

# 1 TRAUMATOLOGY

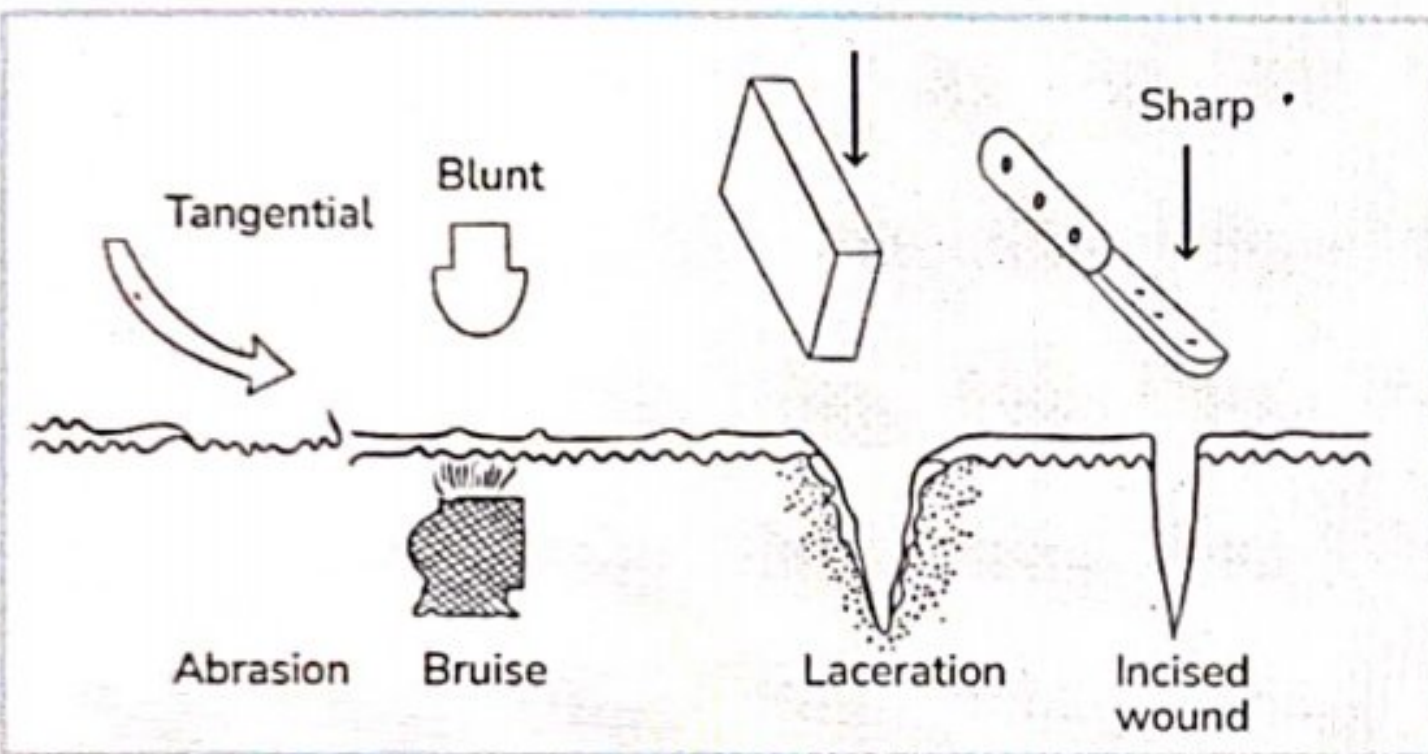


## MECHANICAL INJURIES

### Classification of Injury

00:00:16

Blunt	Sharp	Pointed
Abrasion	Incised	Stab
Contusion	Chop	
Laceration		



### ABRASION

- It is a superficial injury
- Involves only epidermis
- No bleeding and no scarring
- In general abrasions are simple hurt except corneal abrasion which is a grievous hurt

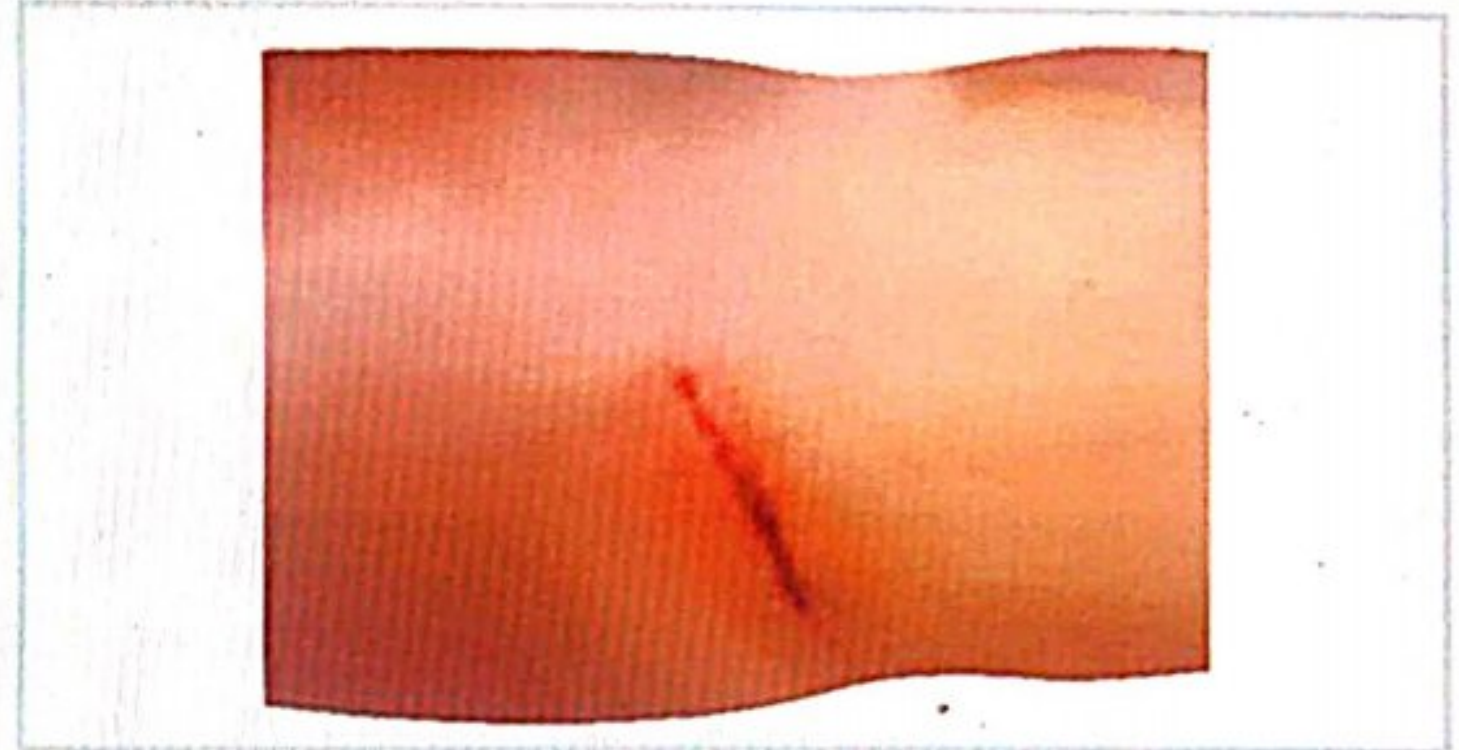


### Important Information

- Scarring is seen in corneal abrasion

### Abrasion Types

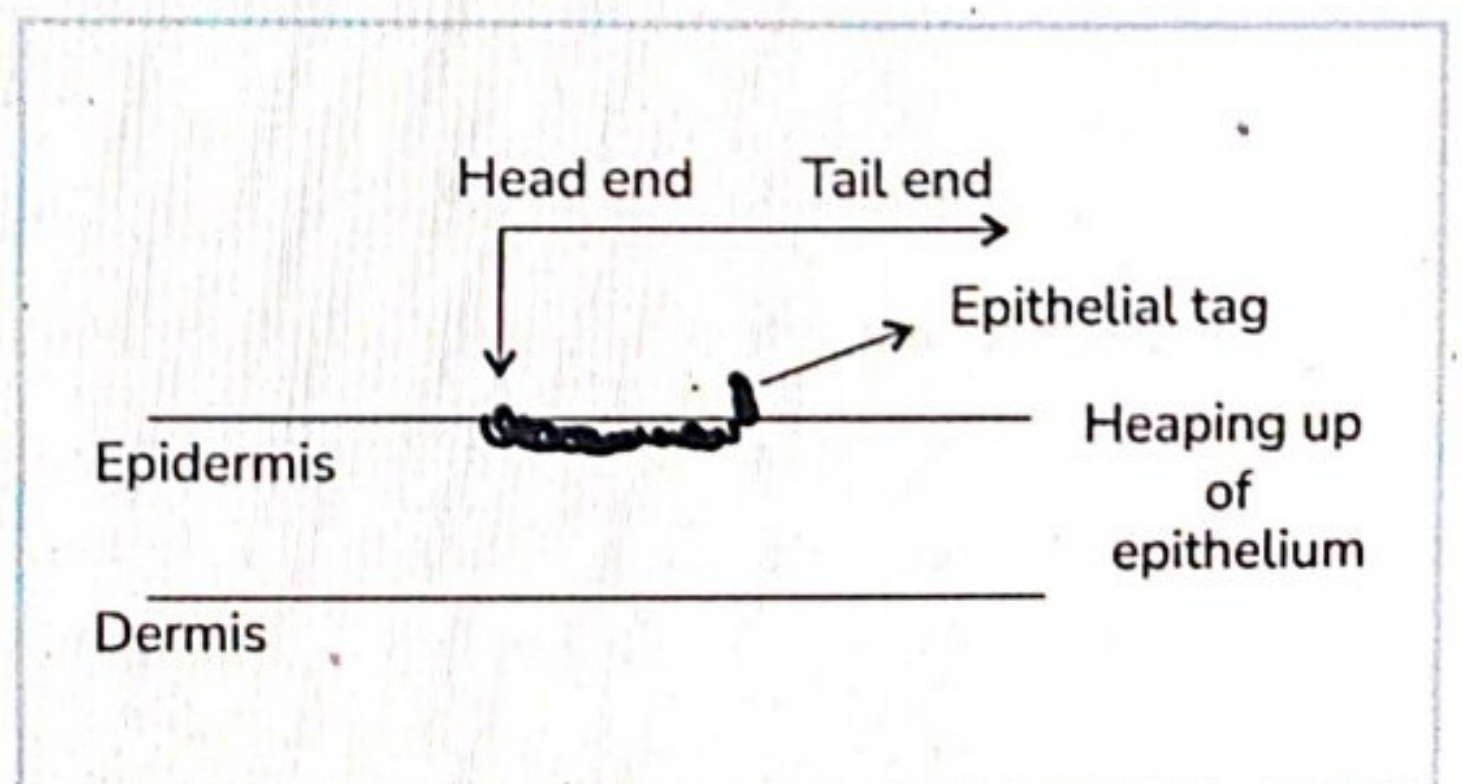
- **Scratch** - Single linear abrasion caused by thorn, nail.



- **Graze** - Multiple lines of scratches over a wide area.
  - Commonly seen with RTA.
  - **Most Common** type of abrasion.
  - Also known as **friction burn / brush burn / gravel rash**.



- Epithelium scraped during a graze is deposited at tail end, which is called as epithelial tag/heaping up of epithelium from which you can find out the direction of force.

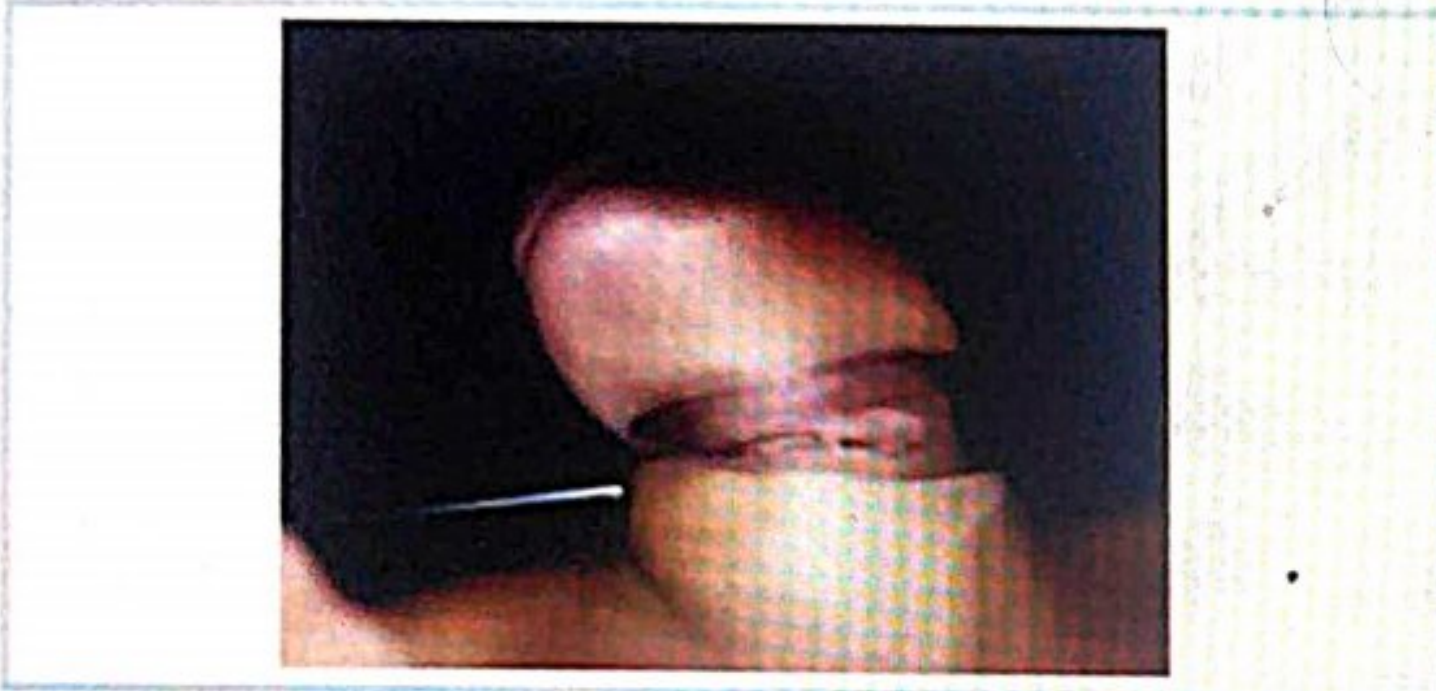




- Pressure – Epithelium crushing due to perpendicular pressure



- Patterned – Epithelium crushing + Pattern of weapon



Ageing of abrasion is found by colour of scab

**MNEMONIC: (R<sup>3</sup>B<sup>3</sup>)**

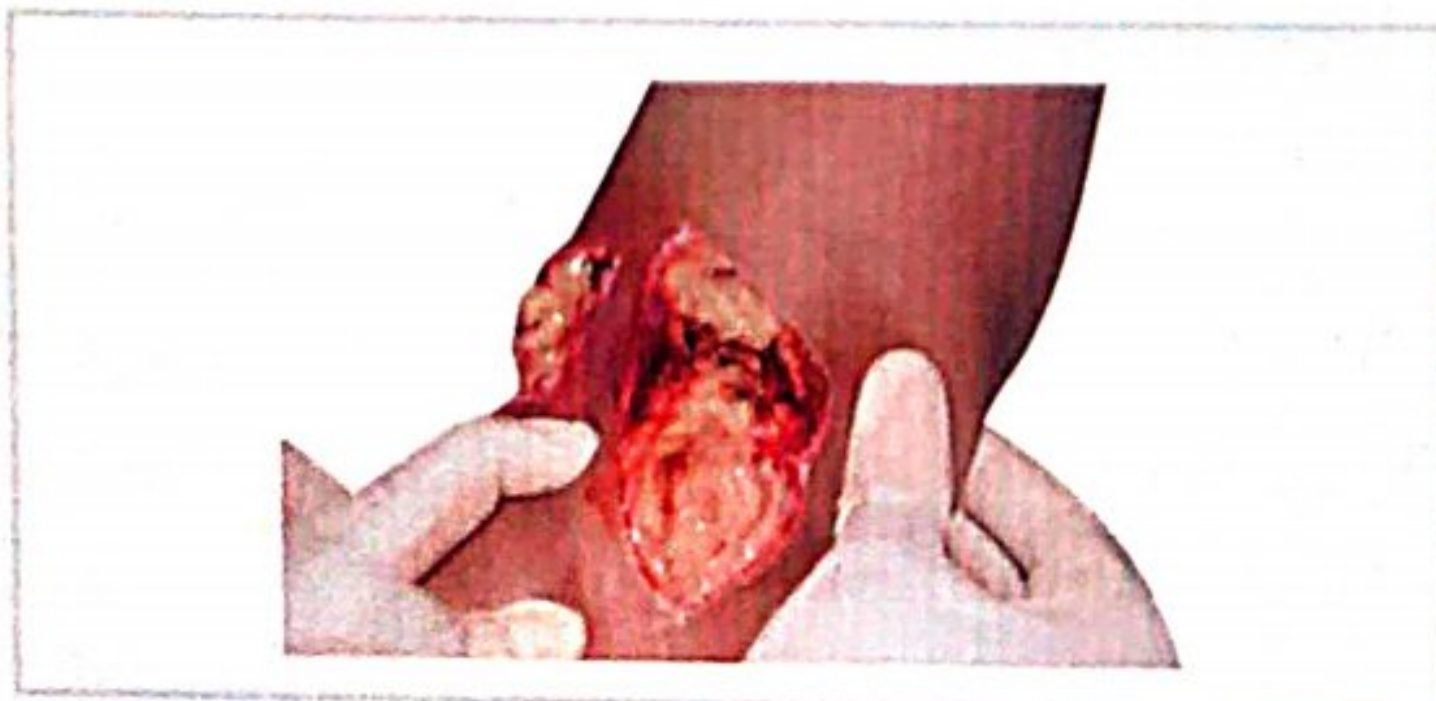
- Raw - < 12 hr.
- Reddish scab - > 12 hr.
- Reddish Brown scab - 2-3 days.
- Brown scab - 4-5 days.
- Black scab - 6-7 days.

Medicolegally most important injury is abrasion

**CONTUSION / BRUISE**

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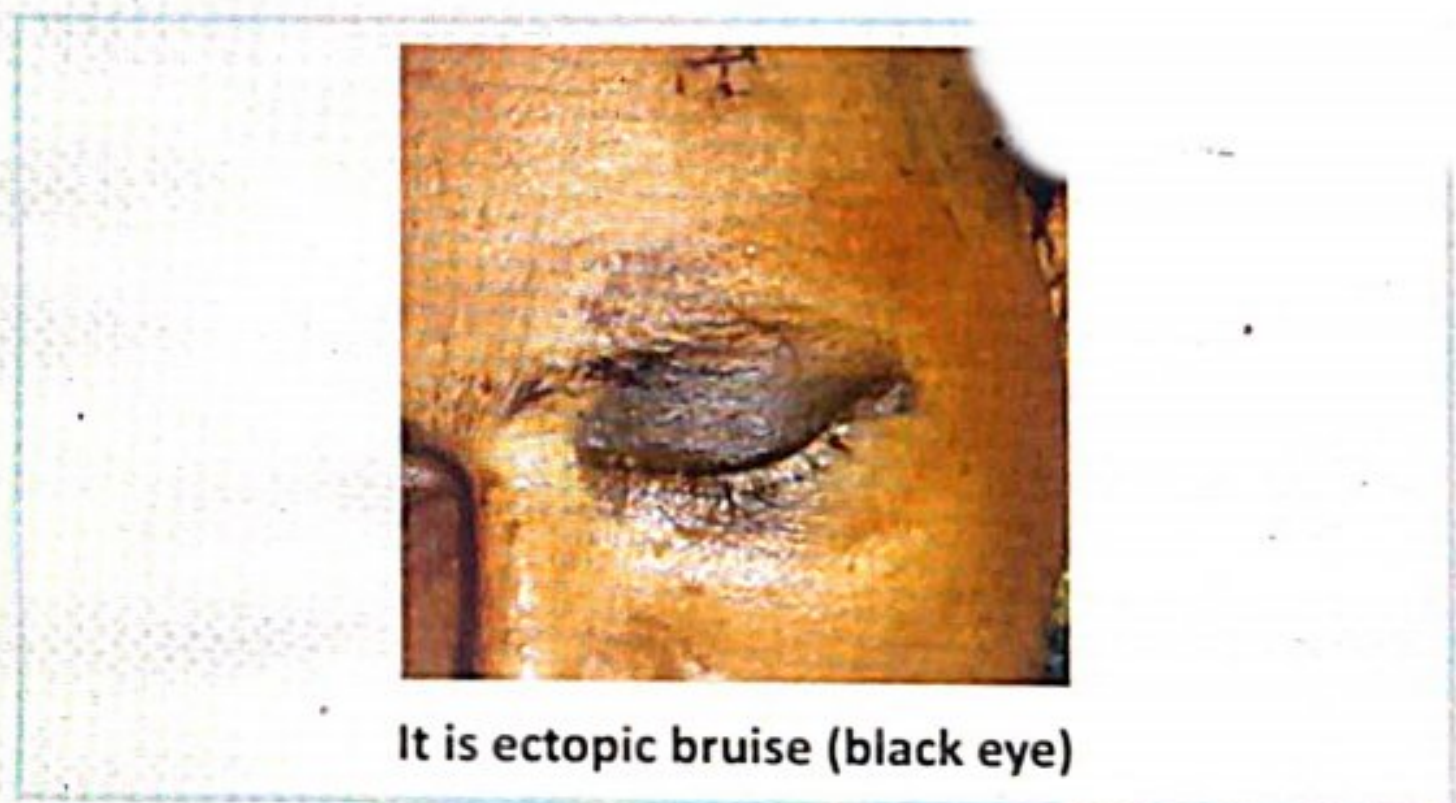
- Blunt trauma to skin will rupture dermal capillaries (epidermis is not involved) and results in blood collection in tissue that causes swelling and reddish discoloration, known as contusion / Bruise.
- Margins of contusion will be irregular.



- Extravasation of blood is seen in contusions.

**Types of contusion / Bruise**

Superficial	Deep	Ectopic/ Migratory	Patterned
<ul style="list-style-type: none"> <li>• Lies over the skin.</li> </ul>	<ul style="list-style-type: none"> <li>• Lies deeper to tissues.</li> </ul>	<ul style="list-style-type: none"> <li>• Injury at one site, bruise will be on another site.</li> <li>• Ectopic –               <ol style="list-style-type: none"> <li>1. Black eye.</li> <li>2. Battle sign</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• It will give the pattern of weapon used.</li> <li>• Patterned –               <ol style="list-style-type: none"> <li>1. Six penny bruises seen in Throttling and Battered baby syndrome,</li> <li>2. Tramline bruise in stick injury.</li> </ol> </li> </ul>





Ageing of Bruise is found by colour

Oxy - Hb	FRESH
De oxy - Hb	FEW HR - 3 D
Hemosiderin	4 D
Biliverdin	5 - 6 D
Bilirubin	7 - 12 D

Timeline	Colour	Reason
Fresh	Red	Oxygenated Hb
Hours to 3 days	Blue	Deoxygenated Hb
4 <sup>th</sup> day	Brown	Hemosiderin
5 <sup>th</sup> - 6 <sup>th</sup> day	Greenish	Biliverdin
7 <sup>th</sup> - 12 <sup>th</sup> day	Yellow	Bilirubin
2 weeks	Normal	

Normally Abrasion heals in - 1 week  
Contusion heals in - 2 week



**Important Information**

- Multiple bruises of varying colours is seen in child abuse/Battered baby syndrome.

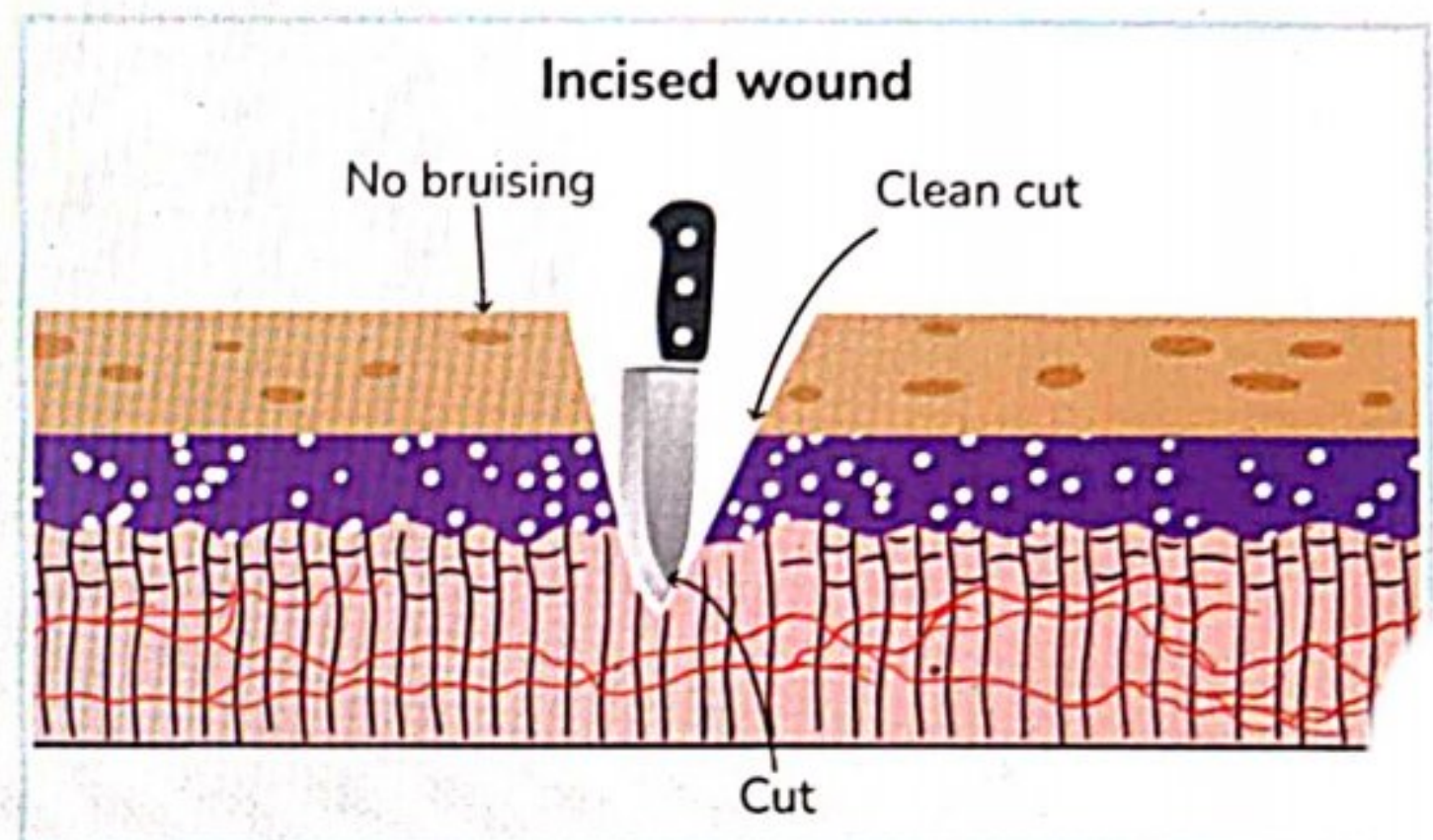
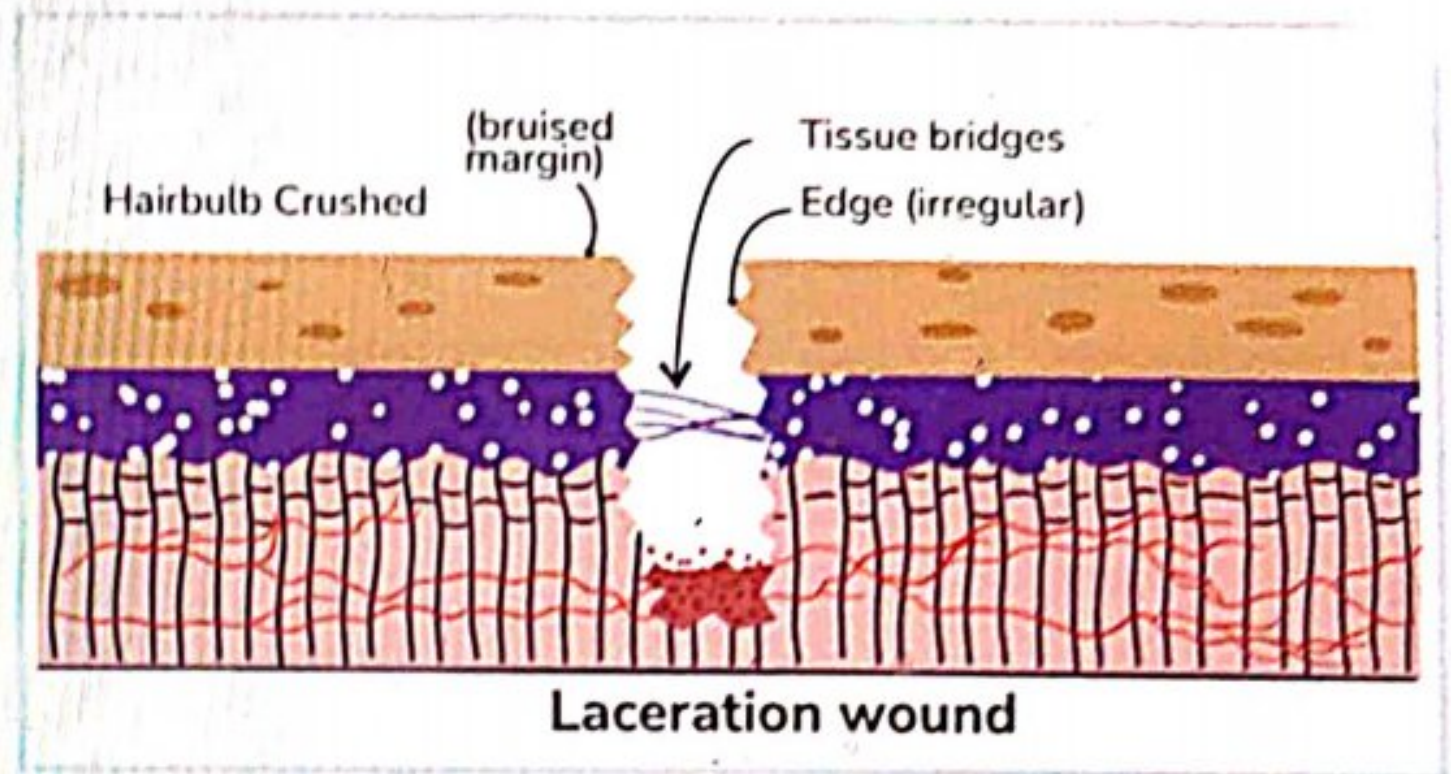
Difference between Contusion and Hypostasis

Refer Table 1.1

**LACERATION & INCISED WOUND**

00:19:20

Wound	Laceration	Incised
Force	Blunt (Tearing type)	Sharp (Cutting type)
Edges	Irregular	Clean, Cut & Regular
Margins	Bruising	No
Hair bulb	Crushed	Cut
Tissue bridges	Present	Absent
Bleeding	Less	More (Profuse bleeding)



**LACERATION**

Types of laceration

- Split laceration
  - Skin is crushed between 2 hard objects
  - Located on bony prominences



• Stretch laceration

- Overstretching of skin + Pressure with pull force.
- Eg- Flapping (Will help in determining the direction of force)



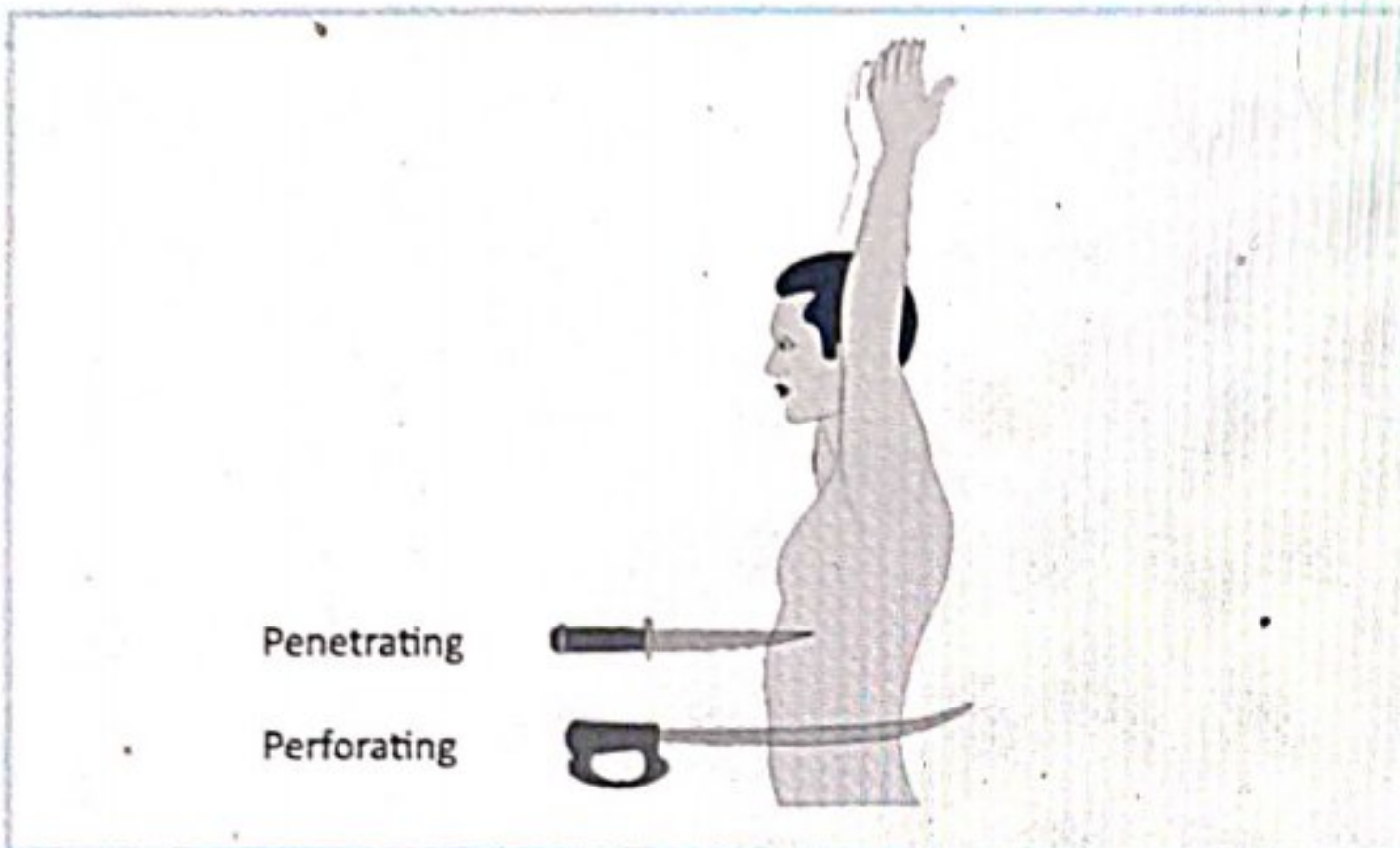


- **Avulsion** - Associated with any shearing force produced by grinding compression trauma.
  - Degloving is seen in avulsion laceration.
  - Flaying - Skin is separated from the underlying tissues

### Important Information

- Split laceration will look like incision wound "incised looking laceration"

### STAB WOUND



- Produced by any weapon with pointed end.
- **Types**
  - Penetrating - Only entry of the weapon
  - Perforating - Entry and exit as well

### Shape

- Single edged knife - Wedge shape
- Double edge knife - Oval
- Screw driver - Stellate shape / Star shaped

### INCISED WOUND

- The characteristic of incised wound is that it has got both the head & tail.



- Swallow tailing seen with Laceration.
- Fish tailing seen with Stab wound (by single edged weapon).
- Tailing is seen in Incision

### Important Information

- Direction of incised wound - Tailing of the wound suggests the direction of force.

### Hesitational cuts / Intentional cuts / Tentative cuts / Feelers strokes



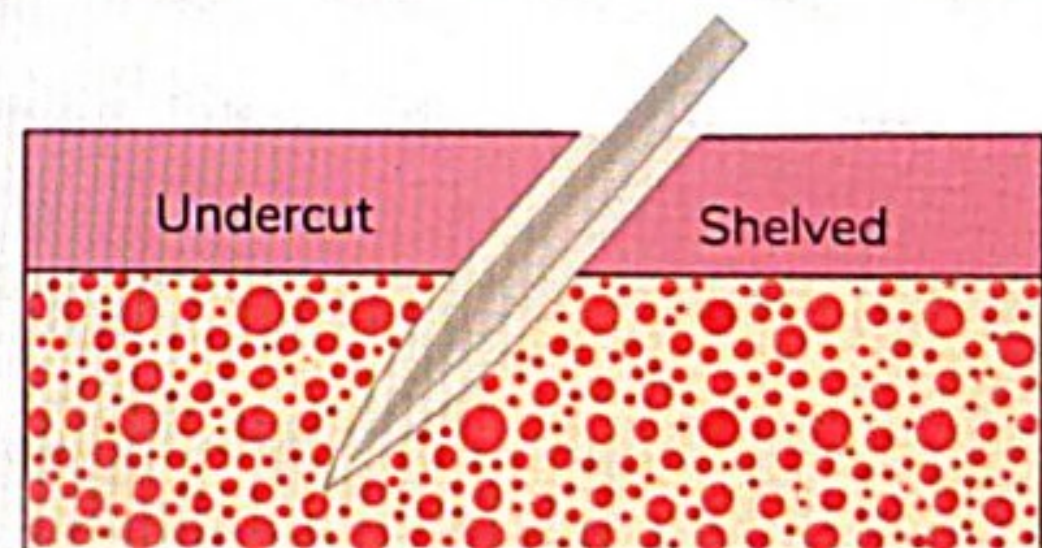
- Present in suicide cases.
- Multiple superficial linear cuts.

### Important Information

- Hesitational cuts usually present over the accessible parts of body and are diagnostic of suicide.

### HOMICIDE

1. Chop wound in head
2. Genital injury
3. Defence wound
4. Over kill
5. Bevelled cuts



### DEFENCE INJURIES

- Injuries sustained while defending the attacks
  - Suggestive of "Homicide"
  - Their presence is not mandatory in all homicide victims







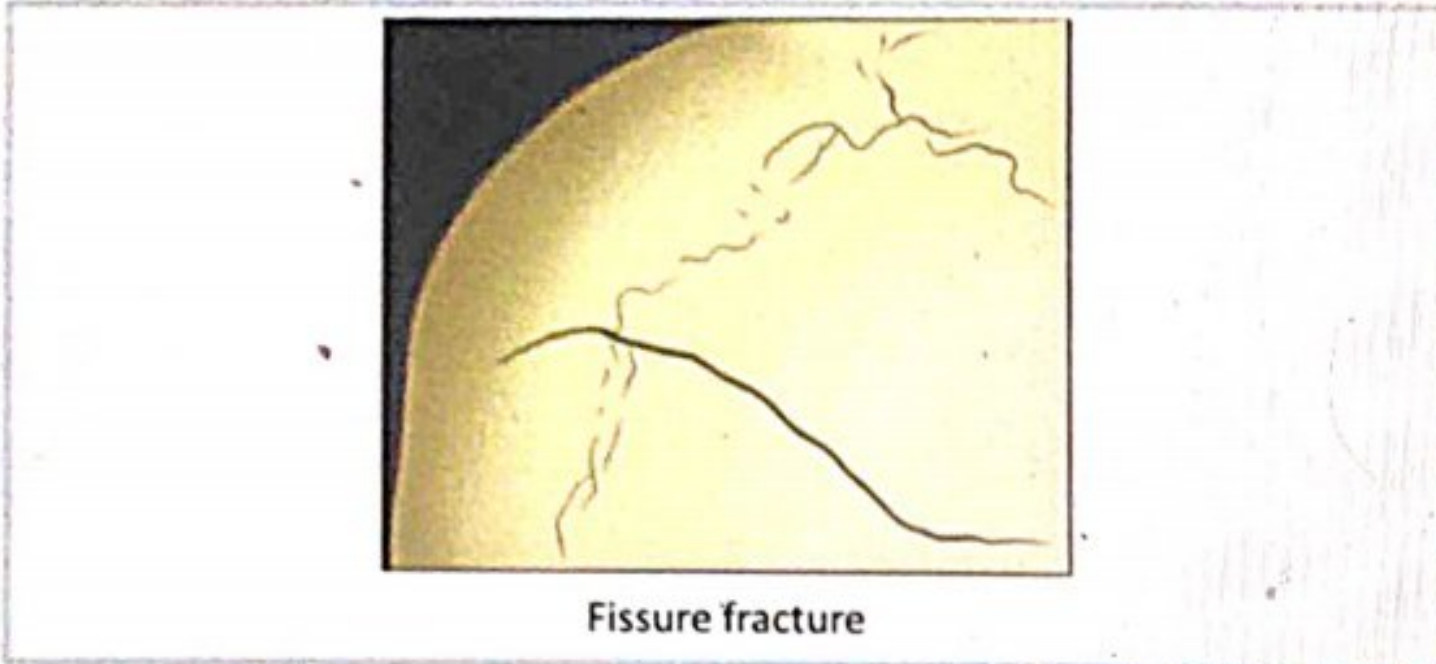
### Important Information

- Common sites are palm, ulnar margin of forearm

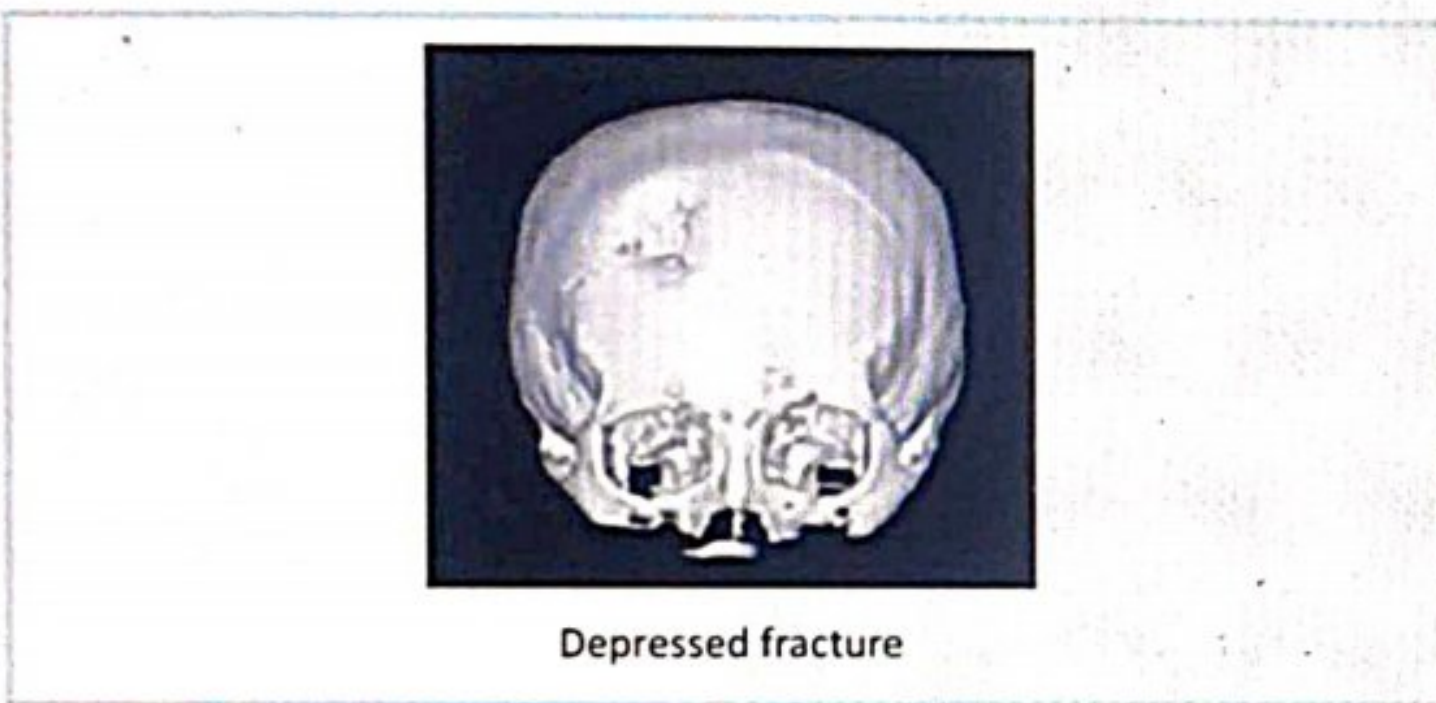
## SKULL FRACTURE

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- **Fissure fracture:** Has a linear fracture line



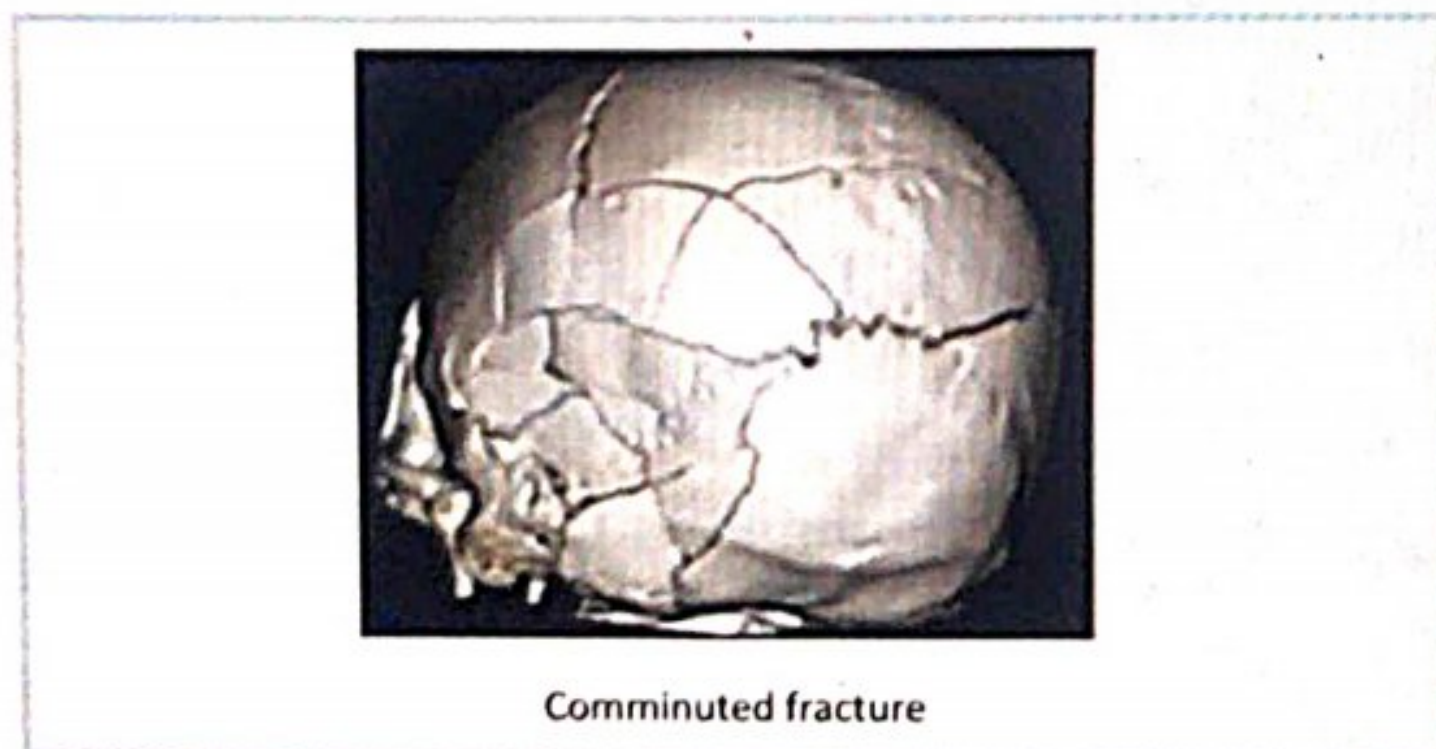
- **Depressed fracture:** Fractured fragment is depressed into cranial compartment.
  - E.g. - Seen with hammer weapon



### Important Information

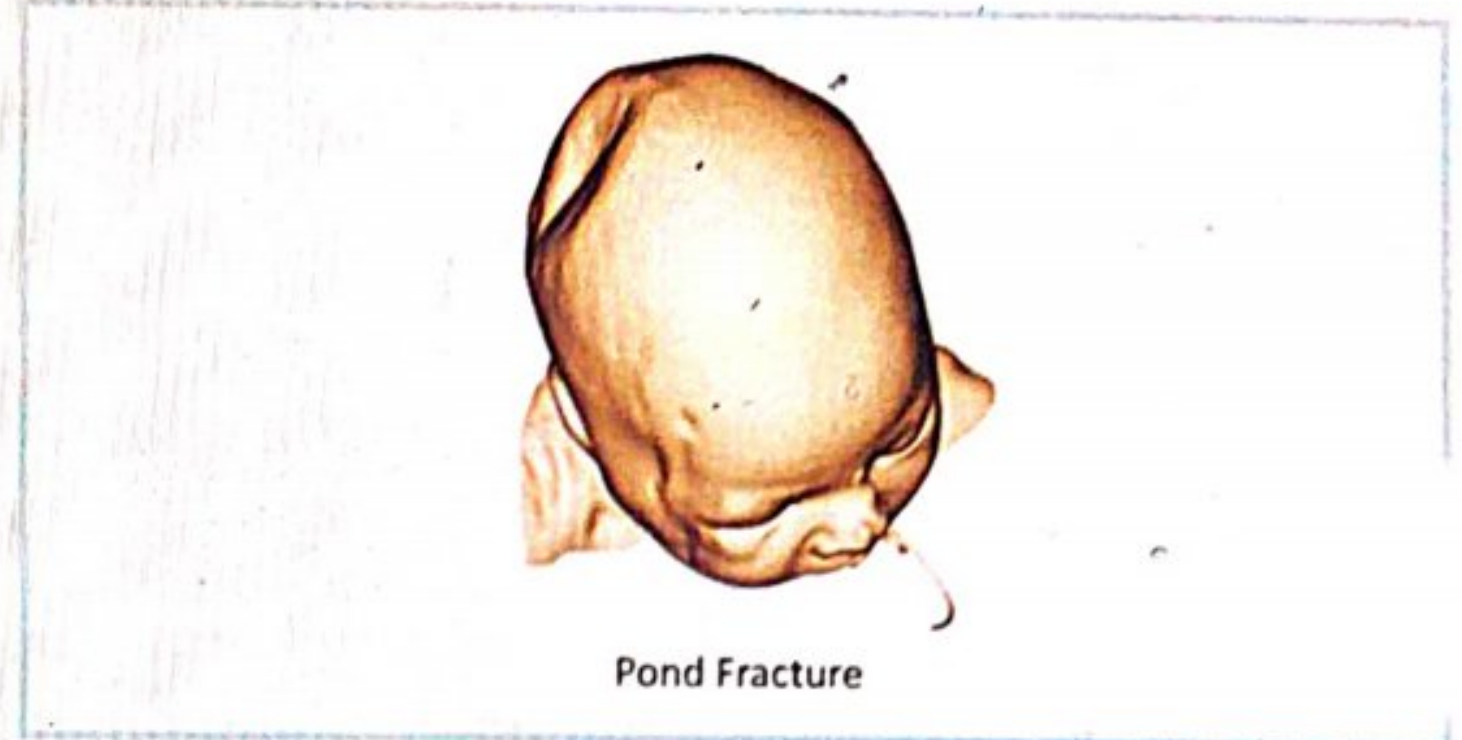
- Depressed fracture Aka signature fracture as it tells about the pattern of the weapon

- **Comminuted fracture:** Has multiple fracture segments

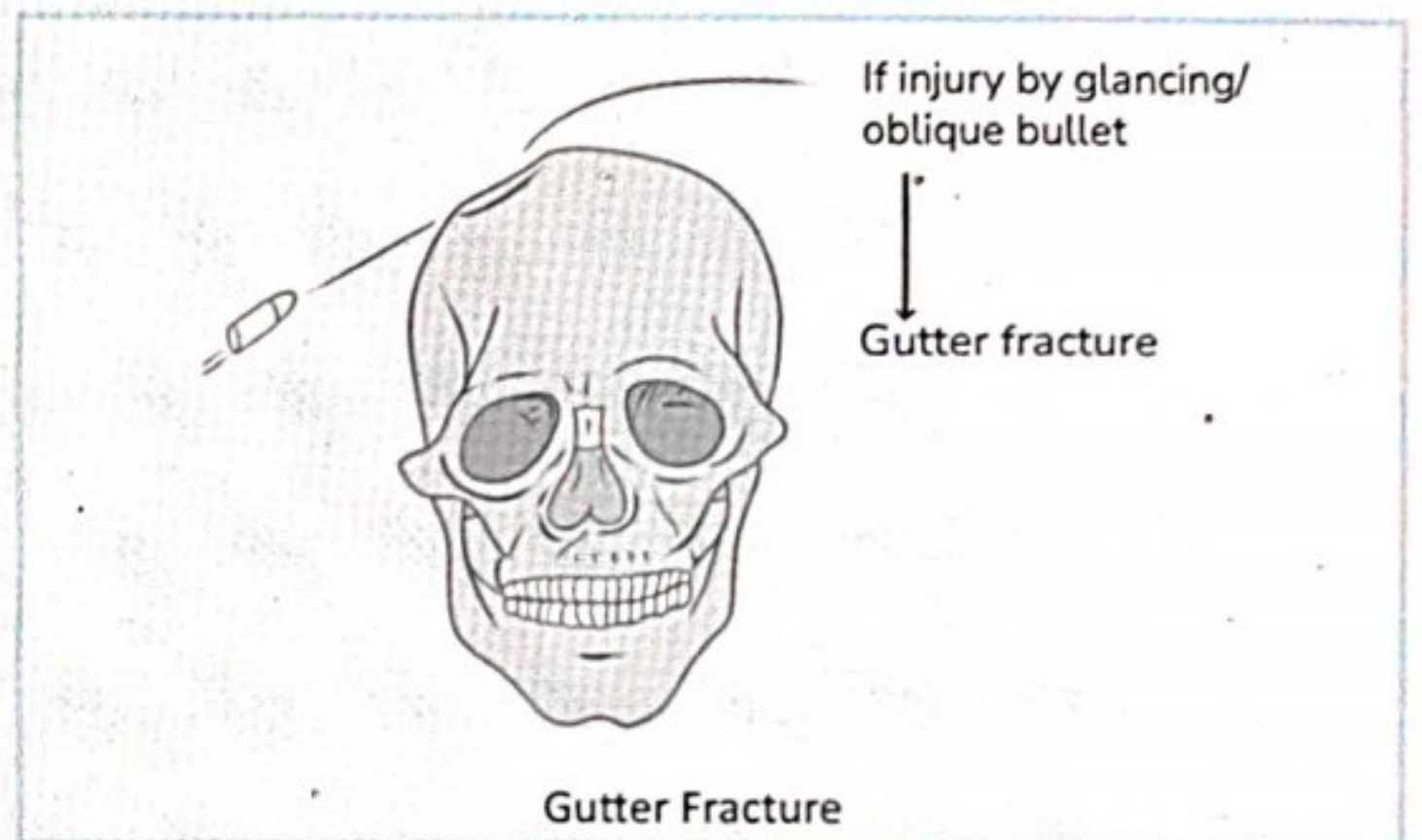


- **Sutural fracture:** Fracture along the suture
  - Aka **diastatic fracture**, commonly seen in parietal suture

- **Pond fracture / Indented fracture:** Usually seen in elastic skull (children)
  - A small depression present at skull



- **Gutter fracture:** Oblique bullet injury or glancing bullet can cause Gutter Fracture



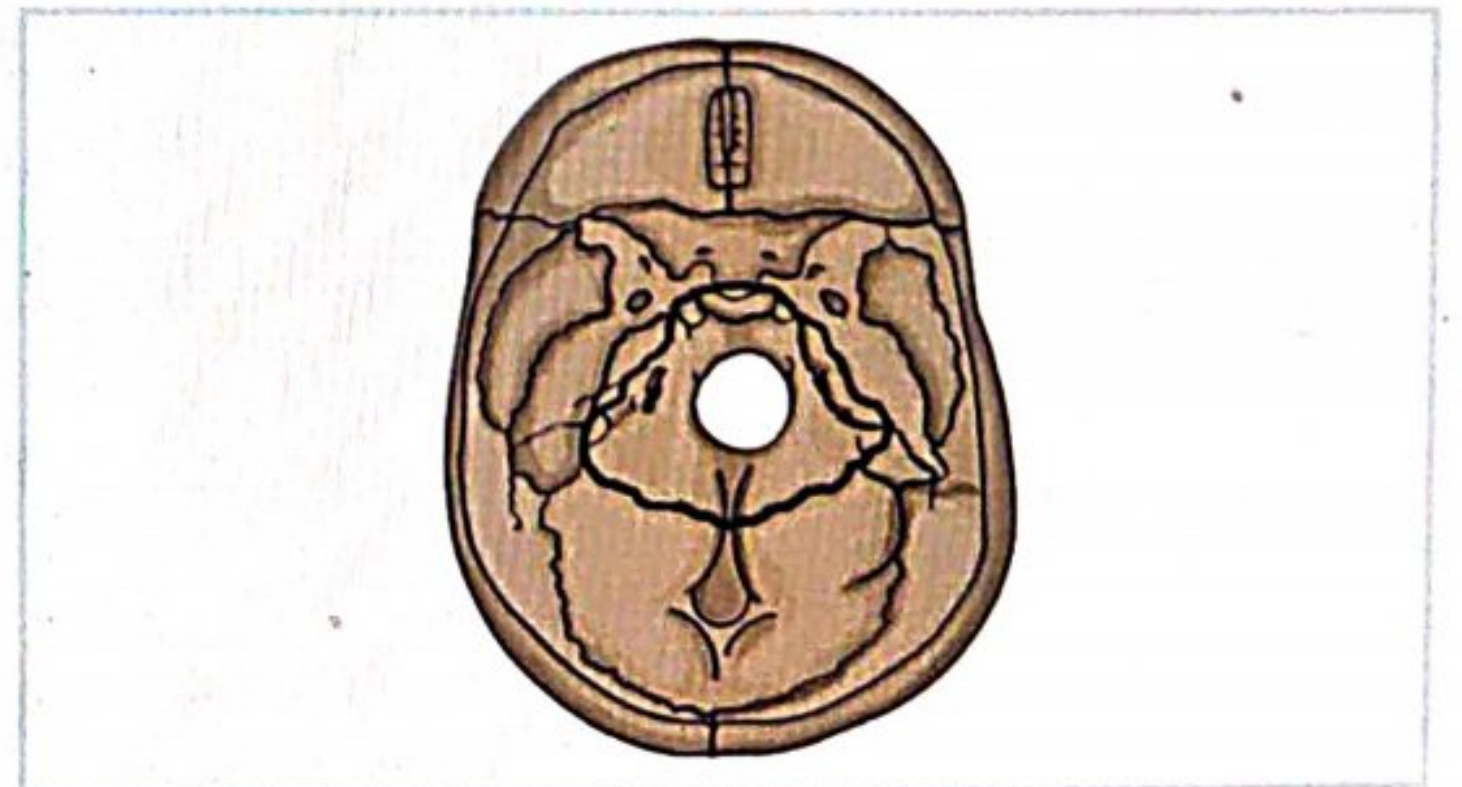
### Important Information

- **Puppe's rule:** If there are multiple fracture lines then we can find out the sequence of blows
  - 2<sup>nd</sup> fracture line does not cross the old fracture line.

## FRACTURE OF SKULL BASE

### Ring Fracture

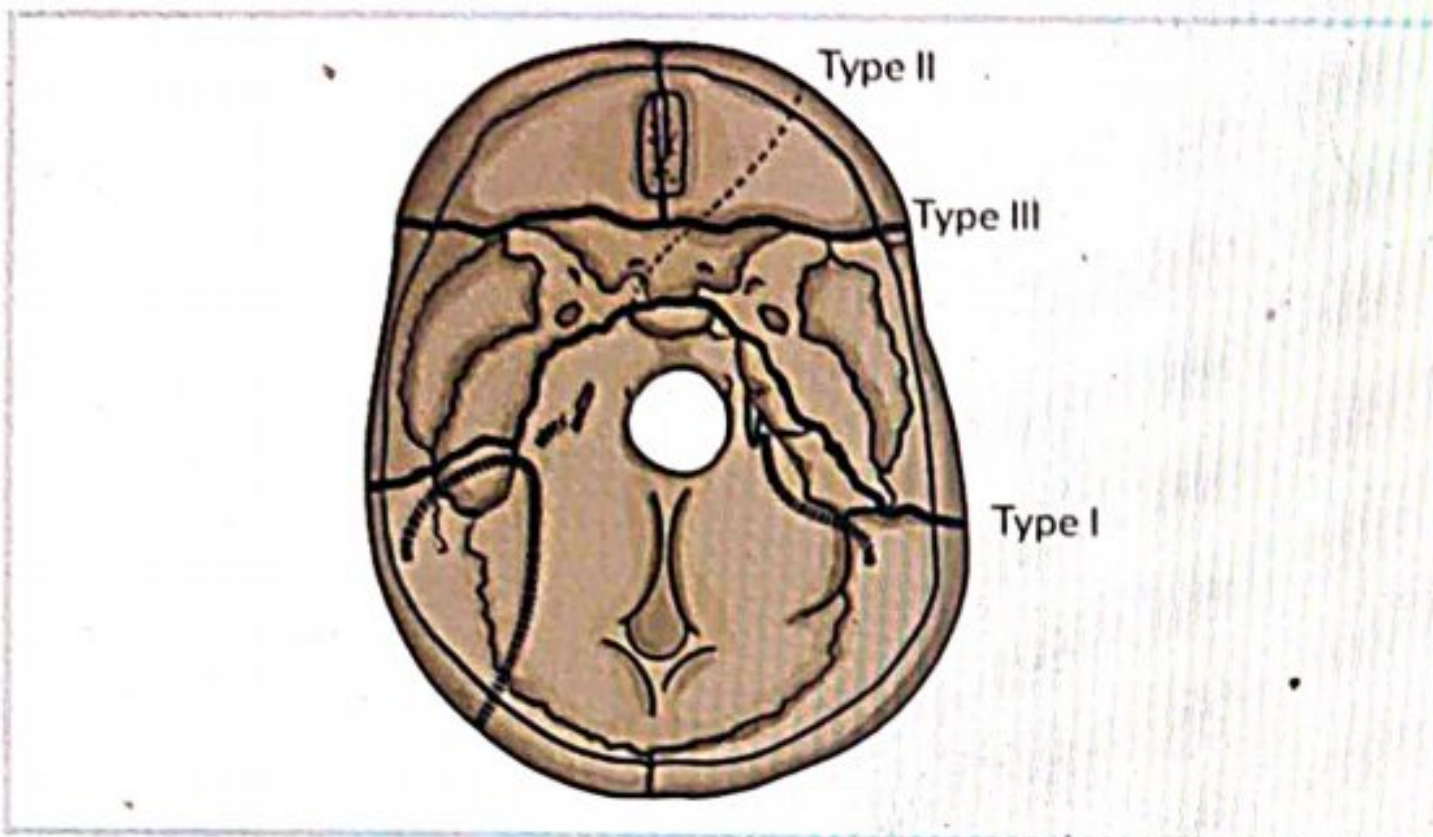
- Fracture line passes around the foramen magnum and it is usually present in case falling from height and landing on feet.
- Seen with posterior cranial fossa fracture.





### Hinge fracture / Motorcyclist fracture

- **Hinge Fracture Type 1**
  - Fracture line runs along with Middle Cranial Fossa from one side of temporal region to the other side of temporal region and divides the skull into front and back half
- **Hinge Fracture Type 2**
  - Hinge fracture is defined as oblique fracture running through sella turcica
- **Hinge Fracture Type 3**
  - Type 3 fracture denotes fracture line running in the anterior half

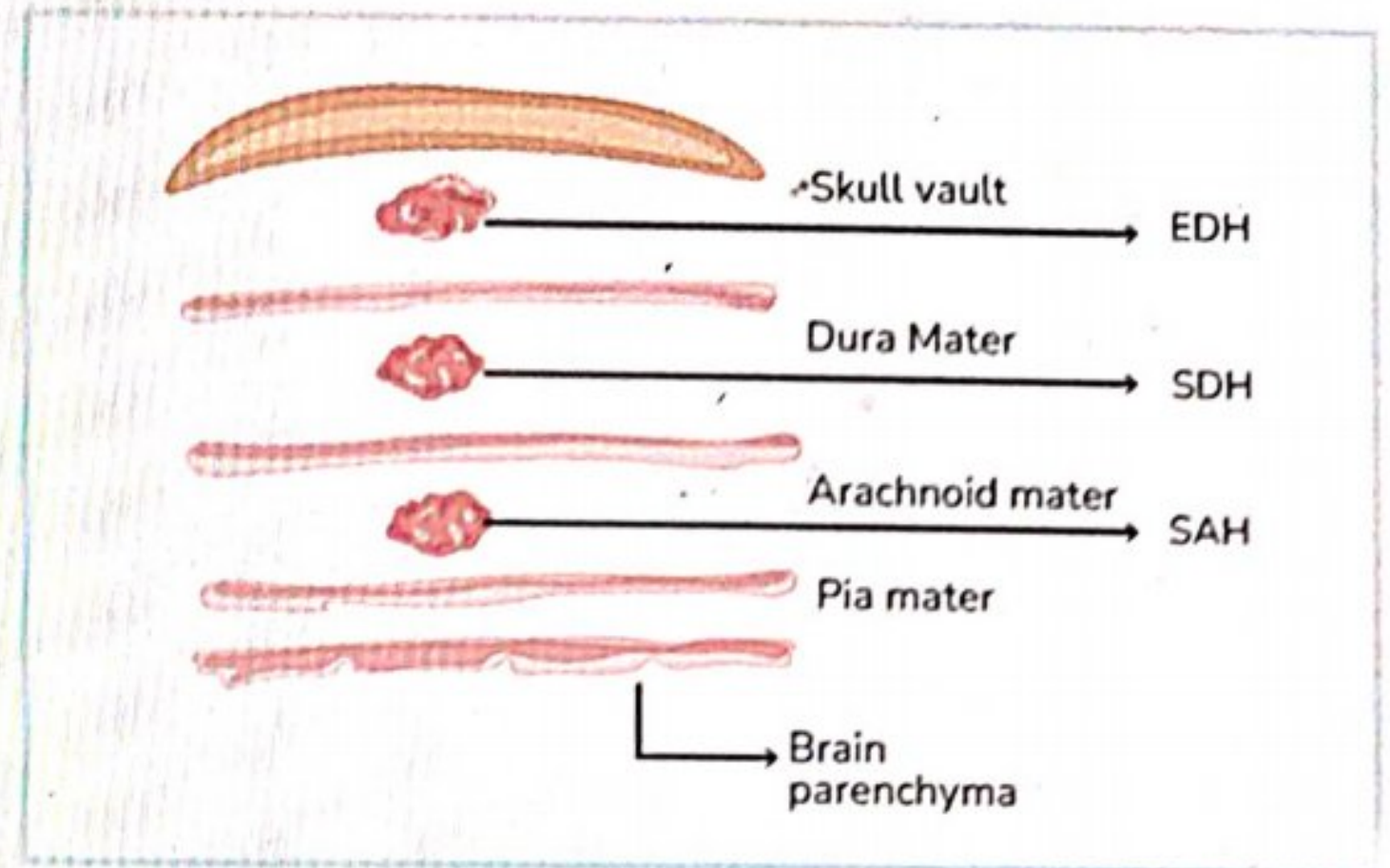


**Important Information**

- Nodding face sign seen in hinge fracture

### Intra cranial Haemorrhages

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- **Source of Bleeding**
  - EDH: Due to rupture of middle meningeal artery present near Pterion, purely due to trauma.
  - SDH: Due to rupture of Bridging Veins. Mostly due to trauma but can also be spontaneous.
  - SAH: Due to rupture of Arteries (Circle of Willis). Trauma or Spontaneous (due to rupture of aneurysm or AV malformation)
- **EDH**
  - Usually a coup injury
  - Associated with fracture of temporal bone
  - It is usually coup injury
  - Clinical feature is that it presents with Lucid interval

**Important Information**

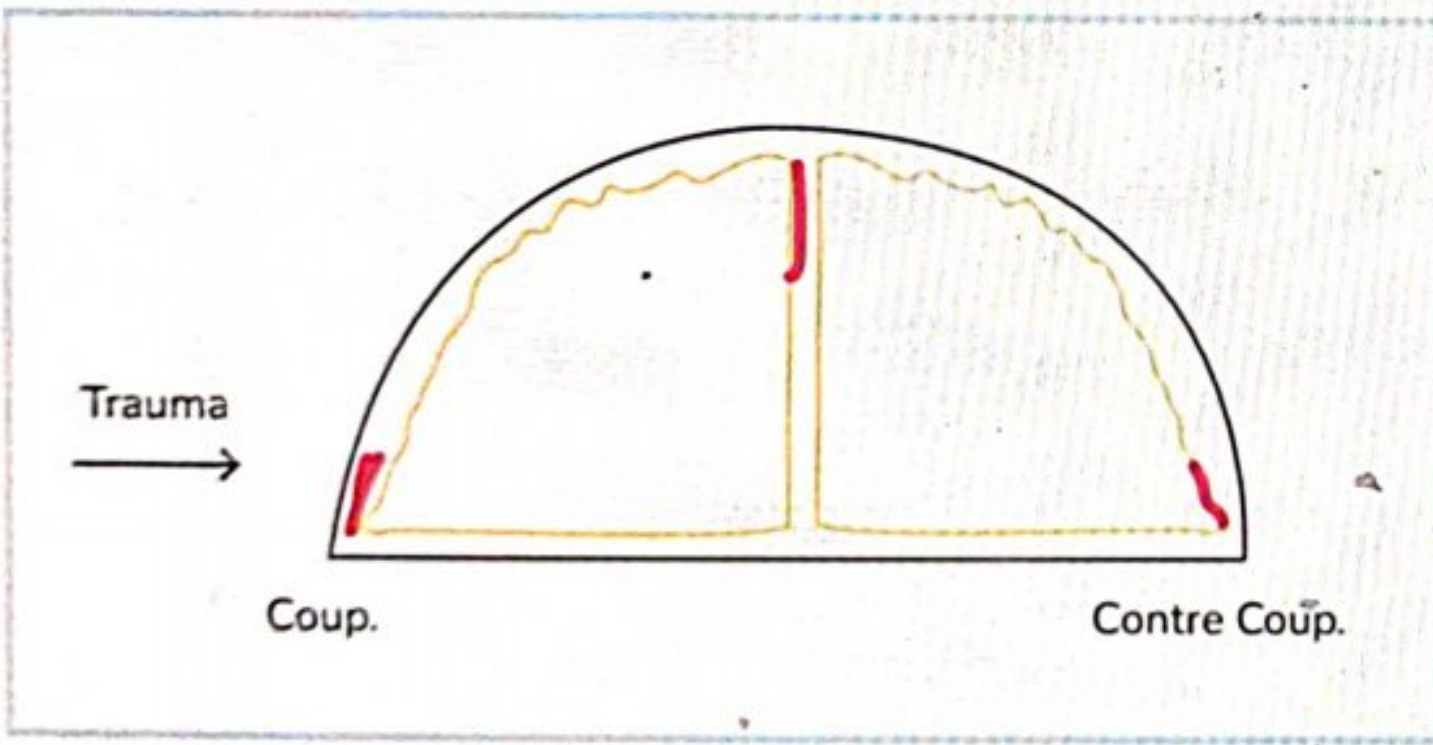
- In EDH, Lucid interval is seen. Period of Consciousness Between two Unconsciousness.

- Doctor can be liable under IPC 304 (A)
- CT SCAN shows Biconvex appearance



### Coup and Counter Coup Injury

00:32:59




Coup injury	Contre Coup injury
<ul style="list-style-type: none"> <li>• Present at the site impact</li> </ul>	<ul style="list-style-type: none"> <li>• Present opposite to the side of impact</li> <li>• Can be present at the opposite side of the same lobe</li> </ul>
	<ul style="list-style-type: none"> <li>• MC site is frontal lobe contusion with occipital fall</li> <li>• Usually seen only when the head is mobile</li> </ul>



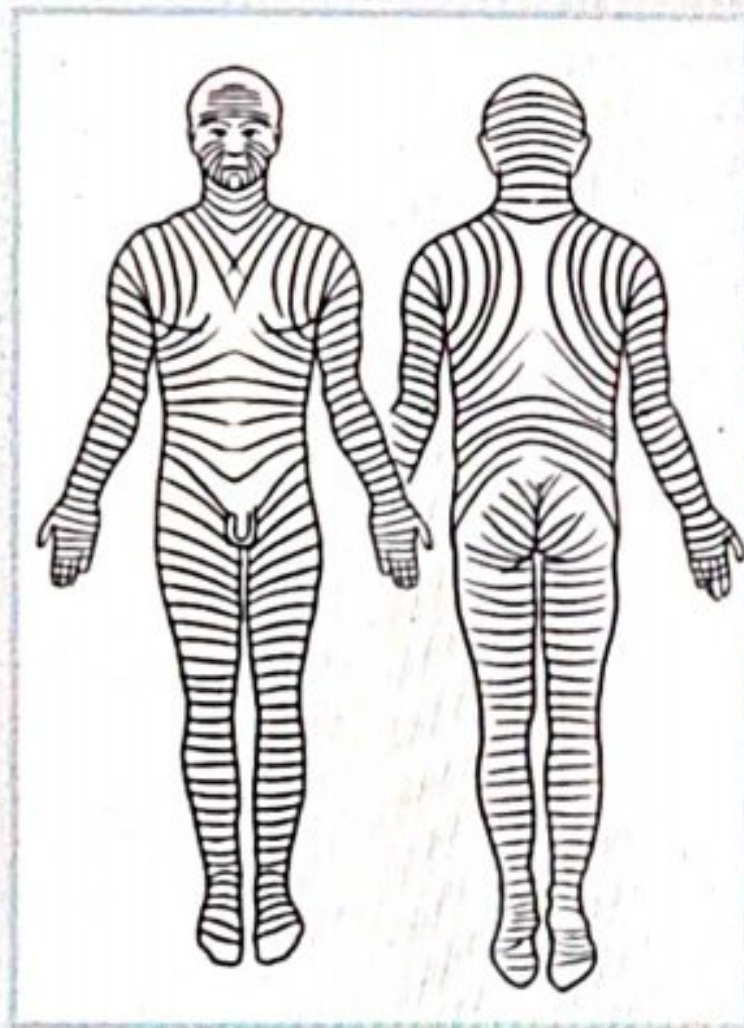
- SDH
  - A - Alcoholics / Aged
  - B - Boxers
  - C - Child Abuse (Battered Baby Syndrome because of wild shaking)
  - E - Elderly person with a minor trauma
  - CTSCAN - Concavo-convex / Crescent shape

- SAH
  - Rupture of Aneurysm (Berry Aneurysm M/C) or AV malformations or trauma or systemic hypertension
  - Presentation - Young age, thunderclap headache, seizure, coma
  - On CSF - Xanthochromia is seen

 **Extra Edge**

**Lines of Langer**

- These are collagen fibres arrangement in body which follow a specific direction



- Lines of Langer determines the gaping of wound

 **Extra Edge**

**Bevelling**

- It is an oblique cut produced by a sharp weapon.
- Suggestive of homicide.



**Self-inflicted / suicidal stab injury**



- Hara-kiri / Seppuku
- Practiced by Japanese soldiers
- Cause of death in Hara-kiri is Evisceration and hypotension



**Table 1.1**

Character	Hypostasis / Livor mortis	Contusion
Site	<ul style="list-style-type: none"> <li>• Seen in dependent area</li> </ul>	<ul style="list-style-type: none"> <li>• Any where</li> </ul>
Edges	<ul style="list-style-type: none"> <li>• Well defined edges</li> </ul>	<ul style="list-style-type: none"> <li>• Ill-defined edges</li> </ul>
Blanching	<ul style="list-style-type: none"> <li>• Present</li> </ul>	<ul style="list-style-type: none"> <li>• Absent</li> </ul>
Extravasation	<ul style="list-style-type: none"> <li>• Blood is retained in intact capillaries therefore, Extravasation is absent.</li> </ul>	<ul style="list-style-type: none"> <li>• Blood escaped through ruptured capillaries therefore, Extravasation is present.</li> </ul>
Colour changes	<ul style="list-style-type: none"> <li>• Absent</li> </ul>	<ul style="list-style-type: none"> <li>• Present</li> </ul>
On incision, pour water	<ul style="list-style-type: none"> <li>• Incision: Blood flows from the cut vessel.</li> <li>• Washable</li> </ul> 	<ul style="list-style-type: none"> <li>• Incision: Blood coagulates in tissues</li> <li>• Not washable.</li> </ul> 



## 2 THERMAL INJURIES



### HYPOTHERMIA

- Body temperature less than 35°C
  - Person has mental confusion and there is failure of vasoconstriction
- This causes all blood to suddenly rush to skin, so the person feels hot and removes all his clothing
- This results in death
- **Hide and die syndrome** - Seen in severe hypothermia
- **Pink hypostasis** - If the person dies in severe hypothermia aka white death this phenomenon is seen.
- **Wischnewsky's ulcer** - Stress ulcer seen in stomach in case of hypothermia



### Important Information

- In Severe hypothermia - Paradoxical undressing is seen
- Mimics sexual assault

### Peripheral Cold Injuries

#### 1. Freezing

- **Frost bite** - Seen in Dry cold
  - Frost bite can be superficial and deeper
  - SUPERFICIAL - Anaesthesia / erythema is seen
  - DEEPER - Edema /blister/thrombosis can be seen
  - Rx- Rewarming (37-40 degree)
  - Frost nip - No freezing, it is followed by frost bite

#### 2. Non Freezing - Chillblains

### HEAT

#### General Effects

- **Heat cramps** - Muscle cramps due to excess sweating (Na depletion)
- **Heat exhaustion** - Na<sup>+</sup> depletion and water depletion. Body temperature is normal
- **Heat stroke**
  1. **Triad of**
    - Core body temperature more than 40.5°C.
    - CNS dysfunction - altered sensorium, delirium
    - Heat stress exposure
  2. Person has tachycardia, tachypnea, hypotension.

#### Heat Stroke Types

- Classical - No sweating, Skin dry and hot
- Exertional - Diaphoresis is seen
- Rx- Cooling of the body

#### Local Effects

1. Dry - due to exposure of fire, produces burns
2. Moist - due to hot liquid, produces scalds

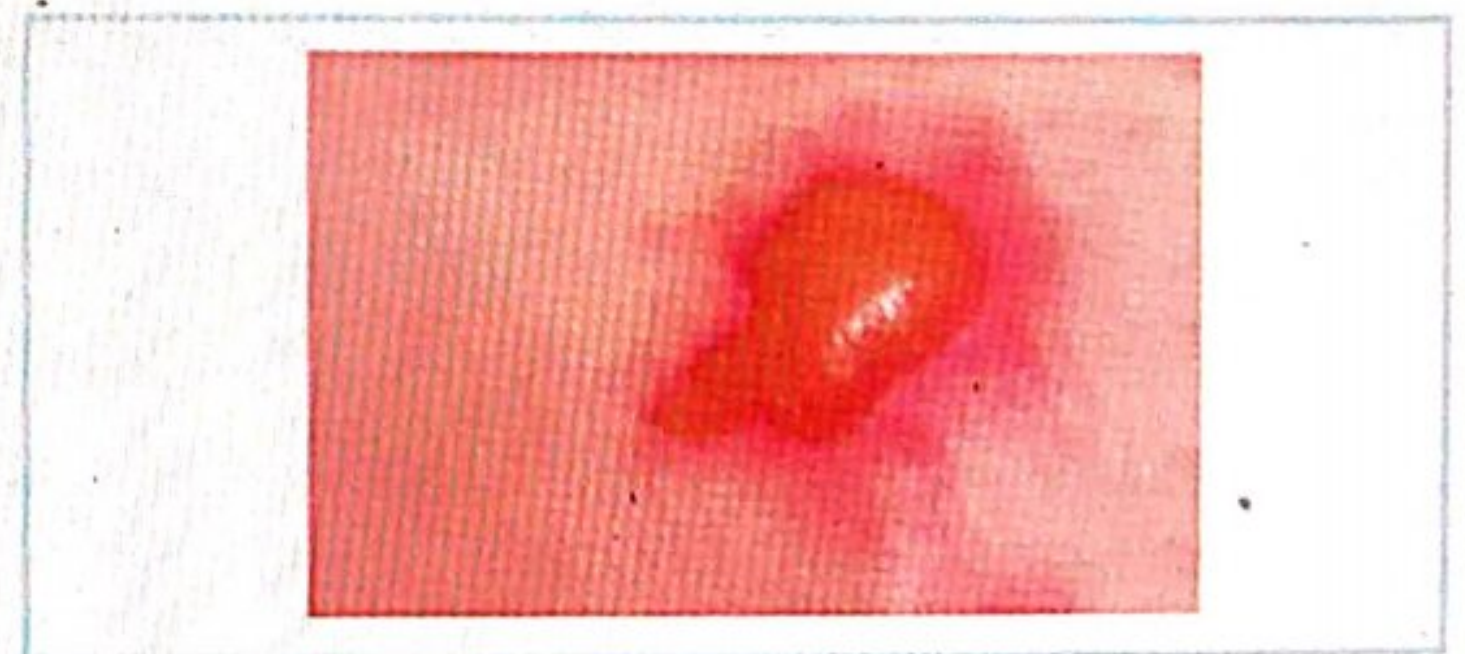
#### Burns

##### Burns – Due to dry heat

- Any superficial burns - Painful /Non scarring
- Any deep burn- Painless / Scarring
- Burn body surface area calculated by - Rule of nine / wallace, lund and browder chart (in children), rule of palm (1%)

### AUTOPSY FINDINGS

- **Non-specific signs**
  - **Heat stiffening / pugilistic attitude / Boxers attitude** - Protein coagulation, resembles rigor mortis
  - **Heat rupture** - Skin splits due to drying and dehydration, look like incised wound. Pale, no bleeding / intact vessels, nerves
  - **Heat hematomas** - Due to boiling of blood leading to rupture of blood vessel and resemble traumatic EDH. → Chocolate brown / honey comb appearance
  - **Heat fracture** - Seen in skull and long bones (street and avenue fracture). Due to pulling of muscle and also due to drying of bone
- **Specific finding - Seen only in antemortem burns**
- **External findings**
  - F- Fluid in blisters (increased proteins and chloride)
  - I – Inflammatory reaction (granulation tissue), infection
  - R- Redness / redline
  - E- Elevated enzymes



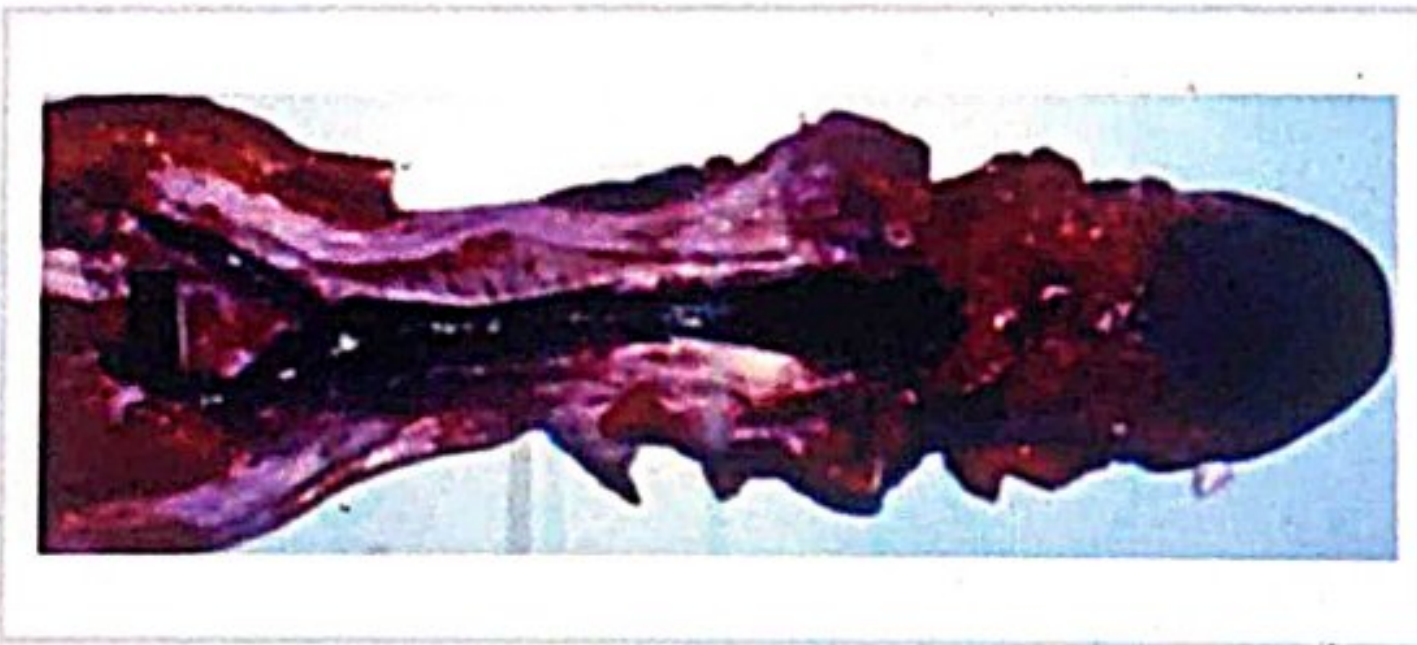
### Important Information

- Gas in blisters is seen in postmortem burns
- **Internal findings** - All are antemortem signs 3C
  - Carbon deposition (Soot) into Airways due to inhalation



of smoke

- CoHb is increased in blood
- CN level raised



### Important Information

- Curling's ulcer seen in duodenum in case of delayed death

	BURNS	SCALDS
Charring	+	-
Singeing of hair	+	-
Clothes	Burnt	Wet
Splashing	-	+
Lines of blisters	-	+
Level of contact	At / above	At/below

## ELECTRIC BURNS

01:06:30

Two types of current - AC & DC

- DC is associated with lightning
- AC is more dangerous
- "Amperage" - More Imp factor for electrocution



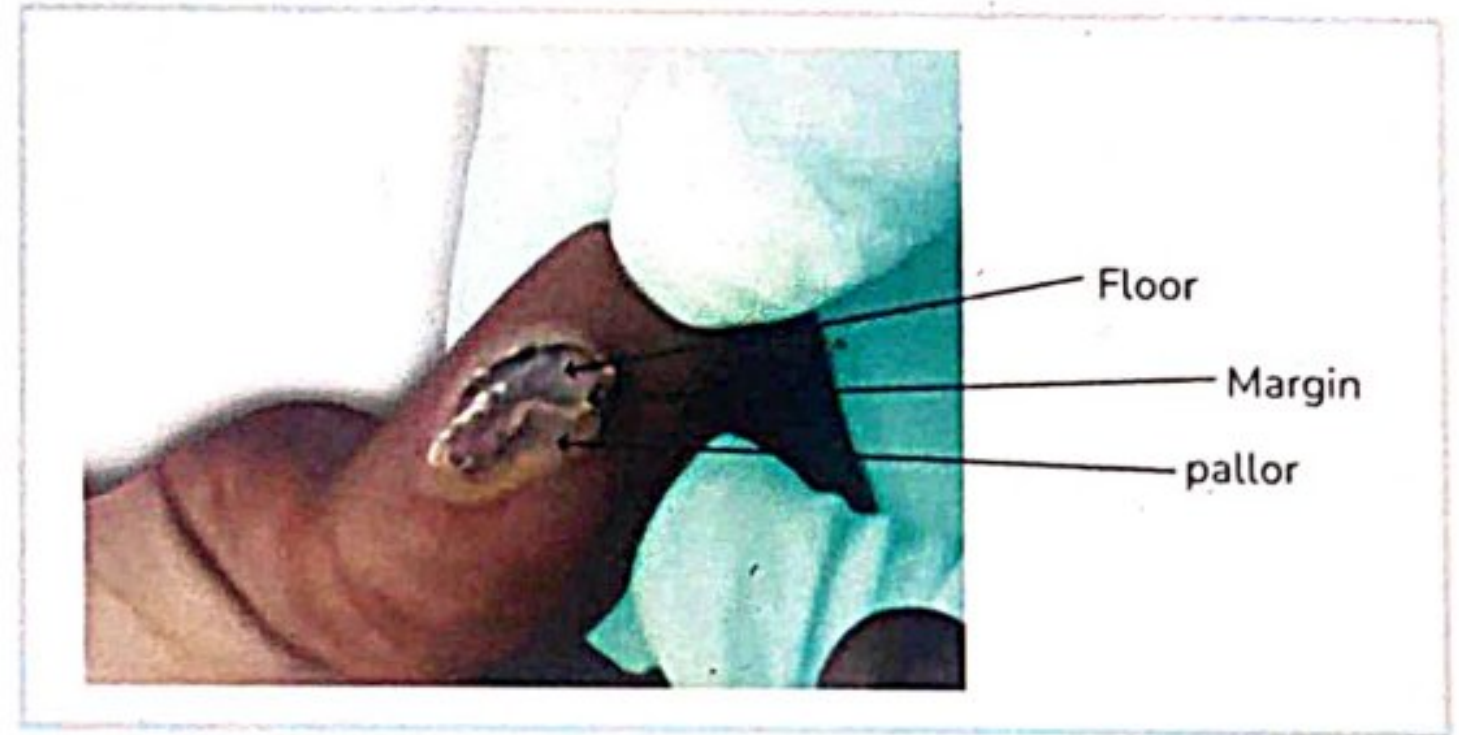
### Important Information

- Cardiac Arrhythmia - M/C/C of death in electrocution
- 2<sup>nd</sup> m/c is respiratory failure

### Classification of Electric Burns

#### 1. Low Voltage Burns

- Joule Burns (endogenous burn)
  - Central depressed floor
  - Pale peripheral areola
  - Due to tight contact with electricity
  - Aka endogenous burn



#### 2. High Voltage Burns

- Flash Burn (diffuse burn)



- Crocodile burn (Multiple pitted)



- Metallisation of entry wound - Metallic ions deposited from wire on skin
- Current pearls - Ion deposition in subcutaneous tissue
- Bone pearls - Due to high voltage calcium get molten into bone

#### 3. Filigree Burns





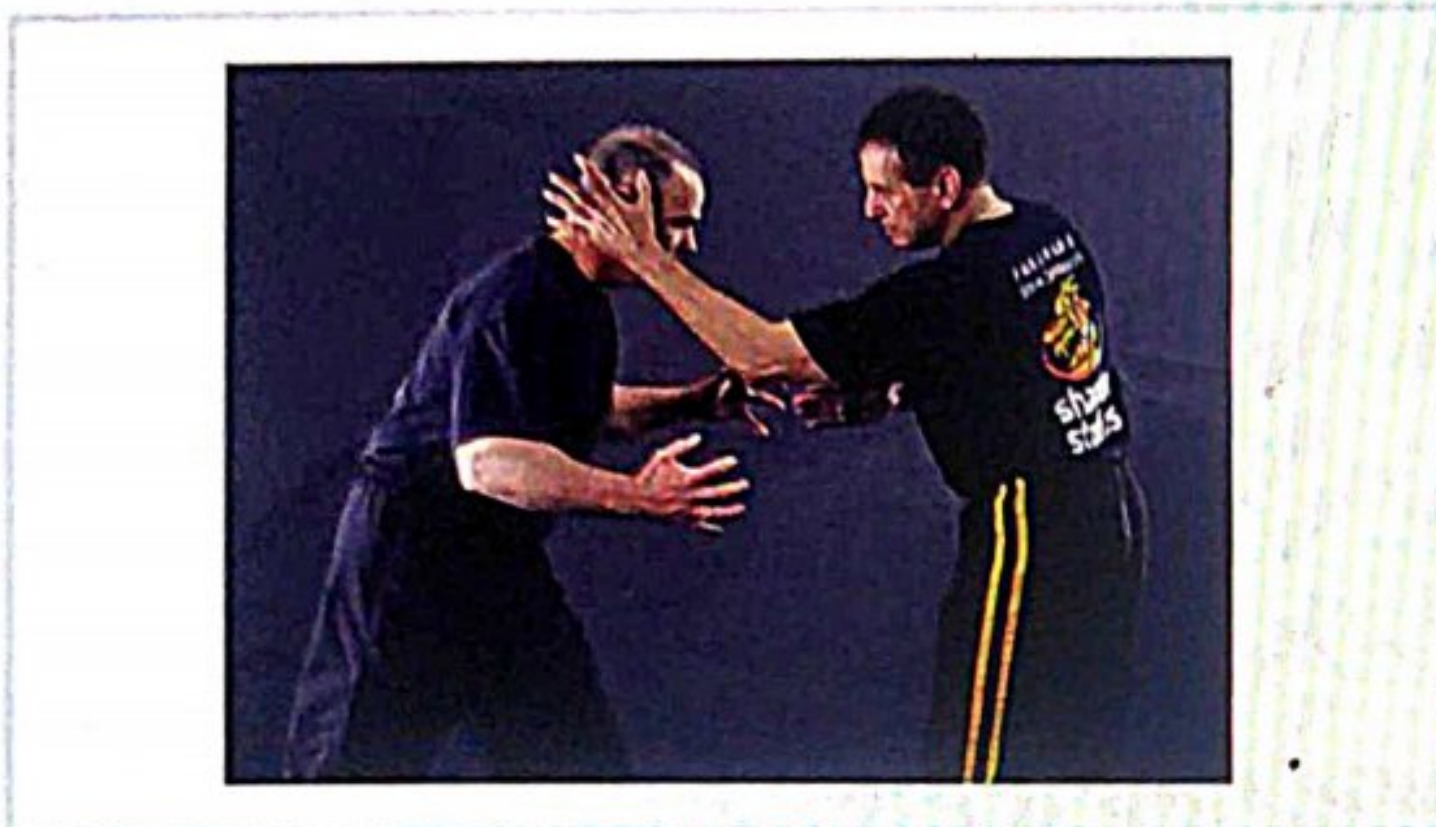
- It occurs due to lightening
- DC current burn
- Lichtenberg Flowers / Arborescent Markings
- Shows branching pattern - Ferning
- Aka Keraunographic markings

## TORTURE

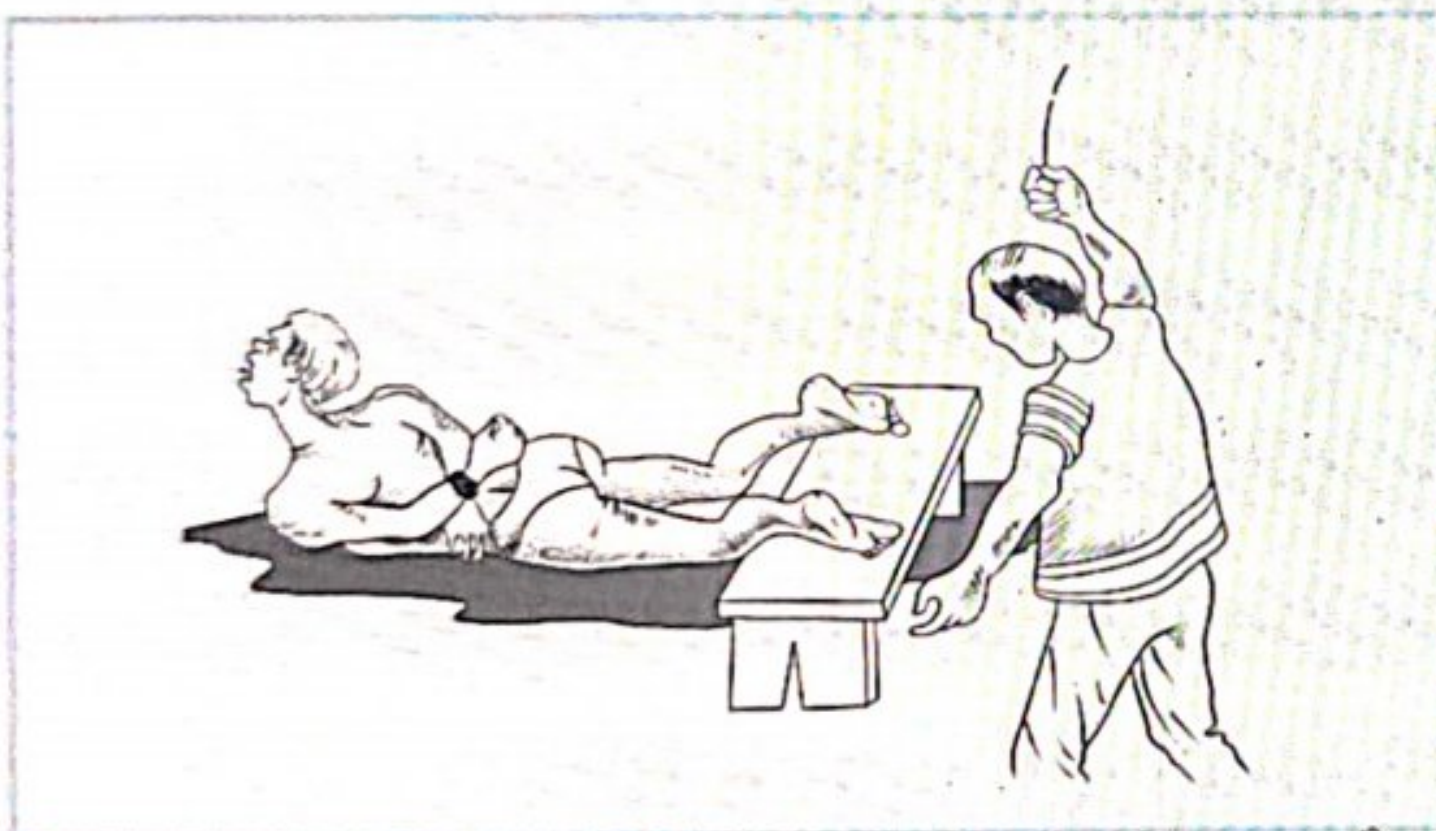
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### Types of torture

- **Telefono:** It consists of repeated Slapping over ears by the open palms of the assailant.



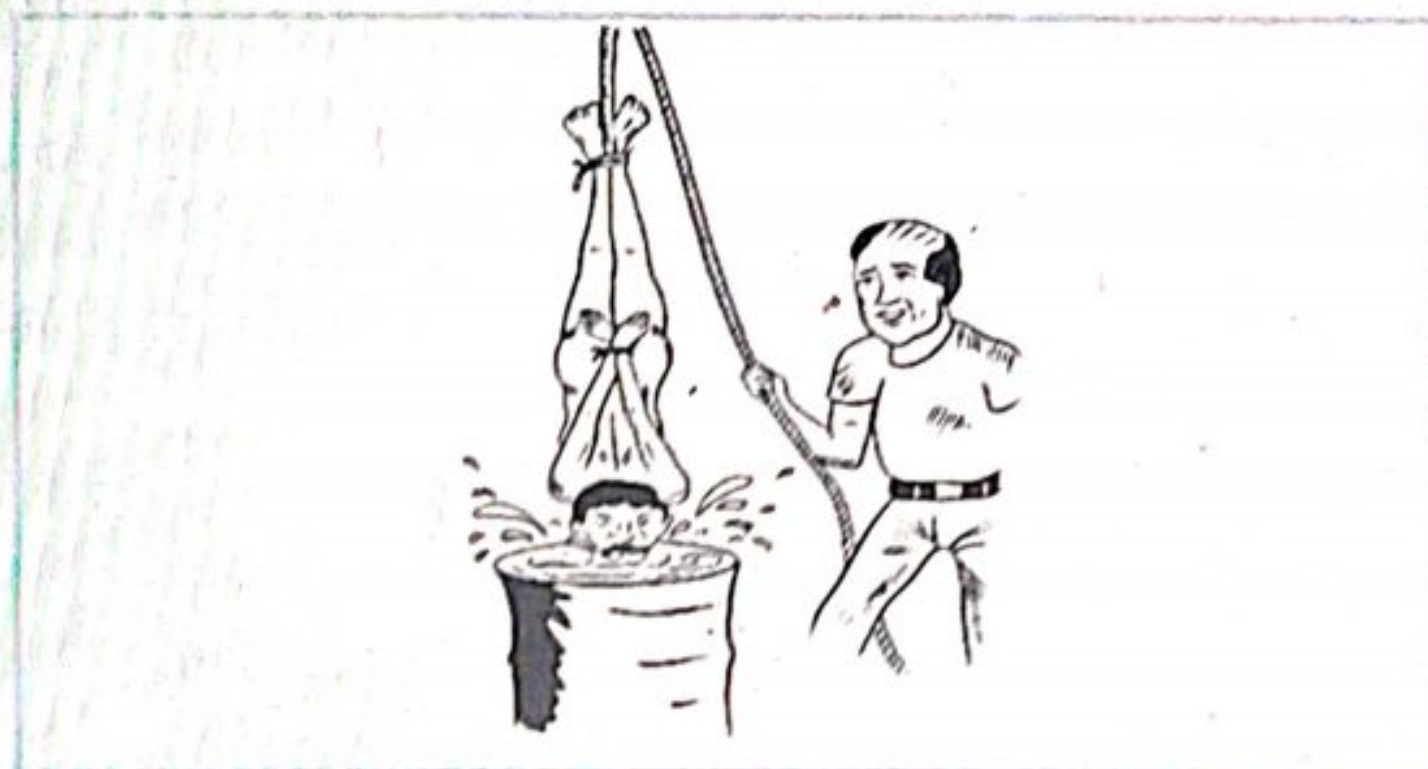
- **Falanga (bastinado):** In this canes or rods are used to beat on the soles of the feet.



- **Dry submarine:** Tying of a plastic bag over the head

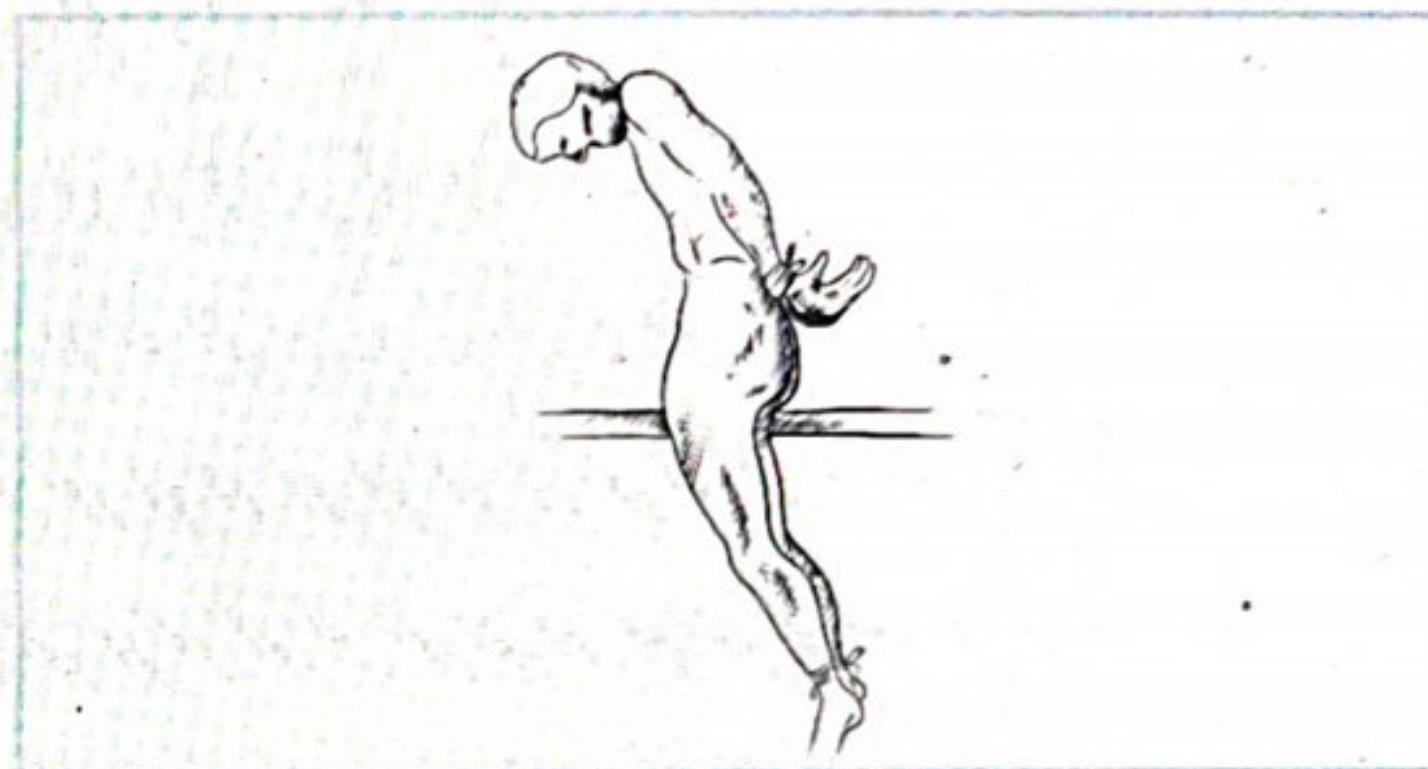


- **Wet submarine:** Forced immersion of head in water



- **Dunking:** Immersion of whole body under water

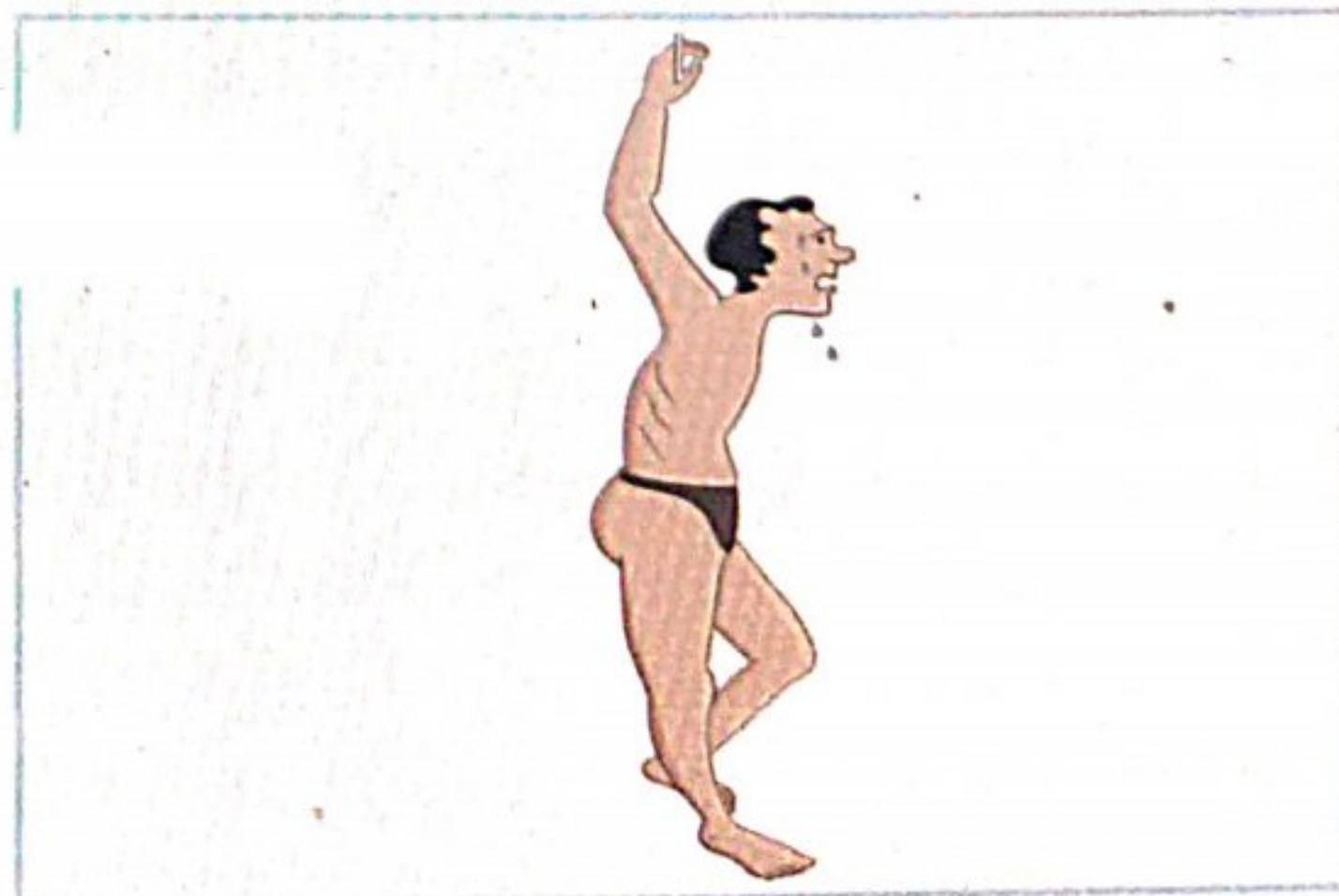
- **Saw horse:** Forced straddling



- **Parrot's perch:** Head down from a horizontal pole placed under the knees with the wrists bound to the ankle



- **Planton:** Long standing

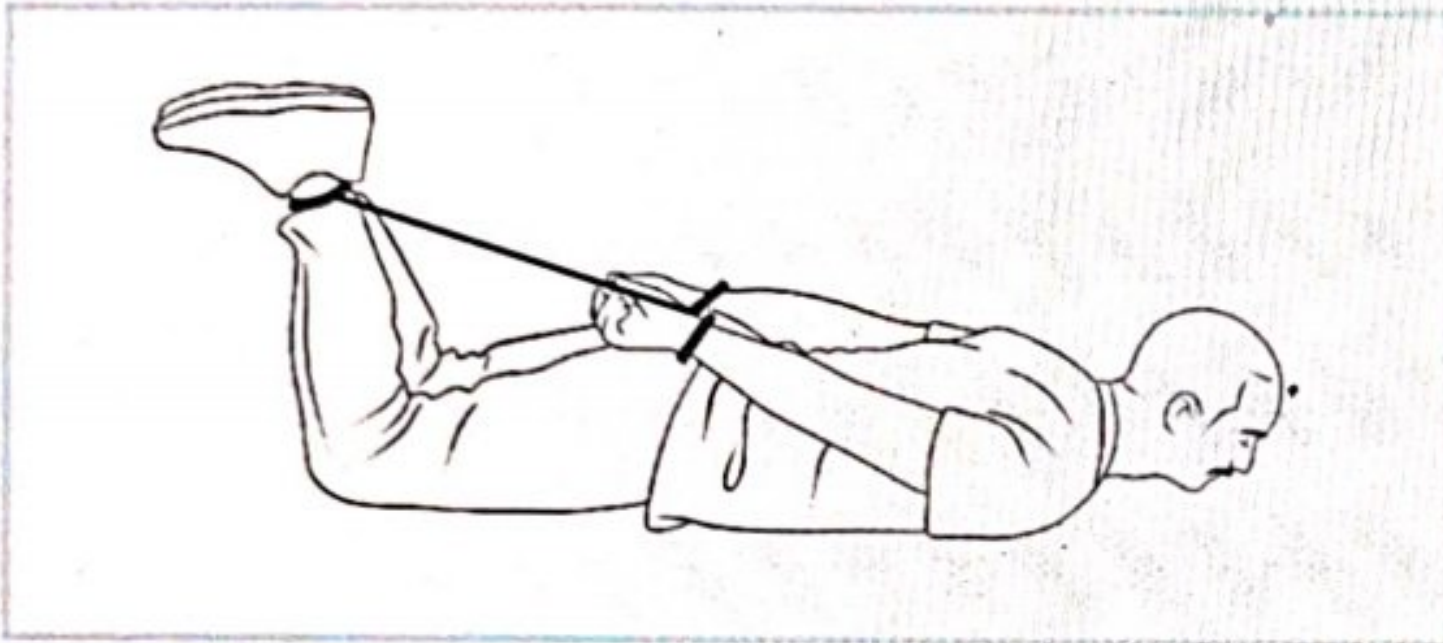




- Cattle's prod: Giving electric shock to genetila



- Hog Tying: Person is in prone position and his wrist and ankle are tied together.

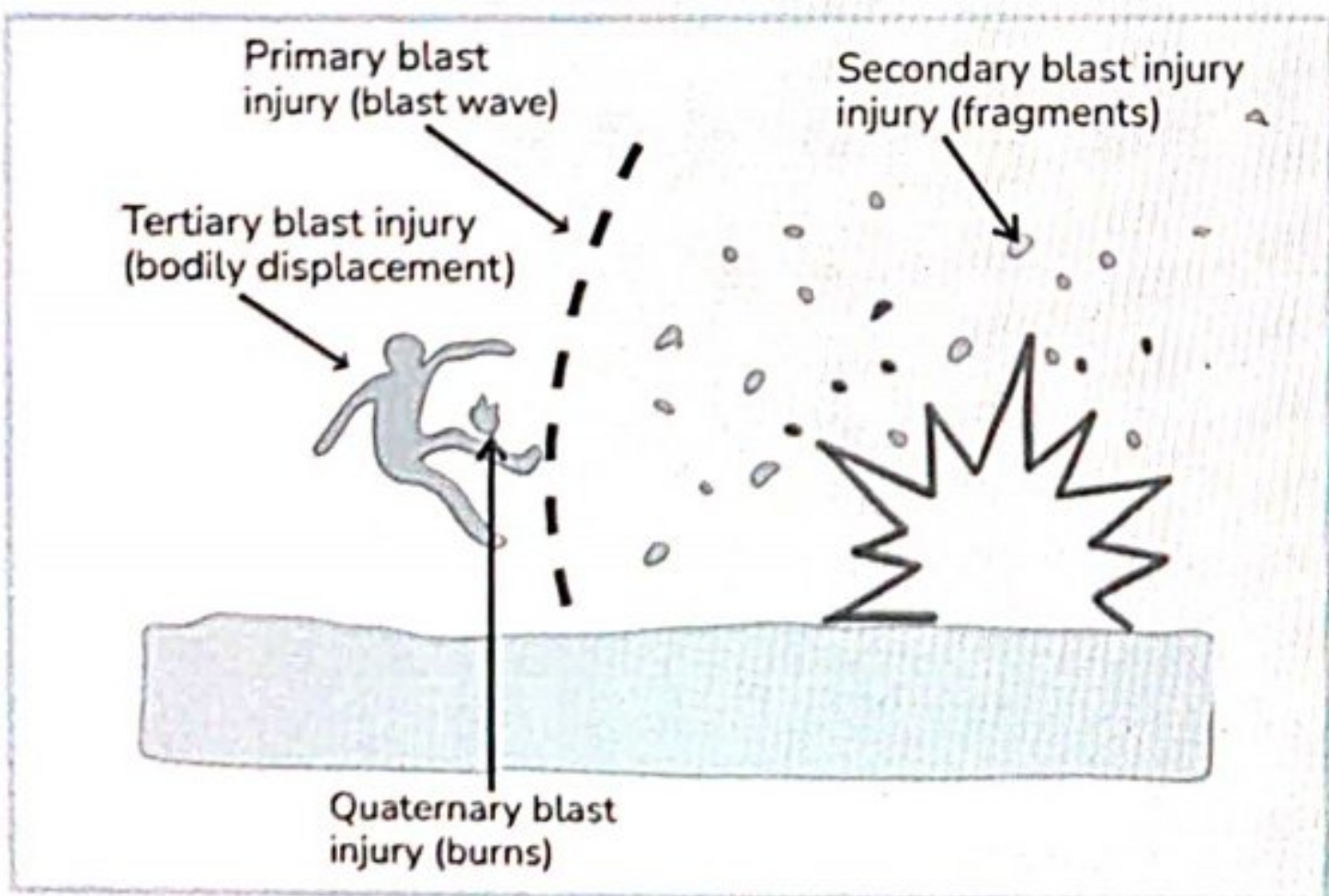


- Black slave: Heated metal skewer inserted into the anus

**Important Information**

- Declaration of Tokyo: Gives guidelines about handling the torture victim. Refrains the physician from helping in torture

## BOMB BLAST INJURIES



### 1. Air Blast

- Blast wave: Primary blast injuries affect ear drum (Tympanic membrane rupture), lung (blast lung), GIT

- Flying missiles / projectiles: Secondary blast injuries is combination of abrasion, contusion and laceration (aka Marshall's triad) can be produced at the same side of the body
- Wind/Victim displacement: Tertiary blast injuries (fractures)
- Miscellaneous factors: Quaternary blast injuries. It is due to building collapse causing traumatic asphyxia or die of burns

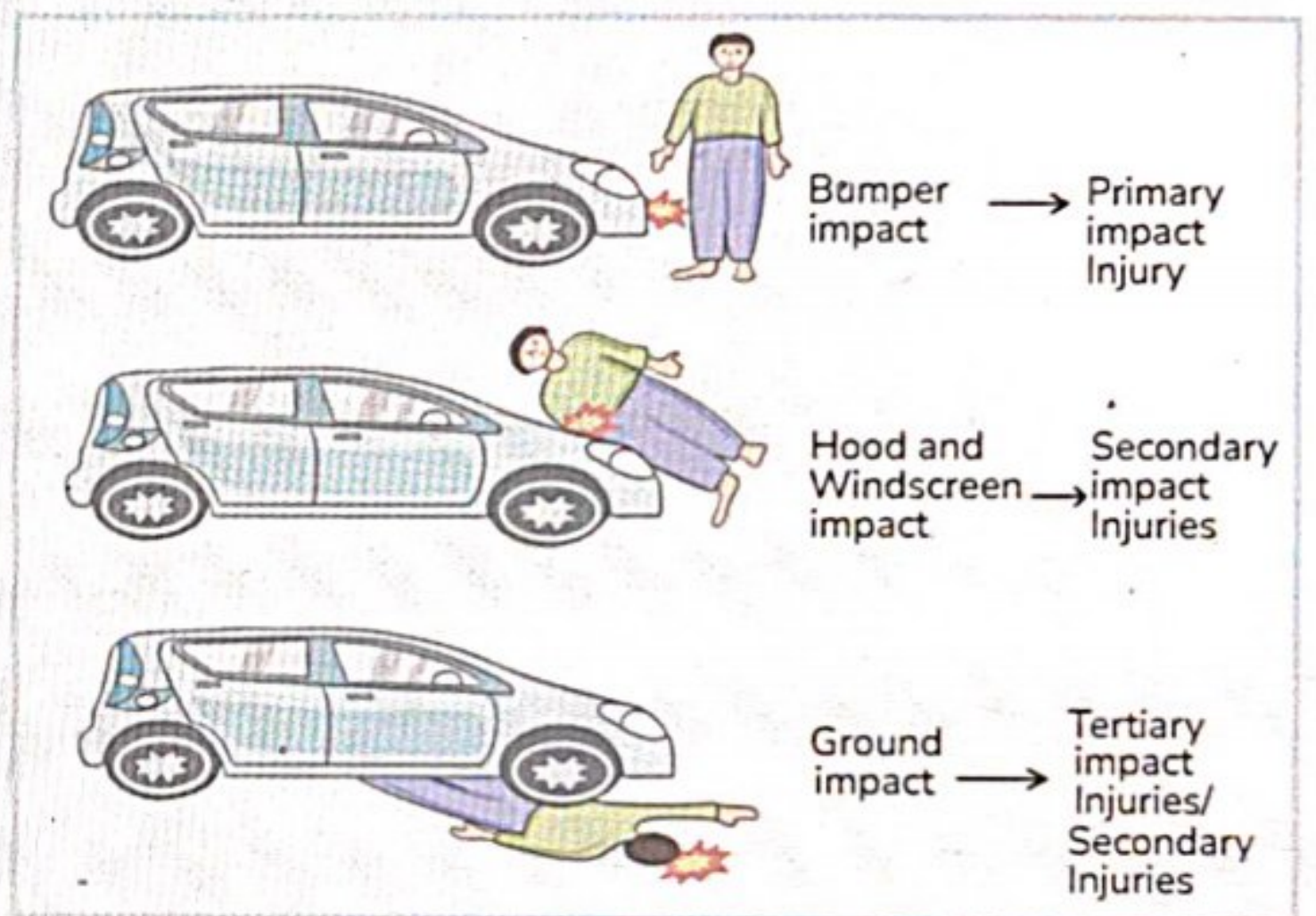
### 2. Underwater blast

- If head under water - Ear drum rupture
- If head above water - GIT injury

## TRANSPORT INJURIES

01:14:54

- 3 types pedestrian, occupant or motor cycle rider injuries. Pedestrian Injuries



### Injuries can be due to

- 1<sup>st</sup> impact with vehicle aka primary impact injuries aka Bumper injury. Tip of bumper fracture tells about direction of impact. Usually involves tibia in the legs.
- 2<sup>nd</sup> impact of vehicle aka secondary impact injuries
- Ground impact aka Secondary Injuries aka Tertiary impact injuries, can have head injuries, abrasions, lacerations.

## OCCUPANT INJURY

### Sparrow Foot Mark

- Due to broken glass of wind shield
- Multiple small cuts over the face

### Whiplash Injuries

- Hyper flexion and Hyperextension.
- Spinal cord contusion
- Rarely vertebral fracture





#### Dashboard fracture

- Front seat passenger, posterior dislocation of hip is seen, patellar fracture.

#### Seat belt injury

- Most Common organ injured is - Mesentery > Small intestine.

#### Tailgating injuries (under running)

- Collision with rear side of vehicle in front. It can cause facial injury or decapitation.





# Previous Year Questions

Q. Identify the injury shown in the image? (AIIMS June 2020)



- A. Incised wound
- B. Lacerated wound
- C. Abrasion
- D. Contusion

Q. In entry wound of skull, beveling is seen in? (FMGE Dec 2019)

- A. Inner table
- B. Outer table
- C. Inner table & Outer table
- D. Multiple small fracture

Q. Rupture of the skin and subcutaneous tissue is? (FMGE May 2018)

- A. Incised wound
- B. Abrasions
- C. Lacerated wound
- D. Contusion

Q. Identify the sign? (NEET Jan 2020)



- A. Battle sign
- B. Racoon sign
- C. Romberg's sign
- D. McEwan sign

Q. Cricket player was hit in the head then becomes unconscious, after sometimes he becomes conscious. After the match, he lost consciousness and was taken to the hospital. The diagnosis could be? (FMGE Dec 2020)

- A. Extradural hemorrhage
- B. Subdural hemorrhage
- C. Subarachnoid hemorrhage
- D. Intracerebral hemorrhage

Q. Identify the condition? (FMGE Dec 2019)



- A. Extra Dural hemorrhage
- B. Subdural hemorrhage
- C. Subarachnoid hemorrhage
- D. Intracerebral hemorrhage

Q. Paradoxical undressing is seen in? (AIIMS May 2019)

- A. Hypothermia
- B. Hyperthermia
- C. Dhatura poisoning
- D. Sexual offence

Q. The injury is suggestive of? (NEET PG 2022)





- A. Postmortem wound
- B. Self-inflicted cut
- C. Defence cuts
- D. Hesitational cut

Q. A dead body is brought with ligature mark over neck, which is encircling the neck, transverse, below the thyroid cartilage. No salivary dribbling noted. This condition is?

(NEET PG 2022)

- A. Throttling.
- B. Mugging
- C. Ligature strangulation
- D. Hanging

Q. Identify the range ? .

(NEET PG 2022)



- A. Pistol near range
- B. Rifle Close range
- C. Pistol close range
- D. shot gun intermediate

Q. A 10 year old child with burns involving the front of anterior part of right chest, front of right upper limb, front of right side of abdomen, front of right leg. The percentage of burns involved is?

(NEET PG 2022)

- A. 5-10%
- B. 15-20%
- C. 25-30%
- D. 35-40%

Q. A patient presented to OPD, with burns of saddened skin, with clear line of demarcation, lines of vesicles running down the body. The probable cause is due to?

(INI CET 2021)

- A. Chemical burn
- B. Burn due to dry heat
- C. Burn due to moist heat
- D. Lightening

Q. Identify the mechanical injury given in the picture?

(INI CET 2022)



- A. Graze abrasion
- B. Hesitation cuts
- C. Six penny bruise
- D. Patterned abrasion

Q. Identify the mechanical injury given in the picture?

(INI CET 2022)



- A. Graze abrasion
- B. Hesitation cuts
- C. Six penny bruise
- D. Patterned abrasion

Q. During examination in injury, hair bulbs are noted to be damaged & crushed. The probable type of wound is?

(FMGE 2022)

- A. Abrasion
- B. Laceration
- C. Stab injury
- D. Incision

Q. Features of artificial bruise is?

(FMGE 2022)

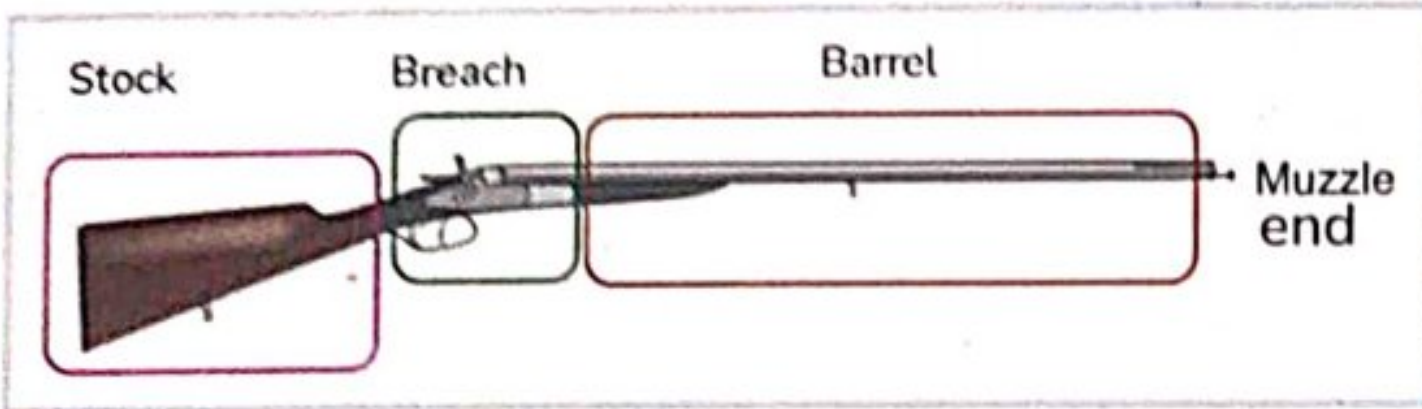
- A. Extravasation
- B. Vesicles
- C. Colour change
- D. Erythema at the site



# 3 BALLISTICS



- It is defined as the study of Firearm.



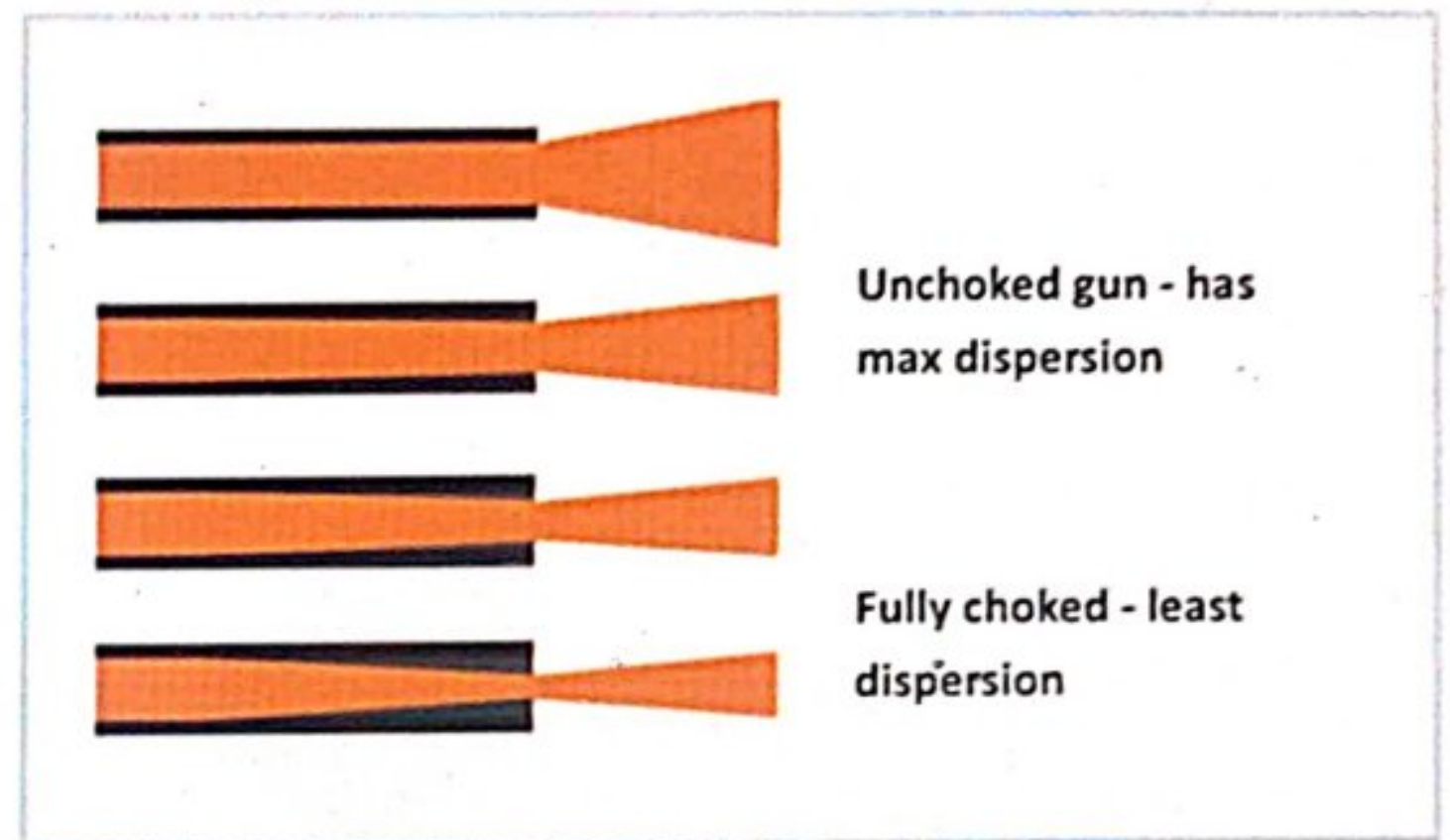
- Proximal Ballistics: Study of Bullet within the gun.
- Intermediate Ballistics: After bullet comes out.
- Wound/terminal Ballistics: Effect of Bullet on target

**Important Information**

- Inner surface of the barrel can be measured by Helixometer

## Smooth Bored Gun

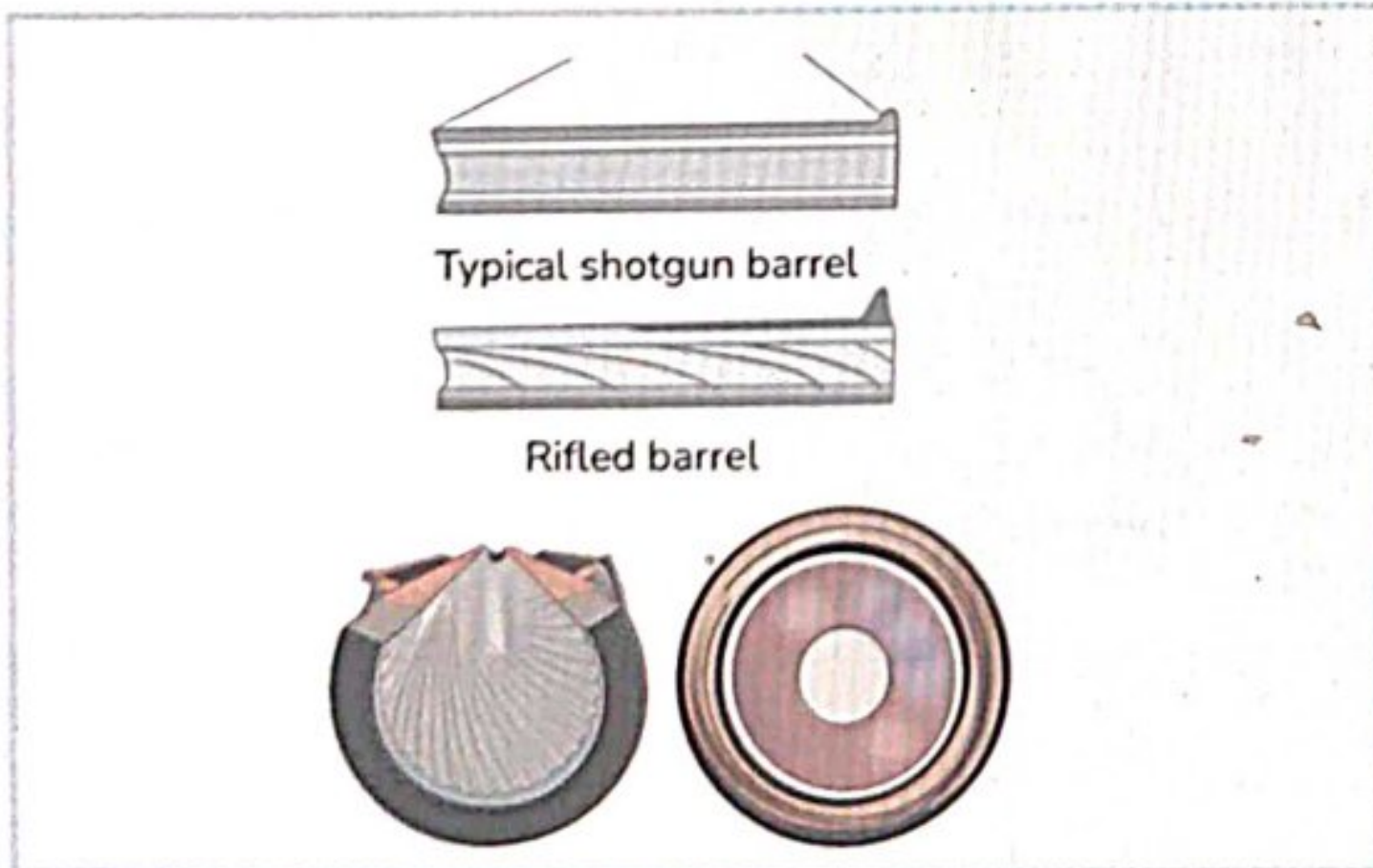
- Range is assessed by "Dispersion of Pellets"
- In smooth barrel firearm: Choking is done (The dispersion pattern is decrease)
- Choking is terminal constriction of barrel



## Two types of firearms

01:19:57

- Smooth Barrel Firearm
  - Inner surface of barrel smooth
  - Smooth bored
  - Lead shots used
  - Also called as shot gun
- Rifled Barrel firearm
  - Inner surface of barrel rifled are grooved, produced by Broach cutter
  - This is known as Rifling



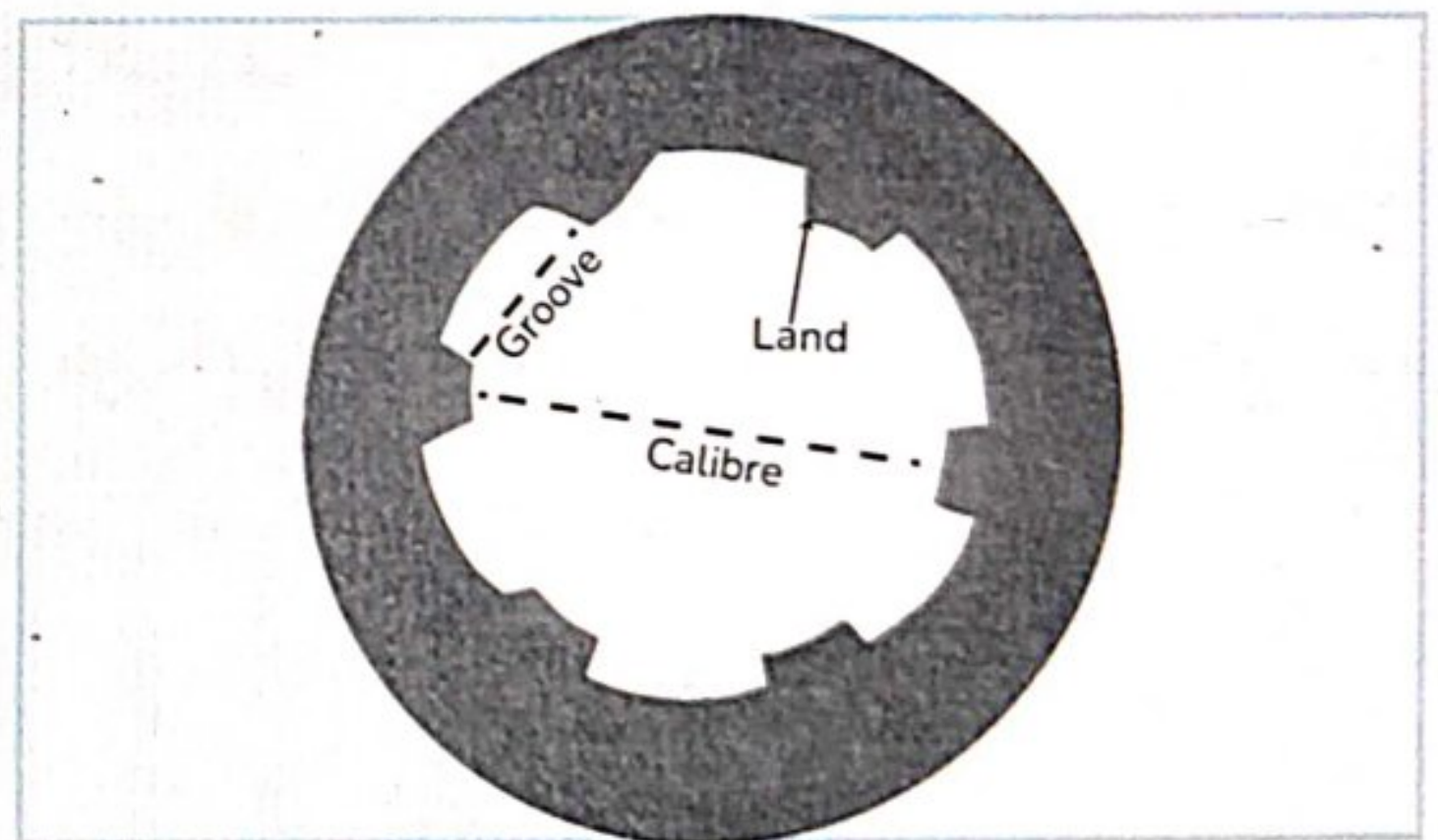
## Benefits of Rifling

- ↑↑ Velocity
- ↑↑ Stability
- ↑↑ Power
- In smooth barrel firearm / Shotgun - Lead shots
- In rifled barrel firearm - Bullets

## Paradox gun

- Smooth bored gun with terminal rifling

## Rifled Gun



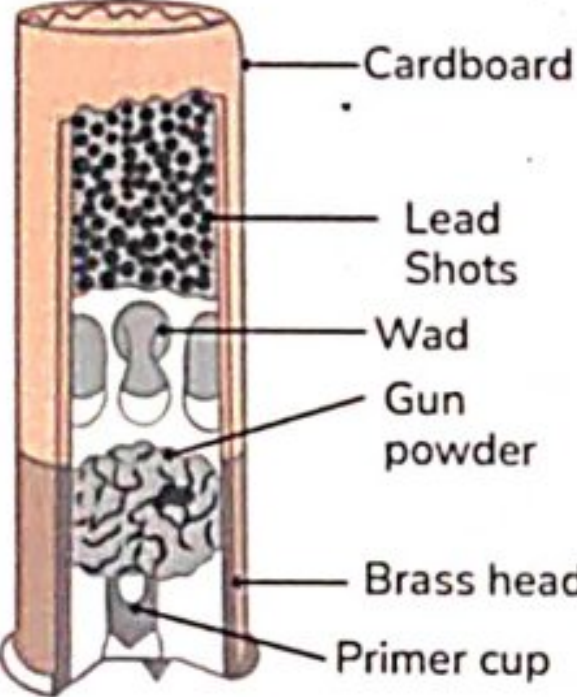
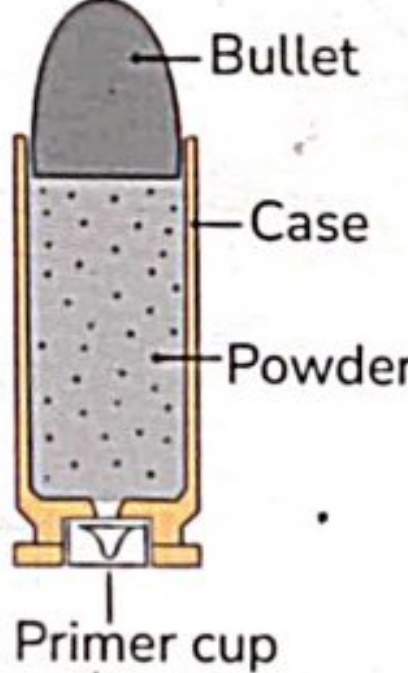
- Calibre: The distance between two opposite lands
- Calibre is used for rifled gun.

## Shotgun/ Smooth Bore / Barrel Firearm

- The number of lead balls made from one pound of lead = gauge / bore
  - Example: 12 balls made of 1 gm lead = 12 gauge
- As the number of gauge increases, size of the barrel comes down.
  - Example: 12-gauge gun will be larger than 24-gauge gun.



## Bullets

Shot gun cartridge	Rifle gun bullet
<ul style="list-style-type: none"> <li>Primer cup / detonator cup (highly inflammable)</li> <li>Gun Powder</li> <li>Wad</li> </ul> <p>Functions</p> <ol style="list-style-type: none"> <li>Separation</li> <li>Lubrication</li> <li>Obturation</li> </ol> <ul style="list-style-type: none"> <li>Lead Shots</li> </ul> 	<ul style="list-style-type: none"> <li>Primer cup</li> <li>Gun Powder</li> <li>Bullet</li> <li>NO WAD in Rifled Gun.</li> </ul> 

## Gun Powders

- Black Powder: 1 gm gives 3L - 4L of gas
  - Composition
    - Charcoal (C): 15%
    - Potassium Nitrate: 75%
    - Sulphur: 10%
  - Because of presence of Charcoal  $\uparrow\uparrow$  Smoke production  $\downarrow$  Power
  - Black gun powder can be termed as FG, FFG, FFFG, FFFFFG - more fineness (F) of powder
- Smokeless Powder: 1 gm gives 12L - 13L gas
  - Composition
    - Nitrocellulose: Single Base
    - Nitro-glycerine + Nitrocellulose: Double Base
    - Nitroguanidine + Nitro-glycerine + Nitrocellulose: Triple Base
- Semi - Smokeless Powder
  - 80% Black powder + 20% Smokeless powder
  - Components causing injury in Rifled firearm

## Sequence of Firing Events

- Pulling of trigger.
- Hitting percussion pin.
- Ignition of primer mixture
- Production of flame
- Ignition of gun powder.
- Propelling of the shots/bullet/pellet.
- Reporting of flame

## DISCHARGES FROM A GUN

- Flame:** Burns / Singeing of Hair (Flame can travel upto 7 cm)
- Smoke:** Blackening (Smoke can travel upto 30 cm)
- Gun powder:** Tattooing / Peppering (Gun powder can travel upto 60-90 cm)
- Bullet:** Punctured wound with Abrasion collar/grease collar/bullet wipe also called as grease deposition.



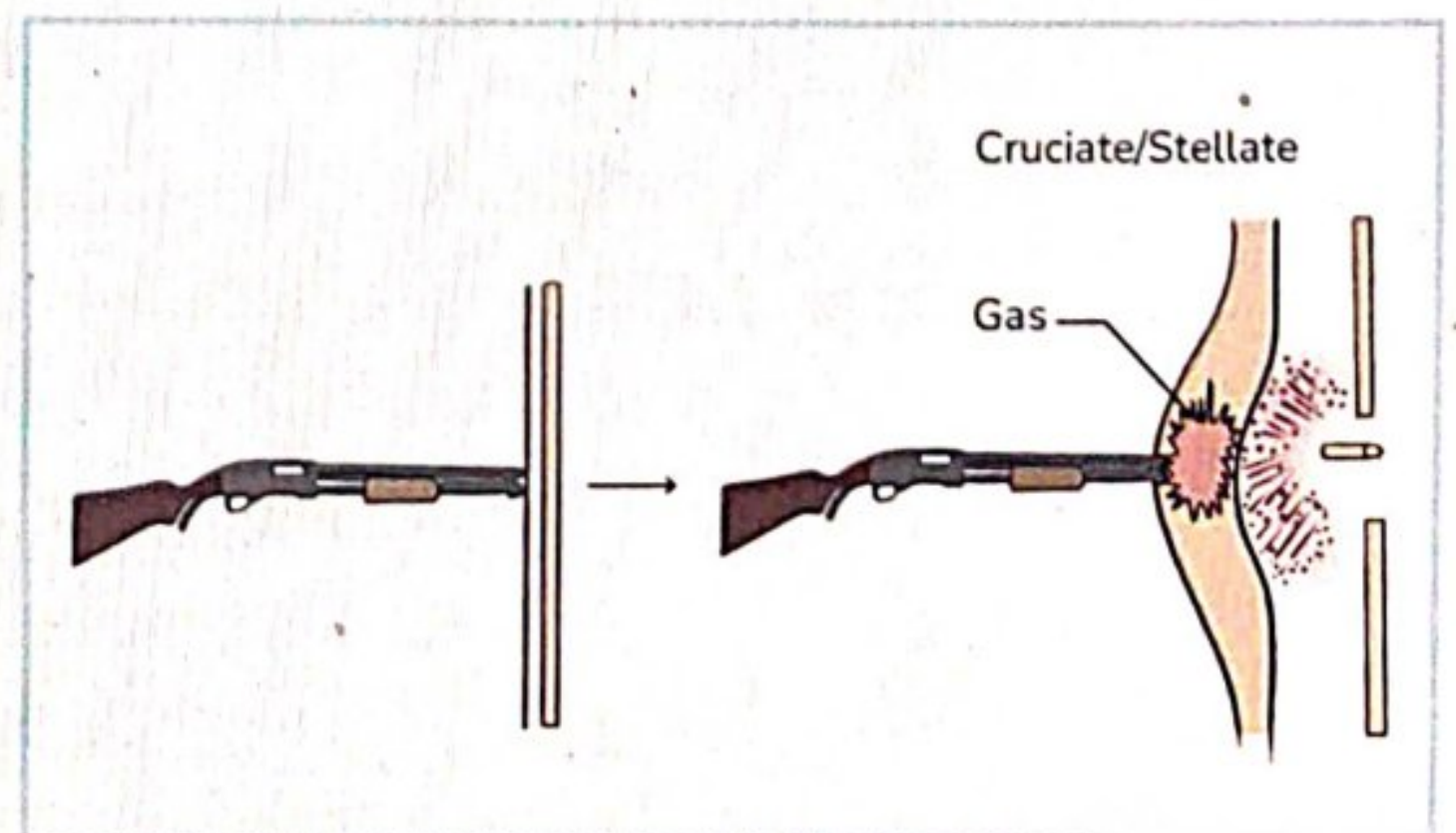
### Important Information

- Abrasion collar: due to spinning of bullet.

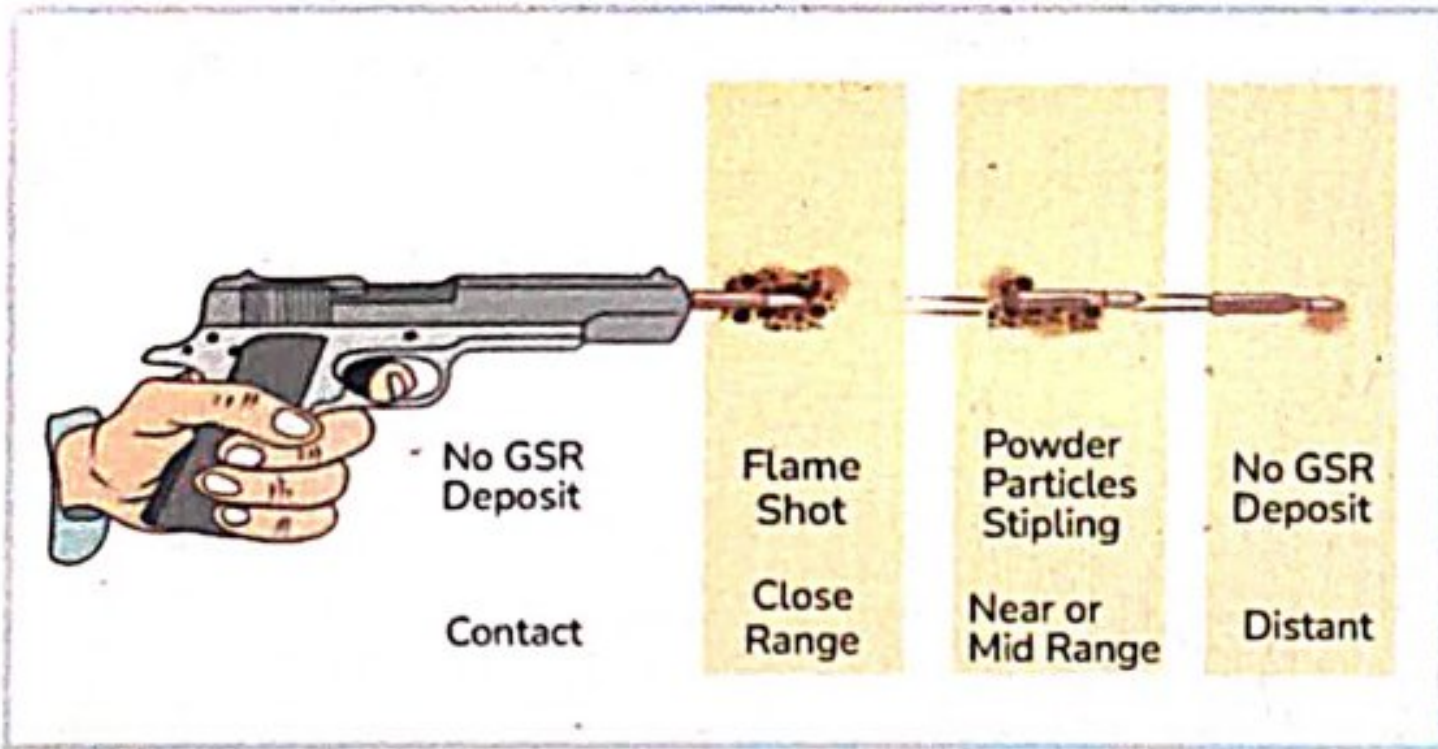
## Ranges of Rifled Gun

- Contact: Tight contact (Cruciate / Stellate margins)
  - Recoil abrasion
  - Stellate / cruciate margin
- Close: Within the range of flame
- Near: Outside flame but inside gun powder
- Distant: Outside gun powder

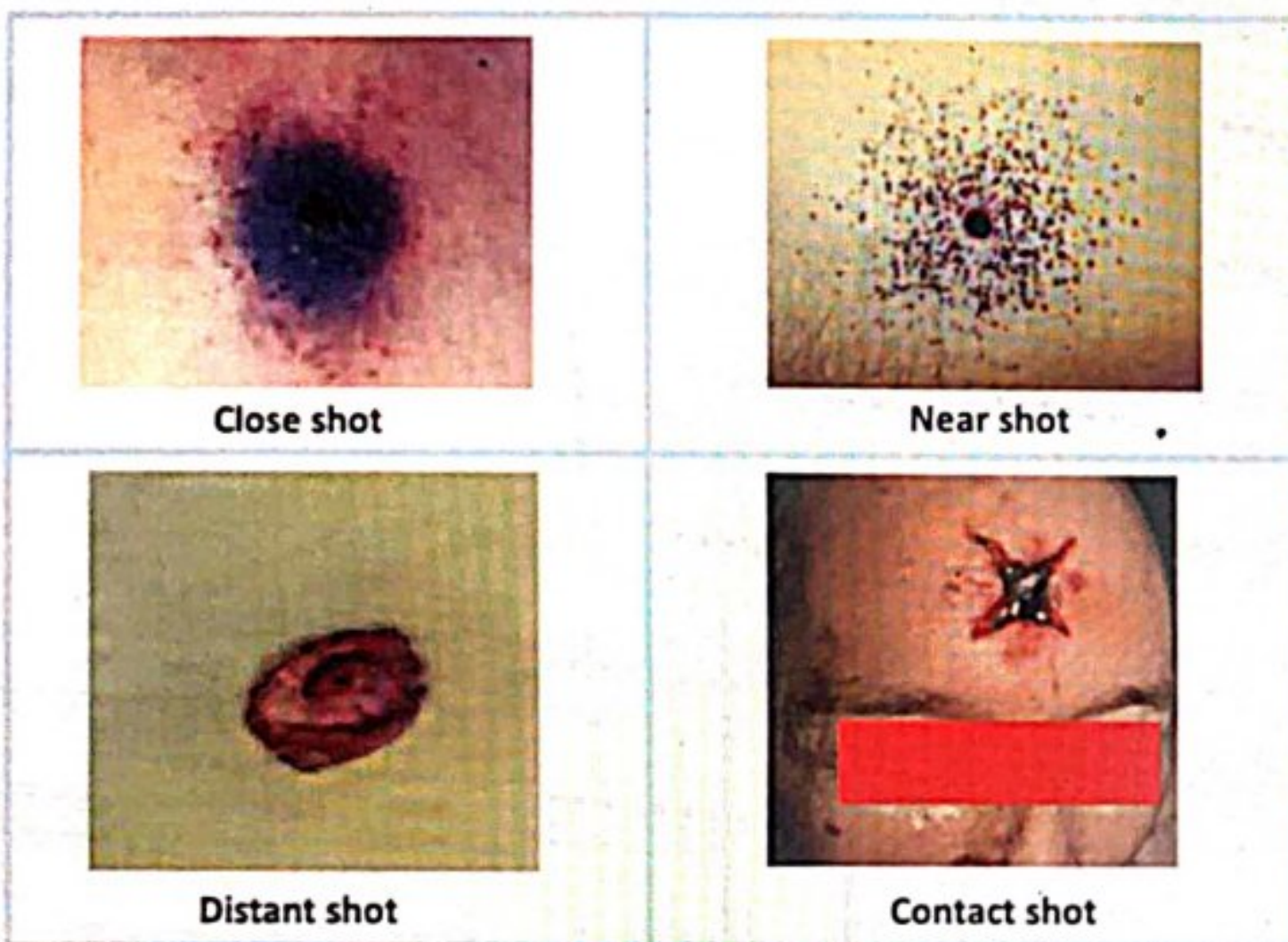
	Contact Tight Contact	Close (Inside Flame)	Near (outside flame/inside gunpowder)	Distant Outside Gun powder
Shape	Cruciate/ Stellate	Circular	Circular	Circular
Muzzle Impression	Present	Absent	Absent	Absent
Burning and Singeing	Absent	Present	Absent	Absent
Blackening	Absent	Present	Absent	Absent
Tattooing	Absent	Present	Present	Absent
Abrasion collar and Grease Collar	Present	Present	Present	Present





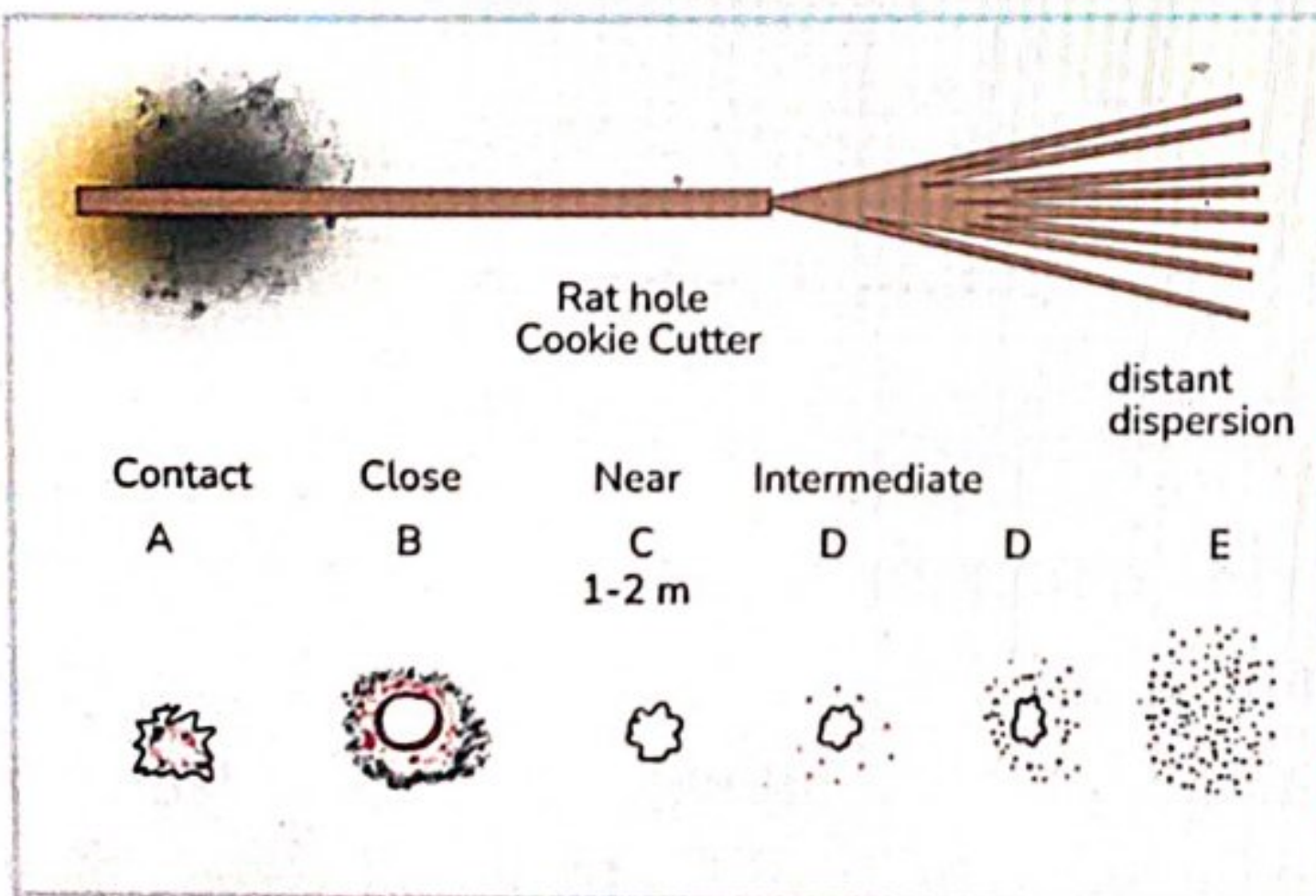


- When bullet enters normally - Perpendicularly, we get circular bullet injury.
- Oval injury by bullet occurs by oblique bullet.



### Range in Shot Gun

- Contact
- Close < 1 m
- Near 1-2 m
- Intermediate 2-4 m
- Distant > 4 m



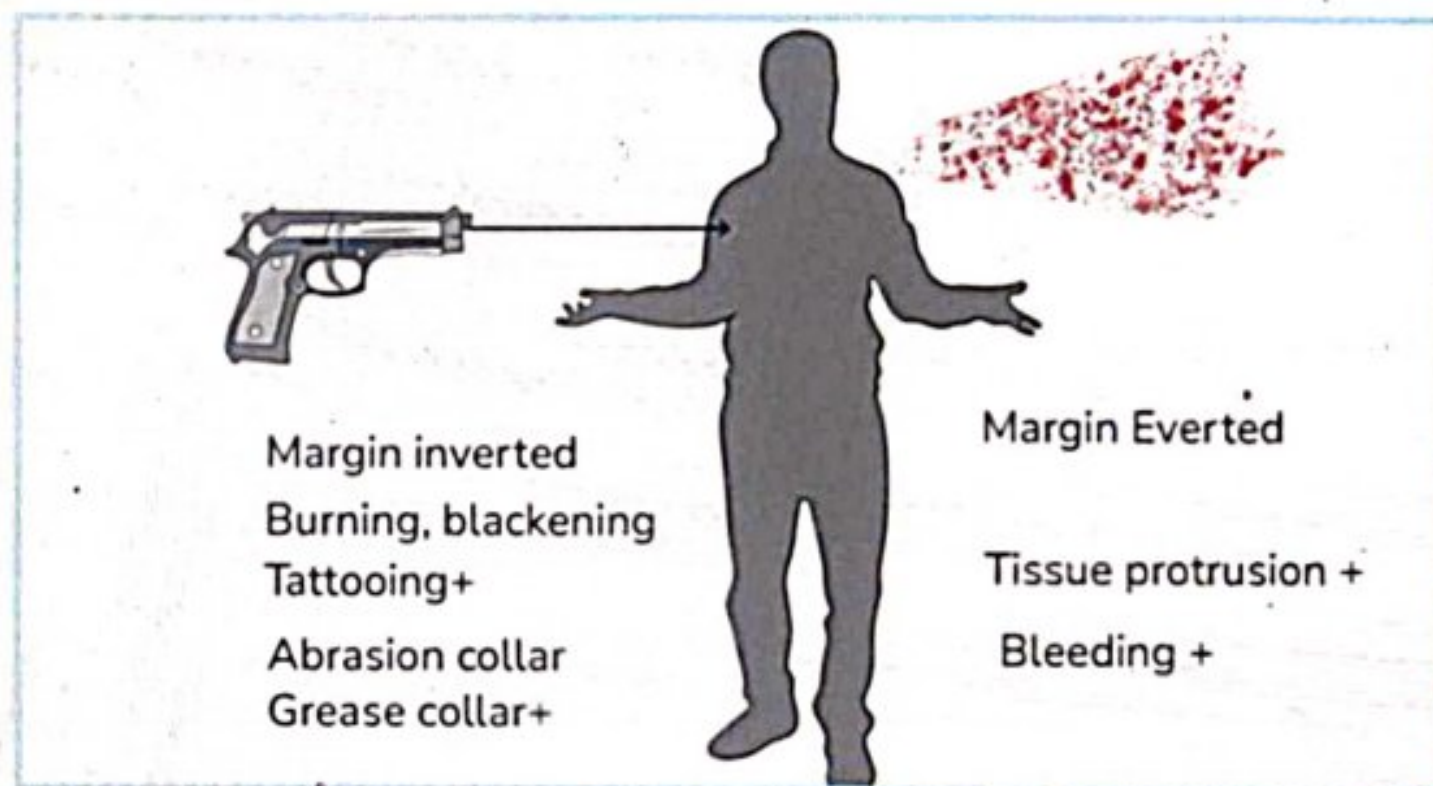
### Important Information

- All the Effects in shotgun fire can be seen in maximum range of 1 m
- Dispersion start at 2 m and completed at 4 m.

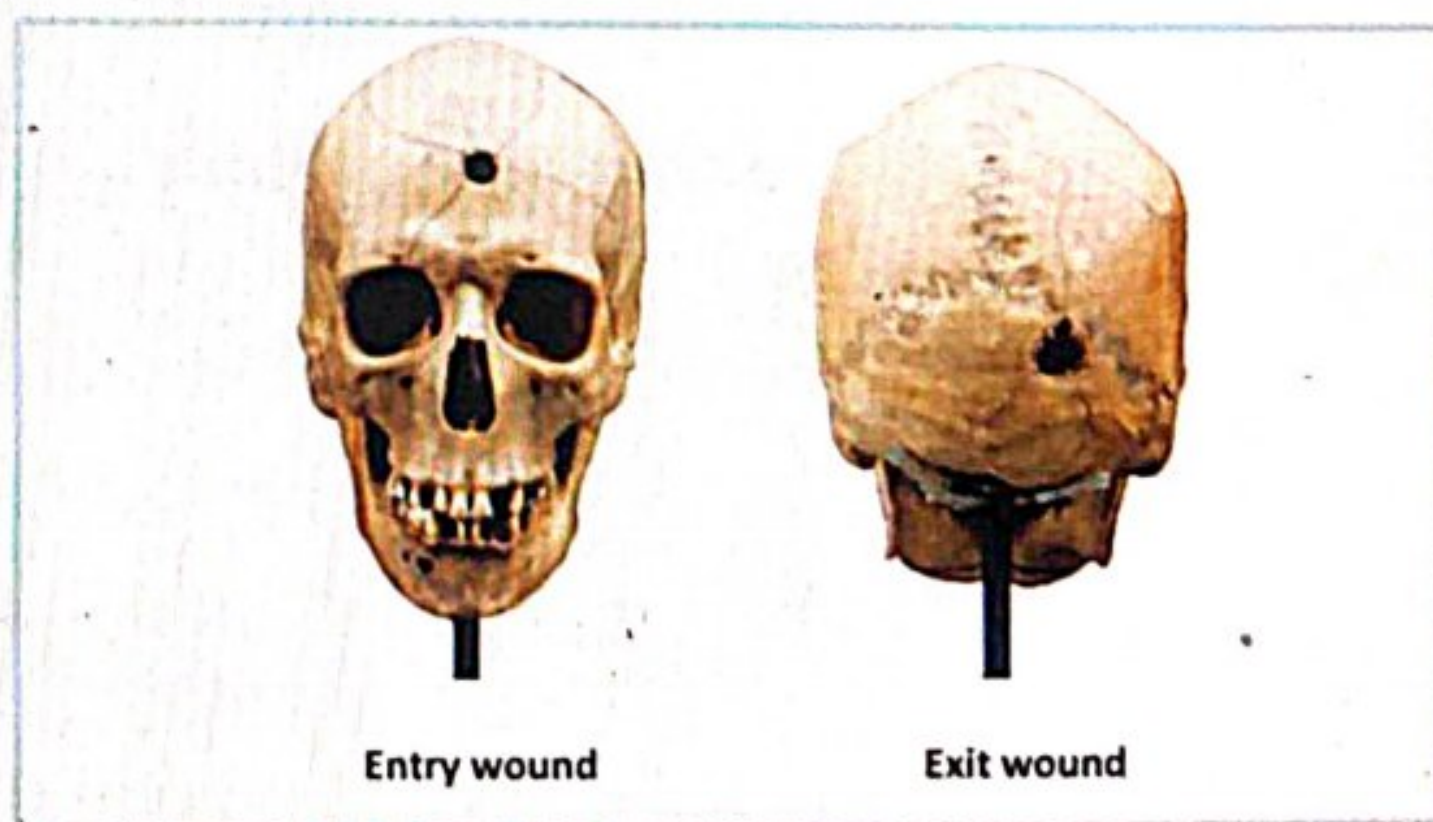


### Entry vs Exit Wound

- Entry and exit Wound over skull can be differentiated by bevelling



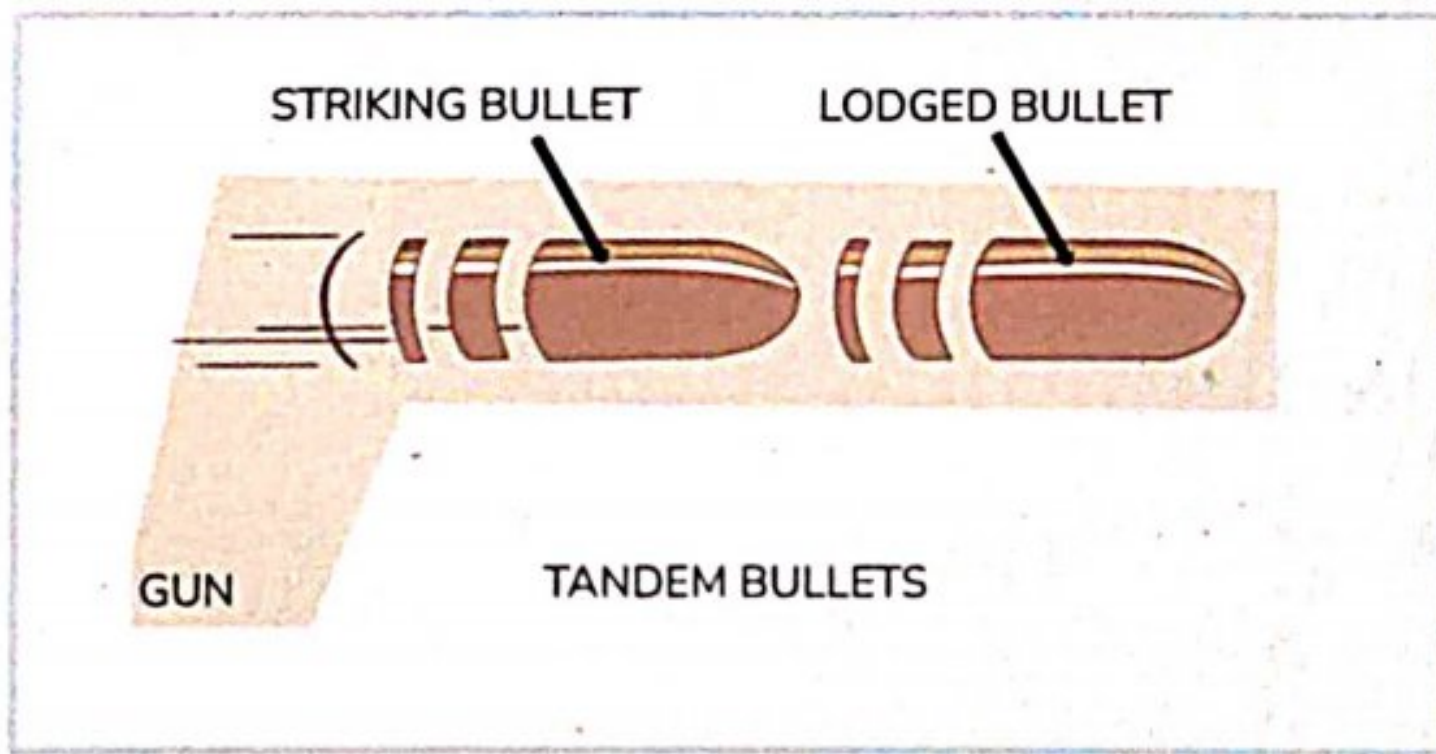
Bevelling	
Entry wound	Exit wound
Inner table – bevelled	Outer table bevelled



### DIFFERENT TYPE OF BULLETS

1. Tandem bullets / Piggyback bullet
  - The first bullet gets struck in the barrel. When it is fired again, the second bullet carries the first bullet and comes out. Two bullets come out of the muzzle end.



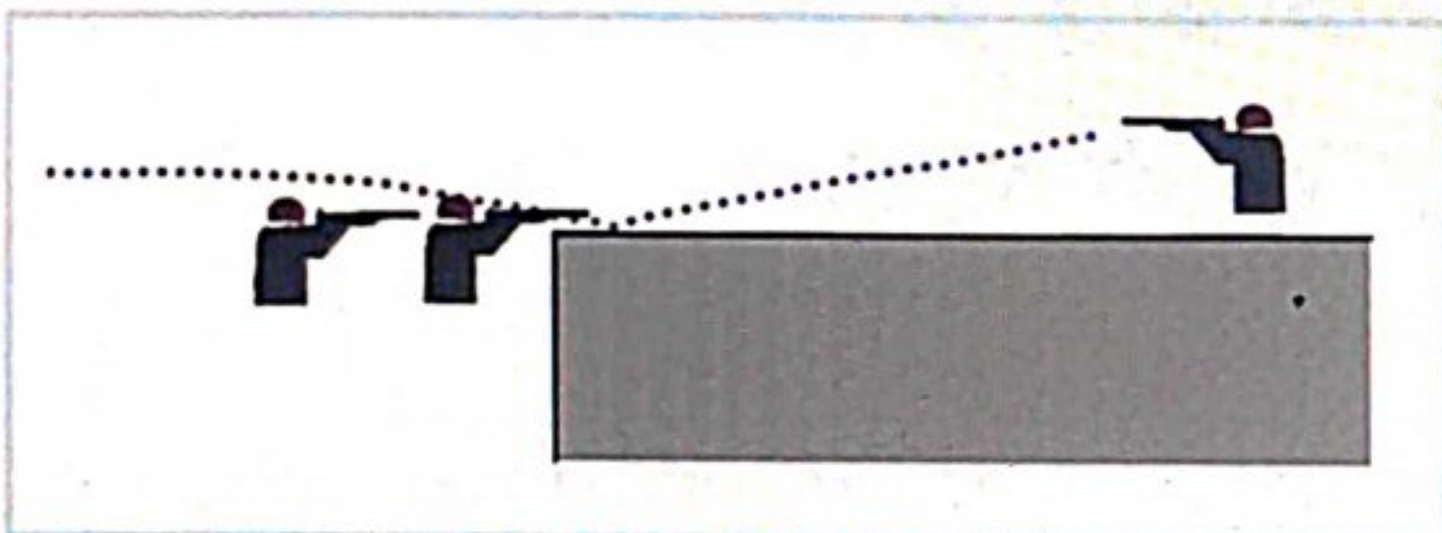


## 2. Tracer bullet

- We can trace the path of bullet via glowing base of bullet in the dark.

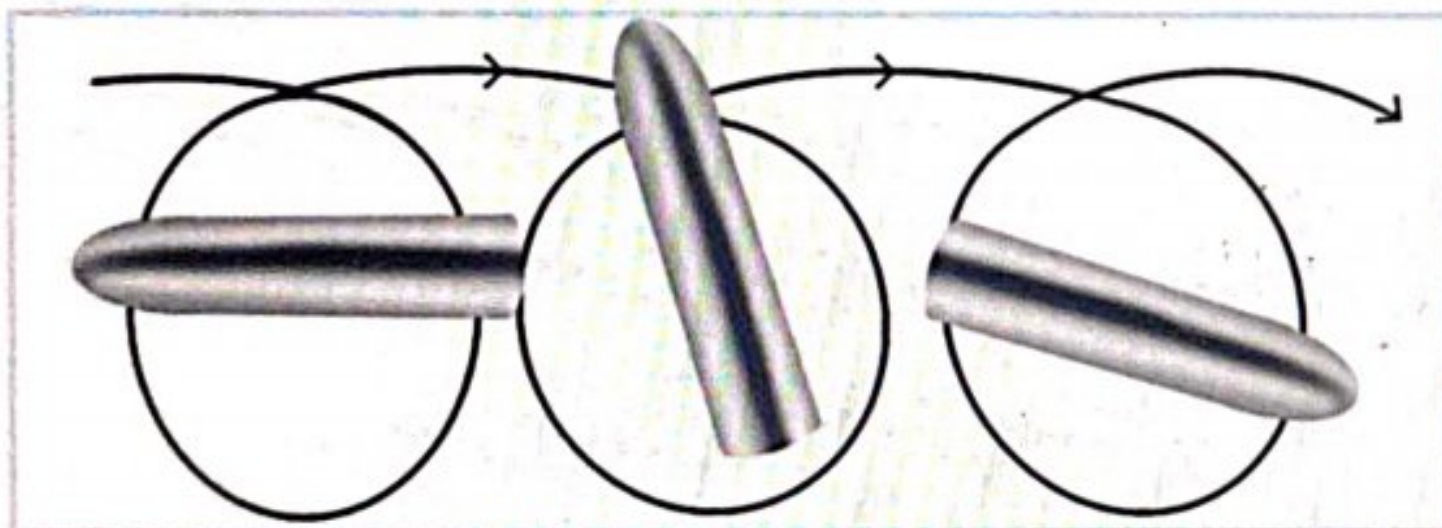
## 3. Ricochet bullet

- Deflected bullet from intermediate surface.



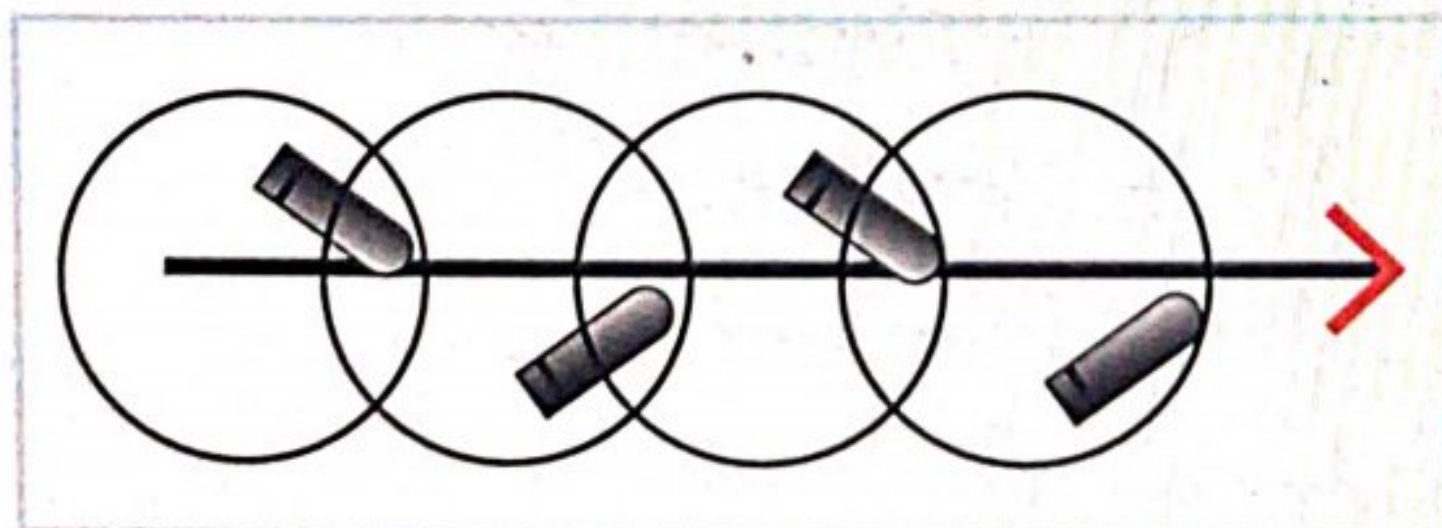
## 4. Tumbling bullet

- Rotating bullet



## 5. Yawing bullet

- Irregular pathway



## 6. Souvenir bullet

- Retained bullet inside the body
- May cause chronic lead poisoning

## 7. Incendiary bullet - Coated with phosphorous, fire on impact

## 8. Frangible bullet

- Bullet fragmented on impact.
- Made up of powder.



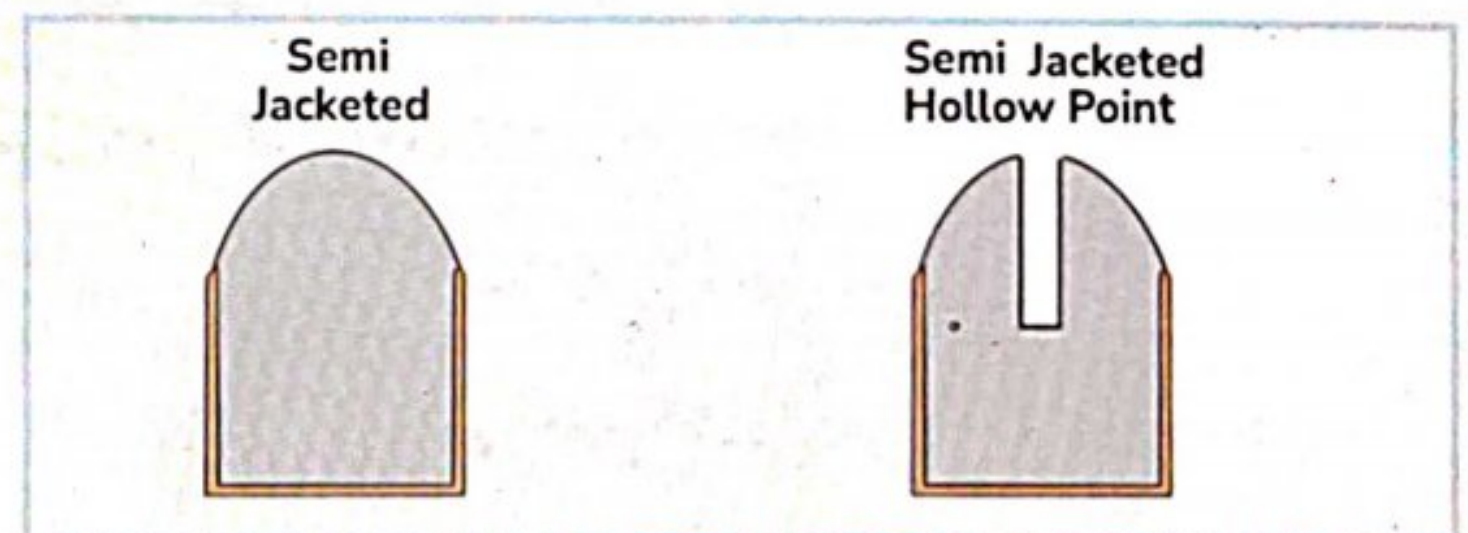
### Important Information

#### Kennedy Phenomenon

- Iatrogenic alteration of appearance of gunshot wounds, so difficult to find the range during post-mortem.

## 9. Dum-Dum bullet / Semi jacketed bullet

- Deformation of bullet happens inside tissues also known as Mushrooming of bullets



## BULLET FINGERPRINTING

02:01:30

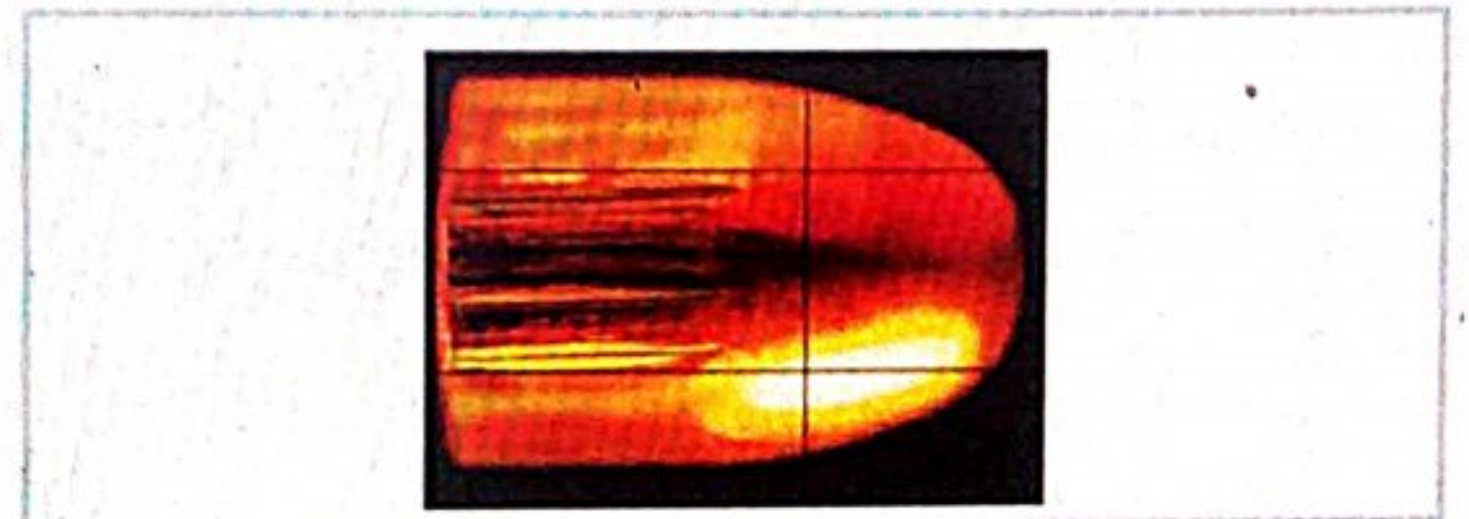
### Primary Marking

- Due to rifling pattern of gun
- Also called as class characteristic



### Secondary Marking

- Due to irregularities (Wear and Tear)
- Vary from gun to gun
- They are more specific.
- Also called as individual characteristics



- We use microscope for comparison of markings.



### Tests for GSR

- Sample to be taken from dorsum of the hand

### Mnemonic- HANDS

1. Harrison and Gilroy's test
2. Atomic Absorption Spectrometry (AAS)
3. Neutron Activation Analysis (NAA)
4. Dermal Nitrate
5. SEM - EDXA (definitive)





## Previous Year Questions

Q. Assertion: Range of shot can be determined by the spread of pellets.

Reason: Shotgun cartridge contains pellets?

(AIIMS May 2019)

- A. Both assertion and reason are correct and reason is correct explanation of assertion.
- B. Both assertion and reason are correct but reason is not a correct explanation of assertion.
- C. Reason correct assertion wrong
- D. Both assertion and reason are wrong.

Q. A middle aged lady was found in a robbed room lying in a pool of blood. On forensic examination there was an entry wound of size around 2 x 2 cm on the left temporal region with tattooing and blackening at the right temporal region. On further examination two bullet fragments were found inside the brain parenchyma. Which of the following could be used to determine the distance from which the weapon was fired?

(AIIMS Nov 2017)

- A. Hair
- B. Clothes
- C. Bullet fragments
- D. Blood

Q. Bullet wipe term is used for?

(AIIMS May 2019)

- A. Gutter fracture of skull
- B. Blackening
- C. Tattooing
- D. Dirt from barrel

Q. The poisoning caused by bullet retained inside the body is?

(FMGE Dec 2019)

- A. Iron
- B. Phosphorus
- C. Nitro cellulose
- D. Lead

Q. Bullet fingerprinting is?

(AIIMS Nov 2018)

- A. Human fingerprints on bullet
- B. Primary marking
- C. Secondary marking
- D. Distorted bullet



# 7

# AUTOPSY



- Also known as **Necropsy**, PME (Post Mortem Examination)

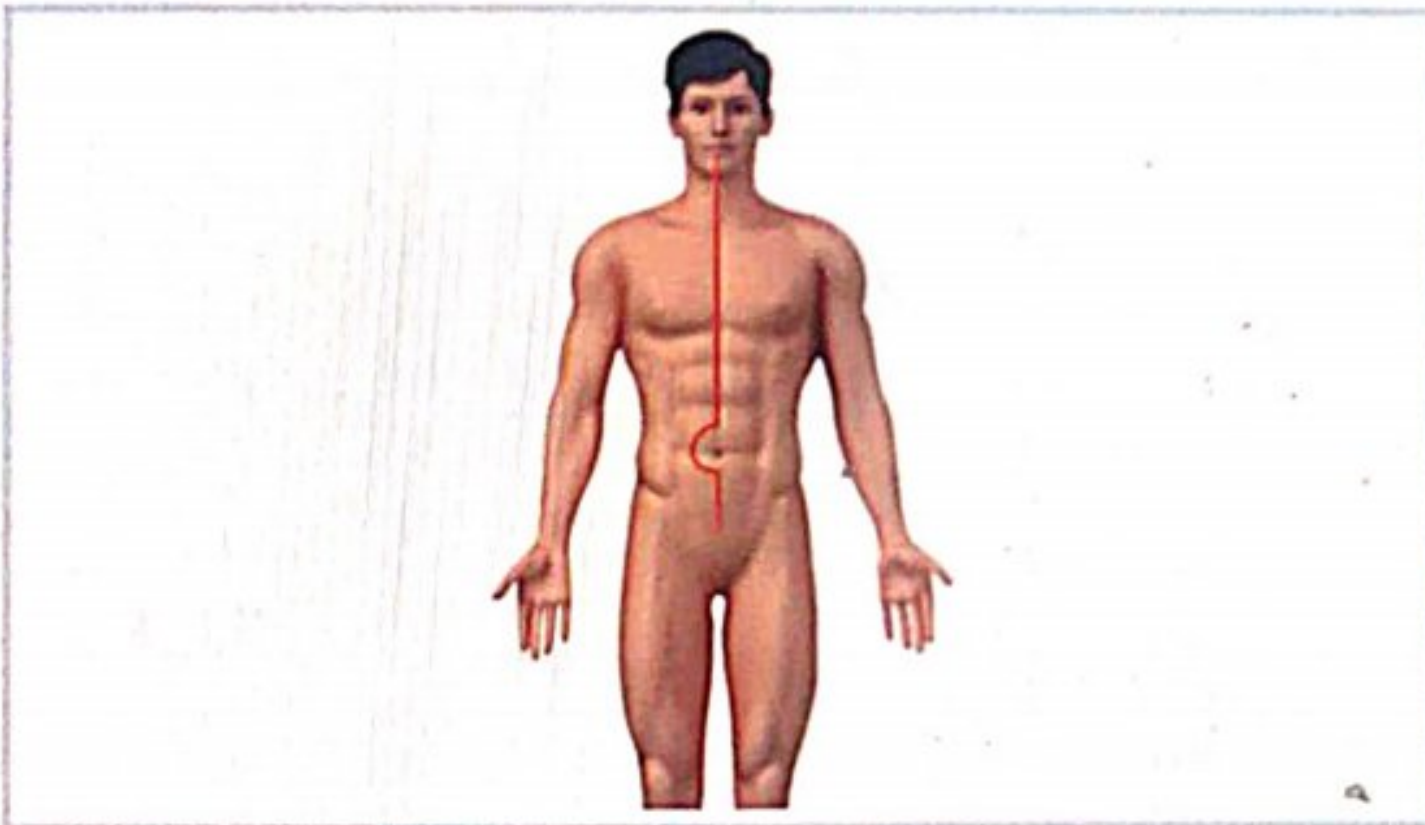
### Refer Table 7.1

- **Psychological Autopsy (No Dissection)**
  - Done in suicidal deaths
  - Done to know about the psychological state of person before committing suicide.
  - Conduct interviews with parents/friends.
- **Virtual Autopsy / Virtopsy (No Dissection):** Complete body scanning to find the structural lesion/ cause of death.
- **Negative autopsy:** Doctor will not be able to state the cause of death. It may be due to incorrect technique, lack of experience, incorrect preservation etc.

### Different Types of skin Incisions

#### 1. "I" Incision

- Starting from chin to pubic symphysis
- Most commonly used.



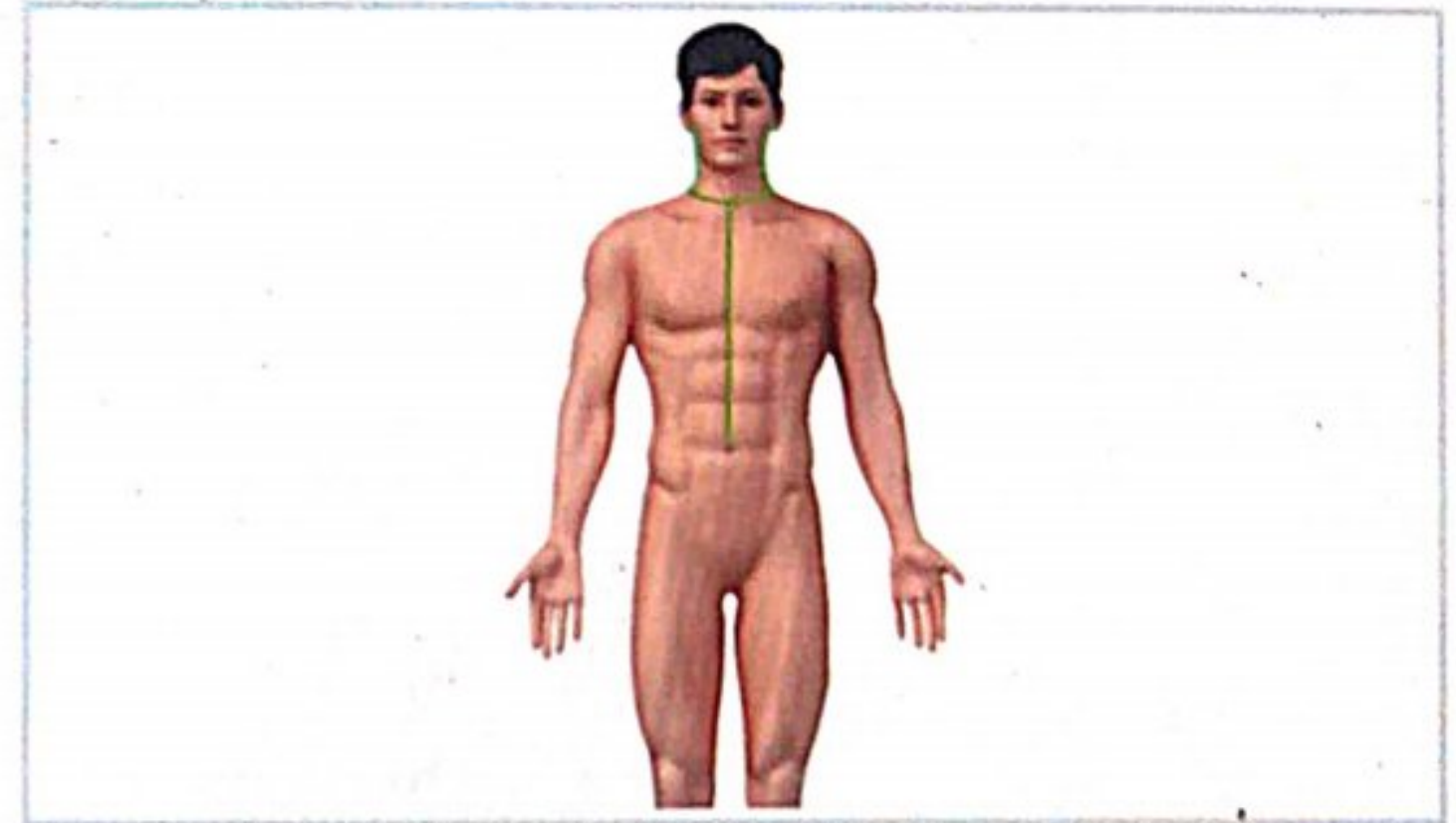
#### 2. "Y" Incision

- Starting from shoulders on both sites reach Xiphi sternum and it comes down to the pubic symphysis.



#### 3. Modified "Y" Incision

- Starts from mastoid comes down the lateral site of neck and then from suprasternal notch to Pubic Symphysis
- **Good for neck dissection**
- Preferred in **Asphyxial deaths**.



### Different Techniques of Organ Removal in Autopsy

03:40:00

- **Virchow's Method**
  - One by one removal of organs
  - **M/C method used.**
- **Letulle's / En mass Method**
  - En-Mass Removal or Evisceration
  - **RAPID method**
  - Also used to study anatomical relation
  - Removal of attachment of tongue and from there we remove all the thoracoabdominal organs together as single mass. Then we dissect the organs.
- **Ghon's Method**
  - **En-block Removal**
  - Targets only one particular area.
  - Ex: In Sexual offence - Only pelvic organ are removed.  
In Thoracic pathology / Trauma - Only thoracic organ are removed.
- **Rokitansky Method**
  - In-situ method
  - **Organ not removed outside the body to avoid spillage and exposure.**
  - Used for infectious diseases.
  - Example: HIV, Hepatitis patient, Covid pt.

#### Heart Dissection

- **Inflow outflow method:** Start cutting from RA → RV → LA → LV



### Brain dissection

- Can be done as Fresh (commonly done) or Fixation with Formalin (best)

### Stomach dissection

- Double ligation method
  - Cut stomach out by applying two ligatures at the ends and cut in middle.
  - The area along lesser curvature has max damage due to poisoning. This is known as **Magenstrasse**
  - So, we **open stomach along greater curvature in poisoning cases.**

### Spinal cord dissection

- Not routinely opened unless we suspect spinal injuries
- 2 approaches: Anterior and posterior.
- **Posterior is easier and better.**

### Air embolism

- **Pyrogallol test**, done to detect air embolism , Brown color indicates positive test

### Which cavity to be opened first when starting autopsy?

- Cranium
  - **In poisoning cases**
  - Asphyxial death cases to decompress vessels
- Thorax
  - Pneumothorax case to demonstrate presence of air in thorax
- Abdomen
  - New born babies: **To check level of diaphragm**
- Asphyxia deaths: Cranium → Thorax → Abdomen → Neck
  - This is to provide **bloodless dissection.**

Table 7.1

	Medicolegal Autopsy	Clinical / Pathological Autopsy
Types of death	<b>M/C type of autopsy in India</b> <ul style="list-style-type: none"><li>• Done in <b>unnatural deaths</b> - Suicide, Homicide</li></ul>	<ul style="list-style-type: none"><li>• Done in Natural deaths</li></ul>
Authorization by	<ul style="list-style-type: none"><li>• Consent from <b>Investigation officer (IO), Police/ Magistrate</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Relative</b> give consent (cannot be done without consent)</li></ul>
Complete / Partial	<ul style="list-style-type: none"><li>• Complete autopsy</li></ul>	<ul style="list-style-type: none"><li>• Partial autopsy</li></ul>





## Previous Year Questions

---

Q. In autopsy, the doctor tied the bronchus and checked the floating and sinking of the lung. The test is identified as?

(FMGE Aug 2020)

- A. Getter's test
- B. Diatoms test
- C. Hydrostatic test
- D. Ploquet's test

Q. In corrosive acid case, stomach is opened along?

(FMGE Jun 2019)

- A. Lesser curvature
- B. Greater curvature
- C. Vertical
- D. Pylorus



# 8 THANATOLOGY



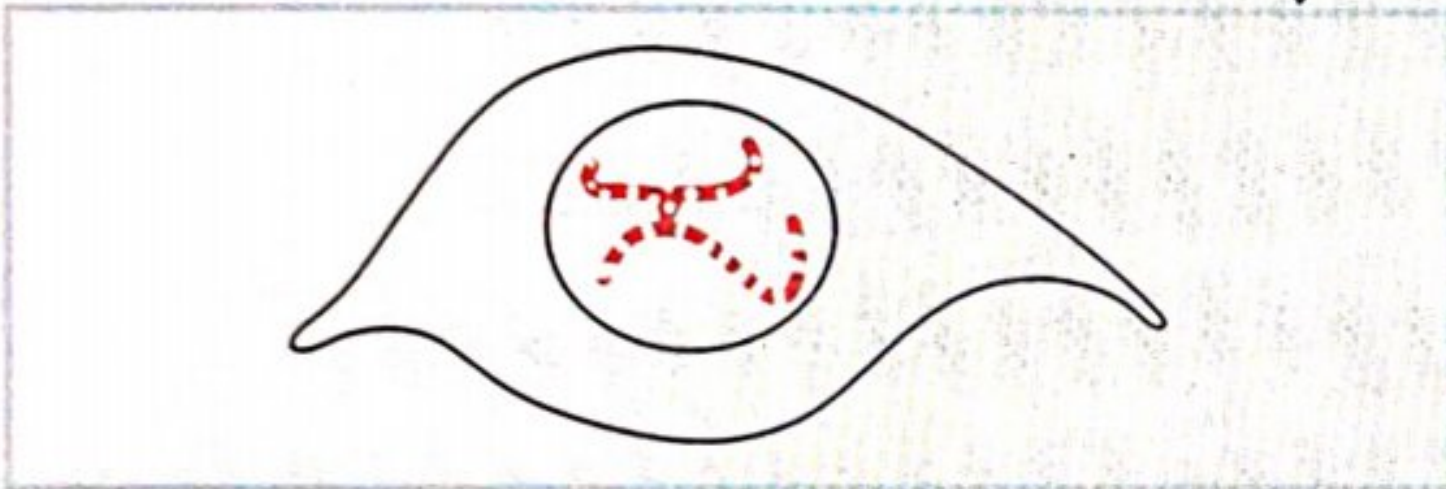
- **Study of Death**
- Defined by Sec. 46-IPC
- Somatic death: Clinically dead
- Cellular/Molecular death: Death at cellular level
- Gap between these two can be used for organ harvesting/ cadaveric use
- Forensic Taphonomy: Study of PM resorption of the body.

## PM CHANGES

Helps us to know Time Since Death (TSD)

### Eye Changes

1. **Kevoorkian Sign / Railway tracking sign:** Retinal vessels appear fragmented due to sudden cessation of blood supply.



- Occurs within few minutes after death.
  - **Earliest eye change.**
  - Determine time since death/ post mortem interval
2. **Tache Noire:** Two triangle shaped opacities on sclera. Eyelids are open, dust will deposit on the Sclera /drying.
    - It takes 3-6 hrs to appear after death.



3. **Vitreous K' level:** Vitreous Sample is the best medium for TSD. Vitreous K' is the reliable indicator for time since death. K' level rise after death. It has linear correlation with death.

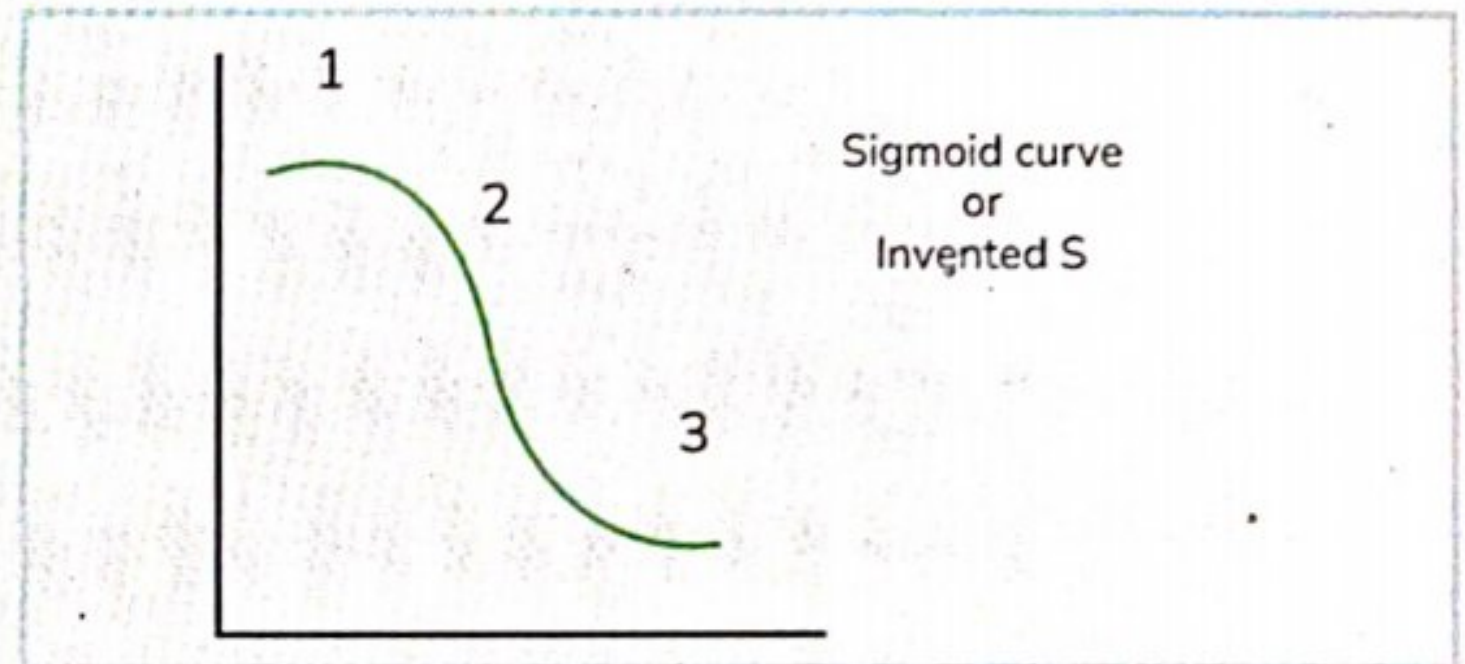
### Algor Mortis

- PM cooling of body: ↓↓ core body temperature. Starts within 15 mins after death
- Sites to Record Core Temp of Body
  - Ideal Site: **Sub hepatic Space.**

- Common site: Rectum (C/I in sodomy)

Temperature is measured by "Chemical thermometer" – **Thanatometer**

- 25 cm long
- Algor mortis curve: **Sigmoid or Inverted S.**
- Average rate of fall in temperature (0.4-0.7 / hr)
  - Summer: 0.5° C/hr
  - Winter: 0.7° C/hr



$$\text{Time Since death} = \frac{\text{Normal body Temp.} - \text{Rectal Temp.}}{\text{Rate of fall of Temp.}}$$

### PM Caloricity

- Body remains warm after death (1-2 hrs)
- Prolonged raised temperature seen in
  - Nux vomica (due to convulsions)
  - Tetanus
  - Heat stroke

This phenomenon is not seen in Burn cases

### Livor Mortis / PM Staining / Hypostasis / Cadaveric Lividity / Suggillation / Vibices



- Blood settles down in capillaries and venules of dependent parts of body.



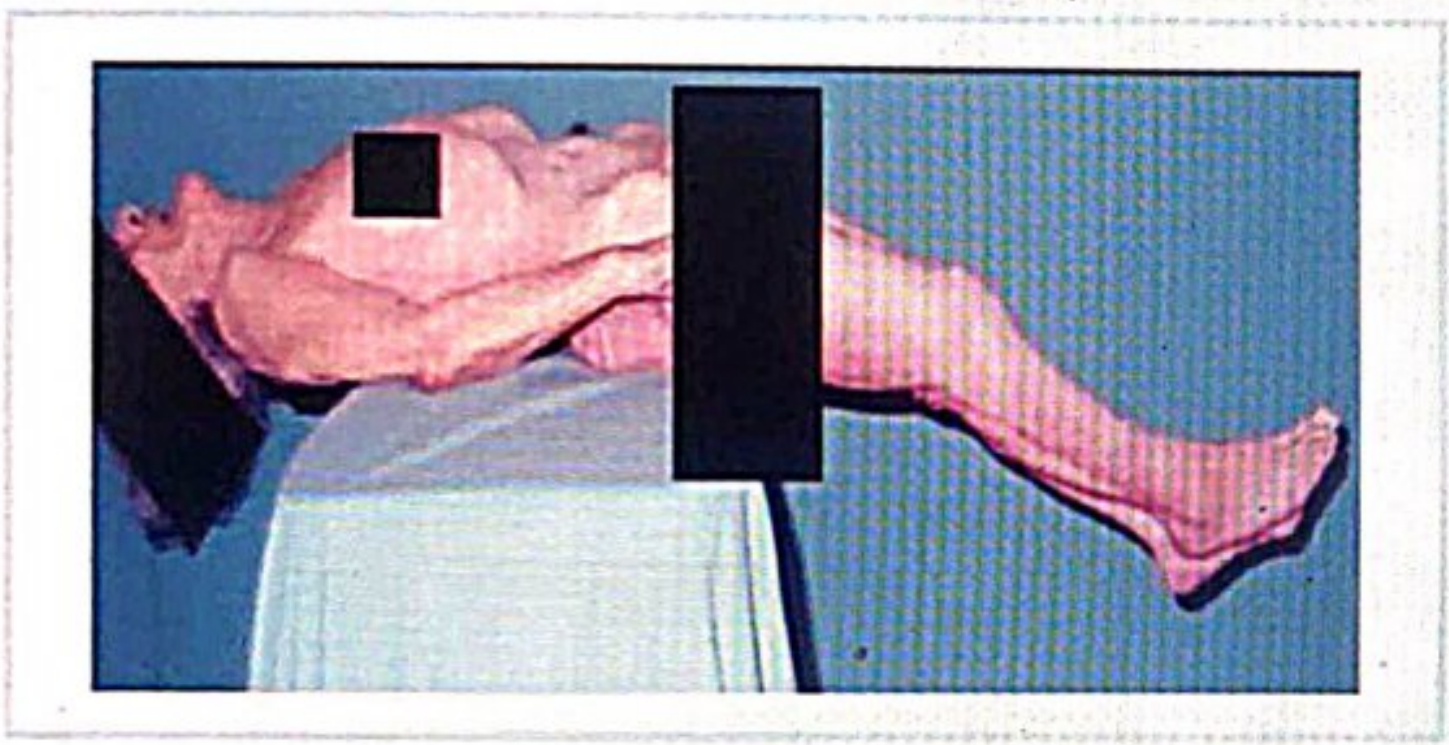
- If supine position LM occurs in back of head, back of chest, back of abdomen and back of legs.
- If the body is suspended in the vertical position it causes "Glove and Stocking" distribution.

**Important Information**

- Onset = 30 mins - 2 hrs after death
- Significantly appears in 4 hrs
- Max in 6-12 hrs

- Livor Mortis is absent in severe anemia/severe bleeding / body in fast flowing river as body keeps on rolling.
- Fixation of LM - 8 hours (Average)
  - On applying pressure if blanching seen, it means not fixed
  - If no blanching seen, then fixed
  - Once fixed it will not change even if body position is changed
- Contact pallor - Pale areas on tight contact

**Rigor Mortis / Cadaveric Rigidity**



- PM Stiffening of Body
- Changes in Muscle after death
- Three phases of Rigor Mortis:
  - Primary relaxation
  - Rigor Mortis (Stiff)
  - Secondary relaxation (Decomposition)
- Rigor Mortis (Stiffness) begins when ↓↓ ATP occurs, and at 85 % of normal ATP level onset of RM begins
- RM is generalised involves both involuntary and voluntary muscles. Involuntary muscles are involved earlier than voluntary muscles.

**Important Information**

- Overall 1st site to Appear: Myocardium
- Externally 1st site to Appear: Eyelid

**Nysten's Rule**

- Sequence of Rigor Mortis progression
- Order of Appearance and Disappearance → Proximal to Distal / Descending pattern: Eyelids → Neck → Jaw, Facial muscles → Thorax → U/L → Abdomen → LL → Fingers & Toes

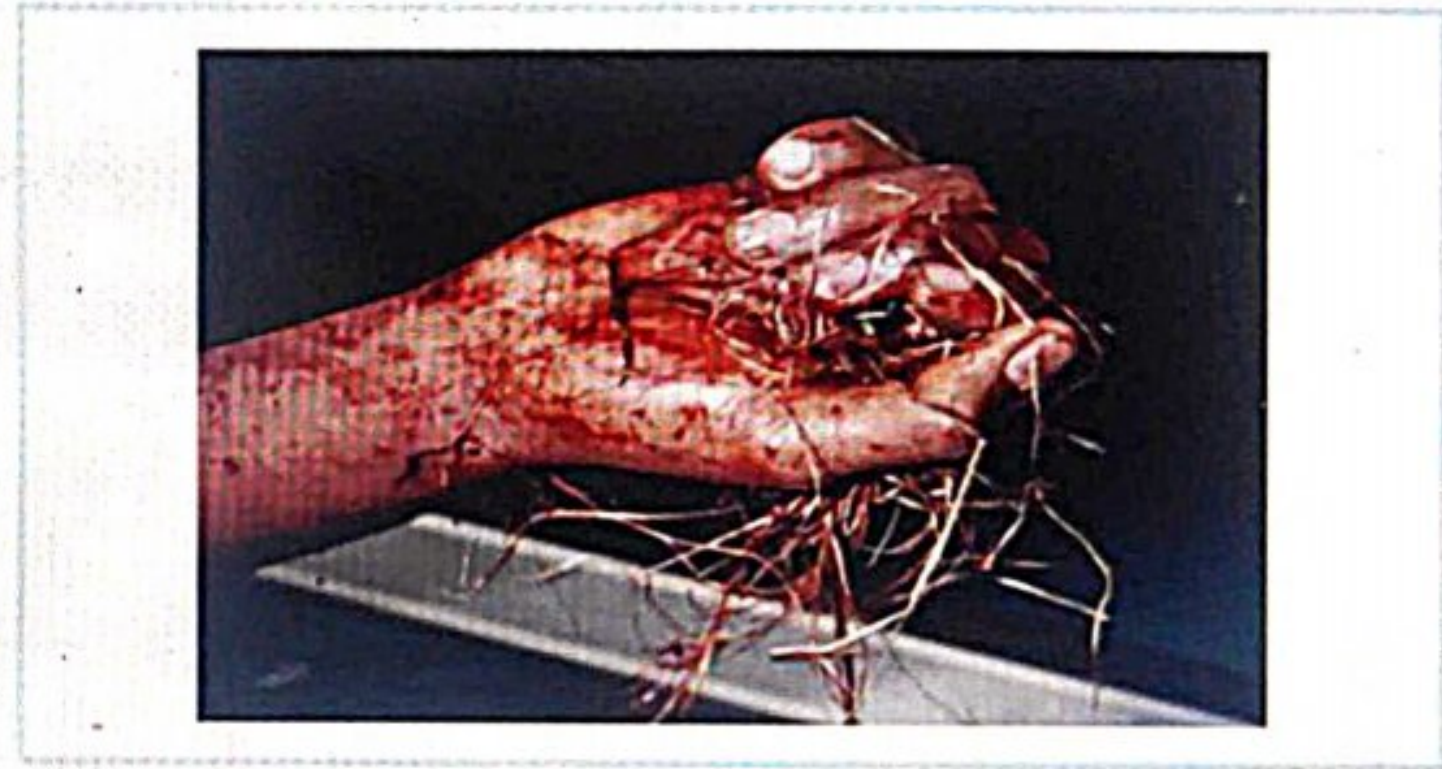
**Rule of 12**

- Starts in 60 minutes, reaches maximum in 12 hrs, stays in body for 12 hrs and disappears from body in another 12 hrs.
- Max 12 hrs, Persist 12 hrs, Disappears 12 hrs

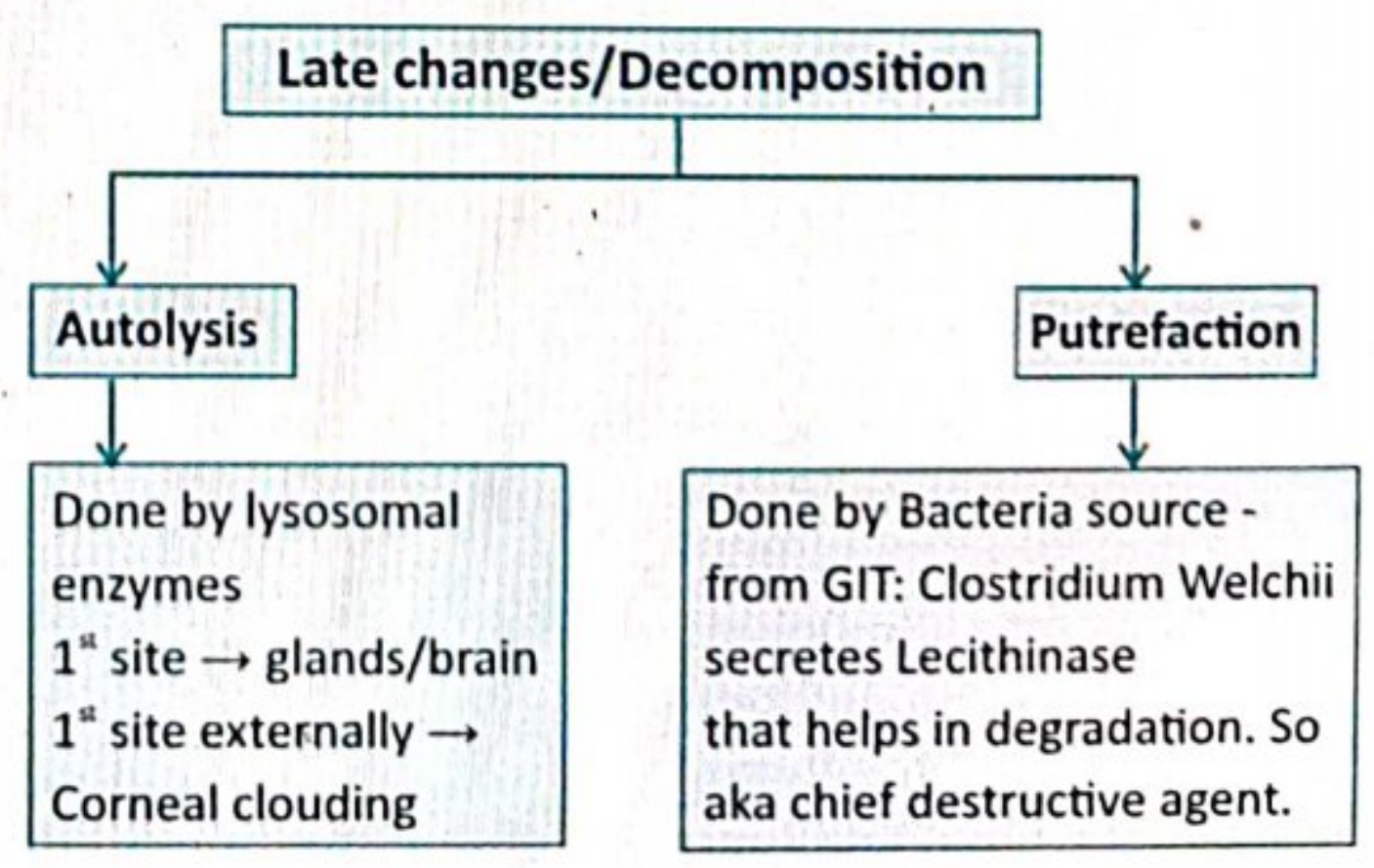
**Situation mimicking Rigor Mortis**

- Heat stiffening: Due to protein coagulation also called as Boxer's attitude/ pugilistic attitude
- Cold stiffening: Due to frozen body
- Gas stiffening: Due to decomposing gas
- Cadaveric spasm

**Cadaveric Spasm**



- Aka Instantaneous Rigor i.e., Occurs immediately after death
- No primary relaxation phases
- Whichever muscle used at the time of death, remains in spasm even after death.
- Tells the last act and manner of death.
- No Mechanism is known
- ALWAYS ANTEMORTEM
- Spasm of a group of Voluntary Muscle → which are in use at time of death





## Changes in Decomposition

1. Colour change
2. Gas formation
3. Liquefaction of tissues (5-10 days)

### 1. Colour change -

- Internally: Reddish brown discoloration in Aortic lumen (overall 1<sup>st</sup>)
- External: Greenish discoloration of "Right iliac fossa" i.e. caecum 1<sup>st</sup> external sign of putrefaction.



### Important Information

- Green colour due to sulph haemoglobin
- Summer- 12-18 hr. Winter- 24 - 48 hr



### 2. Gas Formation

- H<sub>2</sub>S: The most important gas being produced
- Hb + H<sub>2</sub>S - Sulphhemoglobin leads to greenish staining of vessels seen as greenish marking on skin k/a Marbling.
- Time taken for it is 36-72 hrs
- Gas stiffening: Rigidity
- PM skin blisters (gas bubble inside them)



PM Blisters



Marbling



Gas Rigidity

## Casper's Dictum

- The rate of Putrefaction in different Medium

Air (Fastest)	Water	Earth (Slowest - Soil)
1 week	2 weeks	8 weeks

## Order of Putrefaction

- 1<sup>st</sup> Site: Larynx and Trachea
- Early: Stomach → Intestine → Spleen → Liver → Brain → Heart
- (Mnemonic- Sister Lily's Brittle Heart)
- Late: Prostrate / Uterus (Nulliparous) → Skin → Tendon
- Last Site: Bone, Teeth

## Refer Table 8.1

## Embalming

04:22:38

- Artificial method of preservation of dead body by injecting embalming fluid
- Ethanol is not used in Embalming.
- Best method: Discontinuous injection and drainage
- Best: When done within 4- 6 hrs of death
- Should not be done before autopsy (Punishable)



### Important Information

- Normal skin color after embalming= brown
- Embalming of jaundiced body gives green colour

## Exhumation

04:24:12

- Digging out of the body, done only under magistrate inquest 176CrPC.
- No time limit.
- Preserve soil sample to exclude any soil contamination of body (M/C metal - Arsenic)



## Entomology

04:25:11

- Study of insects
  - Life cycle: Eggs → Larva → Maggots → Pupa → Flies
- Life cycle of insect in a dead body can determine time since death.
- We can also determine place of disposal.
- We can identify the cause (poising) of death.



Table 8.1

	Adipocere / Saponification	Mummification
<b>Mechanism</b>	<ul style="list-style-type: none"> <li>• Fat converted to wax(fatty acids + calcium) like Substance</li> </ul>	<ul style="list-style-type: none"> <li>• Drying and dehydration body: Mummification</li> </ul>
<b>Factors</b>	<ul style="list-style-type: none"> <li>• Body exposed to warm, moist climate</li> <li>• Lipase enzyme and Clostridium welchii needed</li> </ul>	<ul style="list-style-type: none"> <li>• Body exposed to dry / hot climate.</li> </ul>
<b>Smell</b>	<ul style="list-style-type: none"> <li>• Ammoniacal smell</li> </ul>	<ul style="list-style-type: none"> <li>• Odourless</li> </ul>
<b>Time</b>	<ul style="list-style-type: none"> <li>• 3 days - 3 month</li> </ul>	<ul style="list-style-type: none"> <li>• 3 month - 1 year</li> </ul>
		

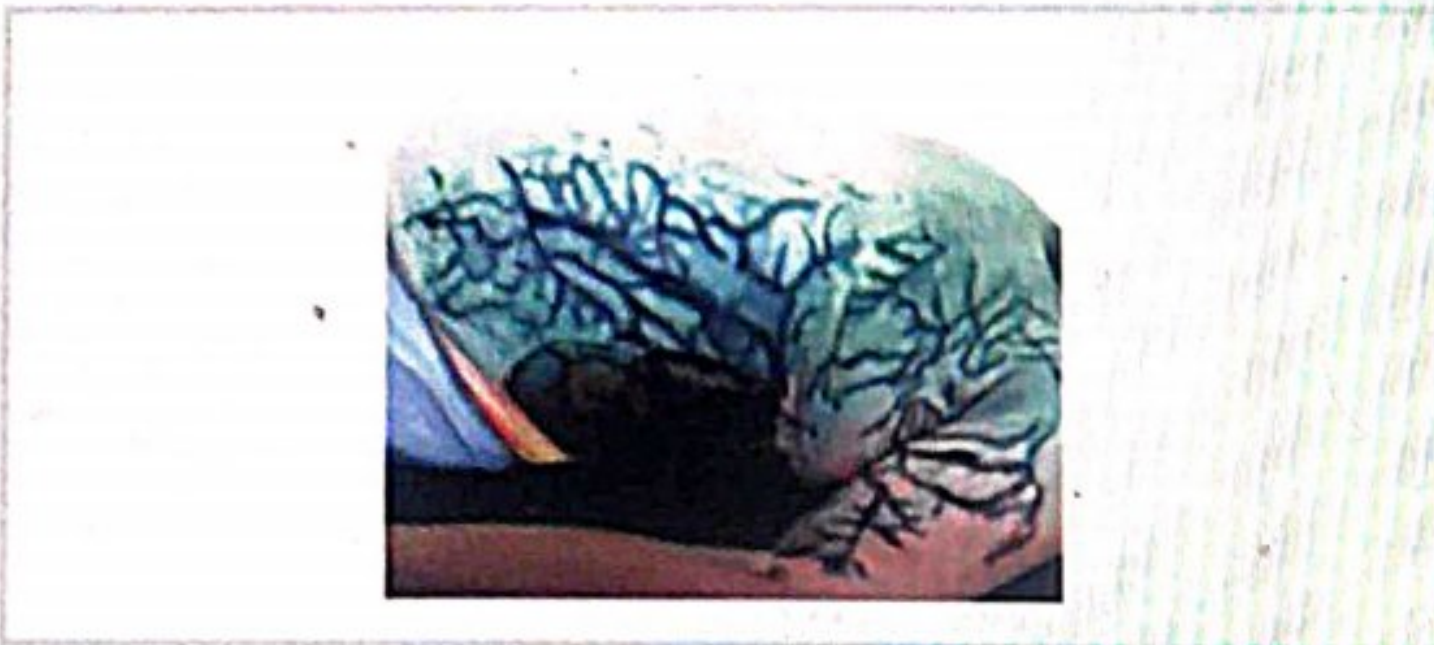




## Previous Year Questions

Q. Identify the Phenomenon?

(INICET NOV 2020)



- A. Filigree Burn
- B. Marbling
- C. Hypostasis
- D. Poisoning

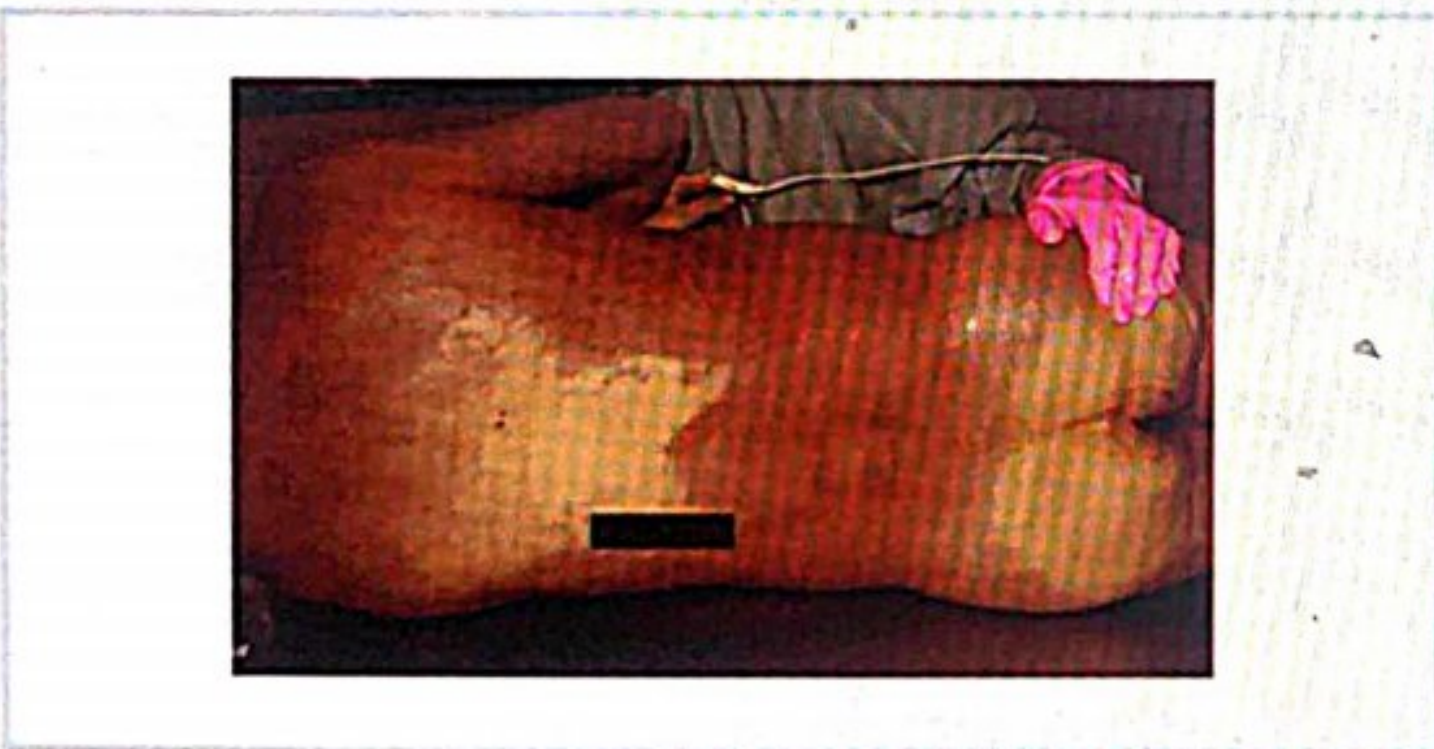
Q. First PM change in a dead body?

(FMGE May 2018)

- A. Maggot formation
- B. Putrefaction
- C. Greenish discoloration of right iliac fossa
- D. Mummification

Q. Which of the following is present in the image below?

(AIIMS May 2019)



- A. Rigor mortis
- B. Algor mortis
- C. Suggillation
- D. Marbling

Q. Rigor mortis first seen in?

(NEET Jan 2019)

- A. Eyelid
- B. Heart
- C. Limbs
- D. Neck

Q. According to Nysten rule, which of the following is the correct sequence of appearance of rigor mortis? (AIIMS Nov 2017)

- A. Eyelid - neck - thorax - upper limb
- B. Face - neck - upper limb - thorax
- C. Orbicularis oculi - facial muscle - jaw - neck - upper limb
- D. Orbicularis oculi - face - upper limb - thorax

Q. True about pugilistic attitude?

(AIIMS May 2018)

- A. Indicate only antemortem burn
- B. Indicate only postmortem burn
- C. Cannot differentiate between antemortem & Postmortem burn
- D. Indicate defense by victim during antemortem death

Q. In the case of RTA, the dead body showed spasm of a group of muscles immediately after death. In which of the following conditions primary relaxation is not seen?

(FMGE DEC 2020)

- A. Heat stiffening
- B. Cold stiffening
- C. Cadaveric spasm
- D. Rigor mortis

Q. Which of the following is the first organ to putrefy?

(NEET Jan 2018)

- A. Brain
- B. Heart
- C. Prostate
- D. Kidney

Q. Which of the following is not used as a preservative in chemical analysis?

(NEET Jan 2019)

- A. Glycerine
- B. Formalin
- C. Rectified spirit
- D. Salt solution



# 13 TOXICOLOGY



- Study of Poisons - Toxicology
- Study of toxin - Toxinology
- Study of venom - Venomics

## CLASSIFICATION OF POISONS

- C - Corrosives
- I - Irritants
- N - Neurotoxic
- C - Cardiotoxic
- A - Asphyxiants
- M - Miscellaneous

### Corrosives

Acids	Alkali
<ul style="list-style-type: none"> <li>• Damage by Coagulative Necrosis                             <ul style="list-style-type: none"> <li>○ Except hydrofluoric acid</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Liquefactive necrosis (More Dangerous)</li> </ul>

### Irritants

Non metallic	Metals	Plant	Animal
Phosphorus	Mercury, Lead, Arsenic	Ricin Abrus Semecarpus Croton Calotropis	Snake Scorpion

### Neurotoxic

- Cerebral
  - Delirium. Eg - Datura, Cocaine, Cannabis
  - Inebriant - Alcohol, Chloral hydrate (Mickey Finn)
  - Somniferous - Opiates
- SPINAL
  - Strychnos nux vomica
  - Gelsimium
- Peripheral nerve - Conium maculatum (hemlock) causes ascending paralysis

01:32:55

### Cardiac

#### MNEMONIC: Car DONA

- DIGITALIS (Foxglove)
- OLEANDER (Kaner)
- NICOTINE
- ACONITE (Monk hood, Mitha zaher)

01:33:40

### Asphyxiants

- CO, H<sub>2</sub>S, HCN

### Miscellaneous

- Agricultural poison
- Food poisoning

### Poisons / Conditions and colour of Hypostasis

- CO - Cherry red
- Cyanide - Bright red
- Hypothermia - Pink
- Phosphorus - Dark brown
- Hydrogen sulphide - Bluish green
- Aniline - Deep blue / brown
- Nitrites - Reddish brown
- Opiates - Black

### Poisons and Smell

- HYDROGEN CYANIDE - Bitter almonds
- Arsenic and phosphorus - Garlic, (OPC)
- Alcohol - Fruity, acetone
- Hydrogen sulphide - Rotten egg (disulfiram, mercaptans)
- OPC - Kerosene smell
- Zinc phosphide - Fishy
- Marijuana - Burnt rope
- Hemlock - Mousy odour

### Poisons and Stomach Mucosa

Stomach Mucosa Appearance	Poisons
• Red velvety stomach	• Arsenic
• Black necrotic	• H <sub>2</sub> SO <sub>4</sub>
• Yellowish skin, teeth and stomach mucosa (Due to picric acid XANTHOPROTEICRXN)	• HNO <sub>3</sub>



<ul style="list-style-type: none"> <li>• BUFF/WHITE COLOR</li> <li>• Thickening (Leathery) (Rest all acids cause thinning of mucosa)</li> </ul>	<ul style="list-style-type: none"> <li>• Carbolic Acid</li> </ul>
<ul style="list-style-type: none"> <li>• Slate grey mucosa</li> </ul>	<ul style="list-style-type: none"> <li>• Mercury</li> </ul>
<ul style="list-style-type: none"> <li>• Blue</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\text{CuSO}_4</math>, Sodium amytal</li> </ul>

### VISCERA PRESERVATION

- Routinely these organs are preserved
  - Stomach
  - Small intestine (proximal)
  - Liver
  - Kidney
  - Blood (most reliable)
- In cases of known poisoning preserve
  - Spinal cord - Strychnos nux vomica, Gelsimium
  - Heart - Aconite
  - Brain - Alcohol (Cerebral poisons)
  - Fatty tissues - Insecticides
  - Bone, hair, nail - Heavy metal poison
  - Lungs - Volatile poison.

### Preservatives

- Saturated solution of NaCl (most commonly used)
  - Avoid in aconite and corrosive poisoning except carbolic acid
- Rectified spirit (95% alcohol) (Best)
  - Avoid in alcohol, formalin, phosphorus, phenol poisoning.
- For Blood - NaF, Potassium Oxalate
- For Urine - NaF, Thymol, Toluene
- No preservative needed in
  - Lung
  - Hair
  - Bone
  - Nail
- Formalin cannot be used for toxicological analysis, chemical analysis, viscera preservation. It is used only for histopathological examination

### LEGAL DUTIES OF A DOCTOR

- 39 CrPC: Intimation to police
- 176 IPC: Punishable for not informing
- 177 IPC: Punishable for false information
- Suicidal and alive: No need to inform
- Suicidal and dead: Inform
- Preserve the evidences
  - Disappearance of evidence is punishable under 201 IPC

### DECONTAMINATION

- **Gastric lavage:** Effective if done within 1 - 3 hrs.
  - Done by Lavacuator (ideal) or Ewalds tube or Ryle's tube
  - Contraindication
    - C - Corrosives (Except phenol)
    - C - Comatose condition
    - S - Convulsant poisoning (Strychnos nux vomica)
    - K - Volatile (Kerosene). Due to risk of aspiration.
- **Activated Charcoal** - Physical antidote



Activated charcoal

- Powder mixed with water and then ingested
- Poison bind to surface of charcoal - This property is known as **adsorption**
- Avoid in CHIM
  - C - Corrosives
  - H - Hydrocarbon
  - I - Insecticide
  - M - Metal
- **Antidotes**
  - Arsenic - BAL, DMSA
  - Copper - Pencillamine, DMSA
  - Iron - Desferrioxamine
  - Lead - EDTA, DMSA
  - Mercury - DMSA, BAL except - Organic mercury
  - Cocaine - AMYL NITRITE
  - Beta blocker - Glucagon
  - Carbon Monoxide - High flow oxygen
  - Cyanide - Hydroxocobalamin, Nitrites, Amyl nitrite, Sodium nitrite
  - Digitalis - Digibind also in oleander
  - Morphine - Naloxone sodium
  - Methanol - Ethanol and Fomepizole
  - OPC - Atropine, Oximes
  - Carbamates - Atropine
  - Organochlorine - Symptomatic treatment
  - Pyretheroids - Also symptomatic treatment





## Previous Year Questions

Q. Gastric lavage is allowed in which corrosive poisoning?

(JIPMER 2017)

- A. Paint thinner ingestion
- B. Lysol ingestion
- C. Crude toilet disinfectant ingestion
- D. Battery acid ingestion

Q. A 3 year old child brought to hospital with history of consumption of iron tablets. History of abdominal pain, diarrhoea & vomiting. The child is in comatose condition. The treatment is?

(NEET PG 2022)

- A. Desferrioxamine
- B. BAL
- C. Activated charcoal
- D. Penicillamine

Q. The antidote in opioid poisoning is?

(NEET PG 2022)

- A. Methadone
- B. Naloxone
- C. Flumazenil
- D. Oximes

Q. A girl had been brought with history of paracetamol tablets from a medicine bottle. The treatment to be given is?

(NEET PG 2022)

- A. Nacetyl cysteine
- B. Naloxone
- C. Flumazenil
- D. Atropine

Q. In a case of lead poisoning the enzymes inhibited are?

(NEET PG 2022)

- A. ALA synthase
- B. Uroporphyrinogen III synthetase
- C. ALA dehydratase & ferrochelatase
- D. Coproporphyrinogen reductase

Q. Lead poisoning 60 mcg / 100 ml. The treatment is?

(FMGE 2022)

- A. EDTA
- B. DMSA
- C. EDTA + DMSA
- D. Penicillamine

Q. Identify the poisonous plant having yellow flowers and seeds are contained in prickly capsules? (INI CET-May-2022)



- A. Argemone mexicana
- B. Nerium odorum
- C. Papaver somniferum
- D. Calotropis procera

Q. All the following are muscarinic manifestations of organophosphorus poisoning, except? (INI CET 2022)

- A. Urinary incontinence and diuresis
- B. Bradycardia
- C. Mydriasis
- D. Bronchoconstriction

Q. Most characteristic feature of muscarinic symptoms in OPC poisoning among the following? (INI CET 2022)

- A. Respiratory symptoms like salivation, rhinorrhea, bronchorrhea and bronchospasm
- B. Mydriatic pupil
- C. Tachycardia
- D. Skeletal muscle contraction

Q. A 27 year old patient comes to emergency with salivation, diarrhoea, watery eyes, dysuria. What will be first line of management? (INI CET 2022)

- A. IV calcium gluconate
- B. Atropine
- C. Pralidoxime
- D. Glucagon