

# **FMT**

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**RR-8.0**

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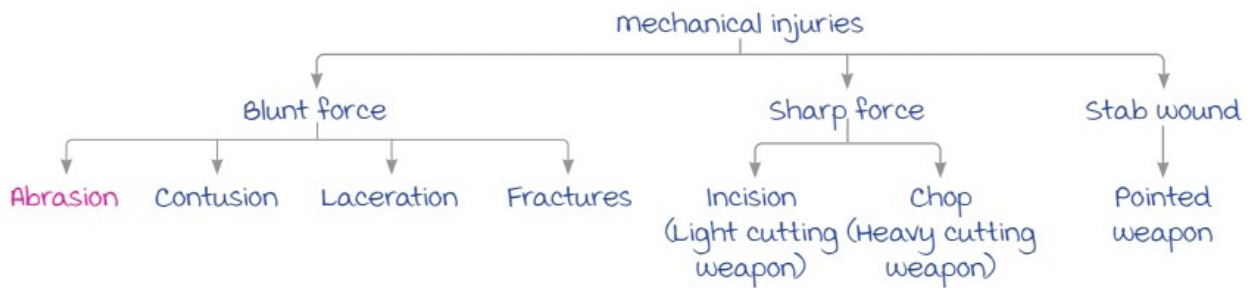
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# TRAUMATOLOGY : MECHANICAL AND REGIONAL INJURIES

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## Abrasion

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- medicolegally important.
- Injury to partial epidermis → No scarring/bleeding.

### Types of Abrasion :

Caused by tangential force

Scratch abrasion : Injury with pin, fingernail, thorn.



Grazed abrasion/Gravel rash/Sliding abrasion :

- D/t friction b/w skin & rough surface.
- m/c abrasion : A/w RTA.



multiple scratches over a wide area

Caused by perpendicular force

Pressure abrasion :

- D/t sustained pressure.
- Eg : Ligature mark.



Imprint/impact abrasion :

- D/t momentary impact.
- Eg : Recoil abrasion, whip mark.

Patterned abrasion :  
Either pressure or imprint abrasion displays the pattern of the weapon.

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**Epithelial Tag :**

- Epithelium is scraped off & heaped.
- Indicates tail end of the abrasion.
- Determines **direction** of force.

**Aging of Abrasion :**Based on color of scab : mnemonic **R<sup>3</sup>B<sup>3</sup>**.

- **Raw** : <12 hours.
- **Reddish** : >12 hours.
- **Reddish brown** : 2 - 3 days.
- **Brown** : 4 - 5 days.
- **Black** : 6 - 7 days.

**Antemortem v/s Postmortem Abrasion :**

	Antemortem abrasion	Postmortem abrasion
Site	Anywhere on body	Bony prominence
Colour	Red	Pale
vital reaction	⊕	⊖

**Diagnosis Based On Type Of Abrasion :**

- Smothering : Nail abrasions + perioral injuries.
- Throttling : Crescentic nail marks.
- RTA : multiple graze abrasions.
- Sexual assault : Abrasions on inner thigh/genitalia.

**Contusion/Bruise**

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**Features :**

- Seen in blunt force trauma.
- **Ill defined margins** of wound.
- **Extravasation** of blood in dermis.

Note : Hypostasis → well defined margins.



Contusion

**Types of Contusions :**

1. Intra-dermal bruise (Superficial).
2. Deep bruise (AKA come-out bruise) : Delayed appearance.
3. Ectopic bruise (migratory/percolated bruise) : Away from the impact site.
4. Patterned bruise : Shows the pattern of striking surface of weapon.

Examples of ectopic bruise :

1. Raccoon eye/black eye/panda eye sign.
2. **Battle sign** : Ecchymosis in mastoid region d/t fracture of **middle cranial fossa**.



Raccoon eye sign



Battle sign

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Examples of patterned bruise :

1. Six penny bruise :
  - Coin shaped bruise d/t pressure of finger tips on the skin.
  - Seen in : Throttling, child abuse.
2. Butterfly bruise : Seen in child abuse d/t pinching.
3. Tramline/Railway line bruise : D/t blow with a rod/lathi/stick.

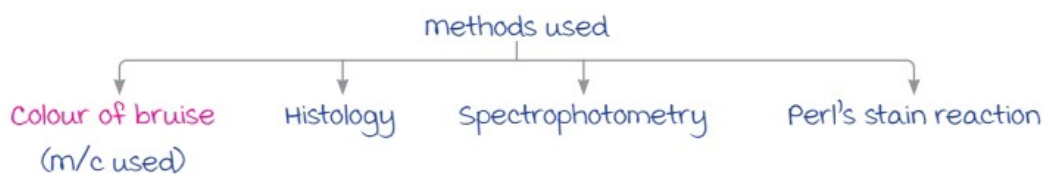
True Bruise v/s Artificial Bruise :

	True bruise	Artificial bruise
Cause	Trauma	Irritant plant extract (Plumbago, Semicarpus, Calotropis)
Site	Anywhere on body	Accessible parts of body
Colour change during healing	Present	Absent
margins	Irregular	Regular
Vesication/blisters	Absent	Present (D/t inflammatory reaction)
Content	Blood	Inflammatory fluid → Acid serum
Itching	Absent	Present

Factors Affecting Bruising :



Aging of Contusion :



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Colour of the bruise :

Ageing of bruise by color		
Type of hemoglobin	Color	Age of bruise
Oxyhemoglobin	Red	Fresh
Deoxyhemoglobin	Blue	Few hrs to 3 days
Hemosiderin	Brown	4 days
Biliverdin	Green	5-6 days
Bilirubin	Yellow	7-12 days

- multiple bruises of different colour → Sign of child abuse.
- Bruise with no colour changes :
  - Subconjunctival hemorrhage.
  - Chronic subdural hematoma.



Livor mortis vs. Bruise :

	Livor mortis (Hypostasis)	Contusion
Site	Dependent parts	Can occur anywhere on body
margins	Regular	Irregular
Blanching	Present	Absent
Extravasation of blood	Absent	Present
Colour changes	Absent	Present
Appearance		

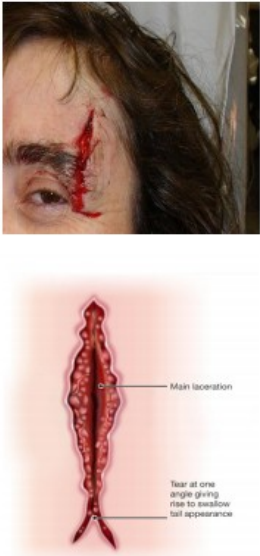

## Lacerations & Special Types of Wounds

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Laceration vs. Incision :

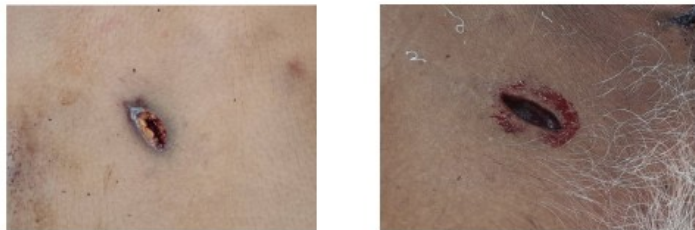
	Laceration (Tear)	Incision (Cut)
margins	Irregular	Clean cut
Feature	Swallow tails	Tailing (Direction of force can be assessed)
Tissue bridges	⊕	⊖
Floor (Hair bulb, vessels)	Crushed	Cut (↑ bleeding due to cut vessels)
Bleeding	Less	Profuse
Images		

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	Laceration (Tear)	Incision (Cut)
Images	 <p>Swallow tailing</p>	 <p>Tailing</p>

**Stab Wound :**



- Produced by any weapon with a pointed end.
- Maximum dimension : Depth.



**Note :**

maximum dimension of incised wound : Length.

Type of weapon based on shape of stab wound :

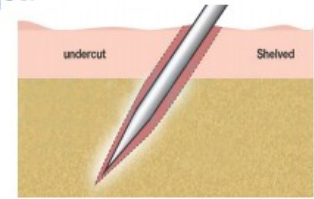
Shape of wound	<ul style="list-style-type: none"> <li>• Wedge/Triangle shape</li> <li>• Fish tailing</li> </ul>	Oval spindle shape
Weapon	Single edge knife	Double edge knife
Image		 <p>Hilt mark :</p> <ul style="list-style-type: none"> <li>• Seen in : Complete penetration.</li> <li>• Helps determine :                             <ul style="list-style-type: none"> <li>- Direction of force.</li> <li>- Type of weapon.</li> <li>- Age of the wound.</li> </ul> </li> </ul>



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Bevelling :

- Blade enters obliquely into the skin → Undermined edges.
- Indicates **homicide**.



Types of Lacerations :

Split laceration :

- AKA **incised looking laceration**.
- mechanism : Skin crushed b/w two hard objects i.e. **bony prominence**.



Split laceration : Skull

Avulsion laceration :

- Shearing force (Tangential) :  
Separation of skin from deeper tissues : **Flaying**.
- Eg : Degloving injury, scalping injury.



Degloving injury

Tear lacerations : Caused by semi-sharp objects.

Stretch lacerations : D/t overstretching of skin.

Lacerated looking incision : Seen in areas with skin folds (Scrotum, axilla).

Hesitation cuts :

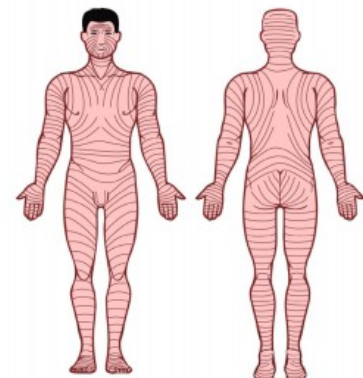
- AKA Tentative cut/intentional cut/feeler's strokes/trial cuts.
- multiple, superficial, linear cuts.
- Site : Accessible parts of the body.
- Indicates suicidal attempt.



Hesitation cuts

Cleavage lines/Langer's line :

- Represent the arrangement of collagen fibers.
- Determine the extent of gaping.



**Hara-kiri/Seppuku :**

- Suicidal stab wound of the abdomen.
- Cause of death : **Evisceration** → Circulatory collapse.



Hara-kiri

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**Chop Wounds :**

- Deep gaping wound caused by heavy sharp weapon.
- Margins : Regular with adjacent bruising.
- Floor : Crushing + fracture of bone.
- Usually suggestive of homicide > suicide or accidental.



Heavy sharp weapon



Chop wound : Cut fracture

**Defence Cuts :**

- Indicates homicide.
- Types :

Active :

m/c seen at palm (1<sup>st</sup> web space).



Passive :

m/c seen at ulnar margin of forearm.



Note : Defence wounds not mandatorily seen in all cases of murder.

**Regional Injuries**

00:43:00

**Skull vault Fractures :**

Fracture	Image
Fissure fracture (Linear crack) : <ul style="list-style-type: none"> <li>• <b>m/c type</b> of skull fracture.</li> <li>• Caused d/t weapon with broad striking surface.</li> </ul>	