POSTMORTEM CHANGES AND TIME SINCE DEATH - 2

EARLY POST MORTEM PERIOD

OBJECTIVES

At the end of this lecture students should be able to,

- Define the important post mortem changes
- Identify the factors influencing post mortem changes

OBJECTIVES

- State the medico legal significance of various post mortem changes

- Differentiate hypostasis from a contusion

MUSCLE CHANGES

- Primary flaccidity followed by rigor mortis

- With putrefaction rigor disappears and secondary flaccidity begins

RIGOR MORTIS

- Post mortem stiffening and shortening of all muscles of the body due to actin and myosin fuse to form gel in the absence of ATP is called rigor mortis.

MECHANISM OF FORMATION

After death,

ATP breaks down

↓

Lactic acid

↓

Actin + Myosin combine

↓

Rigor mortis

ONSET AND DISAPPERANCE

- Onset- 2-4 hours in the face, eyelids, back of the neck, jaw and front of the neck (smaller muscle groups)
- Spreads to trunk 4-6 hours
- Involves larger joints 6-8 hours
- Smaller Joints 8-10 hours
- Complete – 12 hours

ONSET AND DISAPPERANCE

- Lasts- 12 hours
- Goes off- 36 hours
- Usually the disappearance follows the same order
- Once the fully established rigor is broken it will not return

DIFFERENTIAL DIAGNOSIS

1. Cadaveric rigidity

Stiffness of muscles that has its onset immeadiately at death

Finding of items firmly gripped in the hand before the onset of normal rigor

Mechanism is possibly neurogenic

DIFFERENTIAL DIAGNOSIS

2. Cold stiffening
3. Heat stiffening

EFFECTS OF RIGOR MIMICKING ANTE MORTEM CONDITIONS

- Contraction of the Dartos- scrotum is lifted
- Seminal vesicles, prostate and Dartos- expulsion of semen
- Heart muscle- appear as left ventricular hypertrophy

FACTORS AFFECTING RIGOR

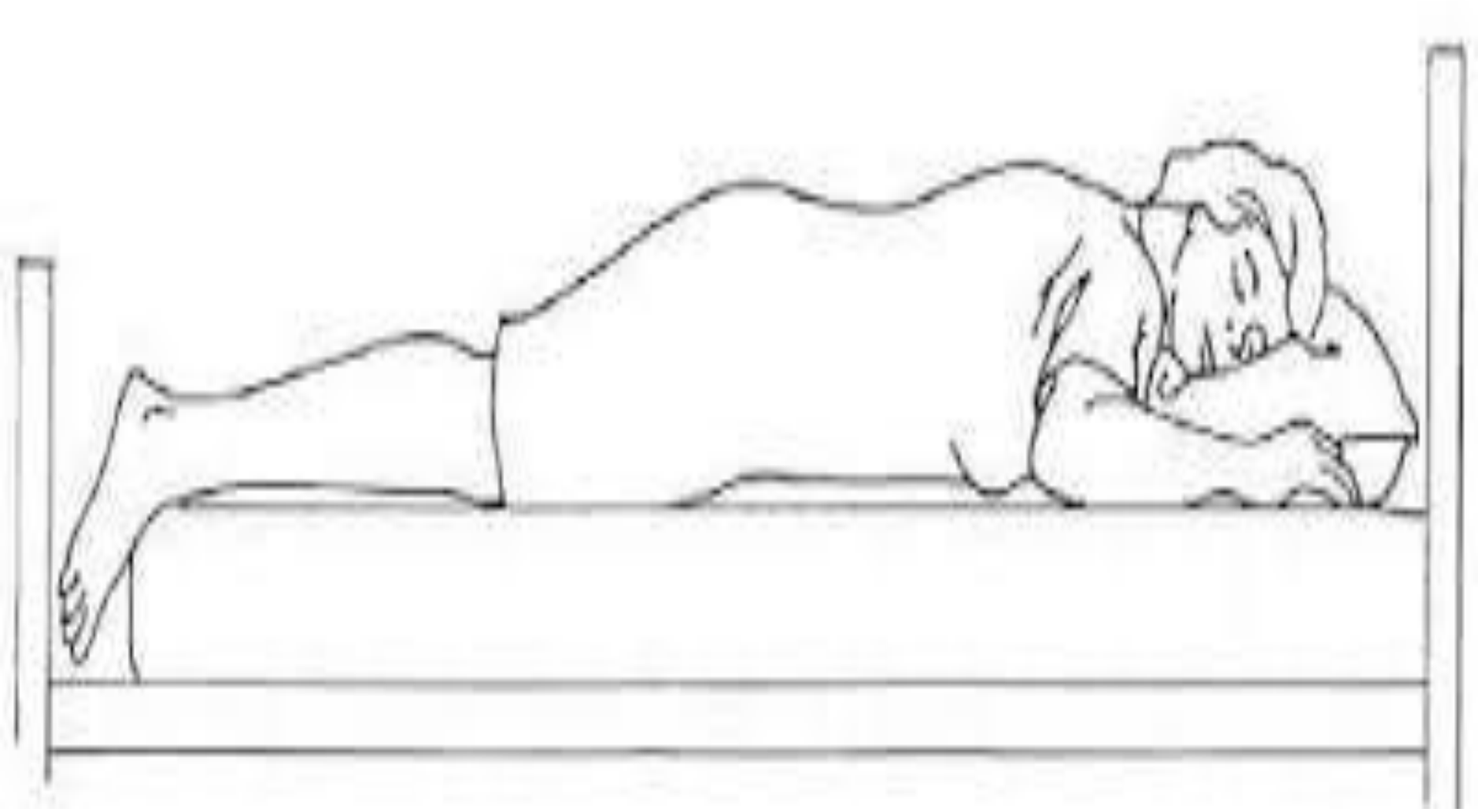
- Weather hot- develops fast
- Increased physical activity, following electrocution- develops fast

FACTORS AFFECTING RIGOR ctd.

- Extremes of age- rapid onset and disappearance
- Build- muscular slow
- After insulin injection – develops fast

MEDICO LEGAL SIGNIFICANCE

- To ascertain the time since death
- To give an opinion on the possibility of mobilizing the body after death
- To determine the initial posture of the body, after moving the body



BLOOD CHANGES – HYPOSTASIS

- Known as post mortem lividity
- It is seen as purplish discoloration of the skin in the dependent areas

HYPOSTASIS ctd.

•Not seen in pressure areas like shoulder blades, buttocks, calves, depths of folds of fat and pressure points due to clothing

• The mechanism is gravitation of liquid blood within the vasculature

TIME OF ONSET AND DISAPPEARANCE OF HYPOSTASIS

- Time of onset is 1 hour after death
- Seen markedly at 5- 6 hours
- It is usually complete (fixed) in 10- 12 hours after death
- However this fixation of hypostasis is just a vague generalization

TIME OF ONSET AND DISAPPEARANCE OF HYPOSTASIS ctd.

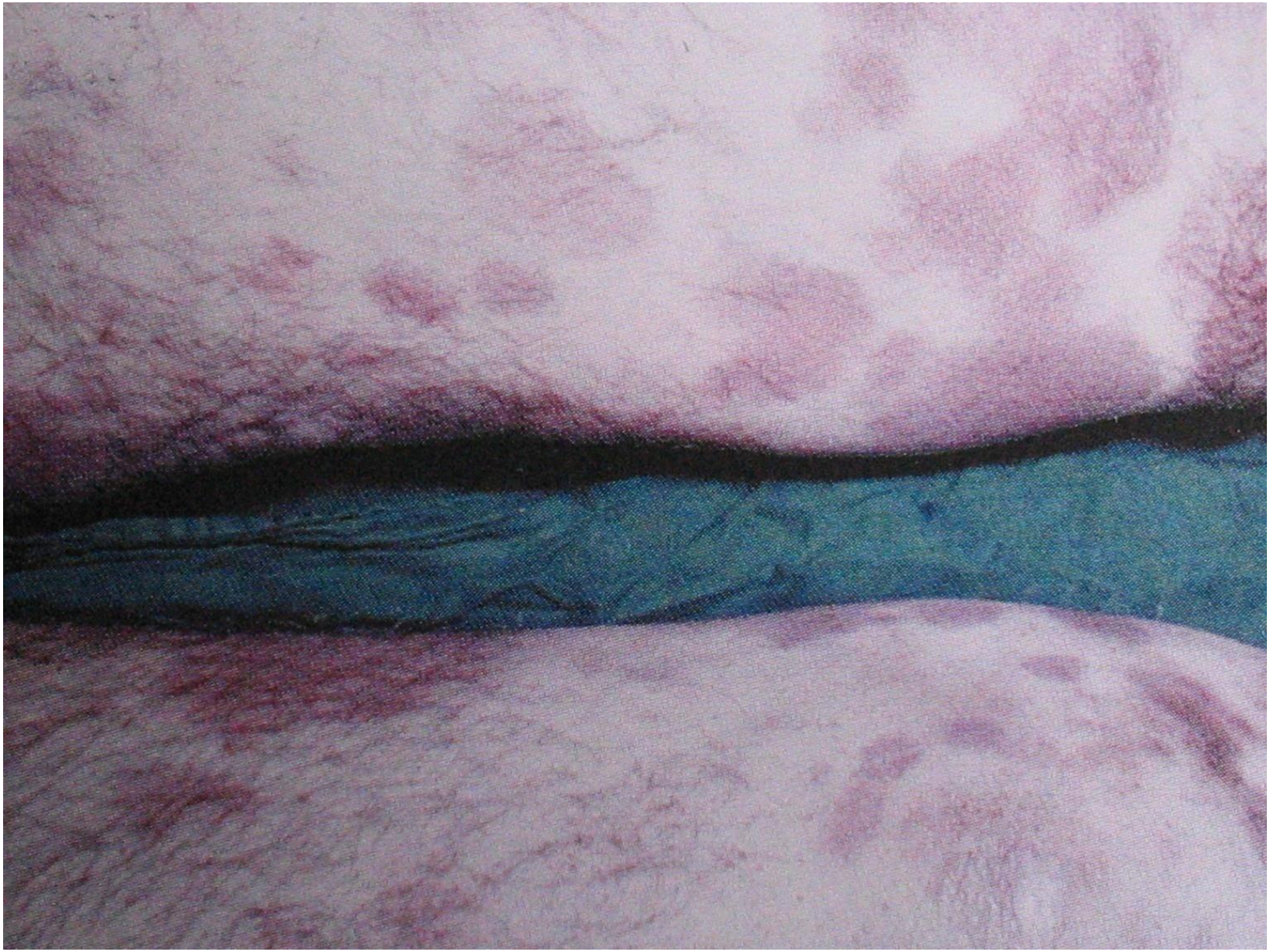
- If the body is changed < 6-12 hours hypostasis may be seen according to the second posture

- If changed > 6-12 hours hypostasis may not change or may be found in both dependent areas

TIME OF ONSET AND DISAPPEARANCE OF HYPOSTASIS ctd.

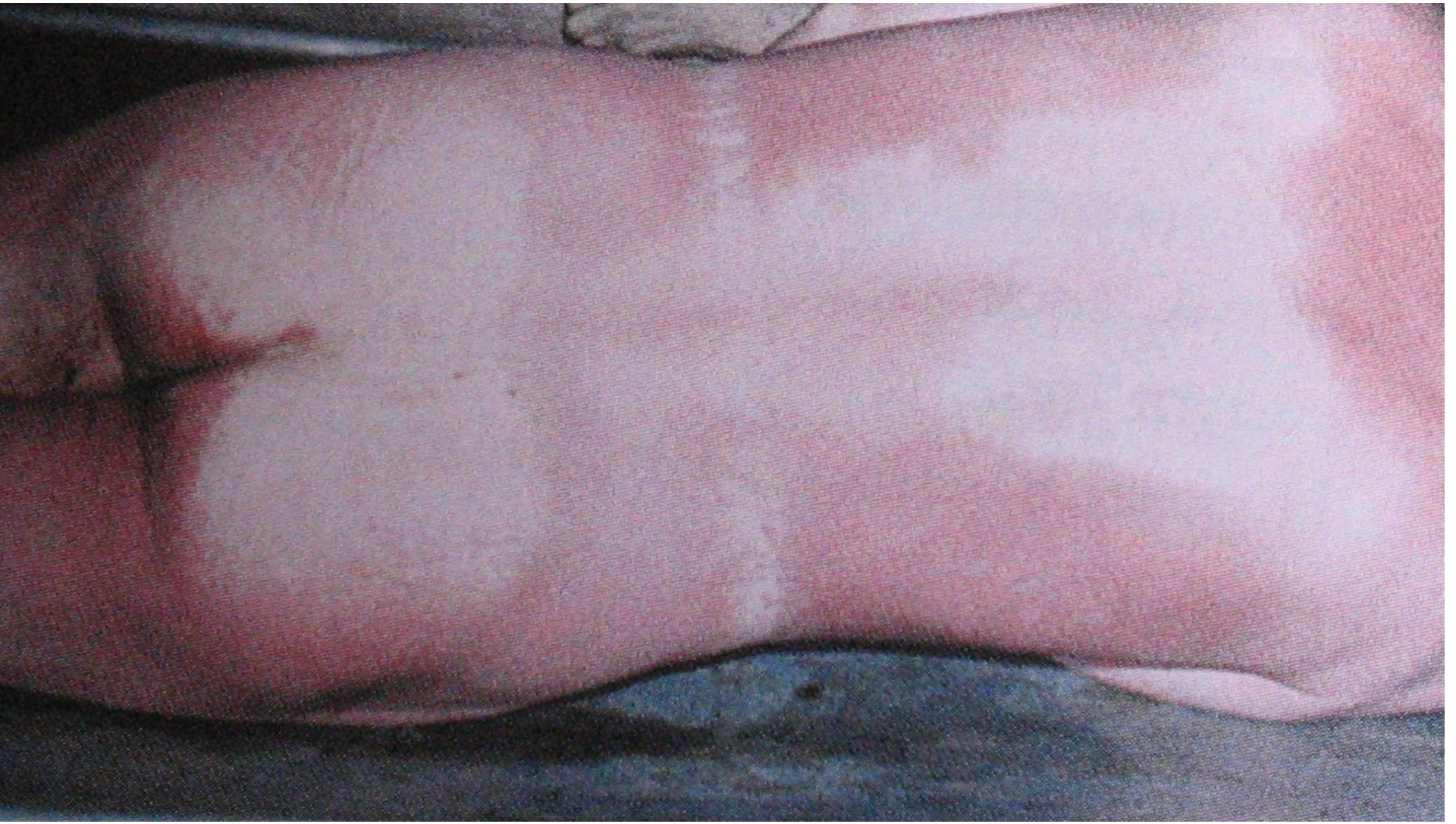
- In severe anaemia or in haemorrhage hypostasis may not be visible

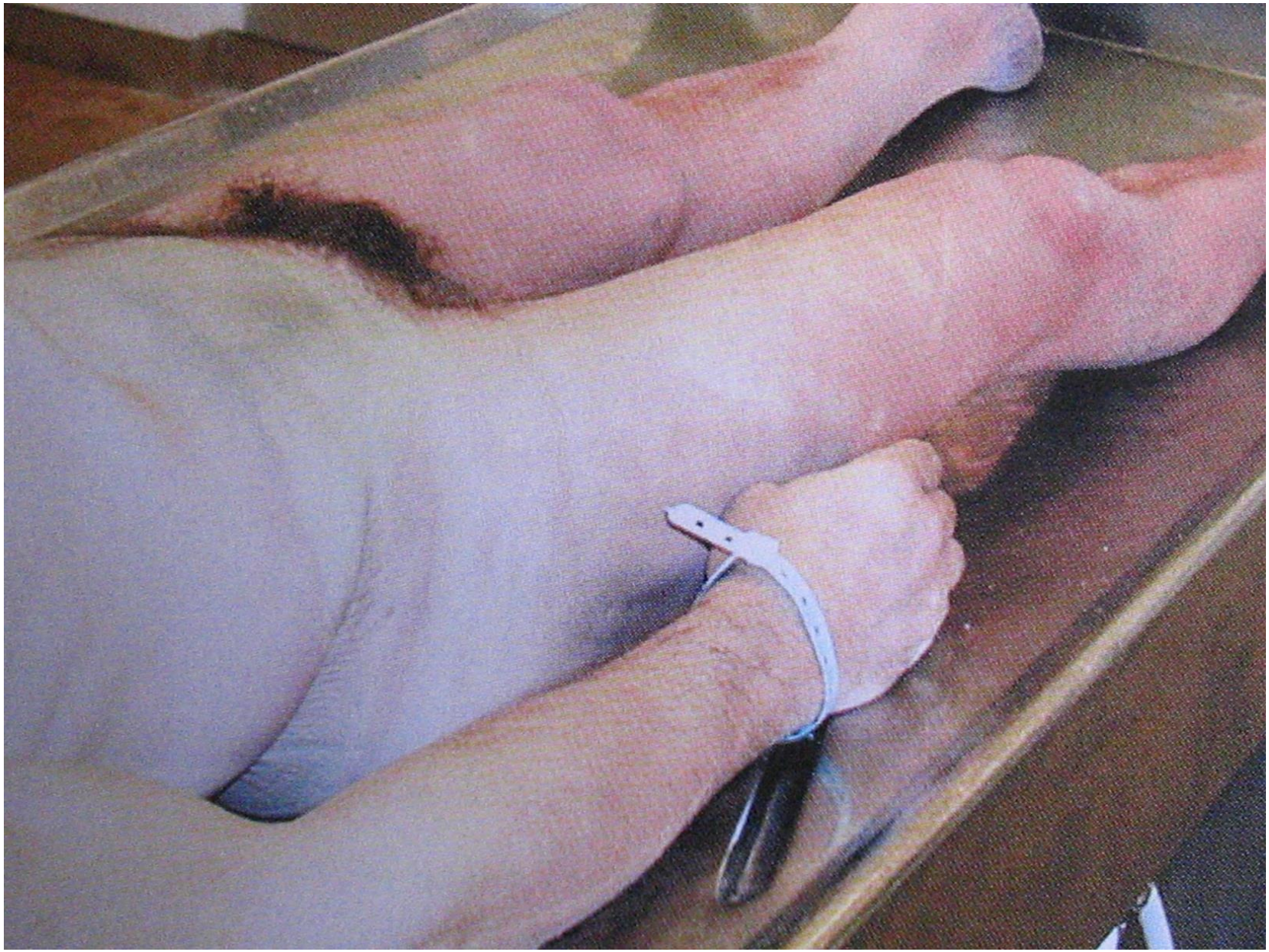
- Hypostasis can be seen in the internal organs as well



Absence of hypostasis in pressure areas

Absence of hypostasis in pressure areas





THE COLOUR OF HYPOSTASIS

May indicate the cause of death,

1. Poisoning with CO- cherry pink
2. CN- pinkish red
3. Nitrate/ Aniline- brown
4. Anaemia/ Haemorrhage- light

THE COLOUR OF HYPOSTASIS ctd.

5. Anoxia- blue
6. Hypothermia- Pink (Also seen if the body is refrigerated)
7. Sepsis with Clostridium Perfringens- bronze
8. Methaemoglobinemia- brownish red

Fig. 13 Cherry-red appearance of carbon monoxide poisoning.

MEDICO LEGAL SIGNIFICANCE

- Estimation of time since death
- Estimation of posture at the time of death
- May indicate the cause of death

DIFFERENTIAL DIAGNOSIS OF HYPOSTASIS

- Hypostasis in bowel loops which are dependent – mimic a mesenteric infarction
- In lungs can mimic pneumonia or an infarction
- Heart- a dark patch on posterior wall of left ventricle may appear as an infarction

DIFFERENTIAL DIAGNOSIS OF HYPOSTASIS

- Behind the oesophagus at the level of the larynx, can be mistaken for a contusion
- External hypostasis may mimic bruise

HOW TO DIFFERENTIATE HYPOSTASIS FROM A CONTUSION

HYPOSTASIS	CONTUSION
Overlying skin may not have injuries	Usually the skin is associated with injuries
No swelling	Swelling is usually associated
Margins are clearly defined	Diffuse margin
Superficial	Underlying subcutaneous tissues and the muscles are usually contused

HOW TO DIFFERENTIATE HYPOSTASIS FROM A CONTUSION ctd.

HYPOSTASIS	CONTUSION
Present in dependent areas only	May see in non dependent areas as well
Not seen in pressure points	Seen
Once cut oozing may be seen and can be washed off	No oozing, cannot wash off

Traumatic Asphyxia

EYE CHANGES

1. Dilation of the pupil

- At the time of death fully dilated
- With onset of rigor-mid position
- In 10-12 hours may be fully constricted
- Later dilates again

EYE CHANGES ctd.

2. Intra ocular pressure

- Starts to drop in ½ an hour
- Zero in 2 hours with soft and flaccid eye ball

EYE CHANGES ctd.

3. Cornea

- Clouding and wrinkling in 6 hours if eyes are open
- If closed in 12 hours

EYE CHANGES ctd.

4. Retina – due to cessation of circulation

- Segmentation and trucking in 1 hour
- Pale in 2 hours
- Hazy disc out line in 6 hours
- Blurred in 10 hours

EYE CHANGES ctd.

5. Tache Noire

- Gets only when eyes are open
- Can see as a brownish area in sclera due to drying which is triangular in shape

EYE CHANGES ctd.

6. K+ concentration in vitreous humour

- Rises in infants faster than in adults
- It is useful only after 24-36 hours later

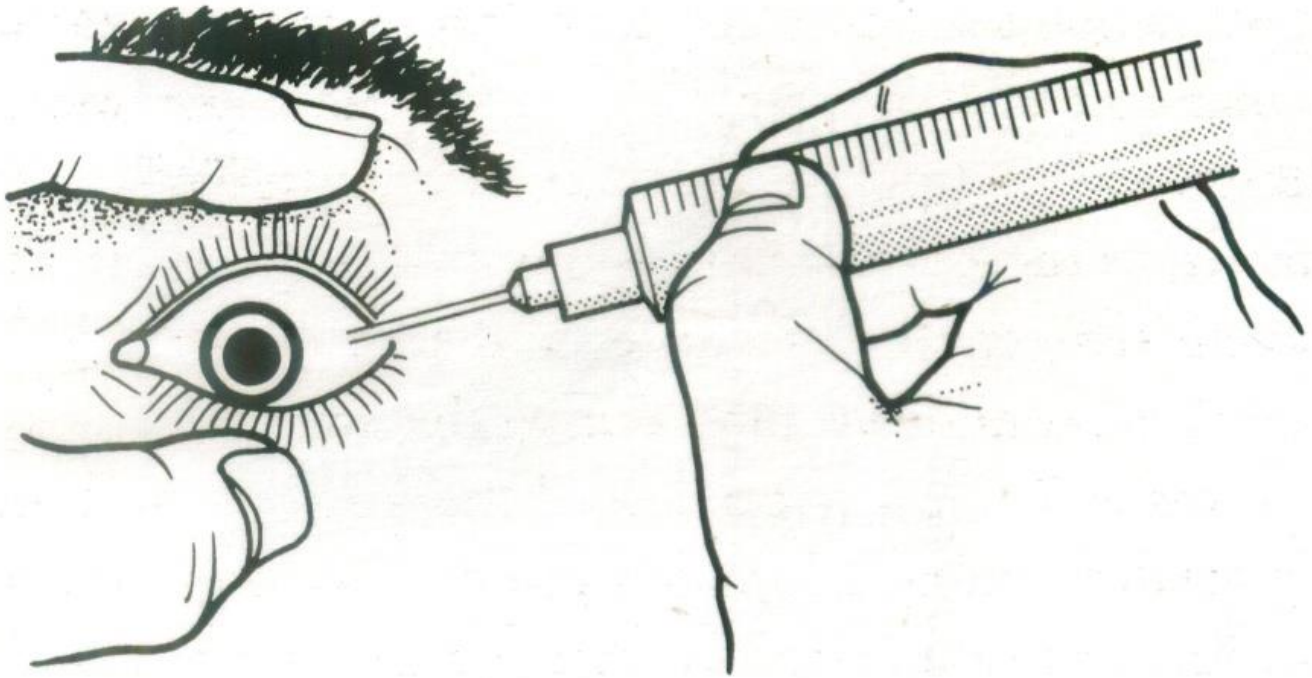


FIGURE 2.35 *Obtaining vitreous humour for analysis. The lids should be retracted and the needle introduced near the outer canthus, so that the hole will be covered when the lids are released. Fluid should be withdrawn slowly, keeping the tip of the needle in the centre of the globe to avoid dislodging the retina. Water can be reintroduced through the needle to restore the tension in the globe for cosmetic reasons.*

SKIN CHANGES

- Loss of elasticity
- Pale and cyanosed
- Cutis anserina – goose flesh due to rigor of erector pili

"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"