




POSTMORTAL CHANGES

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Death

- It is a process rather than event
 - Cardiorespiratory arrest → brain function ceases - 3-4 minutes – risk of cortical damage
 - unconsciousness, loss of all reflexes (the light reflex, corneal reflex – ischaemic failure of the brainstem), no reaction to painful stimuli
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Types of death

- Somatic death – virtually equated with brain death
 - unconciousness, unable to appreciate any sensory stimuli, no voluntary movement
- Cellular death – the tissues and their constituent cells are dead
 - different tissues die at different rates

Diagnoses of death

- No breathing, no heart beating
= uncertain signs of death

- certain signs of death

- Tonelli test of pupils
- livores mortis (post-mortem hypostasis)
- rigor mortis (stiffness)

X supravital reactions (persistence of some tissue functions– muscles can contract)

Postmortal changes

- Physical – hypostasis (livores mortis), cooling of the body (algor mortis), desiccation, diffusion of liquids and gases
- Chemical – rigor mortis, fermentative autolysis, putrefaction
- Assisted of animal predators...

Hypostasis

- „livores mortis“ , „staining“ „lividity“
- circulation ceases → gravity pulls down the stagnant blood to the lowest areas → hypostasis & dependent oedema (blistering)
- the pattern depends on the posture of the body (most common on the back)
- bluish red, red purple ...depends on the state of oxydation
- pink, bright red... hypothermia
- „cherry pink“ ...CO poisoning













The timing and permanence of hypostasis

- variablehalf an hour of death (back of the neck)5-6 h spreads over the body
- may not appear at all (infants, old people, anaemia)

If the body is moved into a different posture

- remain fixed
- move completely
- partly fixed and partly relocated

- true staining of the tissues due to haemolysis - 2nd or 3rd day in temperate conditions
- Hypostasis in inner organs and tissues
- diff. hypostasis x haematoma
(incision → intravascular, wiped x infiltrating, fixed)
- skin haemorrhages (vibices, Tardieu spots)




Tardieu spots

Rigor mortis

- the stiffening of the muscles has some relevance in determining PMI
- The flacid period – 3-6 h after death
- Rigor mortis – small joints first
 - jaw, facial muscles, neck → wrist, ankles → knees, elbows, hips
 - reach the maximum within 6-12 h
 - duration of full rigor 18-36 h

Factors affecting the timing of rigor mortis

- chemical process
(at death \downarrow ADP \rightarrow ATP - 85% ...actin&myosin rigidly linked \rightarrow stiffness)
- temperature (the colder enviroment, the slower process x increased body temp.)
- physical activity shortly before death
(depletion of glycogen)
- deaths from electrocution

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- in other tissues – the iris, the heart, dartos muscle → extrusion of semen, erector pili muscles → „goose-flesh“, „chicken skin“
 - cadaveric spasm – virtually instantaneous form of rigor at the time of death
 - if rigor is broken – will not return x return in new position (depend on the phase of development)

Desiccation

- evaporation from superficial layers of the skin
- change of appearance of cornea, lips, abrasions
- „tache noire“



Tache noire










Decomposition

- autolysis of individual cells
 - tissue autolysis from liberated enzymes
 - external processes (bacteria, fungi from the intestine and outer environment)
 - animal predators (maggots, mammals..)
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Putrefaction

- begins at about 3 days after death
- discoloration of the lower abdominal wall
→ abdomen → face and neck
- reddish green ... dark green
- „marbling“ at about 1 week
- skin blisters & skin slippage
- gas formation, dark red fluid in cavities
- bloody fluid from any orifice
- heavy maggot infestation



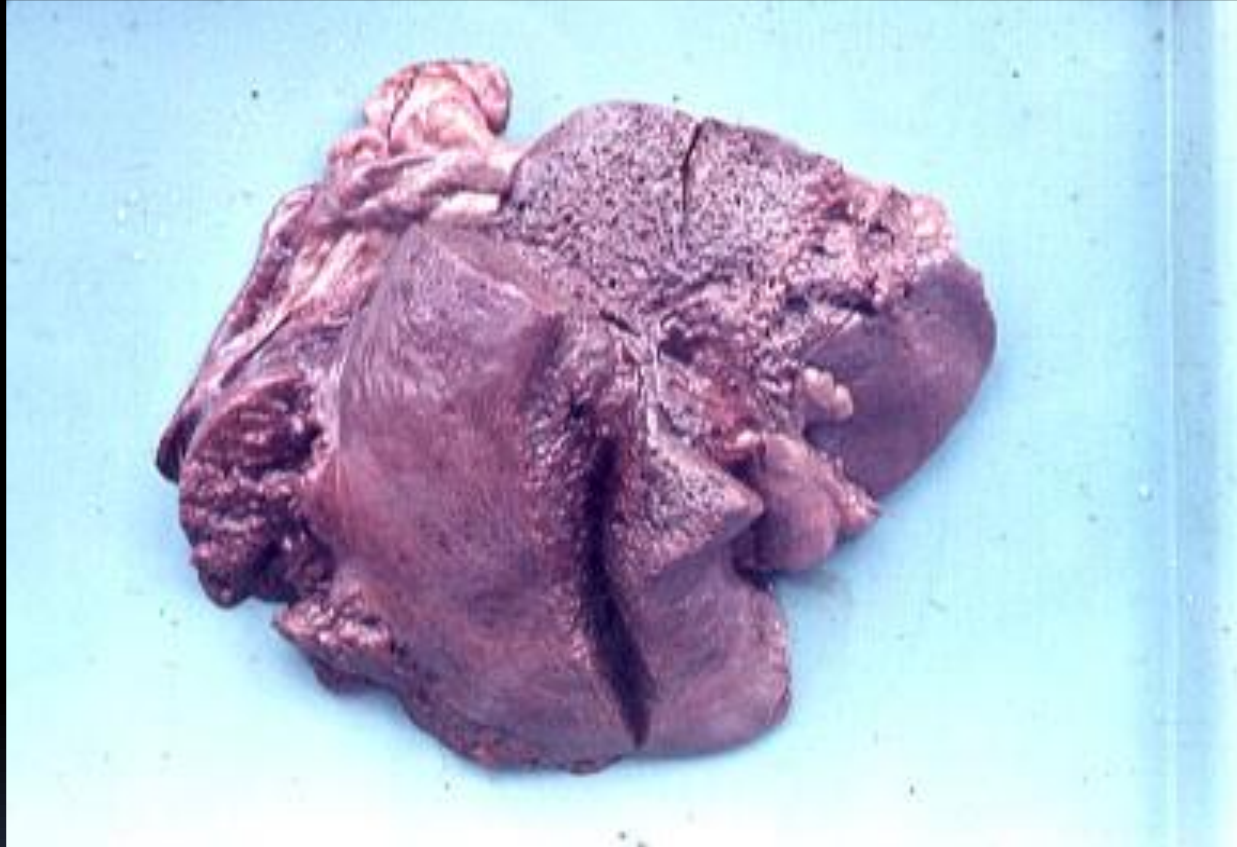
marbling








- cystic spaces in solid organs



- the brain liquefies

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- 2 weeks – epidermis is peeled off, hairs separate, 3 weeks – nails separate...
 - at about 6 months – soft tissues partially absent, the chest and the abdomen opened
 - about 1 year – complete skeletalisation
 - Casper's rule: 8:2:1 (same degree of decomposition – 8 weeks in the ground = 2 weeks in the water = 1 week in the air)
 - highly influenced by the insect and the animals









Adipocere

- gray waxy substance derived from the body fat
- later... brittle and chalky
- hydrolysis and hydrogenation of adipose tissue
- certain environmental conditions (wet graves, immersion in water, alkaline condition)...not necessary
- usually takes 3 months to develop...
- adipocere formation inhibits putrefaction









Mummification

- a drying of the tissues
- partial / extend over the whole corpse
- dry environment with moving air
- warm place/ freezing condition
- the skin is discoloured (yellow-brown to black)...secondary colonization by moulds
- the skin and underlying tissues are hard





