

Chapter 8 :Assessment,classification and documentation of injury

Introduction:

Offences against individuals of a physical nature that may result in criminal prosecutions have a great variety of types and origins, not all of which may cause visible evidence (e.g. poisoning, infection). The role of the forensic pathologist and forensic physician is to ensure that the medical relevance of findings, or lack of them, is understood by the investigating authority.

Most harm or injury can be embraced by one of the following broad groups:

1- Those with a fatal outcome:

- Murder
- Manslaughter

2-Those without a fatal outcome:

- Assault, assault occasioning actual bodily harm
- Common assault
- Battery, or common battery
- Wounding or wounding with intent
- Poisoning
- Inflicting grievous bodily harm or causing grievous bodily harm with intent.

3-Sexual offences:

- Penetrative
- Non-penetrative (both with or without extra - genital injury).

✓ **In the legal context, a wound is an injury that breaks the continuity of the skin. There must be a division of the whole skin structure and not merely a division of the cuticle or upper layer. As the skin is not broken, a bruise or internal rupturing of blood vessels is not a wound. A broken bone is not considered a wound, unless it is a comminuted fracture.**

Types of injury:(depending on the cause)

- 1- By physical force can be divided into two main groups: **blunt force and sharp force**.
- 2- By non-physical forces, which can be **thermal, chemical, electrical or electromagnetic**.

Blunt-force injury:

it is not caused by instruments, objects or implements with cutting edges. The nature of the force applied may include blows (impacts), traction, torsion and oblique or shearing forces. Blunt-force trauma may have a number of outcomes:

- No injury.
- Tenderness.
- Pain.
- Reddening (erythema)
- Swelling (oedema)
- Bruising (contusion)
- Abrasions (grazes)
- Lacerations
- Fractures.

Blunt injuries described (in terms of **force** applied) as being weak (for example a ‘gentle’ slap on the face), weak/moderate, moderate, moderate/severe or severe (for example a full punch as hard as possible) The more forceful the impact the more likely that visible marks. subjective findings and are thus dependent on (1) the pain threshold of the individual (2) their truthfulness.

- **Reddening** describes increased blood supply.
- **Red bruises** have the ability to blanch from finger pressure.
- **Haematoma** refers to a palpable collection of blood under the skin.
- **Petechiae** are small bruises, often described as “pin-point hemorrhages”, < 2 mm

1. Bruises:

(ecchymosis): It is Leakage of blood into underlying tissues from damaged blood vessels. Two events must occur before a bruise can form: 1- **damage to the small blood vessel.** 2- **the leakage of the blood into surrounding tissues** (skin or deep tissue). A **yellow**-colored bruise may be more than 18 hours old. The coloring must not be taken from photographic images where color reproduction may be inaccurate.

Examination of injuries must be undertaken in good light and, in the case of bruises, such is required in order to ensure that small or subtle skin color changes are not missed.

Bruising can occur after death at the lowermost vessels .

2. Abrasions:(graze) Is a superficial injury involving (generally) outer layers of skin without penetration of the full thickness of the epidermis.

Types:

1- **Scratches** (linear abrasions, e.g. caused by fingernails).

2- **Scuff (brush) abrasions** (very superficial abrasions caused by rough surface).

3- **Point or gouge abrasions** (deeper linear abrasions caused by objects such as metal nails).

4- **Crush abrasions** – often associated with ‘intra-dermal bruising’ – are important because they may retain the pattern of the causative object.

3. Lacerations:

appear as ‘cuts, splits or tears’ in the skin and are the result of a blunt force compressing or stretching the skin; they may extend through the full thickness of the skin and can bleed profusely, the same blunt force causing such a laceration may also cause irregular splits, bruising and abrasion at the margins of the wound.

Lacerations are most common where the skin can be compressed between the applied force and underlying bone (i.e. over the scalp, face, elbows, knees, shins, etc.). The shape of the laceration (e.g. linear, curvilinear or stellate) rarely reflects the nature of the impacting object (unless accompanied by other patterned blunt-force injury).

Sharp-force injury :

1. Incised and slash wounds:

Caused by objects with a sharp or cutting edge, most commonly a knife. An incised injury is distinguished from a stab wound by being longer on the **skin surface** than it is deep.

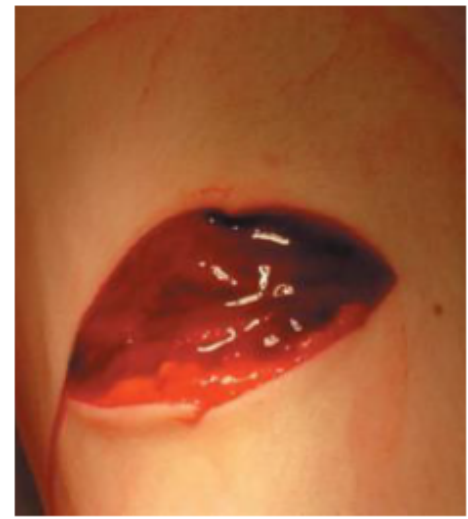
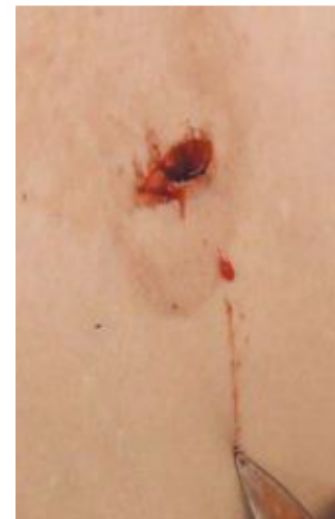
- A **surgical operation** wound is an example of an incised wound.
- Incised wounds over the wrist or neck, where major arteries lie in more superficial tissues, can prove **fatal**.
- Incised wounds caused by sharp implements moving across skin surface during an assault may sometimes be called '**slash**' wounds.

2. Stab wounds : caused by a sharp implement, it is deeper than it is long on the skin surface

Stab – like wounds : caused by (relatively) blunt objects such as screwdrivers or car keys.

Factors determine how much force is required for penetration:

- 1- the sharpness of the tip of the weapon. (**the most important factor**)
- 2- The sharpness of the 'cutting edge' of the implement.
- 3- The nature of the force applied.
- 4- Whether clothing has been penetrated (thick leather jackets may offer significant resistance to penetration).
- 5- Whether bone has been injured (bone tends to suggest that a greater force has been used to inflict the wound).



3. Chop wounds :

caused by a variety of heavy implements, and relatively blunt, bladed instruments. These include some machetes, Samurai swords and axes. Fractures, amputations and substantial scarring may also be a result.

Other types of injury pattern:

Punching: A punch is a blow delivered by the clenched fist.

- Visible injury is seen where the skin is closely applied to bone, e.g. face and skull.
- The entire range of blunt force injuries can be caused, including bruises, abrasions, lacerations and fractures.
- Any examination following a punch to face or mouth requires intraoral examination.

Kicking and stamping: Blows from the foot are commonly directed towards the head and face, the chest and the abdomen.

- Stamping injuries to the front of the abdomen may result in rupture of any of the internal organs.

Bite injuries: Bite marks can be seen in sexual assaults (neck, breasts and shoulders), child abuse (arms and the buttocks) and sports field.

- A forensic odontologist should review bite marks to confirm identity of the biter.
- a swab from area of the bite should be taken for DNA and the bite should be photographed with a scale.

Defence injuries: When a knife or a stabbing implement is directed at an individual, blows to the head and face may be defended by raising the hands and arms to cover the head and face (The arms and hands sustain injuries but the head is protected).

- Defence-type injury after blunt weapon assault will be seen in the same regions, namely the extensor surfaces of arm and upper arm.

Survival after injury:

The length of survival following infliction of an injury is difficult to determine: every human being is different.

Many examples exist of individuals with apparently potentially immediately fatal wounds who have performed purposeful movements/actions for some time after the 'fatal' injury.

Self-inflicted injury:

- Fatal self-inflicted blunt-force injuries may be inflicted following jumping from a height or under a train.

- Self-inflicted bite marks may occasionally be seen on the arms of an assaulted individual.

- In suicidal individuals, self-inflicted sharp-force injuries are most commonly found at specific sites '**elective sites**';

- Incised wounds : most commonly found on the front of the wrists & neck.

- Stabbing injuries : most commonly found over the precordium & abdomen.

- In suicidal acts, the more superficial injuries are referred to as '**hesitation**' or '**tentative**' injuries.

Torture:

- The physical examination must involve systematic examination of the skin, face, chest and abdomen, musculoskeletal system, genitourinary system and the central and peripheral nervous systems. (Specific examination is required).
- Specialized diagnostic tests may be required to assess damage (e.g. nerve conduction studies).
- The history taking should include direct quotes from the victim, establishment of a chronology backing it up with old medical records and photos.
- A summary of detention settings, and abuses, must be obtained with details.
- Attention must also be paid to psychological status of the victim.
- Specific torture techniques that may be described include: beating of the soles of the feet, amputation, positional torture, suspension, electrical burns.



Documentation of injury or marks of injury:

- Forensic physicians dealing with the injured living person can get a history directly from him.

- **Important points** should be considered when taking history:

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| 1- Time of injury or injuries. | 2- Has injury been treated. |
| 3- Pre-existing illnesses. | 4- Regular physical activity. |
| 5- Regular medication. | 6- Handedness of victim and suspect. |
| 7- Use of drugs and alcohol. | 8- Clothing worn. |

Characteristics should be recorded for each injury:

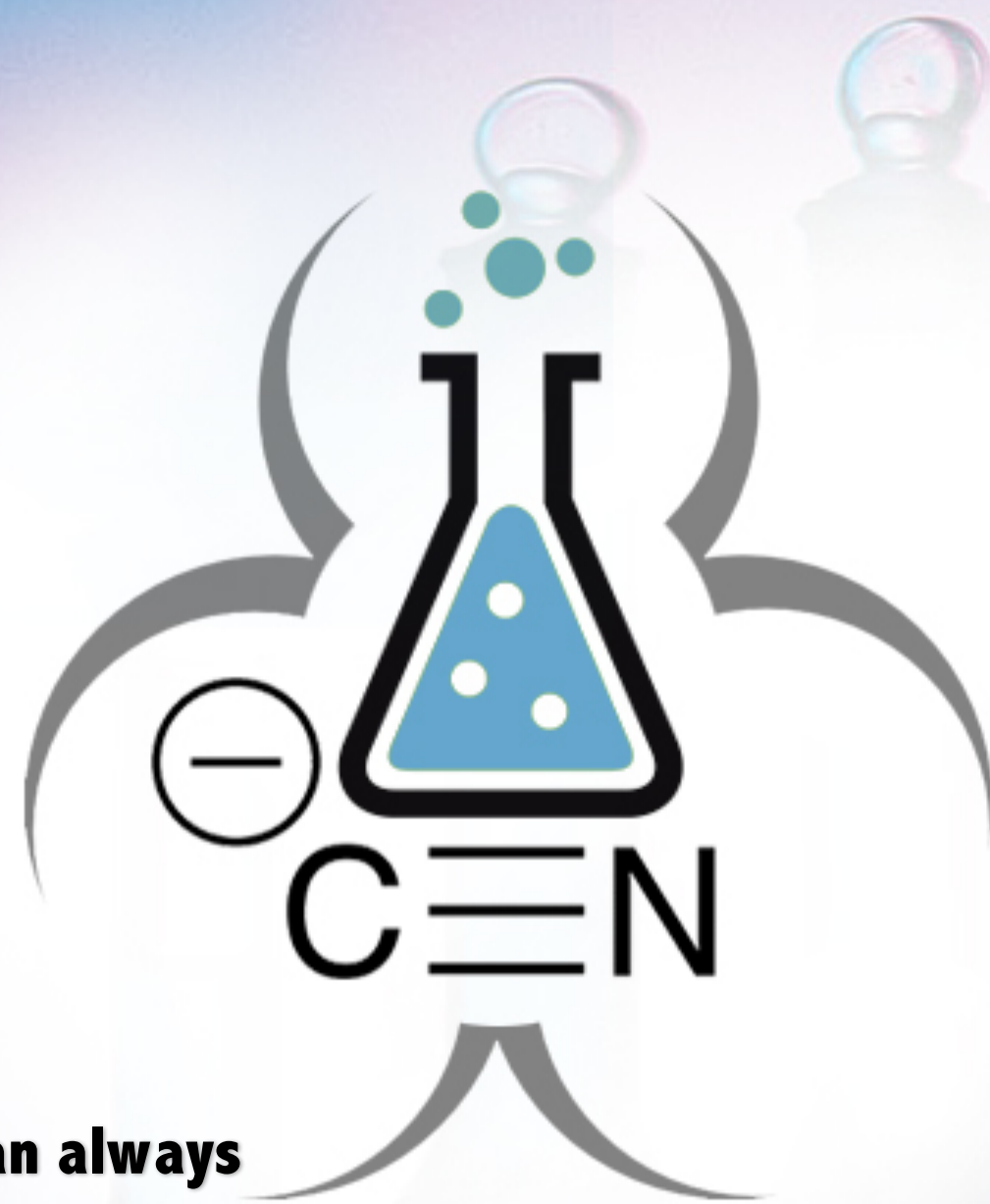
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| 1- Location (anatomical – measure distance from landmarks) | 2- Pain | |
| 3- Tenderness | 4- Reduced mobility | 5- Type (e.g. bruise, laceration, abrasion) |
| 6- Size | 7- Shape | 8- Color |
| 9- Orientation | 10- Age | 11- Causation |
| 12- Handedness | 13- Time | 14- Transientness. |

The recording of such information in the clinical setting should be in three forms:

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| 1- written form. | 2- hand-drawn body diagram. | 3- digital image form. |
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Table 8.1 Some characteristics that may be associated with self-inflicted injury

Characteristic	Additional Comments
1. On an area of the body that the individual can access themselves	Injuries in sites less accessible (e.g. the middle of the back) are less likely to have been self-inflicted
2. Superficial or minor injury	Severe self-inflicted injuries may also be caused, particularly in those with psychiatric disorder
3. If there is more than one incised wound, they are of similar appearance, style and orientation to one another (e.g. parallel with each other)	Typically, self-inflicted sharp force injuries are more superficial, numerous and similar to each other than those sustained in an assault, where the natural reaction of the injured person is to avoid repeated injury
4. If there are other types of injury (e.g. scratches, cigarette burns) these are also of similar appearance, style and orientation to each other	As above – multiple superficial, and relatively trivial injuries that are similar in nature and extent to each other should raise the possibility of self-infliction
5. Injuries grouped in a single anatomical region	As above
6. Injuries are grouped on the contralateral side to the patient's handedness	A right-handed person will tend to harm themselves on the left side of the body
7. Tentative injuries	Smaller or lesser injuries grouped with the main injuries are termed 'tentative' or 'hesitation' marks, where initial attempts at injury have been made
8. Old healed scars in similar sites	May indicate previous attempts at self-harm
9. Scars of different ages in similar sites	May indicate repeated previous attempts at self-harm
10. Slow-healing injuries	Persistence of wounds that would otherwise have been expected to heal, in the absence of any other factors
11. Psychiatric and related issues (such as eating disorders, drug and alcohol misuse)	There may be an increased incidence of self-infliction with such conditions
12. Possibility of self-inflicted injuries created to stage a crime	These may lack many of the features referred to above.



**If you have any questions You can always
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