

INFANT DEATH

Medicolegal view

جامعة المعرفة

Lina Serhan ♥

DEFINITIONS

- ◉ 1. **Infanticide**: It means unlawful destruction of a newly born child and is regarded as murder in law.
- ◉ 2. **Feticide**: It means killing of fetus prior to birth.

CAUSES

Either by:

1. Acts of commission or
2. Acts of omission

Acts of Commission

اطول، اسوء

- These are the willful acts done to cause the death of infant.
- It includes:
 - Suffocation
 - Strangulation
 - Drowning
 - Head injury
 - Fracture-dislocation of cervical spine
 - Concealed puncture marks (pithing)
 - Poisoning.

direct

direct

Acts of Omission

- Acts of omission refer to failure to take care of child or negligent towards the child during or after birth. It includes:
 - Failure to provide assistance during labor.
 - Failure to clear the air passage after birth.
 - Failure to cut and ligate the umbilical cord.
 - Failure to feed the child.
 - Failure to protect the child from heat or cold.

abuse

MEDICO LEGAL QUESTIONS



The following questions are raised while doing autopsy in infant:

1. was the child stillborn or dead?
2. Was the child born alive (i.e. live born?)
3. If born alive, how long did the infant live the birth?
4. What was the cause of death?

HOW DO WE EXAMINE A POST MORTEM NEW BORN?

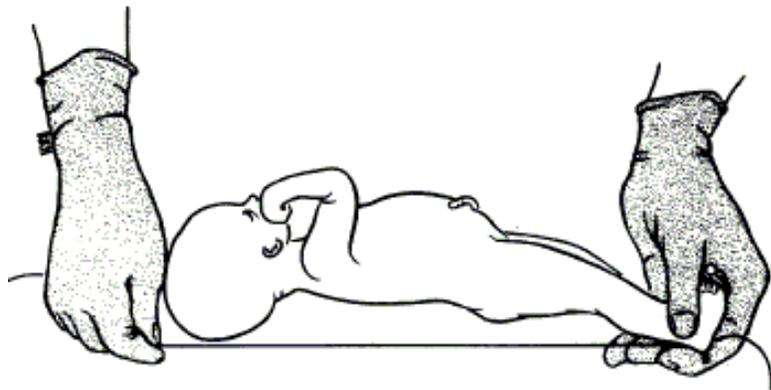


WE SHOULD EXAMINE THE FOLLOWING:

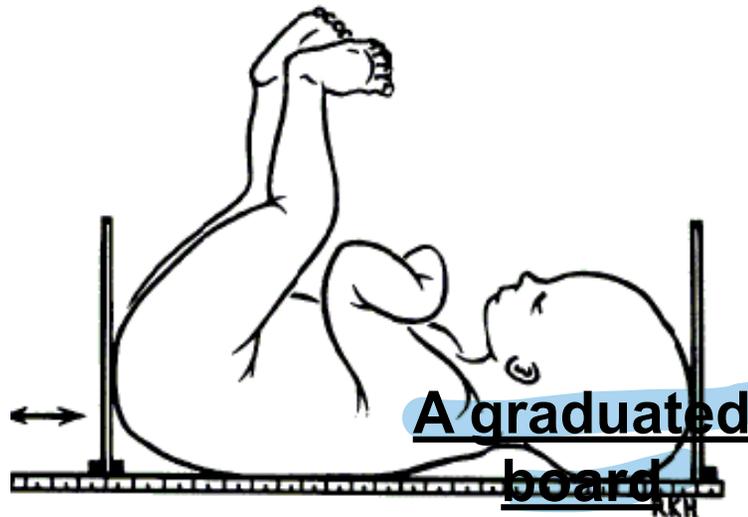
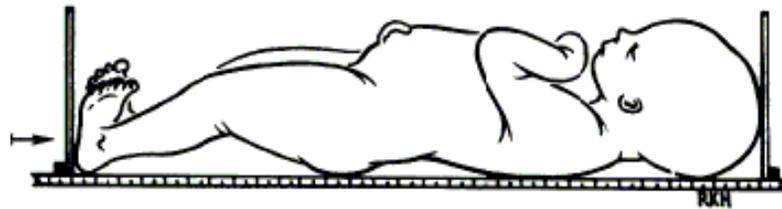
- ◉ Weight and measurement
- ◉ External examination
- ◉ Examination of head and neck
- ◉ Vertebra and spinal cord
- ◉ Mouth and pharynx
- ◉ Thorax and abdomen
- ◉ Abdominal organs
- ◉ The skeleton
- ◉ The placenta

WEIGHT AND MEASUREMENT

- Size must be measured accurately and compared with known standers.
- Length:



Crown-heel length by thread



A graduated board

EXTERNAL EXAMINATION

- ◉ The external surface of the body is examined for evidence of maceration, cyanosis, petechial hemorrhages, injury and skin lesions and the orifices are examined for patency



EXAMINATION OF THE SKELETON

- ◉ It's better to have an X-ray photograph for each baby coming to necropsy.



STILL-BORN (STILL BIRTH) CHILD

Definition: The child which has issued forth from the mother after the 28th week of pregnancy and did not AT anytime, after being completely expelled, breathes, or shows any other signs of life".

. Thus, a still-born child is alive in uterus up to the initiation of birth process and died during the process (i.e. delivery) but did not show any sign of life after being completely born

DEAD-BORN CHILD (DEAD BIRTH)

- Definition: A dead-born child is one, which had died in uterus before the birth process begins and may show rigor mortis, maceration or mummification at birth.
- Fetal death has been defined by World Health Organization
- (WHO) as "*death before complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy.*"



MACERATION



Cheesy

Definition: It is a process of aseptic autolysis occurring in fetus that remains dead in the uterus surrounded by liquor amnii. → الـ تـحلـلـ من الـ مـا يـتـعـفـن

Maceration in fetus is sign of death.

. **Mechanism:** The cells of fetus break down after death and due to enzymatic action (autolysis) body becomes soft and flaccid. ^{ليس} not

Unlike putrefaction or decomposition, there is no bacterial action in maceration.

Duration required: If fetus remains in uterus after death, then the earliest sign of maceration is seen at about 6 to 12 hours in form of areas of desquamation and appearance of brown-red discoloration of umbilical cord stump.

MACERATION CONT.

1. Features of Maceration

- . The macerated fetus is **soft** and **flabby** and **flattens** when kept on table.
- . Emits sweetish disagreeable smell
- . The earliest sign of maceration is **skin slippage** (seen at 6-12 hours).
- . Skin is sodden and shows red or **purple coloration** with **large blebs** (or blisters) containing serous or sero-sanguineous fluid. The epidermis is easily peeled off leaving moist, greasy areas underneath.

MACERATION CONT

1. Abdomen is distended.

Joints become abnormally mobile or flexible with Bones get flexible and are easily detached from the soft parts.

. Skull bones show loss of alignment and they override over each other due to shrinkage of brain after death, known as Spalding sign. Brain becomes pulpy and grayish-red in color.

. Body cavities contain reddish serous fluid.

. Internal organs become soft and edematous

. Umbilical cord is red, smooth, softened and thickened.

MACERATION, ULTRASOUND



MUMMIFICATION



- . It is drying and shrinking of fetus occurring in uterus after death.
- . It results when liquor amnii is scanty and no air enters the uterus.

PUTREFACTION



منتفخ

If the membranes are ruptured early and air enters the uterus, then the dead fetus shows signs of putrefaction instead of maceration.

LIVE-BORN CHILD (LIVE-BIRTH)

A child showing a sign of life, even when only part of the child is out of mother, though the child has not breathed or completely born, is considered as **live-born child**.

. Causing death of such child is treated in the same manner as homicide.

Viability of Child

Viability means the ability of fetus to lead a separate existence after birth by virtue of certain degree of development.

A child is viable after 210 days or 7 months or 30 weeks of intrauterine life.

Evidence of Live Birth (Signs of Live Birth)

Following are considered as signs of live birth.

1. Crying of baby
2. Movement of body or hand or foot
3. Muscle twitching or twitching of eyelid.

Following two conditions are considered:

1. **Vagitus uterinus**: Crying of a child even when it is in uterus
2. **Vagitus vaginalis**: Crying of a child even when it is in vagina

. Thus, it may possible that child may didn't show any sign when it comes out although cry of child is heard by people. **So crying of child is not conclusive proof of live birth.**

the external and internal autopsy findings in live birth

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External changes

- ◉ 1. Changes in chest
- ◉ 2. Changes in skin
- ◉ 3. Changes in umbilicus

Internal changes

- ◉ 1. Changes in lung
- ◉ 2. Position of diaphragm
- ◉ 3. Changes in heart and circulation
- ◉ 4. Changes in gastrointestinal tract
- ◉ 5. Changes in middle ear
- ◉ 6. Changes in kidneys
- ◉ 7. Changes in blood

CHANGES IN UMBILICUS AND UMBILICAL CORD

Fig 1



Features	Time
<u>Shrinkage of lumen of blood vessels</u>	<u>Just born</u>
<u>Cut margin of cord dries up with blood clot</u>	<u>2 hour</u>
<u>Contraction of umbilical arteries</u>	<u>10 hour</u>
<u>Drying of cord</u>	24 hour (1 day)
<u>Inflammatory line (red ring) at base of umbilical cord stump</u>	48 hour (<u>2 day</u>)
<u>Shriveled and mummified cord</u>	2- <u>3 day</u>
<u>Obliteration in umbilical vein</u>	<u>4-5 day</u>
<u>Cord shriveled, dry and falls-off</u>	5-6 day
<u>Complete healing of umbilicus</u> →	<u>7-10 day</u>



Gross and microscopic examination; of the lungs

قوله

non-respired lungs appear

Volume

- small, collapsed, lie in the back part of chest on side of vertebral column.

Color

- reddish-brown and hard in consistency like a liver, **non** crepitant.

cut section

- uniform, hard and exude little froth-less fluid.

Margins

- Sharp

Microscopy

- alveolar lining epithelium is cuboidal to columnar with less vascularization.
-

Respired lung

- filling the whole pleural cavities and medial margin overlaps the mediastinum and pericardium.
- bright red or pinkish with mottled appearance, spongy, elastic and crepitant.
- spongy and exude frothy blood.
- rounded.
- alveoli appear expanded with flattening of epithelium and increased vascularization

TESTS done on the lungs

non-respired lungs appear

Respired lung

Static test or Fodere's test

- weight of lungs (both) varies from 30 to 40 gm.

from 60 to 70 gm.

Ploucquet's test

- weight of both lungs is about 1/70th of the weight of whole fetus.

- about 1/35th of the weight of whole fetus.

Specific gravity

- 1040 to 1050

- 940 to 950

Hydrostatic tests

- lung pieces sink

Fallacies of hydrostatic test

- lung pieces float

Putrefaction - presence of gases of decomposition

Artificial respiration

Pulmonary edema

Pneumonia

Atelectasis - non-expansion of lung

Obstruction by alveolar duct

SUDDEN INFANT DEATH - SIDS

- ◉ **Sudden Infant Death Syndrome (crib death) -**
the sudden death of an infant, usually under 1 year of age, which remains unexplained after a complete postmortem investigation, including an autopsy, examination of the death scene and review of the case history
- ◉ **3,000 SIDS deaths per year in the U.S**

SIDS - WHAT IT IS

- ◉ **Major cause of death in infants after 1st month of life**
- ◉ **Sudden & silent in an apparently healthy infant**
- ◉ **Unpredictable & unpreventable**
- ◉ **Quick death with no signs of suffering - usually during sleep**

SIDS - WHAT IT IS NOT

- ◉ Caused by vomiting or choking.
- ◉ Caused by external suffocation or overlaying.
- ◉ Contagious or Hereditary.
- ◉ Child abuse.
- ◉ Caused by lack of love.
- ◉ Caused by immunizations.
- ◉ Caused by allergy to cows milk.

TYPICAL SIDS INFANT SCENARIO

- ◉ Almost always occurs during sleep or appearance of sleep
- ◉ Usually healthy prior to death
- ◉ May have had a cold or recent physical stress
- ◉ May have been place down for nap, found not breathing or appearing dead
- ◉ Parents not hearing signs of struggle