

Mechanical injuries

Mechanical trauma

Classification

Blunt force injuries

Abrasions

Bruises/contusions

Lacerations

Sharp force injuries

Incised

Stab wound

- Firearms injuries
 - shot gun
 - rifled firearms

Definition of wound

- Damage to any part of the body due to application of mechanical force
- Some jurisdiction
 - Require integrity of the body surface to be breached
- Serious bodily harm

Sec 44 Injury

"Any harm whatever illegally caused, to any person, in body, mind, reputation or property."

Note: The word "wound" is not defined in the Law.

Definition

“Whoever causes pain, harm, disease, infirmity or injury to any person, or impairs or dismembers any organ of the body or part thereof of any person without causing his death, is said to cause **hurt**”.

S.332 (1) PPC

Mechanism of wounding

- Body usually absorb force
- Resilience
- Elasticity
- Rigid strength of its skeletal frame work

Effect of excessive mechanical force

- Compression
- Traction
- Torsion
- Tangential
- Leverage stresses

ABRASIONS

An abrasion is a superficial injury caused by friction or pressure between the epidermis and some blunt object.

TYPES

- Scratch
- Graze *brush burn*.
- Imprint or Contact or Patterned abrasion
- Friction abrasions

Scratch

It is a linear injury caused by a sharp object running across the skin, such as a nail.

Finger nail abrasion

- Child abuse, sexual attacks, and strangulation
- Neck, face, arms and forearms
- Linear scratches if fingers drag down the skin
- Short, straight and curved when skin is gripped in a static fashion.
- Concavity indicates the orientation of the finger tips
- Elasticity of skin returns it to original position

Graze

when a broad surface of skin scratches against some surface, such as dragging a body on the road.

It resembles a burn – thus is also called a *brush burn*.

- Initially there is a serrated border, and then a heaped up epithelium at the end

Distribution on body depends on the position in which it was dragged.

Imprint or Contact or Patterned abrasion

It is produced by a direct vertical pressure of an object on the body surface; it leaves its impression.

The shape of the object can be identified.

Friction abrasions

These are produced by pressure of some linear object accompanied with sliding movement

For example: abrasions around ligature mark in hanging and strangulation, in whiplash beating

Age of an Abrasion

Fresh - Bright red

Red scab – 12-24 hours

Reddish brown scab – 2-3 days

Healing – 4-7 days

Healing complete – 7-10 days

Antemortem or Postmortem?

Forensic Significance

DEFINITION

Extravasation of blood into the tissues due to rupture of capillaries venules, and small arterioles usually as a result of trauma, is called as a **bruise**.

- Damage to veins, venules and small arteries
- Contusion
 - Any where in the body
 - e.g. spleen, mesentery, or muscles
- Bruise
 - Lesion visible through skin or present in subcutaneous tissue

TYPES OF BRUISES

1. SUBCUTANEOUS BRUISES
2. INTRADERMAL BRUISES
3. DEEP BRUISES OR CONTUSIONS

Intradermal bruise

- Blunt impact
- Situated in sub epidermal layer
- Blurred especially at edge
- Patterned object
 - Object with alternate ridges and grooves
- Amount of blood is less

Subcutaneous tissue

- Situated in subcutaneous tissue
- Blurred at edges
- Raised above the skin
- Vary in size
 - Pin head bleeding to large localized collection

Deep Bruise

- Deeper to subcutaneous tissue
- Take time to appear on surface
- Infrared photography reveal such bruises
- Assaulted person should be examined again after interval of one or two days

Movement of bruise

- Appear on different place from point of impact
- May move under gravity

E.g. black eye

Bruise of arm and thigh lowers down around elbow
or knee

Factor affecting bruising

- varies with the amount of blood in the extravasation.
- The size of the hemorrhage depends partly on the intensity of the injuring force.
- The size and density of the vascular network varies from place to place

- Resilient areas, such as the abdominal wall and buttocks, bruise less

- Volume of blood lost depends upon
 - Fragility of the blood vessel
 - Coagulation of blood

FACTORS AFFECTING BRUISING

- **Tissue type:**
- **Severity of trauma**
- **Age:**

- **Sex:**
- **Skin color:**

- **Diseases.**
- **‘Gravity shifting’**

Gravity shifting

- Black eye
- Battle sign
- Fracture femur

Pathologic Bruising
occurs in diseases

AGEING THE BRUISE

(Color Changes in a Bruise)

These are due to degradation products of blood

Conditions simulating a bruise

In dead

- Hypostasis

In living

- Irritant skin lesions

Differentiating bruise from Irritant skin lesions & fictitious bruises

Ante Mortem And Postmortem

FORENSIC SIGNIFICANCE

- **Nature of trauma - i.e. blunt**
- **Indicator of antemortem nature**
- **Site of trauma**
- **Degree of violence**
- **Identity of the weapon**
- **Time of injury.**