body touches the ground. Constricting force is weight of the body.
- B. **Incomplete or partial hanging:** Lower part of the body is touching the ground (toes or feet touching the ground) or in sitting, kneeling, lying down or prone position. Weight of the head acts as the constricting force.

- On the basis of intent

- A. Suicidal
- B. Accidental
- C. Homicidal
- D. Autoerotic



Fig. 10.2: Classification of hanging (position of knot)



Fig. 10.3: Classification of hanging (degree of suspension)

Cause of Death

- i. *Asphyxia:*
- ii. *Venous congestion*
- iii. *Combined asphyxia and venous congestion:* **Commonest cause.**
- iv. *Cerebral anemia*
- v. *Reflex vagal inhibition* leading to sudden cardiac arrest.
- vi. *Fracture/dislocation of cervical vertebrae:* It is seen in judicial hanging.

Secondary effects of hanging in persons who have recovered (near-hanging) are:

1. . Hemiplegia
2. . Epileptiform convulsions
3. . Amnesia
4. . Cervical cellulitis
5. . Parotitis
6. . Retropharyngeal abscess.

Autopsy of Neck (Asphyxial Deaths)

- Photograph of the victim along with ligature (if present) is recommended.

A - External Examination

- *General features*
- *Ligature*
- *Ligature description*
- *Description of ligature mark or furrow*

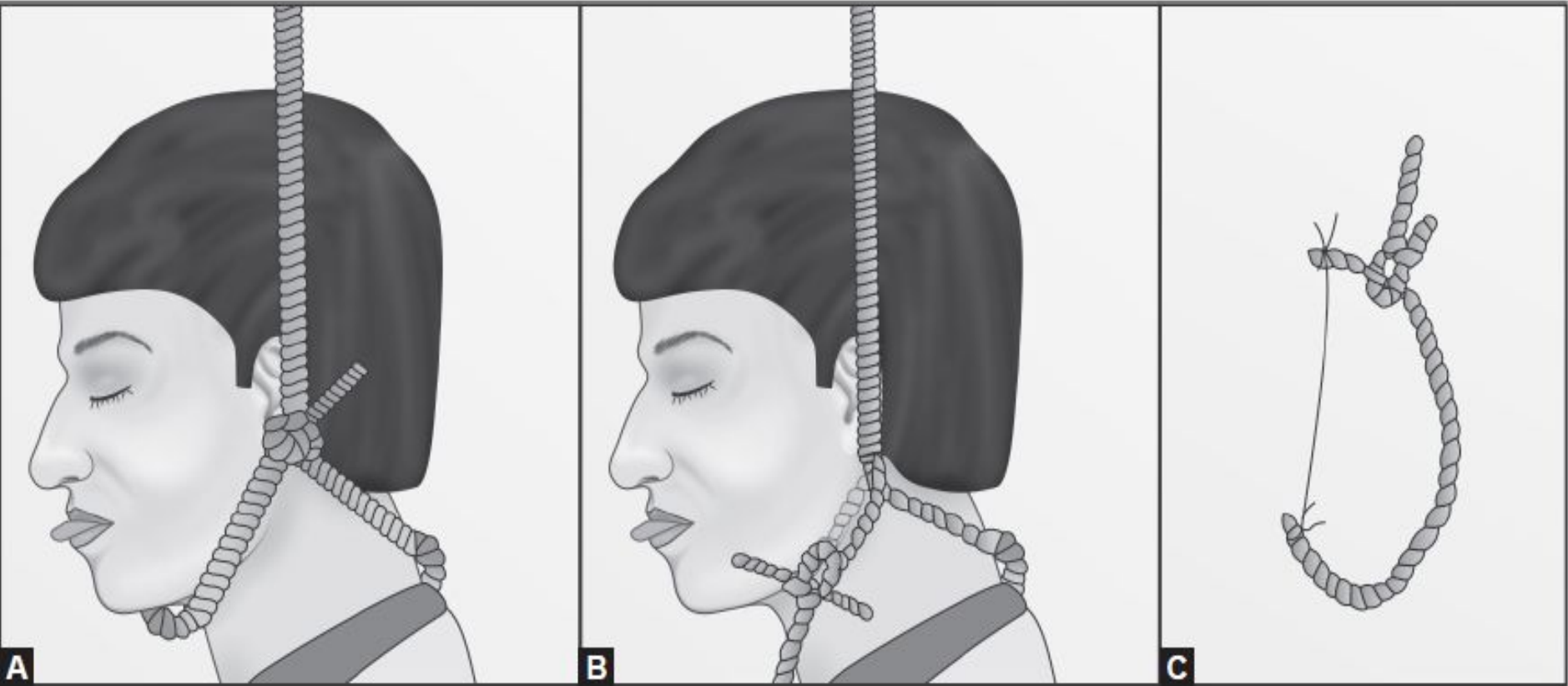
B - Internal Examination

Ligature

- Is ligature present in situ or removed?
- **Knot:** If in situ, note knot position, number of loops.

Ligature description

- Type of material
- Circumference of noose
- Width
- Nature of knot (slip-knot or fixed).
- If, in situ, it should be cut away from knot and reconstructed by joining cut ends with tape or another cord



Figs 10.4A to C: (A) Fixed noose, (B) Running noose, (C) Method of cutting the noose and preserving the cut ends and the knot

Description of ligature mark or furrow

1. Course (angled or straight)
2. Width
3. Associated skin changes or trauma
4. Relation to thyroid cartilage
5. Pattern
6. Neck circumference at level of furrow (to determine degree of neck constriction)
7. Transfer of ligature material.

Factors which influence the appearance of ligature mark

- ***Period of suspension:*** Longer the suspension, deeper is the groove, and it is more prominent and parchmented.
- ***Degree of suspension:*** Mark becomes more prominent and deep in case of total suspension.
- ***Weight of the body:*** Heavier the body, more marked is the ligature impression.

Postmortem Findings in Hanging

- **A . External Findings**
 1. **Face**
 2. **Neck**
 3. **Other parts of body**

1. Face

- i. Swollen, cyanosed face .
- ii. Prominent eyeballs
- iii. Dilated pupils
- iv. Subconjunctival hemorrhages.
- v. Protrusion of tongue.
- vi. Bleeding from nose/ears .
- vii. Lips and mucous membrane of mouth are blue.
- viii. Dribbling of saliva: *Surest sign of antemortem hanging.*

2. Neck

i. Ligature mark ('furrow')

1. *Site*: Usually above the THYROID.
2. *Size/shape*: Depends on the type of material used.
3. *Direction*: It runs obliquely, backwards, non-continuous, upwards and towards the point of suspension. *Skin at the site*: Usually depressed/grooved, pale in color, but later becomes yellowish brown, dry, hard and parchment-like with small abrasions at its edges, corresponding to the thickness and edges of the rope. These abrasions, known as *rope burns*, are due to frictional force.
4. The pattern of ligature may be reproduced in the furrow.
5. Postmortem blisters may be seen on skin squeezed adjacent to the furrow.

❖ Based on the ligature mark in the neck, the **diagnosis of antemortem hanging can be made if the following triad of characteristics** is present:

- i. Streaks or bands of reddened or pink tissue
 - ii. Imprint of the pattern of the ligature in the furrow
 - iii. Sloping or upward angle towards the suspension point.
- Microscopically, engorgement in the reddened and pinkish area in contrast to the adjacent non-engorged and nonhemorrhagic areas may be demonstrated.

Medico-legal Questions

Q. Whether the hanging was suicidal, homicidal or accidental?

Suicide

Homicide:

Very rare. Not ordinarily possible in an adult victim, unless intoxicated or made unconscious or the victim is either a child or a debilitated person.

- Homicide should be suspected where:
 - i. There are signs of violence/disorder of furniture
 - ii. Clothing of deceased is torn or disarranged
 - iii. There are injuries, either offensive or defensive.

Postmortem hanging/postmortem suspension

- Person may be murdered and the body suspended to simulate suicide. Look for signs of dragging to the place of suspension. Beam or branch of tree shows evidence of the rope having moved from below upwards, as the body has been pulled up. *In true suicidal hanging, the rope moves from above downwards .*

Differentiation 10.1: Antemortem and postmortem hanging

S.No.	Feature	Antemortem hanging	Postmortem hanging
1.	Salivary dribbling mark	Present	Absent
2.	Fecal/urinary stains	May be present	Absent
3.	Ligature mark <ul style="list-style-type: none"> ◆ Direction ◆ Continuity ◆ Level in the neck ◆ Parchmentization ◆ Vital reaction 	Oblique Non-continuous Above thyroid Present Present	Circular Continuous At or below thyroid Absent Absent
4.	Knot	Single, simple, on one side of neck	Multiple, granny or reef type on occiput/chin
5.	PM staining <ul style="list-style-type: none"> ◆ Above ligature mark ◆ In lower limbs ◆ Glove-stockings like 	Present Present Present	Absent Absent Absent
6.	Evidence of injury <ul style="list-style-type: none"> ◆ Self-inflicted ◆ Struggle ◆ Tear of carotid artery intima ◆ Imprint abrasion 	Present Absent Present Present	Absent Present Absent May/may not be present
7.	Elongation of neck	Present	Absent
8.	Cyanosis	Deeply positive	Absent or faintly present
9.	Emphysematous bullae on lungs	Absent	Present
10.	Point of suspension	Compatible with self-suspension	Not so
11.	Histochemistry of ligature mark	Increased serotonin and histamine	Not so

Lynching

- Lynching is *a form of homicidal hanging*.
- A suspect, an accused or an enemy is overpowered by several persons, acting jointly and illegally, and hung him by means of a rope from a tree or some similar object.
- It was prevalent in North America, where it was practiced by whites on blacks .

Judicial Hanging

- In case of judicial hanging, the ligature is looped around the neck with the knot under the chin (submental), but subaural (below auricle) knot is also used.
- The drop is at least the height of the person (5–7 feet, depending on the weight) and the hanging is complete. The ligature around the neck causes a forceful jerky impact on the neck at the end of the fall, so as to cause fracture of cervical column (fracture dislocation of C2 from C3, rarely C3 and C4 vertebrae—*hangman fracture*) with stretching or tearing of cervical spinal cord, but not decapitation. In judicial hangings, odontoid process is usually not fractured.