TRAUMATOLOGY

By

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Learning objectives

- At the end of this fifty minutes lecture to a class of 100 students of 3rd year mbbs,the students should be able to
- Define and Differentiate trauma,and the terms used synonymous to it.
- Classify the wound into hurt or injury.
- Enlist the factors involved in wound production.

LO

- It ll be assessed during and after the lecture by examples,Q&A session and naming the mr. cat.

TRAUMATOLOGY

This term is a combination of two words:

"Trauma and Logos"

Trauma:

It is defined as breach or dissolution of the natural continuity of any of the tissue of a living body, externally or internally, caused by actual physical violence/ force.

Logos: Science

So, Traumatology means

"Scientific Study of Wounds or Injuries"

Definitions of Other Terms Synonyms To Trauma

1. Wound:

(Medical term) "Damage to living tissue" (In Pakistan, the term wound is not defined in the law)

Definitions of Other Terms Synonyms To Trauma (contd….)

2. Injury:

(Legal term) defined in section 44 P.P.C. " any harm whatever illegally caused to any person in body, mind, reputation or property".

3. HURT:

(Legal term) defined in Sec 332 of P.P.C. "Causing of pain, harm, disease, infirmity, injury or impairing, diabling or dismembering any organ of the body or part thereof without causing death".

MCQ

The students of 3rd year MBBS class have mentally tortured their teachers by the result of their 1st class test. It is

A. Trauma
B. Wound
C. Injury
D. hurt

Trauma

- **In USA : 74% of all deaths occur due to trauma in the age group of 10 -24 years.**

- **In India: 62% of all deaths occur due to trauma in age group of 15-44 years.**

Types of Traumatology

1. General Traumatology:

- ✦ Definitions
- ✦ Mechanism of wound Production
- ✦ General Feature of wounds
- ✦ Laws related to wounds
- ✦ Classification of wounds

2. Special Traumatology:

- ✦ Firearm injuries
- ✦ Regional Injuries
- ✦ Electrocution & burns
- ✦ Sexual Assaults etc

MECHANISM OF WOUND PRODUCTION

(All the mechanical injuries are the result of the interaction between weapon and the body)

Factors Required For Wound Protection

1) Weapon / object
2) Force= kinetic energy(KE)=½ mv^2
3) Body / tissue
4) Impact causing transfer of energy

Factors Required For Wound Production

1. Weapon:

Any instrument of offence is called weapon.

Commonly used conventional weapons are:

- **Blunt weapons e.g. stick, rod, stone, belt, fist.**
- **Sharp edged weapons e.g. knife, razor blade.**
- **Pointed weapons e.g. ice pick, dagger, needle.**
- **Firearm weapons e.g. Pistol, revolver, shotgun.**


Medieval Weaponry
A.
B.
C.
D.
E.
F.
G.
H.
I.


GANG WAR
The Urban Gang Simulator

Factors Required For Wound Production

2. Force

Force= kinetic energy(KE)=½ mv^2

3. Body/ Tissues

Body composed of different types of tissues as

- Soft and elastic tissues (Skin, Muscles, Internal organs)
- Relatively rigid and less elastic (Ligaments and cartilage)
- Hard with limited elasticity (Bones)

Factors Required For Wound Production

4. Impact

Force / Energy required for production of a wound is transferred to the tissues as a result of impact between weapon (propelling force) and the body (counter force).

PROPELLING FORCE:

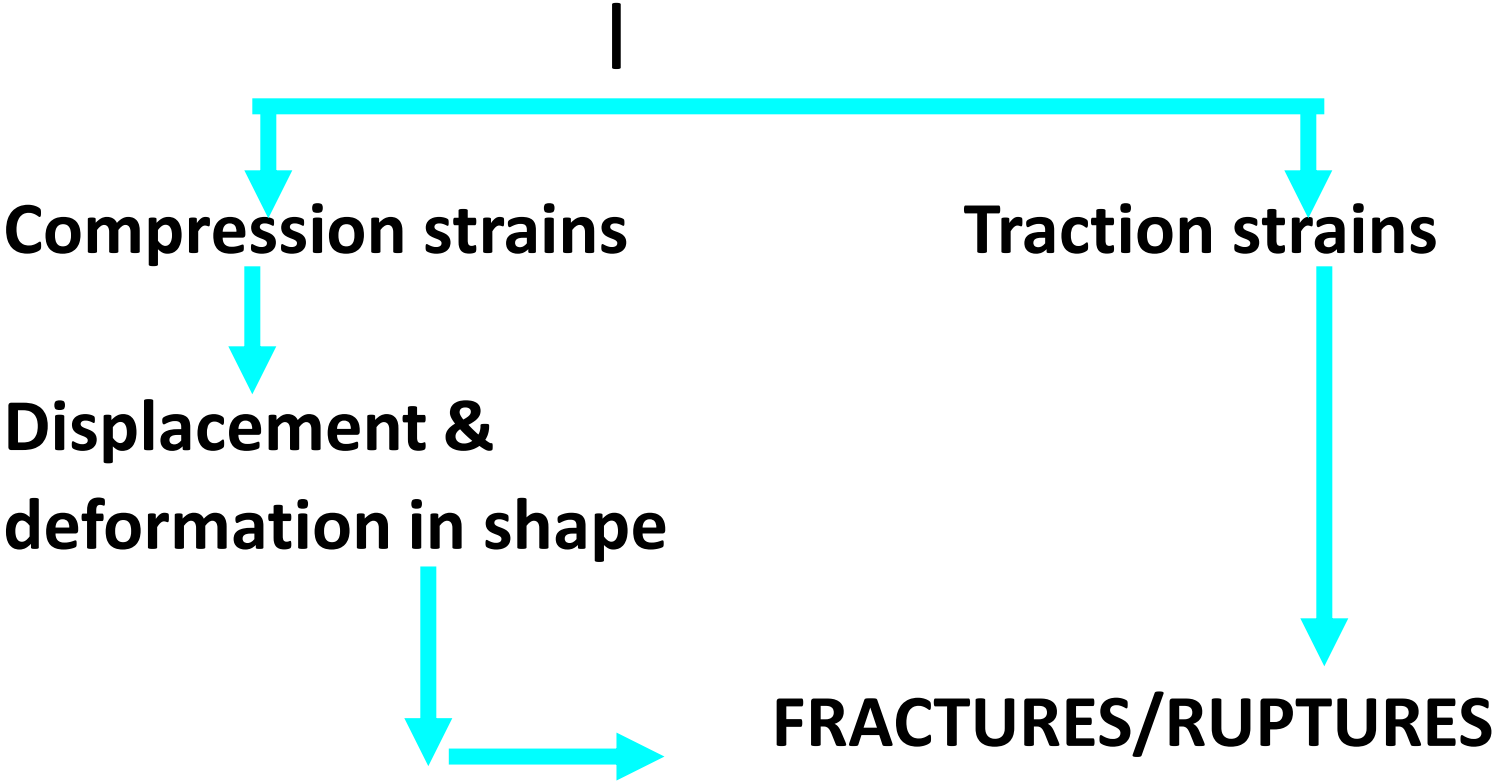
- ✦Movement of object / weapon
- ✦Movement of the body
- ✦Combination of above

COUNTER FORCE:

- ✦Inertia of the body
- ✦Object against which body strikes

Energy transmitted to the body as a result of impact is used in:

1. Causing the body to move as a whole
2. Causing the non-uniform motion of the localized tissues.



FACTORS EFFECTING THE APPEARANCE OF WOUND

Total 6 factors,

- 3 belongs to the weapon used and
- 3 to the body of victim.

A. Factors belonging to the weapon used

1- Type of weapon-- Directly controls the shape of wound

2-Execution of mechanical force - may be direct at the site of impact e.g. injuries with stick/brick etc. or

indirect away from the site of impact e.g. Stretch laceration, deceleration injuries.

3- Weight and velocity of the weapon- The wounding power of any moving object = KE(kinetic energy) = ½ mv^2(m=mass/weight and v=velocity).

B. Factors belonging to the part of body struck.

1. **Architectural design of the tissues**

a. **Body composition.** Body Composed of different types of tissues

- **Soft and elastic tissues** e.g. Skin, muscles, internal organs.
- **Relatively rigid and less elastic** e.g. Ligaments and cartilages.
- **Hard with limited elasticity** e.g. Bones.

b) Design of Formation of Tissues

- **Compact as in limbs**
- **Cavity as in abdomin , chest and cranium. In cavities, organs of different designs are present.**
- **Solid as liver , spleen and kidney.**
- **Spongy and containing air as lungs.**
- **Hollow sacs with fluids of different densities as blood in heart, urine in urinary bladder and water mixed food in stomach and intestine.**

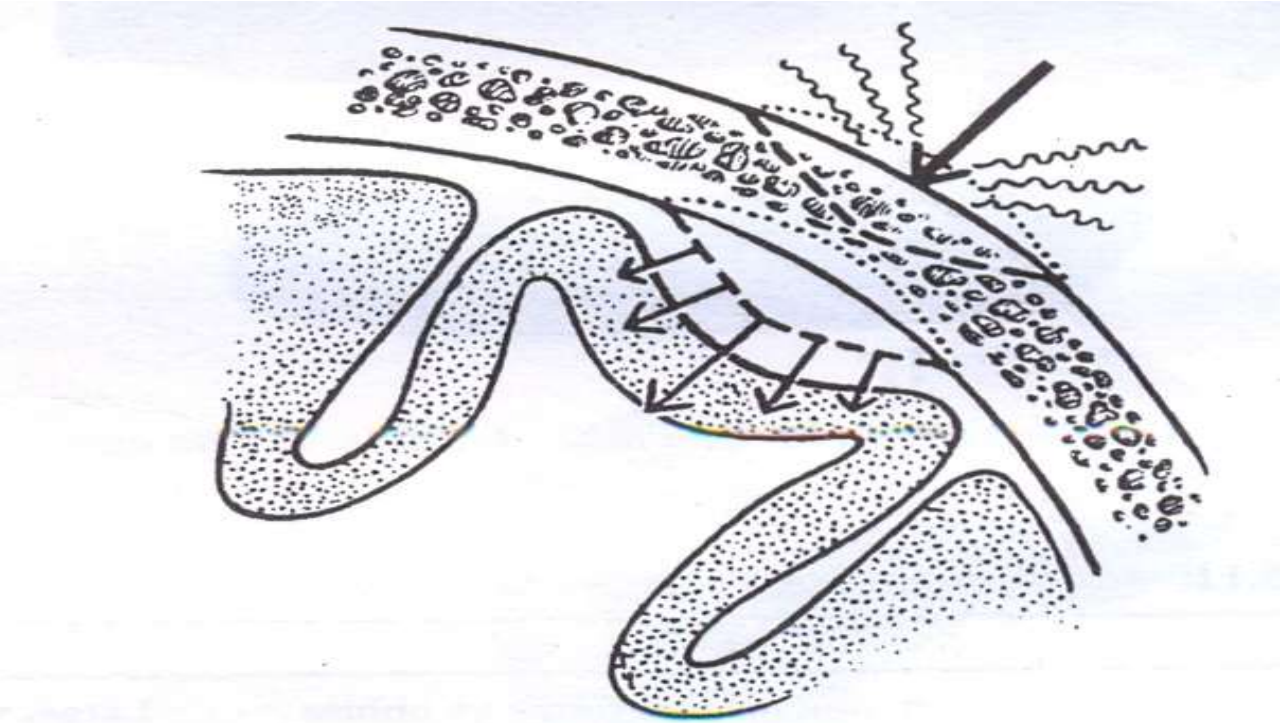
- **An impact with a club having same force and same direction, on different parts of the body having different architectural designs, shall produce injuries of different shape. Impact on the forehead produces a laceration, whereas similar impact on the buttock shall produce a bruise.**

- **This difference in shape of wound is due to the difference in architectural design. The forehead has scalp stretched over a bone whereas buttock comprises mostly of soft tissues of skin, fat and muscles.**

2. Resistance of the tissues. **It depends upon two factors.**

a. Extent of surface area struck.

The resultant wound depends upon the surface area involved.



b. Ability of the part to absorb the force with out damage

Soft and elastic tissues as skin and muscles, absorb the striking force effectively without being injured where as hard and inelastic tissues as bone, fracture with the same force.

3-Effect of movement of the part struck.

- **A strike on stationary head produces an injury of scalp and deeper structures at the site of impact (Coup – injury)**
- **If moving head strikes with a stationary object, the resultant injury will be combination of impact injury (Coup–injury) and another injury at a point diagonally opposite to the point of impact (Contre-Coup injury)**

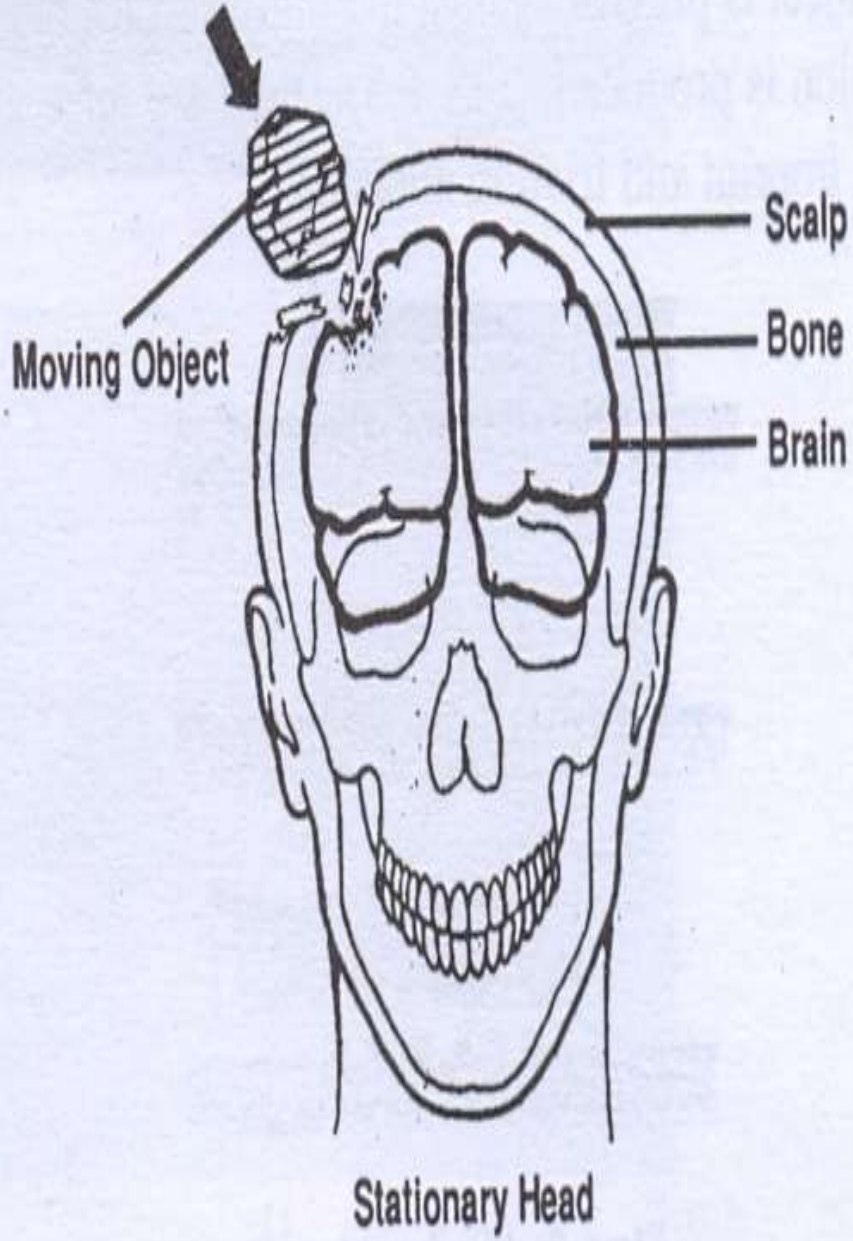


Fig 6.3: *Impact injury to the stationery head.*

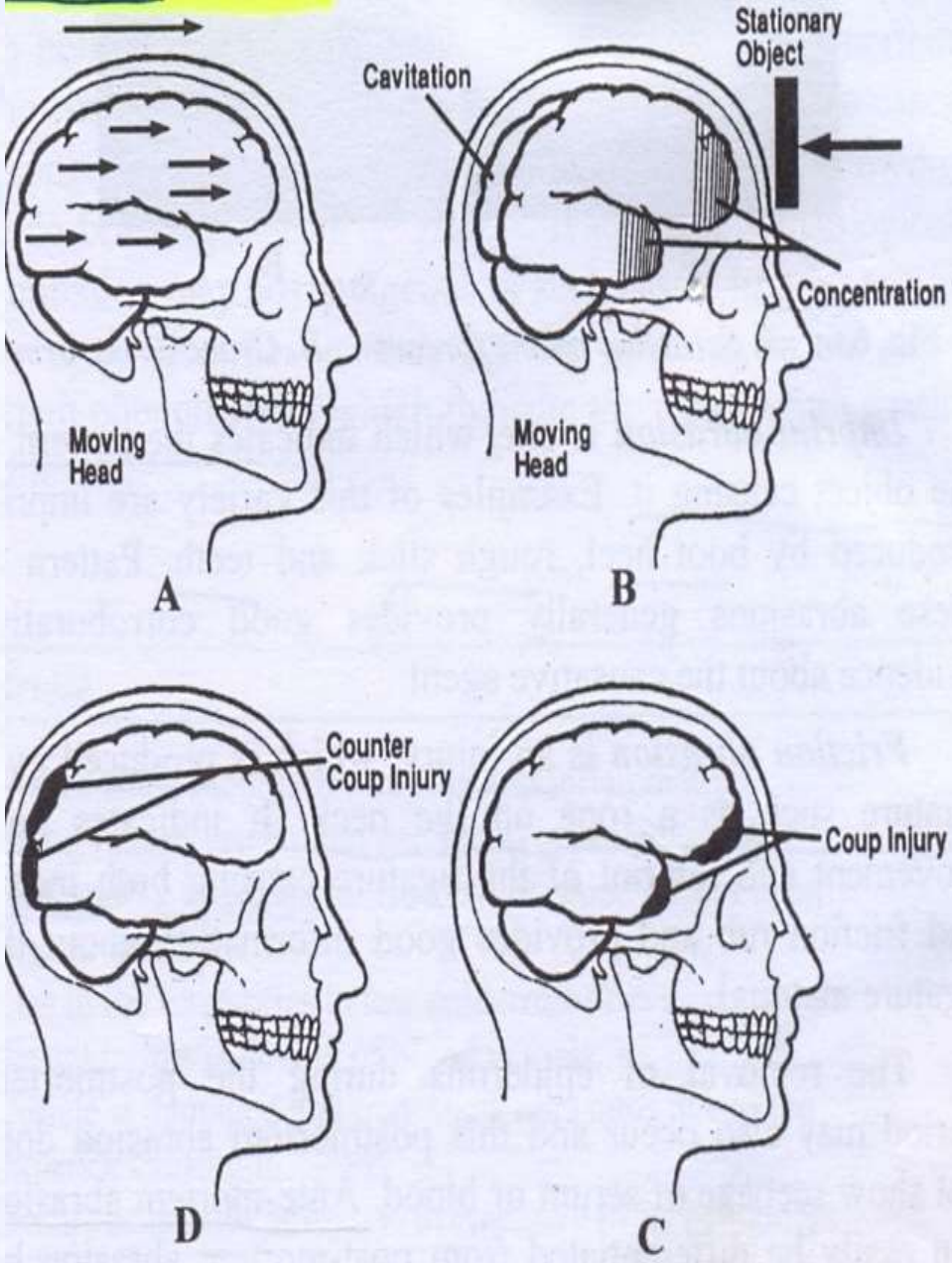
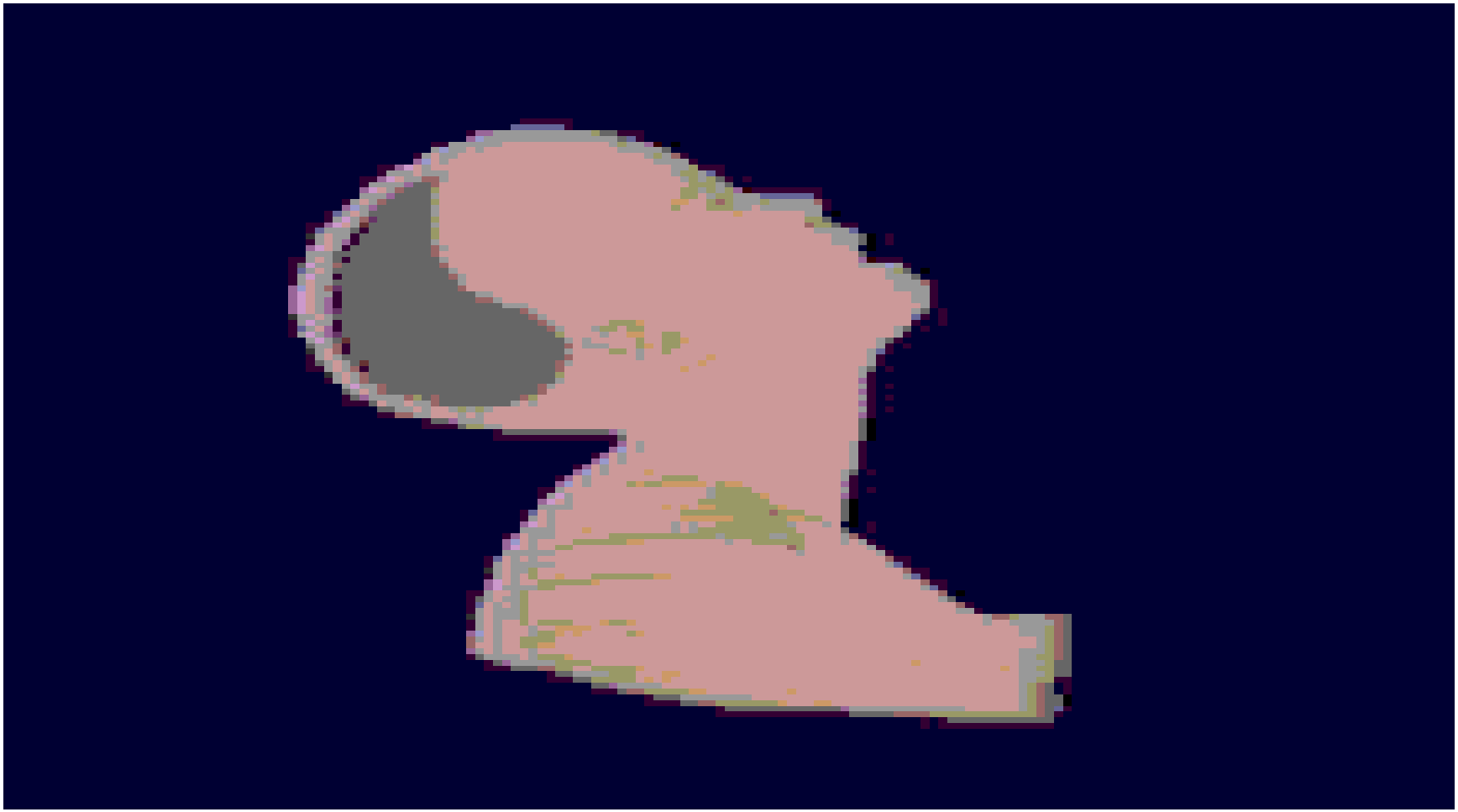


Fig. 6.4: *A. Moving head. B. Striking a stationery object. C. & D. Causing coup and contre-coup injuries.*

Coup and counter coup injuries




LOONEY TUNES
"That's all Folks!

CLASSIFICATION OF WOUNDS/INJURIES

A) MEDICAL CLASSIFICATION:

1) Closed wounds:

Where whole thickness of skin has not gone e.g. bruise, superficial burns, abrasions.

2) Open wounds:

Where whole thickness of skin had gone e.g. lacerations, cuts, stab wounds, deep burns, firearm wounds.

B) CLASSIFICATION ON BASIS OF CAUSATIVE AGENT:

1) **Blunt weapon injuries** e.g. bruises, abrasions, lacerations
2) **Sharp edged weapon injuries** e.g. incised wounds/cuts
3) **Pointed weapon injuries** e.g. stab wounds
4) **Firearm injuries**

(From 01 to 04 also called Mechanical Injuries)

5) Thermal injuries

6) Electrical injuries

7) Chemical injuries

8) Radiation injuries

9) Explosion injuries

Mechanical Trauma is subdivided into 03 types

- **Blunt Force Trauma**

it is also subdivided into three parts.

- ✓ **Abrasion**
- ✓ **Contusion**
- ✓ **Laceration**

- **Shape Force Trauma**

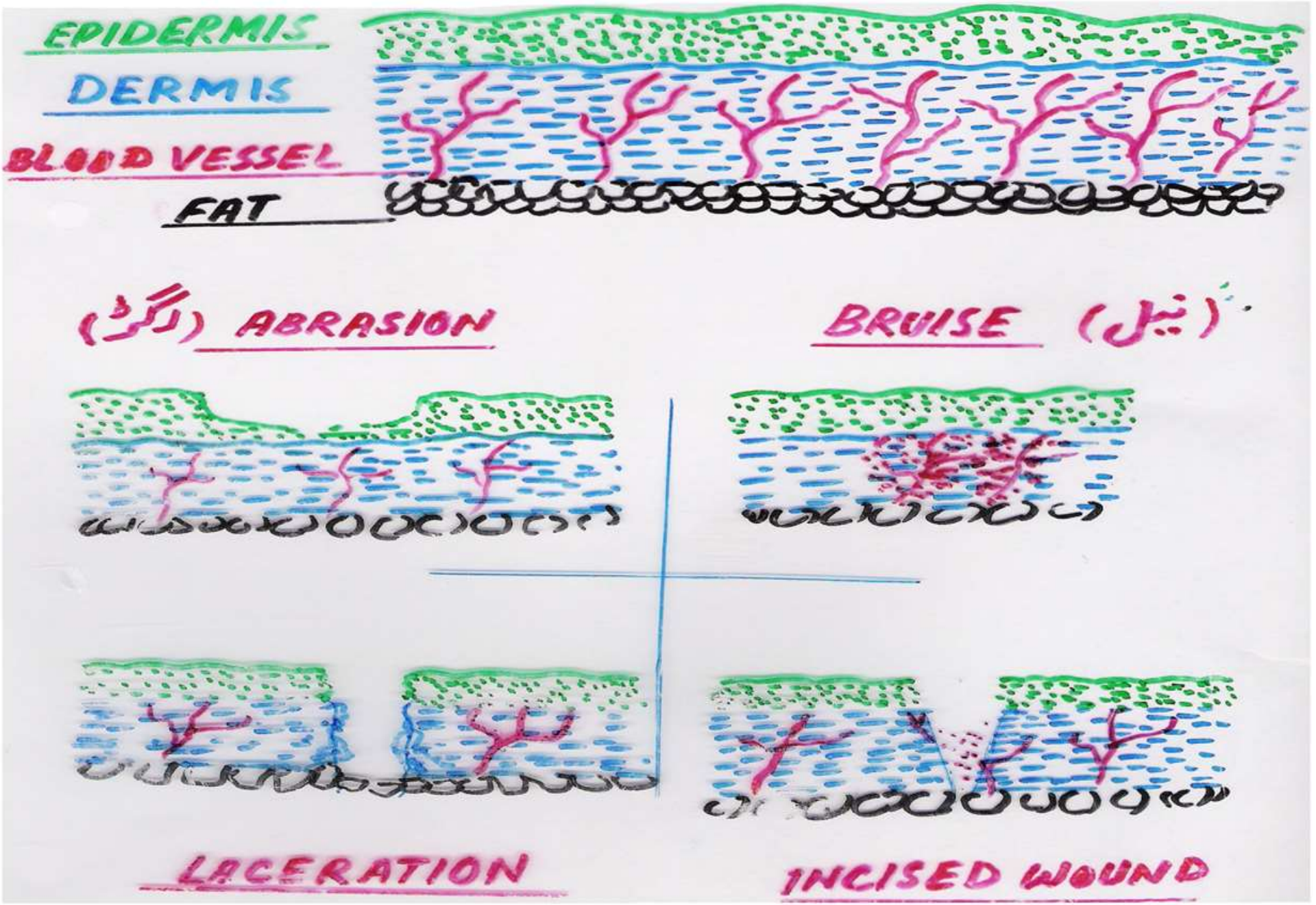
it is also subdivided into three parts.

- ✓ **Incised wound**
- ✓ **Stab wound**
- ✓ **Chop wound**

Firearm injuries/ wounds

- **By rifled firearm (Gunshot Injuries)**
- **By smooth bored firearm (Shotgun Injuries)**

Mechanical Trauma



C) CLASSIFICATION ON BASIS OF MOTIVATION OF INFLICTION

1) Homicidal
2) Suicidal
3) Accidental
4) Fabricated
5) defense

D) LEGAL CLASSIFICAITON:

(Types of Hurts)

i) Itlaf-i-udw

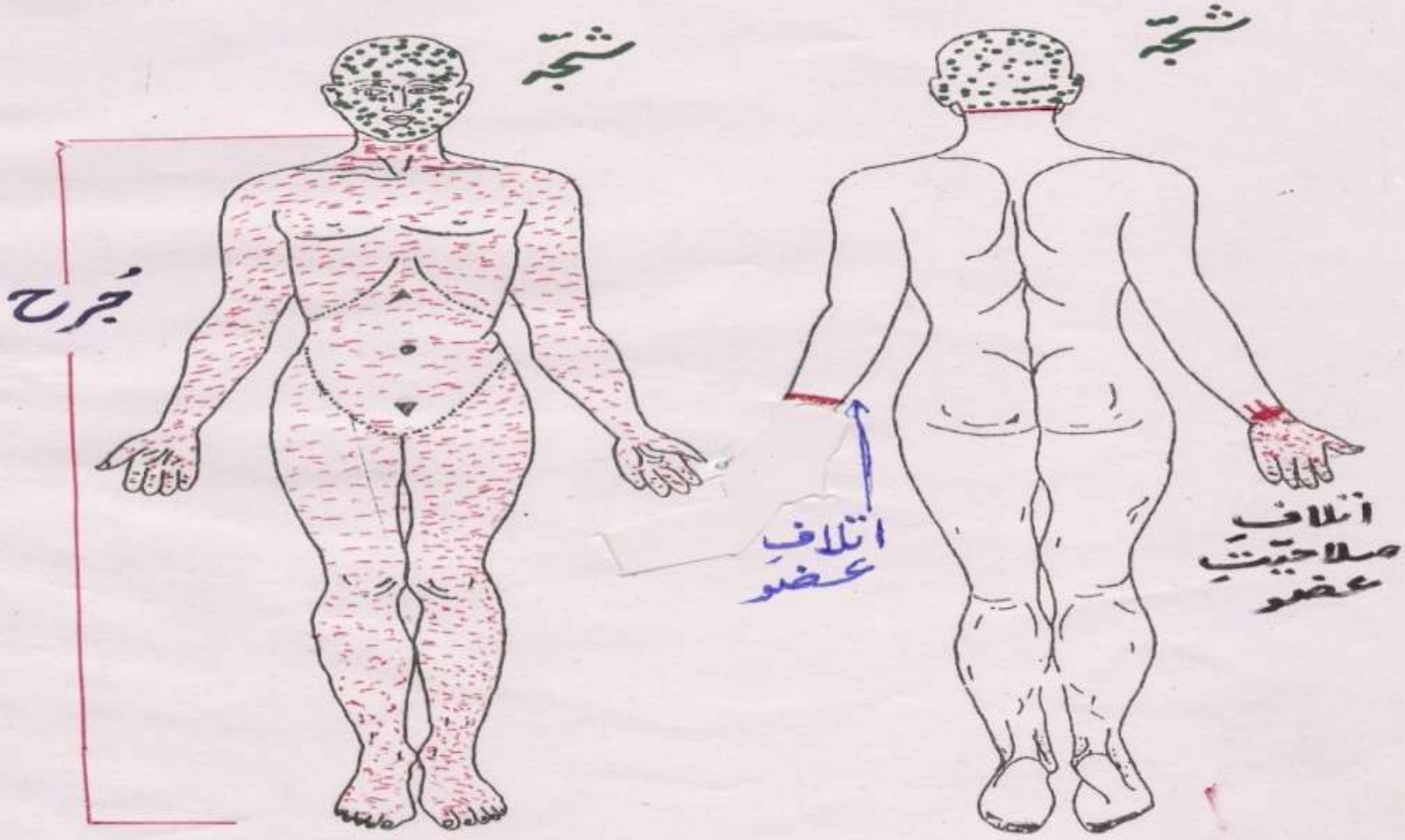
ii) Itlaf-i-Salahiyyat-i-udw

iii) Shajjah

iv) Jurh

v) All kinds of other hurts

Out Lines Of the Body For Leading Injuries of Dead Bodies



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Mechanical Trauma subdivision

➢ Shape Force Trauma

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- ✓ **Incised wound**
- ✓ **Stab wound**
- ✓ **Chop wound**

Firearm injuries/ wounds

- **By rifled firearm (Gunshot Injuries)**
- **By smooth bored firearm**

(Shotgun Injuries)

ABRASION

These are superficial injuries involving only outer layer of skin and do not penetrate the full thickness of skin.

Mechanism of Production:

It is produced by the pressure & movement over the skin with a hard object.

Clinical Findings of an Abrasion

- It produces minimum bleeding.
- It heals rapidly within seven days.
- It leaves no permanent scar on the skin.

Classification of Abrasion

Depending upon the manner in which they are inflicted, there are three types of abrasions.

1- Moving abrasion: It has 02 sub types

a) Scratches

b) Graze

2- Imprint abrasions(pressure or contact Abrasion.)

3- Friction abrasion

1. Moving abrasion

- **It indicates the direction of the force causing abrasion showing heaping or piling up of the epidermis at the far end.**
- **It has 02 sub types**

A. Scratch

B. Graze

A- SCRATCH

- It is a linear injury produced by a Sharp pointed object, such as a pin, thorn, fingernail, running across the skin, carrying the torn epithelium in front of it.
- The direction of force is therefore indicated by a sharp edge initially & heaped up epithelium at the end.

Scratch

Multiple Scratches

B- Graze

It is an injury produced when a broad surface of skin slides or scrapes against a rough surface (object), often found in traffic accidents when body is dragged.

Graze Contd

- **In it, direction of force is indicated by the serrated border initially and heaped up epithelium at the end.**

GRAZE

Graze

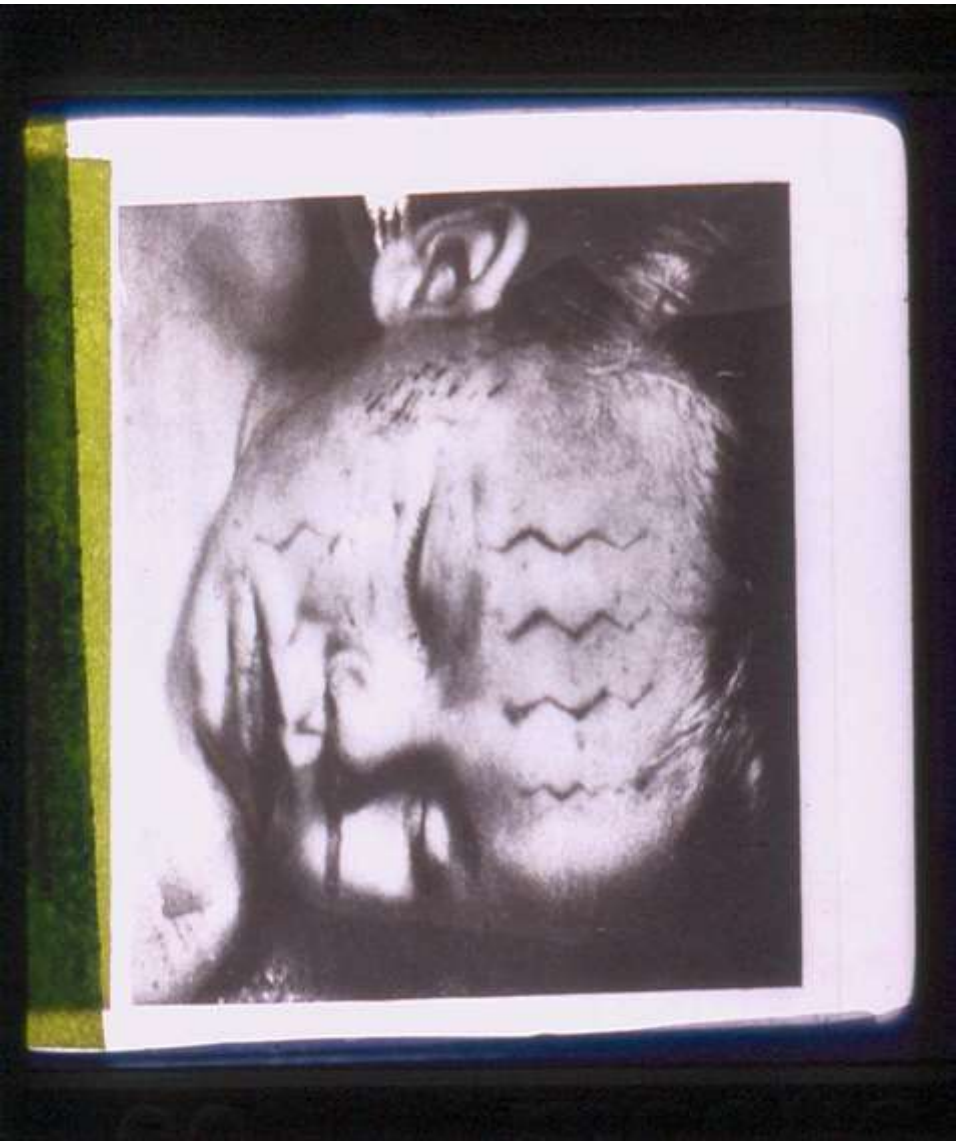
2- Imprint (Pressure/contact/ patterned)Abrasion

- **It indicates the pattern of the object causing it.**
- **It is produced by direct impact, pressure or contact of some object upon the skin.**
- **It is usually with a bruise of the surrounding area.**

Examples :

- **Tyre marks in RTA**
- **Muzzle marks in gunshot injuries**
- **Teeth marks in biting**
- **Nail & thumb marking in throttling.**

Imprint Abrasion



Pressure Abrasion

3- Friction Abrasion

It is caused by frictional force of a ligature and pressure against the skin e.g.

- **Ligature mark by rope/wire in hanging or strangulation.**
- **It indicates both movement and imprint of the ligature.**

Brush/ Friction Burn

- Some cases of grazes or friction abrasion may be said as brush or friction burn.
- In some cases of graze or friction abrasion, it resembles a burn after drying so called brush / friction burn.
- It is caused by the frictional force of rubbing against a surface.
- Examples: ligature mark in strangulation or dragging of body against the road in accidents

Friction Abrasion

AGE OF ABRASION

- **Fresh Abrasion(1-12 hours):** Bright in color and lymph or blood is oozing.
- **Scab Formation:** Occur within 24 hours
- **Reddish Brown:** Within 2-3 days
- **Shedding of the scab and Re-epithelization:** Within one week
- **Complete Healing:** Within two weeks.

Human bite mark

- Can occur during sexual behavior\assault,child abuse,self defense,self inflicted or a child biting another child.
- Bite may tear or crush,resulting in two u shaped marks ,corresponding to upper and lower anterior six teeth(canine to canine)and separated by an open space which can be contused from teeth pressure.

Antemortem vs postmortem abrasion

Antemortem abrasion

- Anywhere on the body.
- Bright red
- More exudate.scab slightly raised.
- Vital reaction present.
- Healing process may be evident.

Postmortem abrasion

- Usually over bony prominences.
- Yellowish,translucent and parchment like.
- Less.no scab.
- Vital reaction absent.
- Not seen.

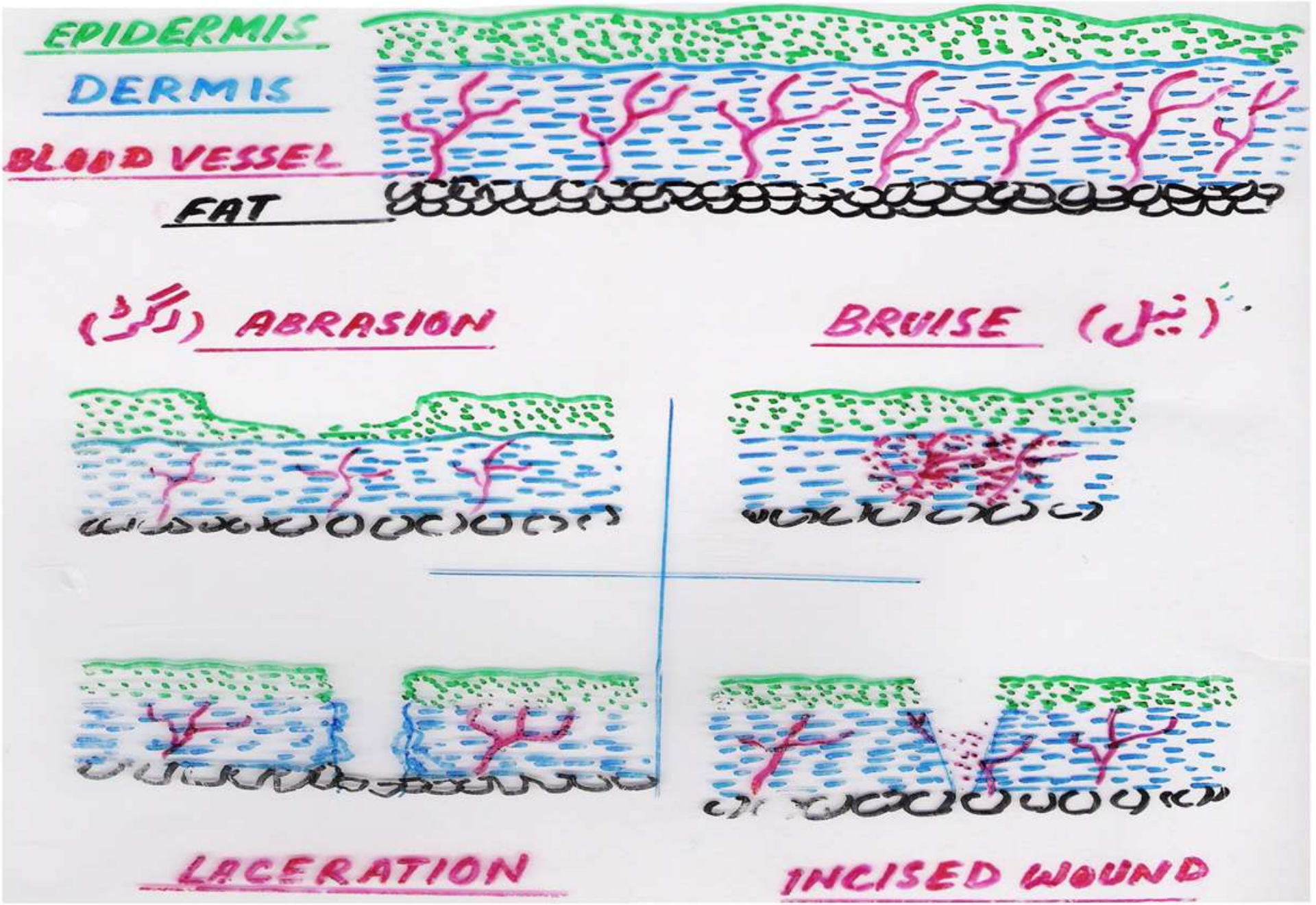
Differential diagnosis

- Postmortem insect bites of the skin.
- Powder stippling(firearm injuries)
- Excoriation of skin by excreta and diaper rash
- Dry skin of scrotum and vulva
- Decubitus \pressure ulcers
- Postmortem abrasions

MEDICO LEGAL IMPORTANCE

1) May indicate severe internal injury.
2) Gives nature of object causing it.
3) Tells direction of force.
4) Gives timing of injury.
5) Indicates manner of infliction.

Mechanical Trauma



BRUISE OR CONTUSION

- **"It is an extravasations of blood into the tissues due to application of blunt force without any loss of the continuity of the skin".**

- **It is a closed wound and is caused by blunt weapon**

Please Note:

- **The contusion is found more commonly externally on the body surface (skin) but also found in internal organs like heart, lung, brain, liver and kidney.**

BRUISES / CONTUSIONS

Important to Note:

Though the terms bruise and contusion are used synonymously, however,

Bruise is for the lesion visible through the skin while,

Contusion is for the bleeding anywhere in the body, visible or invisible.

So bleeding in viscera like spleen, liver, etc, not visible externally, is called as contusion rather than a deep bruise.

Mechanism of Production of a Bruise

Impact by blunt weapon → sudden pressure on the skin → crushing to the underlying tissues and rupturing of small blood vessels → extravasation of blood into the surroundings tissues → discoloration of skin externally due to blood collection.

Clinical Manifestations of Bruise

- Pain
- Redness
- Swelling

FACTORS CONTROLLING APPEARANCE OF BRUISE

A) Type of Tissue:

More lax tissues are easier for blood to spread and extravasations may move along the tissue line least resistant under influence of gravity (Gravity Shifting) e.g., Black Eye.

Gravity Shifting of Blood

This factor is many a times responsible for the appearance of bruises at a site other than site of injury e.g. Black Eye.

Blow on forehead can cause bruising around the eye & kick on the calf can result in bruising around the ankle. Thus site of bruise does not always indicate the site of injury.

Black Eye

B) Age:

Children and aged bruise easily.

C) Natural Diseases:

Persons with coagulation defects, diseases of blood vessels and liver will bleed more so bruising easy and more than impact force

D) Color of Skin:

Visibility is better/clear in fair persons.

E) Vascularity of the Part:

Bruising directly proportional to Vascularity.

F) Sex:

Female especially obese bruise easily.

Classification of Bruises

1- Intradermal (superficial/patterned) Bruise:

- In this the hemorrhage may lie in the immediate sub epidermal layer and its shape (pattern) correspond to the weapon causing it.

e.g. whips, moter tyre and tram-line bruise.

Examples

‘Tram–line’ or ‘Railway–line’ bruise.

This comprised of two parallel linear bruises with an unbruised area in between resulting from a rod etc.

Patterned Bruises

(Tram-line Bruises)

Fig. 16.3B: *Types of bruises:* 'Tram-line/Railway-line' bruising on the back and left shoulder. (*Courtesy:* VV Wase, Professor and HOD,

2- Subcutaneous Bruise

- The extravasated blood is found in the subcutaneous tissues.
- It is blurred at the edges and raised above the skin surface.
- It appear soon after the injury and may vary in size from a pin head bleeding to a large collection of blood (hematoma).

3- Deep Bruises
(Delayed/Migratory/Ectopic Bruises)

- **This blood collection is deeper to the subcutaneous tissues**
- **These produce a mild swelling.**
- **They take more time to appear externally than other bruises.**
- **They may also be found in a different location than actual site of injury, e.g.**

Black Eye.

Deep Bruises(contd)

- Some deep bruises appear at the surface (externally) late from a few hours to 02 days

- While some others (of internal organs)may not appear externally at all.

Artificial Bruises

- Caused by application of irritant substances like marking nut juice, calotropis, root of plumbago etc.
- Found on parts of the body within easy approach.

Medicolegal importance

- Artificial Bruises are made to frame a false charge of assault against others

Artificial Bruises

Differentiated from the true bruises

- **By the presence of vesicles and inflammation.**
- **The irritant substance may be discovered on laboratory examination.**

ESTIMATION OF AGE OF BRUISE

From color changes

Due to action of tissue enzyme on the extravasated blood.

COLOUR CHANGES

- Fresh: is "RED" – due to oxygenated Hb.
- After 12 hours: "BLUE" due to deoxygenated Hb.
- 1-2 days: "BLACKISH BLUE OR BROWN"- due to Haemosiderin.
- After 3 days: "GREENISH" due to Haemotoidin.

COLOUR CHANGES

- **After 7 days: "YELLOWISH" due to Bilirubin.**
- **After 2 weeks: Complete disappearance.**
- **More is the depth & severity of the bruise, longer is the time of complete disappearance.**

Multiple Bruises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MEDICOLEGAL IMPORTANCE OF BRUISE

1) It is evidence of application of blunt force.
2) Helps in identification of weapon.
3) Indicates degree of violence.
4) Tells time of infliction of injury.
5) Homicidal & accidental bruises- common

   Self-inflicted bruises__ rare

LACERATION

It is an open wound in which the skin and underlying tissues are torn/ crushed as a result of application of blunt force e.g. Blows from blunt objects, falls or impact from vehicles.

LACERATIONS

Fig. 16.6C: Degloving/avulsed lacerations of scalp (*Courtesy:*

Features of A Lacerated Wound

- **Shape** — **Irregular**
- **Margins** — **Irregular**
- **Angles** — **Blurred/ill-defined**
- **Walls and bed** — **Irregular showing tissue tags**

(Tissue Tags: These are strands of tissues crossing the walls and beds of lacerated wound)

Features of A Lacerated Wound (contd.)

• Bleeding	Less as compared to incised wound
• Hair	Pushed into wound
• Hair bulb	Crushed
• Area around wound	Frequently bruised
• Clothes	Torn Irregularly

- **The healing of a laceration is always followed by a scar**

Mechanisms of Production:

1) Crushing of tissues between two hard objects.
2) Over stretching of tissue.
3) Grinding compression by weight.

TYPES OF LACERATION

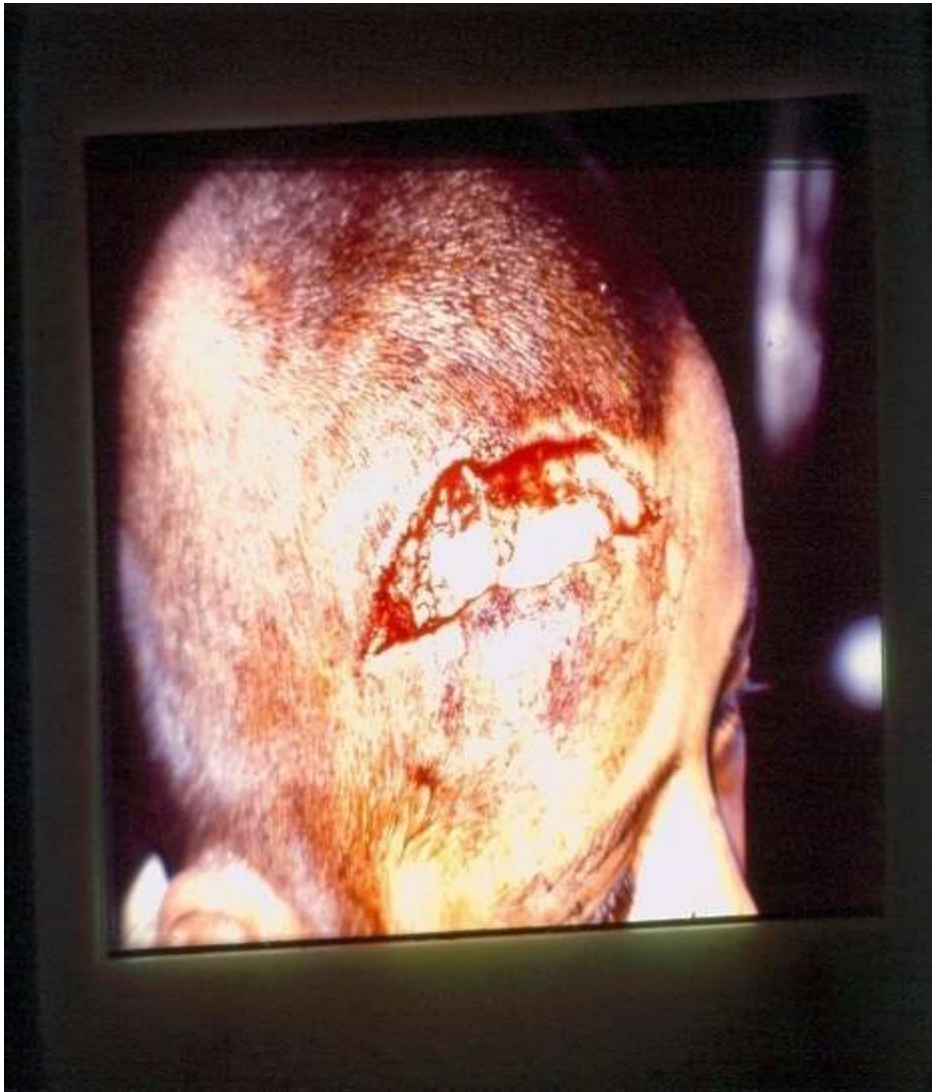
(DEPENDING UPON THE MANNER OF THEIR PRODUCTION)

1. Split laceration
2. Stretch laceration
3. Avulsion (Degloving of the skin/Grinding Compression)
4. Tear
5. Internal laceration

1. Split Laceration

- It is Produced by blunt perpendicular impact
- It is crushing of the skin due to sudden compression between two hard objects (weapon & underlying bone) on areas where skin is firmly supported by underlying bones like scalp, chin, eyebrow.
- It is linear in shape, simulating an incised wound.

Split Lacerations



Features of Split Lacerations

1) Breach of tissue, simulating an incised wound.
2) External hemorrhage minimal.
3) Bruising of the edges and surrounding tissue.
4) Elements such as hairs present in the wound.
5) Crushing of hair bulbs

2. Stretch Laceration

- It is commonly produced by a blunt tangential impact.
- it is most commonly seen in those areas where skin is supported loosely as forearm, thigh or abdomen.
- In this, breach of skin is due to over stretching of the skin till it splits and produces a flap.
- Breach of skin is slightly away from the point of stretch/force.

Mechanism of production

It may be produced by pressure with push or pull

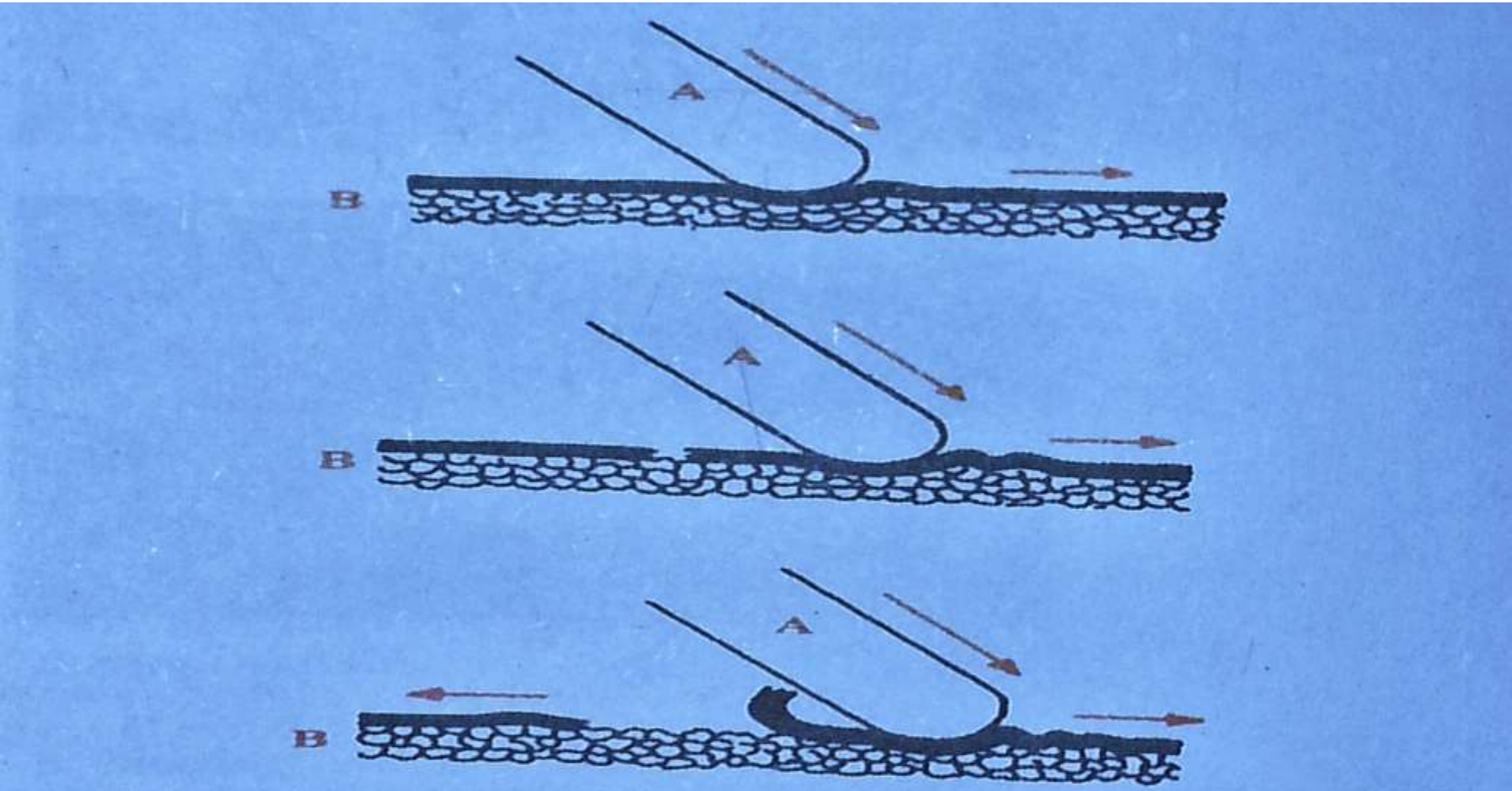


Fig. 6.12: *Weapon A stretching soft tissue B to rupture it Arrows indicate direction of pressure and movement.*

Stretch Laceration

Examples:-

a) In industry or in vehicular run over accidents when parts of the body get trapped.

b) When a bone is bent/fractured. The fractured fragment of the bone may stretch and pierce the skin and project out.

STRETCH LACERATION

FEATURES

1) Breach of skin and soft tissues.
2) External bleeding will be more.
3) Edges are Irregular.
4) Flapping of skin is in the direction of stretching force.
5) Bruising at the point of pressure, not at edges.

3. Avulsion

(Degloving of the skin/grinding compression)

- It is more or less produced by horizontal crushing impact.
- This laceration is because of grinding compression of the tissues by heavy weight to such an extent as to separate the skin from the deeper structures.
- Underlying muscles are crushed

Examples:

Passing a vehicular wheel over a limb.

LACERATION BECAUSE OF GRINDING COMPRESSION BY WEIGHT (Avulsion)

Fig. 16.6C: Degloving/avulsed lacerations of scalp (*Courtesy:*

6.6A: Avulsed lacerations of left heel and foot (*Courtesy:*

FEATURES

- Separation of skin from underlying tissues
- Extreme extravasation of blood into potential spaces of crushed tissue causing swelling
- Less external bleeding.
- Tension and severe pain-present.
- If present on large area, may precipitate fat embolism or crush syndrome and death

4. TEAR

It is a type of over stretching by an irregular penetrating object e.g. Door handle of a car, broken bottles, earthen ware parts etc. in this injury irregular tearing of skin and tissues results.

5. Internal Laceration

- When the blunt force exceeds the tensile strength and elasticity of an internal organ or tissue, laceration may result in such organ.
- This may be without any external tear of the skin.
- In such a case, there may or may not be an abrasion or bruise at the impact site.

Medicolegal importance of lacerations

- Homicidal ad accidental lacerations—common.
- Suicidal lacerations—rare.
- Special attention to rule out any internal laceration.
- The crushed tissues may cause fat embolism or may be infected.
- Any foreign material in the wound or material (tissue fragments, blood or hair etc.) attached with the object may be used as trace evidence.

INCISED WOUNDS

Definition:

Cutting of the skin and underlying tissues by a sharp edged weapon (knife/cutting glass).

Mechanism of Production:

“Pressure and movement”

Factors controlling the appearance of an incised wound

1. Sharpness.
2. Shape of the weapon.
3. Manner of infliction.

Incised Wound

Incised Wound

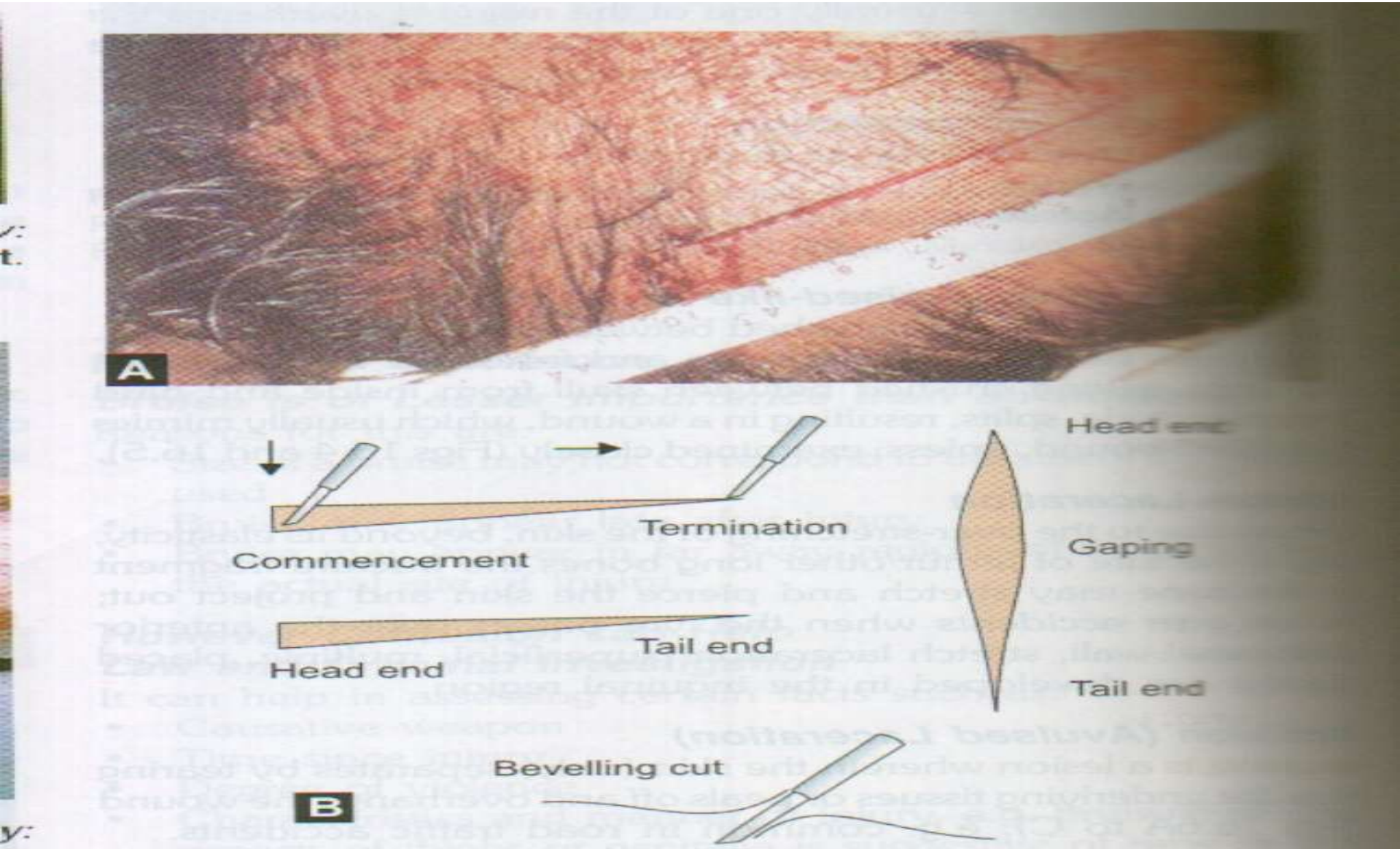
Features of an incised wound

- ✦Involvement of the clothes
- ✦More external haemorrhage
- ✦Clean regularly cut margins
- ✦Smooth and clear cut bed
- ✦Absence of crushing
- ✦Cutting of hair bulbs
- ✦Gaping
- ✦Tailing
- ✦Length is the greatest dimension

Tailing phenomena of an incised wound:

All incised wounds are deeper at point of commencement and shallower at termination. The deeper end is called **head of the wound** and the shallower end **tail of the wound** while this phenomena is known as **tailing phenomena of the wound.**

Tailing phenomena of an incised wound



Figs 16.7A and B: (A) Incised wound on the scalp (Note the tailing) (B) Line drawing illustrating the tailing phenomena and bevelling

TYPES OF INCISED WOUNDS

1. Homicidal
2. Suicidal
3. Accidental
4. Self inflicted
5. Therapeutic
6. Defensive

Medicolegal Aspects of incised wounds:

Most common self inflicted injury

Self inflicted injuries

- These are also kwon as **Factitious injuries or Forged or Fabricated wounds or Invented injuries**.
- These are made to frame a false charge against another person.
- the following different types of these injuries may be found on the body but the most commonly seen injuries are abrasions and incised wounds.

A. Self inflicted abrasions:

Commonly seen on the body of females, produced by them by their own nails. These abrasions are found as scratches on the face, front of the shoulder and chest.

B. Self inflicted bruises:

- These are difficult to produce on ones body by himself or by his friends, being a very painful process.
- Rubbing or application of an irritant material (as marking nut juice, calotropis etc.) on the skin can produce a simulation of a bruise.
- Its differentiation from a true bruise is easy. False bruise has a defined outline and tiny vesicles at its margins, which can be seen with magnifying lens. The irritant substance may be discovered on laboratory examination.

C. Self inflicted laceration:

Rare possibility unless the person is very desperate or mentally ill. The only site is the forehead, which is injured by striking a blunt object or banging it against the wall.

D. Self inflicted incised wounds:

These are most commonly superficial cuts. Such cuts are usually multiple, arranged parallel and are on the accessible parts such as forearm, abdomen or scalp. They show tailing and do not involve clothes.

Contrasting features of self inflicted wound with those of an assault

Characteristics	Self-inflicted	Assault
Site	Accessible	Anywhere
Depth	Superficial	Usually deep
Number	Multiple	One or more
Arrangement	Parallel	Random
Tailing	Present	Absent
Clothes	Nor involved	Involved
Defense wounds	Absent	Present

Features of self inflicted incised wounds

- Multiple
- Superficial
- On accessible parts
- Parallel
- Superimposed
- Tailing phenomenon present
- Non involvement of clothes and vital areas
- Mostly with knife or razor blade
- Elective sites

Features of Suicidal Incised Wounds

Inflicted with knife / razor

Elective sites:

- **Throat**
- **Chest (Heart Area)**
- **Forearm (redial)**
- **Thigh (femoral)**

Suicidal Incised wound at wrist

Characteristics of Suicidal cut throat

1. Wound complex on the neck
2. Multiple hesitation cuts at the point of initiation
3. More deep at commencement
4. Tailing at termination
5. One/two deep lethal wounds
6. Site high up in the neck and on opposite side of the working hand

Characteristics of Suicidal cut throat

7. Direction oblique downwards.
8. Weapon may remain clenched in hand due to cadaveric spasm.
9. Absence of defense wounds.

Tentative Cuts

- **Tentative Cuts are Preliminary cuts before gathering sufficient courage to make a final deep bold cut – seen at commencement and merge with main wound.**

Fig. 16.8A: Suicidal cut-throat wound with hesitation cuts

Defense Wounds

- Due to immediate and instinctive reaction of the victim to save him/herself by raising an arm or by grasping weapon.

Defense Wounds

Medicolegal Importance

- ⇨ **Differentiate homicide from suicide.**
- ⇨ **Absence does not rule out homicide as attack from behind or on unconscious or intoxicated victim are possible.**

Defense Wounds

S.No	Features	Incised wound	Lacerated wound
01.	Production	Produced by sharp edged weapon	Produced by blunt weapon
02	Shape	Linear or spindle	Irregular
03.	Margins	Regular	Irregular
04.	Angles	Sharp and well defined	Blurred and ill-defined
05.	Walls	Smooth, showing no bridging or tissue tags	Irregular, showing tissue tags
06.	Bleeding	Profuse	Comparatively less
07.	Hair	Cut in line of the wound	Pushed into the wound
08.	Hair bulbs	Cut in line of the wound	Crushed
09.	Area around the wound	Not bruised	May be bruised
10.	Clothes	Show corresponding cuts	No such finding/torn irregularly


It's just the beginning

Learning objectives

- At the end of this 50 minutes lecture to 100 students of 3rd year mbbs,the students should be able to
- Define stab wounds
- explain different types of stab wounds in relation to qisas and diyat act 2001.
- Identify chop wounds with their causative weapon.

Cont. LO

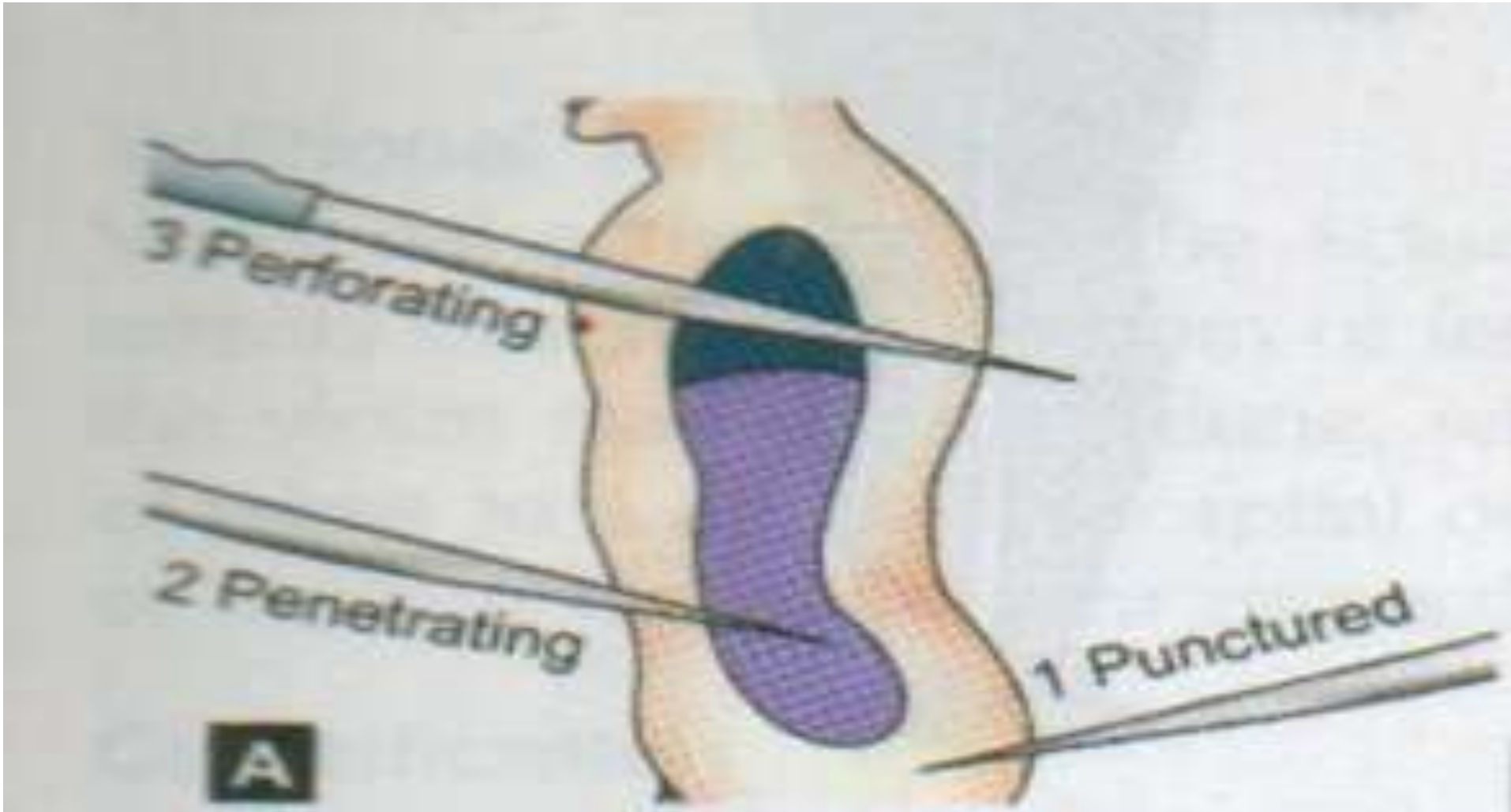
- This will be facilitatedthrough multimedia slides.
- The students will be introduced with forensic day for brainstorming.
- Evaluation will be done through monthly tests.
- Queries will be answered through Q&A session at the end.


ROAD SIDE
ACCIDENT

STAB WOUNDS

- Also called punctured wounds.
- Caused by pointed weapon when inflicted with thrusting force.
- Possible with knife, dagger, needle, ice pick, scissors, screw driver, pens, pencils & fork etc.
- May be Penetrating or Perforating.
- Depth is the greatest dimension.

TYPES OF STAB WOUNDS



Figs 16.10A and B: A. *Types of st*

TYPES OF STAB WOUNDS

1. Punctured wound(stab wound)

Here the weapon just enters into the part of the body without entering into any cavity of the body. It is a typical stab wound as its depth is greater than width.

Punctured wound of the thigh

Fig. 16.8J: Punctured wound of the thigh by a knife

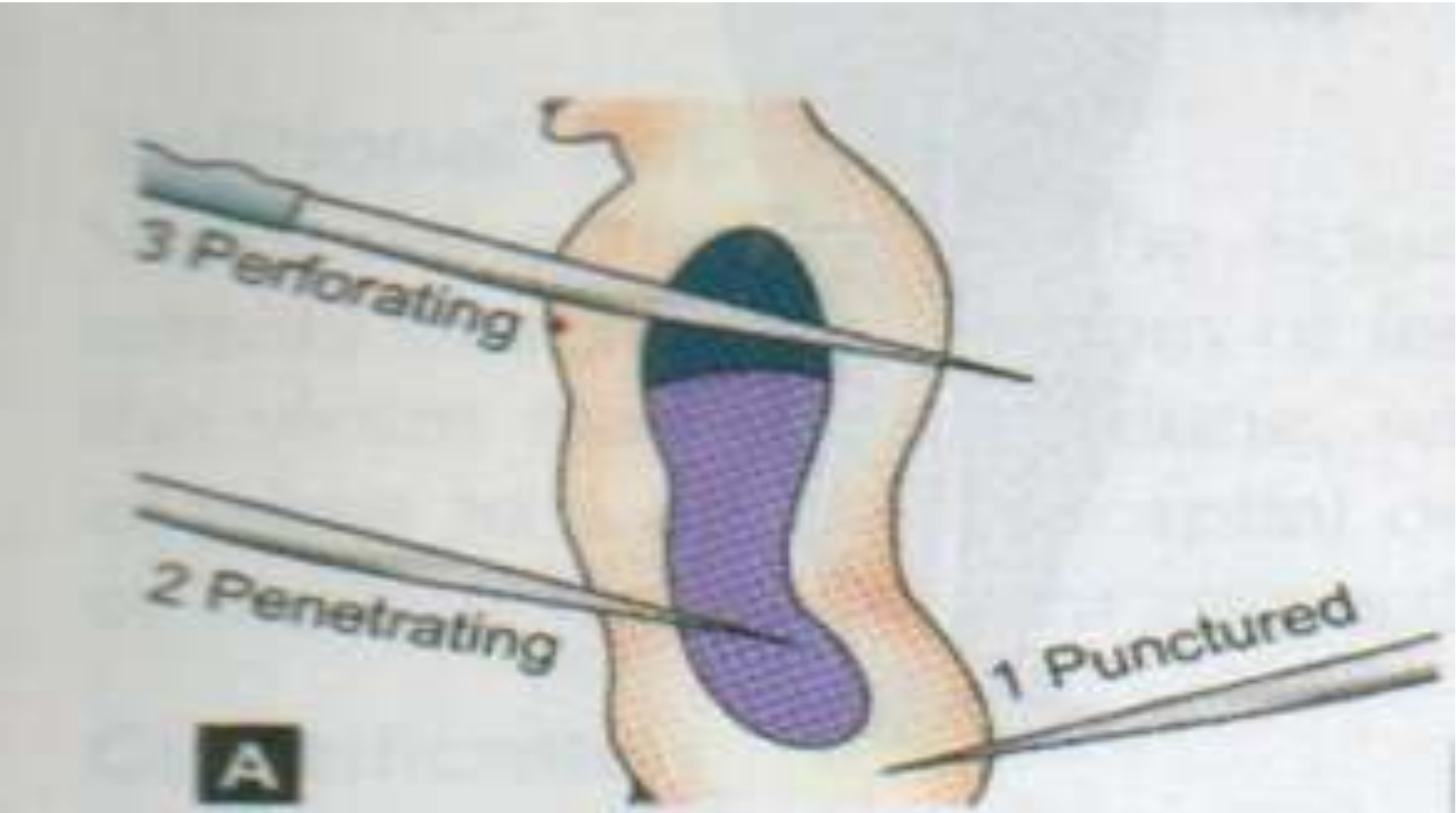
2. PENETRATING WOUND

Here the weapon just enter into the body cavity producing only one wound i.e. wound of entry.

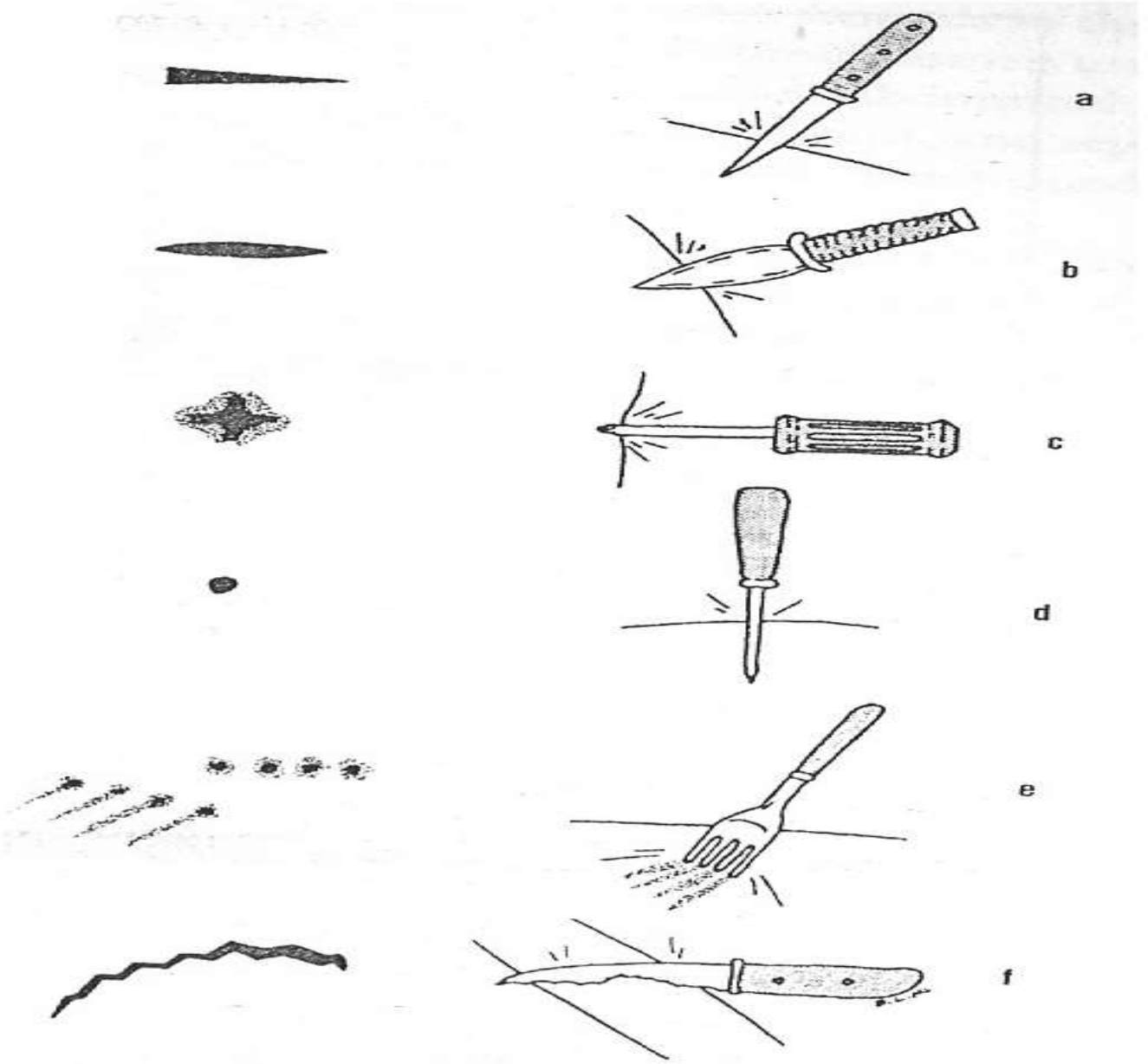
3.Perforating wound:

Here the weapon after entering into one side of the body/cavity of body will come out through the other side, producing two wounds- wounds of entry and wound of exit.

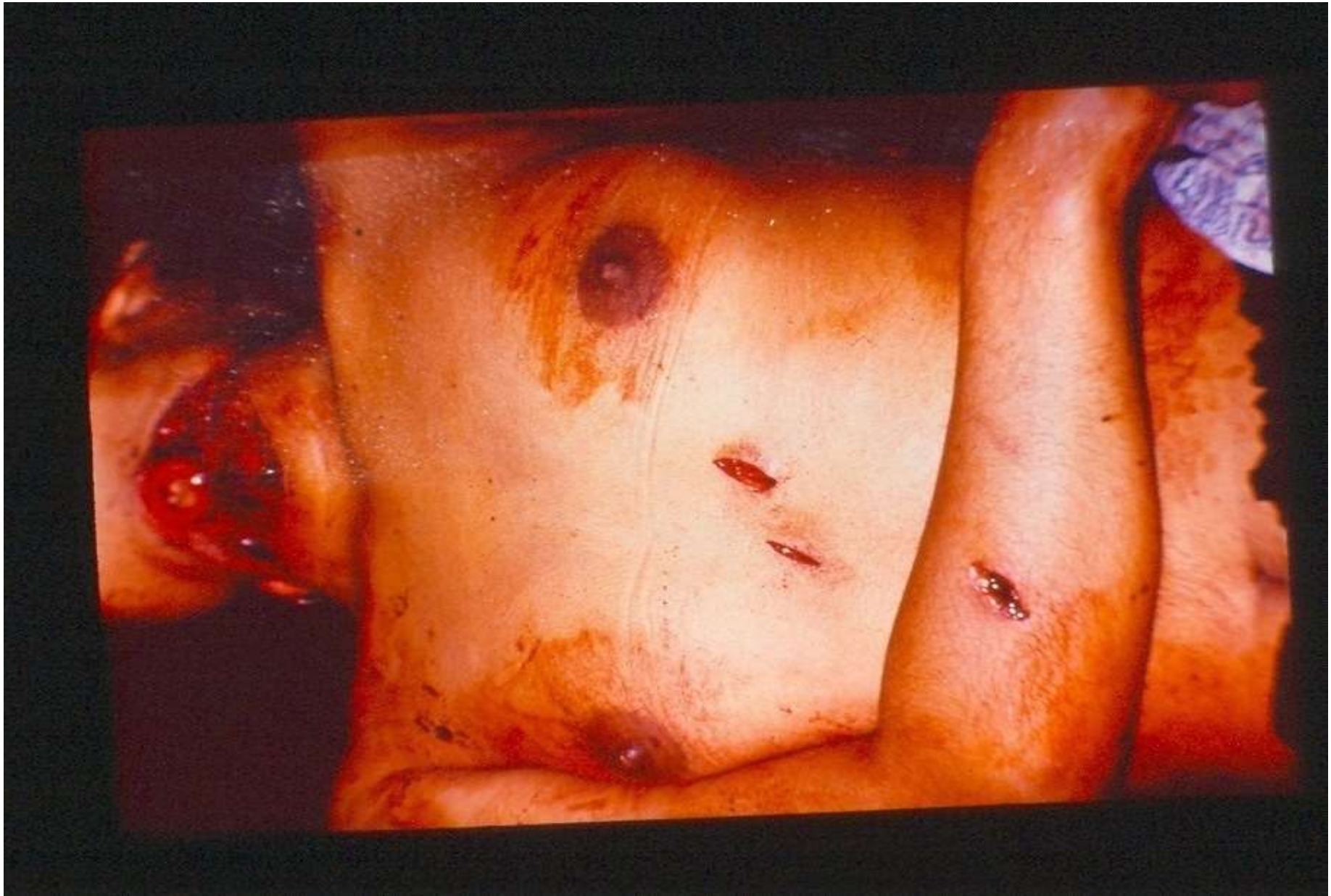
TYPES OF STAB WOUNDS



Figs 16.10A and B: A. *Types of st*


a
b
c
d
e
f

Stab Wound



Stab Wounds

The size & shape of a stab wound is dependent Upon

a) Shape of the weapon.
b) Direction of the thrust.
c) The movement of the blade in the body.
d) The movement of the victim.
e) State of the skin (tension or relaxation).

o Stab wound- Contd

- o The depth of the stab wound may be equal to, less than or greater than the length of the knife blade.
- o Stab wound may be large & irregular due to:-
  - a) Movement of the victim during withdrawal of weapon.
  - b)Twisting the weapon in the body by perpetrator.

Stab wound- Contd

The stab wound may be a gaping wound or a slit like wound depending upon the pattern of the Langer's lines (pattern of elastic fibers in the dermis of the skin).

if perpendicular to fibers then gaping wound and if parallel, then slit like wound.

Langer's Cleavage lines

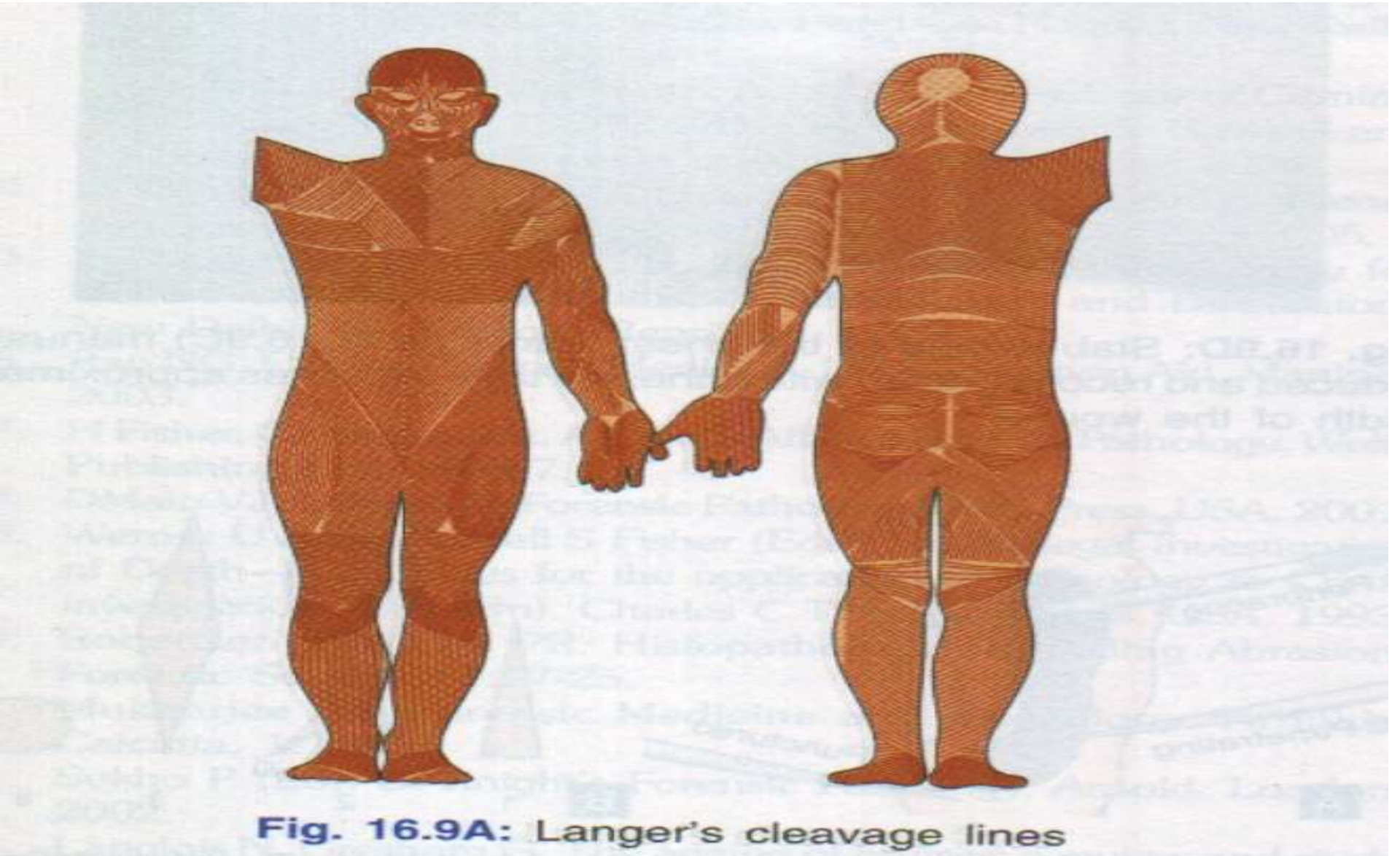


Fig. 16.9A: Langer's cleavage lines

Medicolegal Aspects

- **Mostly stab wounds are homicidal**
- **Occasionally suicidal**
- **Rarely accidental.**

Features of homicidal stab wound

- Multiple
- Size, depth, shape variable
- Defense wounds may be present
- Any site (may be inaccessible)
- Clothes involved

Cut Laceration/Chop Wound

The injury is produced by a blow with the sharp cutting edge of a fairly heave weapon such as hatchet,axe,chopper etc.

Features:

1) **Breach with heavy sharp edged weapon**
2) **Bruised edges**
3) **Margins - sharp**
4) **Hair forced in**
5) **Under lying bone usually cut**

Chop wounds

Fig. 16.12: Chop wounds of the face

Fig. 16.11: Chop wounds of the head

Chop wounds

Fig. 16.14: Chop wound of the chin and cut throat wound of neck. (*Courtesy:* B Dr Santha Kumar, Professor and HOD, Forensic Medicine, Govt. Stanley Medical College, Chennai, Tamil Nadu)

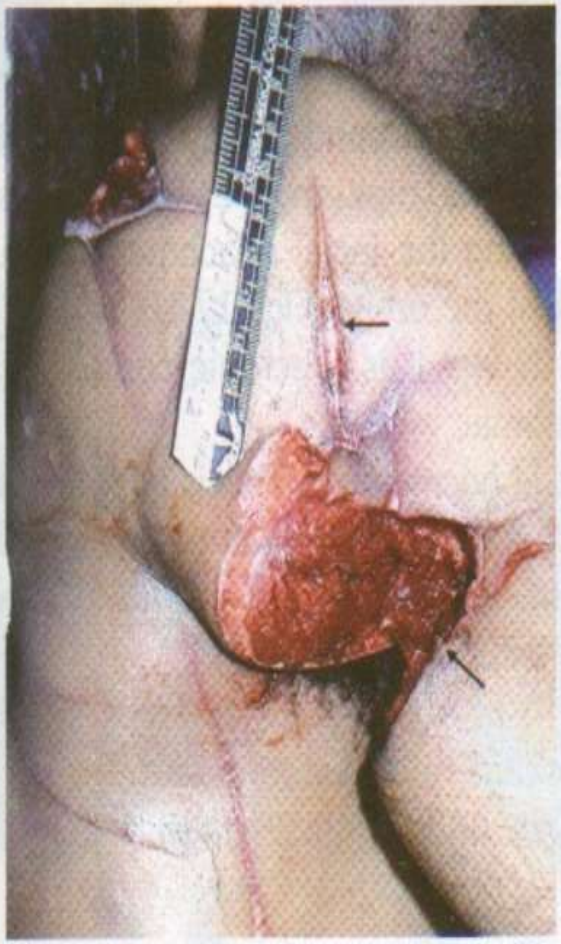
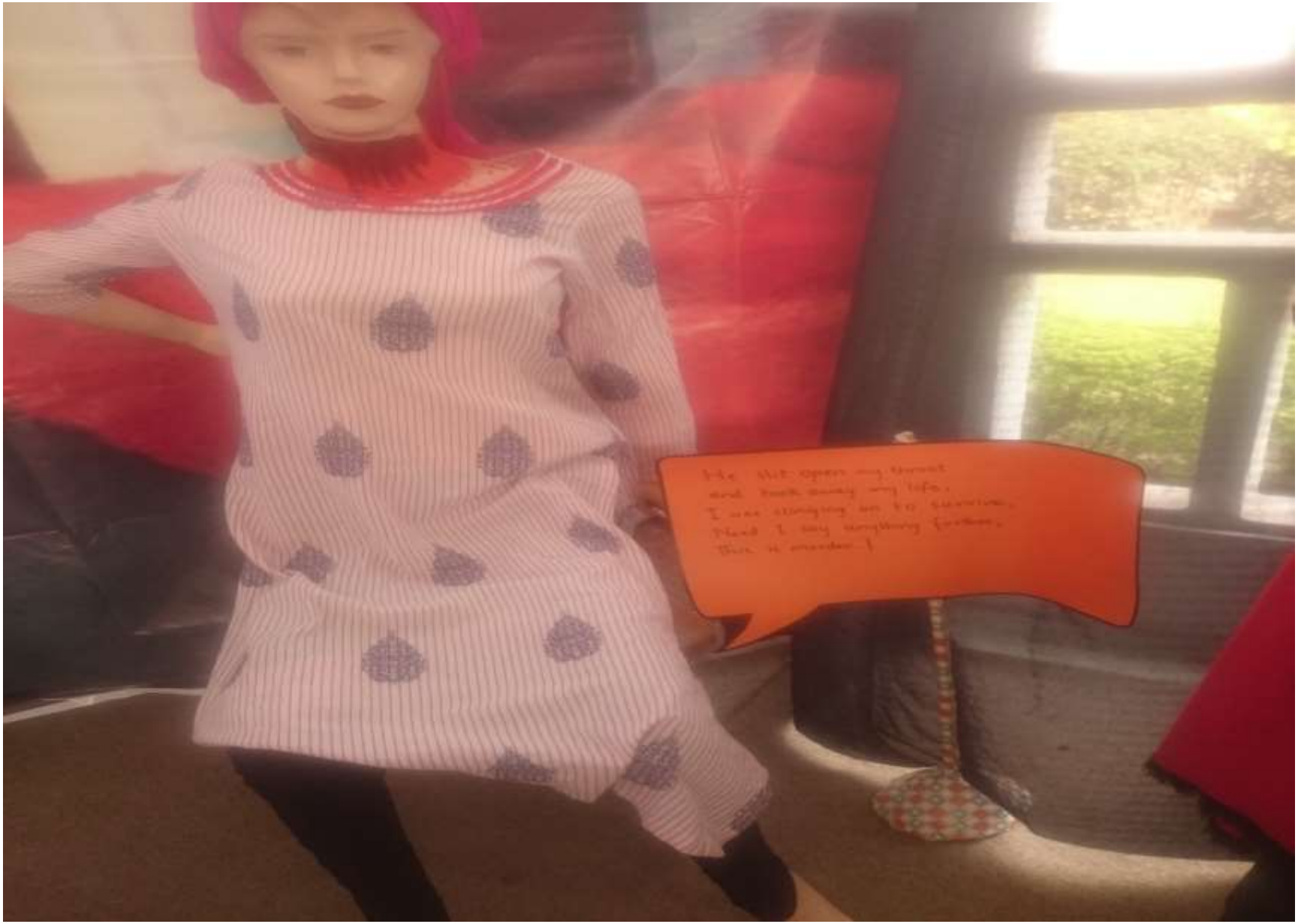


Fig. 16.15: Chop wound of the right upper arm

MEDICOLEGAL IMPORTANCE

- Usually seen on exposed parts as head, face, shoulders etc.
- Usually with severe injury to underlying bones and organs.
- Mostly homicidal, a few are accidental and very rarely is suicidal.
- Examination of wound may reveal the causative weapon.


He slit open my throat
and took away my life.
I was clinging on to survive.
Now I say anything further.
This is murder!


STITCHES
ON
LACERATION

CLASSIFICATIO N OF POISONS

ACCORDING TO MODE OF ACTION



CORROSIVES



IRRITANTS






NEUROTROPICS



ASPHYXIANTS

CARDIAC POISONS

ABORTIFACIENTS

MISCELLANEOUS

ROLL NO 241,407

3RD YEAR MBBS

FASIHA QURESHI

Any questions???

Bone fractures

- Depending upon the amount of force,

1. Slight force within the limit of bone elasticity,it causes a local indentation at the site of impact without breaking the bone and then recoil back.
2. Greater force beyond elasticity limit ,will produce fracture which commences at the point of maximum convexity.

Long bone fractures

- In adults,

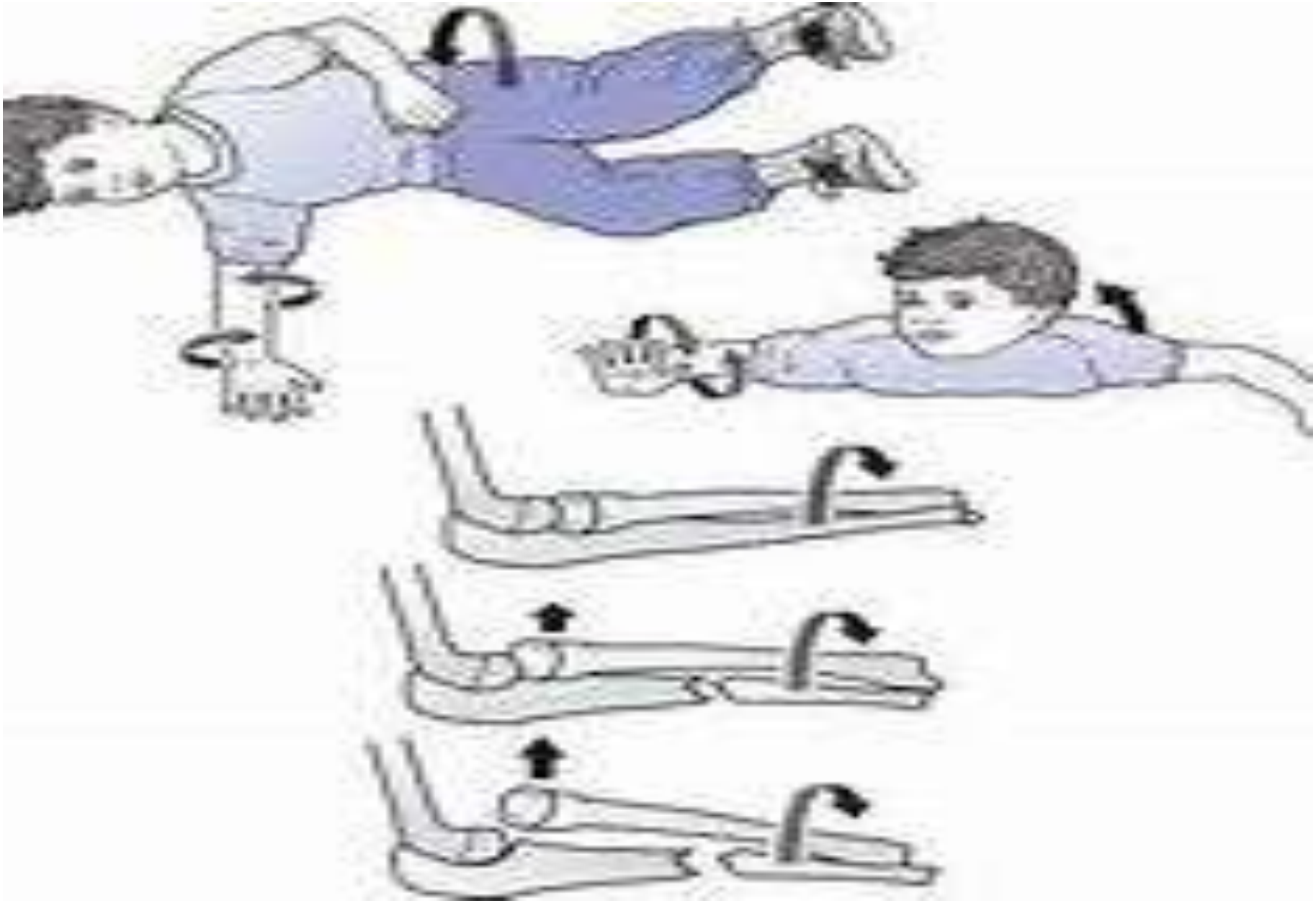
1. At the point of impact ,or
2. Bone acts asa lever and diverts force to another remote weaker point.

- In children
- Bones are elastic comparatively.so less damage ,causing
- GREEN STICK FRACTURES.

Indirect application

- Of force results in

1. Spiral fractures by limbTwisting and
2. transverse fractures as in battered baby syndrome.



Skull bone fractures

- Varies in different parts due to thinness and thickening in bith vault and skull.

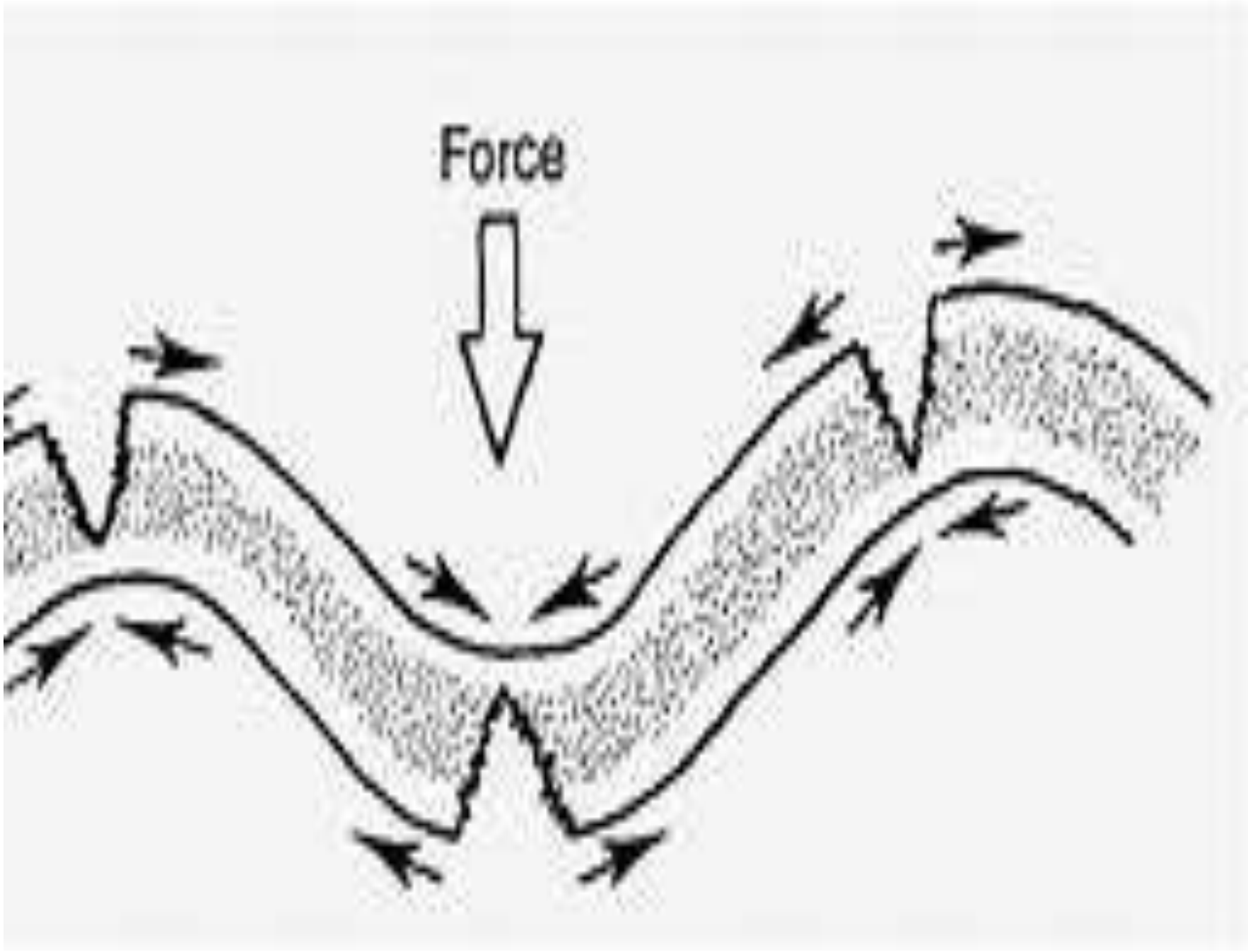
1. Direct impact……..linear fracture radiating from point of impact.
2. Indirect imapact……fissured fracture distant from site of impact.e.g.

- Fracture on base of skull if fall from height on feet or buttocks.

rowbotham

- Devides it into

1. Local deformation at the site if sufficient to cause bend of skull or crushing of outer table into diploe.
2. Apex formation


Force

D) LEGAL CLASSIFICAITON:

(Types of Hurts)

i) Itlaf-i-udw

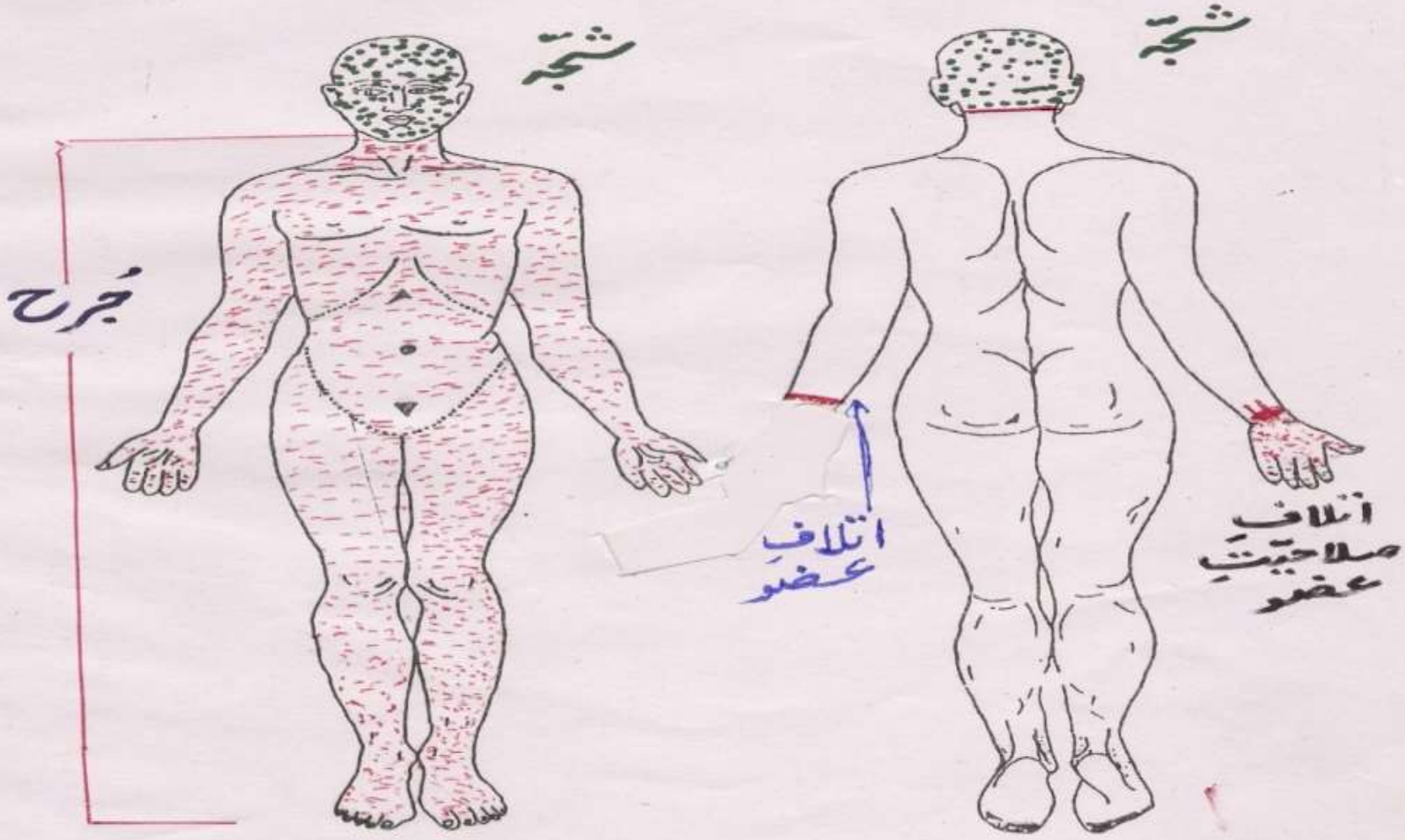
ii) Itlaf-i-Salahiyyat-i-udw

iii) Shajjah

iv) Jurh

v) All kinds of other hurts

Out Lines Of the Body For Leading Injuries of Dead Bodies



ITLAF-I-UDW

Causing of dismemberment, amputation, severement of any limb or organ of the body.

ITLAF-I-SALAHIYYAT-I-UDW

Destroying or permanently impairing the function or capacity of an organ of the body or causing permanent disfigurement.

SHAJJAH

Hurt on the head or face which does not amount to

Itlaf-I-Udw or Itlaf-I- Salahiyyat-i-Udw.

TYPES

SHAJJAH-I-KHAFIFAH:

Hurt without exposing of bone.

SHAJJAH-I-MUDIHAH:

Exposing of bone without its fracture.

SHAJJAH-I-HASHIMAH:

Fracturing of bone without displacement.

SHAJJAH-I-MUNAQQILAH:

Fracturing of bone with displacement.

SHAJJAH-I-AMMAH:

Fracturing of bone and the wound touching the membranes of brain.

SHAJJAH-I-DAMIGHAH:

Fracturing of bone with rupturing of the brain membranes.

JURH

Hurt on parts of the body other than the head and the face bearing mark of a wound which may be temporary or permanent.

TYPES OF JURH

JAIFAH:

Wound extending to the body cavity of the trunk.

GHAYR-JAIFAH:

Jurh not amounting to Jaifah.

TYPES OF GHAYR-JAIFAH

DAMIYAH:

Rupturing of the skin with bleeding.

BADIAH:

Cutting of the flesh without exposing bone.

MUTALAHIMAH:

Lacerating of flesh without exposing bone.

MUDIHAH:

Exposing of bone.

HASHIMAH:

Fracturing of bone without displacing it.

MUNAQQILAH:

Fracturing of bone with its displacement.

All kinds of other hurts

337 L (1):

Whoever causes hurt, not mentioned hereinbefore, which endangers life or which causes sufferer to remain in severe bodily pain for twenty days or more or renders him unable to follow his ordinary pursuits for twenty days or more.

337 L (2):

Whoever causes hurt not covered by sub-section (1)