

# INJURY



# Defination of Injury



A Wound or Injury is defined as termination of the natural continuity of any of the tissues of the living body.

Any physical damage to the body caused by violence or accident or fracture can be called Injury.



Under  
section  
44 IPC.

Legally, as per sec. 44 IPC; injury is defined as any harm caused illegally to a person i.e. to his body, mind, reputation or property.

# Classification



- **Aetiological classification**

|               |  |
|---------------|--|
| 1. Mechanical | <ol style="list-style-type: none"><li>1. Abrasions</li><li>2. Contusions</li><li>3. Lacerations</li><li>4. Incised</li><li>5. Stab</li><li>6. Fire arm</li><li>7. Fractures and dislocation</li></ol>  |
| 2. Thermal    | <ol style="list-style-type: none"><li>1) Due to heat - Burns and Scalds</li><li>2) Due to cold - Frostbite, Trench foot, Immersion foot</li><li>3) Chemical burns</li><li>4) Radiation burns - due to x ray, UV rays etc.</li><li>5) Electric burns</li><li>6) Lightening burns</li><li>7) Explosive burns</li></ol> |



- **Medicolegal classification**

- 1) **Depending upon severity** - Simple injuries and Grievous injuries.
- 2) **Another classification** - Suicidal, homicidal, accidental, defence and false
- 3) **Depending upon moment of death** - Ante mortem injuries and post mortem injuries.



- **Other View of Types of Injuries:**

1. Self-Inflicted Injuries
2. Defence Injuries
3. Offensive Injuries
4. Unintentional Injuries





## 1. Self-inflicted injury





## 2. Defence injury







## Unintentional injury





# **1. Mechanical Injuries**



## **DEFINITION**

The mechanical injury is defined as “damage to any part of the body due to application of mechanical force”, like Blunt force, Sharp Force and firearms. The injury which is associated with loss of tissue is usually mentioned to as wound.





# TYPES

1. Abrasions
2. Contusions
3. Lacerations
4. Incised
5. Stab
6. Fire arm
7. Fractures and dislocation





# ABRASIONS



# Abrasions:



Abrasions are injuries where there is discontinuity in the skin due to loss of superficial epithelial layer .

(Epidermis) only caused by a hard, blunt and rough object. These are produced as a result of blow, fall on a rough surface, slide or being dragged in a vehicular accident, finger-nails, thorns or teeth bite. When abrasions are healed there is no permanent scar.

# Abrasions



# Characteristics of Abrasion



They are superficial injuries. They bleed slightly, though sometimes there may be only lymph exudation. Large abrasion may be painful and may bleed profusely. The site of abrasion is site of impact. The following are the different type of abrasions:

1. Scratches
2. Grazes
3. Perssure Abrasions
4. Imprint Abrasions
5. Other Abrasions
6. Contused Abrasions



# Medico-legal Importance:



1. Abrasions may be simple in nature but medico-legally they are very important. It is usually seen in accidents and assaults. Suicidal abrasions are rare.
2. It indicates site of impact and direction of the force.
3. The age of Injury can be known; therefore time of crime can be calculated.
4. Type of weapon of assault.
5. Whether injury is ante mortem or post mortem
6. PM abrasion may result due to assault or due to mishandling or during shifting of a dead body.



# Age Changes in Abrasions:



| Time - Age           | Changes  |
|----------------------|--|
| <b>Fresh</b>         | Bright red   |
| <b>12 to 24 Hrs.</b> | Abrasion surface is covered with bright red crust called scab, due to coagulation of blood             |
| <b>2 to 3 Days</b>   | Scab colour becomes reddish brown  |
| <b>4 to 7 Days</b>   | Epithelium covers the defect under the scab  |
| <b>8 to 14 Days</b>  | Scab dries, shrinks and falls off without leaving any mark due to the process of healing (Normal Skin) |



# CONTUSIONS

# Contusions or Bruises:



A contusion is an effusion of blood into the tissue, due to ,rupture of subcutaneous vessels usually capillaries. They are caused by application of blunt force like fist, lathi/stick, in road traffic accident ,hit with a hard object like stone, fall from height .hammer etc

# Contusions



# Characteristics



1. Usually there is no loss of continuity of skin but may be associated with abrasions or laceration.
2. When a large blood vessel is injured, haematoma is formed. The size varies from small pin head to large collections of blood in the tissue.
3. Due to the application of force on the skin, the underlying subcutaneous blood vessels rupture, this causes extravasation of blood in subcutaneous tissues. This is called ecchymosis.

# Medico-legal Importance of Bruises:



1. The bruises may be accidental, suicidal, or a homicidal in nature. Self-inflicted bruises are rare as they are painful.
2. Actually it is simple injury, but contusion of the heart may cause death. Multiple contusions may cause death from shock and internal haemorrhage. A contusion may contain 20 to 30 ml blood or more.
3. The shape and size of bruise generally correspond to the object. So, the weapon or object can be identified.





4. The age of injury can be determined.
5. In case of fall, sand, dust, mud etc. may be found on the body.
6. The manner of injury may be known from its distribution.
7. Bruises may be artificially produced to make false charges against someone. These false bruises are produced by irritants like juices from marking nut, root of chitrak, etc.





# Age of Bruises

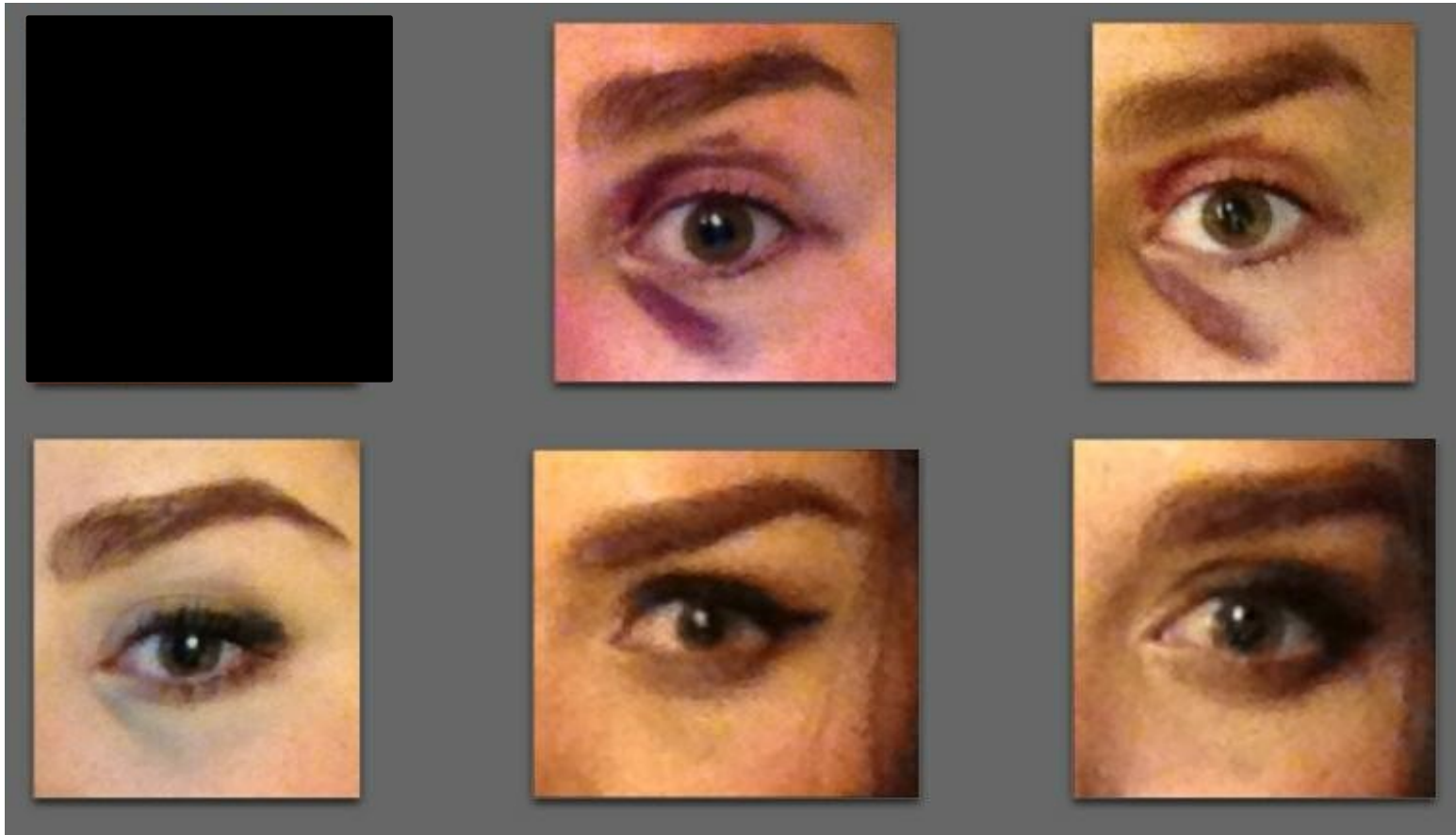


A superficial bruise appears at one as a Bright red discolouration. A deep bruise may take several hours to two days to appear. Therefore, a second examination should be carried out two days later.

| Time                | Changes               |
|---------------------|-----------------------|
| Fresh               | Bright Red            |
| Few hours to 3 days | Bluish                |
| 4th day             | Bluish black to brown |
| 5th–6th day         | Greenish              |
| 7th–12th day        | Yellowish             |
| 2 weeks             | Normal                |

The colour changes are well appreciated in fair persons as compared to dark persons. In healthy persons, changes are faster as compared to sick persons. Ecchymosis situated in deeper

# Age of Bruises





# LACERATION

# Lacerations:



Commonly known Wound . Laceration is a wound in which tissues are torn due to heavy, hard and blunt force to the body. They are also called tears or ruptures. e.g. hit by lathi or blow or in road traffic accident.



# Laceration



# Characteristics



1. It involves injury to some deeper layers and parts of body.
2. There may be fracture of bones.
3. Shape and size of injury do not correspond to the weapon.
4. The margins are irregular, torn, swollen and contused.
5. Haemorrhage is less because in these vessels are crushed and torn across, hence they bleed less.
6. Hair and hair follicles can be crushed..

# Laceration are of Following types



- 1.Split
- 2.Strech Laceration
- 3.Avulsions
- 4.Tears
- 5.Cut laceration





# Medico-legal Importance of laceration:



1. Lacerations are usually seen in accidents and assaults.
2. Suicidal lacerations are rare, as they are painful.
3. The type of laceration may indicate the cause of injury or the shape of weapon.
4. Foreign matter may be found in the wound, indicate the crime circumstances.
5. These are usually grievous injury.

# Age of Laceration



| Time             | Changes                 |
|------------------|-------------------------|
| Initially        | Bleeding                |
| After 12-24 Hrs. | Clotting                |
| After 18-36 Hrs. | Pus formation           |
| After 1 - 2 Wks. | Granulation<br>tissue   |
| After 4 - 8 Wks. | Healing of<br>fractures |



# INCISED



# **Incised wound / Cut / Slash / Slice wound**



It is a wound produced by a sharp weapon such as knife, blade, scalpel etc. and is a clean cut through the tissue, which is longer than its depth.



# Incised wound



# Characteristics



1. The edges are smooth, clean cut, everted and free from contusions.
2. If an incised wound is caused by a heavy weapon like gadasa, the edges of the wound may show contusion.
3. The starting of incised wound (head) is deeper and it gradually becomes shallower and tails off towards the end. The tailing off of an incised wound shows the direction by which the weapon was drawn off.
4. If the blade of the weapon enters the body obliquely, the tissues will be visible at one margin and the other margin will be undermined (Bevelling cut).

# Age of incised wound



If injury is non-gaping, healing is like an abrasion and results without scarring.

| Time                | Changes  |
|---------------------|--|
| <b>Fresh</b>        | Haematoma formation.   |
| <b>12 Hrs.</b>      | The edges are red, swollen.  |
| <b>24 Hrs.</b>      | A scab of dried clot is seen on the wound. Vascular buds begin to form.          |
| <b>36 Hrs.</b>      | The capillary network is complete.   |
| <b>2 to 3 Days</b>  | The wound is filled with fibroblasts and capillary buds in from the cut surface. |
| <b>3 to 5 Days</b>  | Definite fibrils are seen, vessels show thickening and obliteration.             |
| <b>1 to 2 Weeks</b> | Scar is formed.  |





**Scars of incised wound**

# Medico-legal Importance of Incised Wound:



1. It indicates the nature of weapon.
2. It gives an idea about the site of impact and direction of the force.
3. The age of the injury can be determined.
4. Position of wound may indicate mode of action i.e. suicidal, accidental or homicidal.
5. The homicidal incised wounds, defence incisions are present on dorsum of hand, ulnar aspect of forearm or on the palm.
6. P.M. incised wounds may be caused by the criminal to hide crime or identity.



# STABBING

# Stab or Punctured Wounds:



A stab wound is an injury, Caused by a sharp pointed weapon, when the sharp tip is thrust into the body.



# Stabbing wound



# Characteristics of Stabbing



1. In stab wound depth is more as compared to breadth.
2. It is caused by sharp, pointed and cutting instruments such as knife, dagger, nail, needle, spear, arrow, screw driver etc.
3. Stab wounds are called penetrating wounds when they pass through tissues, enter a body cavity like thorax or abdomen.
4. A sharp, pointed, cylindrical or conical instrument may produce a wound with circular margins.
5. When puncture wound is hidden it is called concealed puncture wound e.g. puncture wound in fontanel, inner canthus of eye, ears etc.
6. Healing is usually by scarring

# Medico-legal Importance of Stab Wound:



1. Stab wounds are mostly suicidal or homicidal. Accidental wounds are rare.
2. Position, number and direction of wounds may indicate mode of action i.e. suicidal, accidental or homicidal.
3. The shape of the wound may indicate the class and type of weapon.
4. The depth of the wound will indicate the force of penetration.
5. Direction and dimension of the wound indicate the relative positions of the assailant and the victim.
6. The age of the injury can be determined.



# Circumstances of Incised and stab wound:



## 1. Accidental wounds

Usually caused by -

- a) Fall upon a sharp edged object.
- b) Impact by sharp objects e.g. glass pieces.
- c) Unintentional cut or stab by sharp edged or pointed object e.g. knife, blade, house hold appliance etc.



## 2. Suicidal wounds

In most of the cases, we may found -

- a) Wounds are multiple, parallel, superficial in any one accessible area of the body, such as neck, wrists, groin and rarely on backs of legs or on chest.
- b) Suicidal cut-throat wounds are usually seen above the thyroid cartilage, the direction is from left to right. Multiple 20 to 30 wounds may be seen on the other parts of the body. The cloths are not cut and circumstantial evidence may be helpful.



- c) Unintentional cuts are found on the fingers where the blade has been gripped.
- d) More than one method may be used for suicide.
- e) In right handed persons, the most severe wounds are often found on the left side of the body.



### 3. Homicidal wounds

In it -

- a) Multiple gaping wounds on any part of the body including back.
- b) Defence wounds may be found.
- c) Wounds, particularly on the breast and genitals indicate sexual offence.



**FIREARM INJURY**

# Firearm injury



1. Forensic Ballistics is the science dealing with the investigation of firearms, and the problems arising from their use.
2. A firearm weapon is an instrument which discharges a missile by the expansive force of the gases produced by burning of gun powder.
3. Firearm injury is an injury caused by a firearm weapon.

# Types of fire-arm weapons:



1. Smooth bored weapons - Shot gun, Muskets, air guns, air pistols etc.
2. Rifled bored weapons - Rifles, hand guns, revolvers, pistols

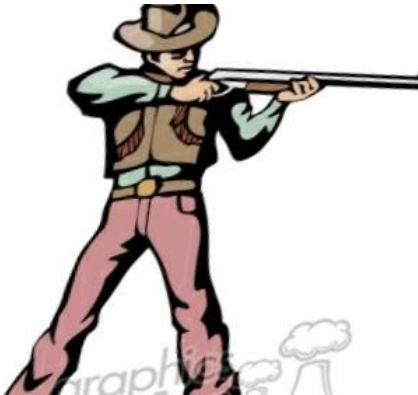




# 1. Smooth Bored or Shotgun Weapons:



These are heavy weapons carried over the shoulder and they have a barrel which is smooth bored inside. The shotgun may have one barrel or double barrel. These guns are usually used by police to control mob, or they are used in killing birds or small animals





# Shot-gun



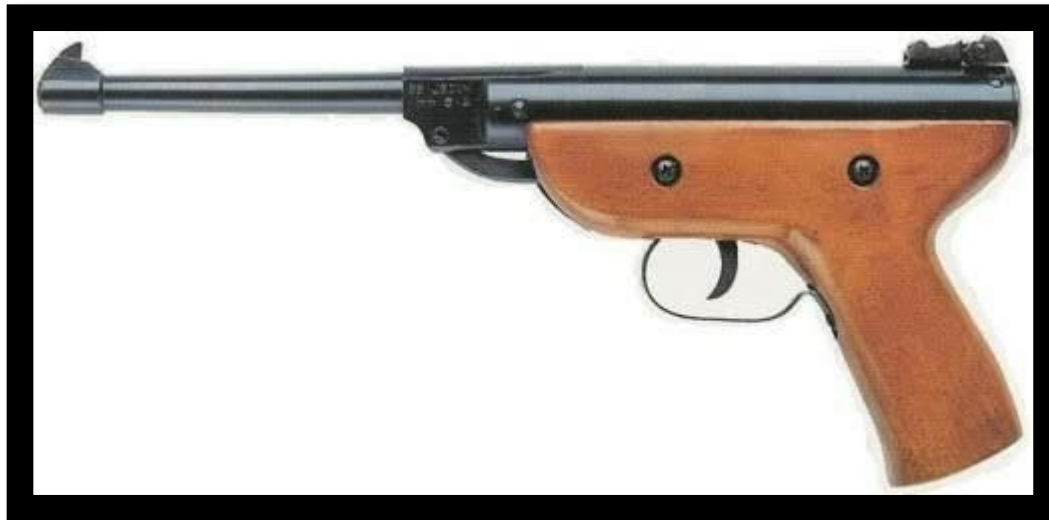


# Air-gun





# Air-pistol





# Musket



## 2. Rifled bore weapons:



Rifling is a process in which spiral grooves are cut upon the inner surface of the bore to impart rotational motion to a bullet. It stabilises the bullet and gives greater accuracy and range for the bullet to hit the target.





# Rifel







# Hand-gun





# Revolver



# **POST-MORTEM EXAMINATION of fire arm injuries -**



The following steps should be taken while conducting PM of fire-arm injuries:

1. Record preliminary data.
2. The photograph of front and back view is taken without removing clothes.
3. Examination of clothes should be done carefully by removing without cutting.
4. All wounds (with scale) on the body should be photographed again after removing the clothes.

# Medico legal aspects of fire arm injuries -



1. Suicide by fire arm is seen mostly in males. The weapon is usually found at hand due to cadaveric spasm.
2. In case of homicidal fire arm injury - the weapon will not be found at the scene. There may be evidence of struggle. Variety of wounds can occur depending upon the circumstances. The wound is usually close range or long range type.
3. Accidental fire arm injuries are rare.
4. When wound of entry present and wound of exit absent
  - i) Bullet may be lodged in body tissue, bone or clot.
  - ii) Bullet may be thrown out through natural orifice i.e. through vomit, cough or faeces.
  - iii) Bullet may come out through the wound of entry itself.



5. When - During single firing, single wound of entry but multiple wounds of exit

i) Internal bullet fragmentation.

ii) Bone fragmentation.

iii) Contact or close range firing in shot gun

6. When - During single firing, multiple wounds of entry and exit

i) External bullet fragmentation

ii) Long range firing

iii) Depending upon the posture of the body same bullet may enter through arm, trunk etc.



**THANK YOU**