

Forensic medical traumatology

TRAUMATOLOGY is studies about injuries.

TRAUMA bodily harm with or without structural alterations resulting from interaction with physicochemical agents, imparting energy to tissues.

By properties injuries are divided into:

- 1) **anatomic** (wounds, scratches, bruises, breaks of bones, internals damages, body division to pieces);
- 2) **functional** (pain, shock, brain or heart concussion).

By results of damage there are:

- 1) **ante-mortal** (grievous with danger to life, grievous without danger to life, moderate and simple bodily injuries);
- 2) **post-mortal**.

Classification.

Trauma can be classified by the affected area of the body:

1. Polytrauma (40%)
2. Head injury (30%)
3. Chest trauma (20%)
4. Abdominal trauma (10%)
5. Extremity trauma (2%)
6. Head injury (30%)
7. Chest trauma (20%)
8. Abdominal trauma (10%)
9. Extremity trauma (2%)
10. Facial trauma
11. Spinal cord injury
12. Genitourinary system trauma
13. Pelvic trauma
14. Soft tissue injury

By application of blunt force:

1) abrasion; 2) bruise or contusion; 3) laceration; 4) fracture or dislocation of a bone, tooth, or joint.

By application of sharp edge and pointed and of a weapon:

1) incised wound; 2) punctured (stab) wound; 3) incised-stab wound; 4) chopped wound; 5) sawn wound.

By application of teeth: 1) bite marks.

By a high velocity projectile: 1) firearm wound.

Traumatism is a homogeneous traumas origin of people who has the similar work and living conditions.

Classification of traumatism:

1) transport; 2) job-related - industrial and agricultural; 3) domestic; 4) school; 5) sporting; 6) military.

Among objects there selects:

Weapon – it is more frequent all the articles of self-defence, intended exceptionally for injuries causing (knuckleduster, knife, pistol).

Instruments are numerous objects which are utilized in a technique, production, private life as devices, means of labour (crowbar, hammer).

Actually blunt objects are such objects which do not have special setting (stick, stone, brick, board) or have special setting (chair, table) however don't belong to weapon or to instruments of labour which at certain terms can be utilized for injuries causing.

Classification of blunt objects:

1. With a flat prevailing surface (surface of table, floor)
2. With the flat limited surface (hammer, axe)
3. With a spherical surface (dumbbell, weight)
4. With a cylinder surface (stick, pipe)
5. With a trihedral corner (table corner).
6. With a rib or dihedral angle (edge of brick, edge of hammer surface)

Types of action mechanism of blunt objects:

Blow (stroke) is a shove which arises as a result of brief action of blunt object onto man body under right or near to right angle. Depending on blow force there arise: bruises, scratch, wounds breaks, breaks of internal.

Clench takes place then, when within some time force of blunt objects directed to meet each other. Trauma weight depends on mass and area of object which trauma is caused.

Stretching is a kind of blunt objects action mechanism at which their forces, that operate on the man's body, are directed in opposite directions. At that there appear: cracks, skin tears, avulsed wounds.

Friction arises in case of body slipping on an object or at the time of blunt object motion at an angle to the body region. During friction there appear scratch, shallow wounds.

Blunt objects caused the followings injuries:

Scratch is a superficial skin injury, which does not penetrate through all its layer, but violates only safety of epidermis or epithelium of mucous tunic, sometimes papillary layer of skin. Scratch is a local injury, that specifies into place of force and is a confirmation of fight and self-defence. The remoteness of scratch formation can be defined by its cicatrization speed.

There select four stages:

1st stage – initial - at first hours after trauma the surface of scratch will be moist, covered by interstitial fluid with the blood drops admixtures. Within 12 hours the surface will get dry and there appear black-and-brown scab below from intact skin level.

2nd stage – formation of a scab - within 2-3 days from the moment of trauma the appeared scab rises to the intact skin level, and then rises over it.

3rd stage – epithelization under a scab - up to 5th-6th day as a result of epithelium excrescence under scab it begins to separate from periphery. Up to 7th-12th day epithelization is over, the scab falls away.

4th stage – mark of an abrasion - will be over up to 15th day from scratch formation with the gradual disappearance of traces which remain at the place of scab that fall away.

Bruise is an impregnation of hypodermic cellular tissue or more deep fabrics by blood that was flowed out from the damaged vessels. Bruises can also appear under mucous tunics.

The remoteness of bruise formation can be defined after its color changing («flowering»), that is due to haemoglobin transformation:

- 1) first hours after an origin bruises have red-purple, blue-purple colouring;
- 2) withing 1-2 days bruise has blue-red colouring;
- 3) on 3rd-4th day bruise has fulvous-and-greenish colour;
- 4) on 5-6th day bruise becomes yellow colour.

In a week bruise becomes three-colour: yellowish on periphery, greenish in a middles and blue in a center, that is caused by its uneven thickness.

Hemorrhages under eyes, under lips mucous tunic, direct into derma don't change the color because of oxygen penetration in blood from surrounding air through the moist membranes.

Wound is a mechanical injury of skin, mucous membranes, and deeper located fabrics.

As a result of blunt hard objects action rise up:

- 1) compound wound; 2) avulsed (lacerated) wound; 3) fragmented wound; 4) bite wound.

Mechanism of wounds formation: at the moment of injuring object contact with skin there is a fabrics clench with their deformation, displacement with a stretch that results the skin layers breaking.

General characteristics of wounds caused by blunt objects:

- 1) edges are uneven (often patchwork), stripped, squashed, have the places from inferior bones separation;
- 2) walls are uneven, squashed;
- 3) within days of wound, especially nearer to the ends, there are fabric membranes - surviving fibres of connective tissue, that extend from one wound edge to the other and form because not all the fabrics in wound area are broke through their different closeness, elasticity, unevenness of blunt object impact value distributing, its surface unevenness.

Fracture are partial or complete violation its anatomic integrity.

Fractures can be:

- 1) open (compound) which are characterized by violation of skin integrity;
- 2) close fracture when skin integrity at fracture place is not broken.

Fractures are divided into:

- 1) local (direct, local) which arise at blow or injuring object pressure place;
- 2) remote (indirect, construction), that appear at some distance from the place of force acting.

Ribs fracture

Ribs as flat bones by form are arch similar which predetermines their durability. The breaks of ribs can arise both at the place of force applying, and at the distance, in the places of the most bending.

At the place of force applying a rib is deformed and in the area of external plate can become compressions (clench), and of internal plate - stretching. As a result the fracture line of external plate of rib is big toothed with chips and breaking up, and on internal plate approaches to even line.

At the rib break at the distance the external plate of rib stretches, and the internal plate becomes compressions. According to this the line of break on the external plate of rib approaches even, and on an internal surface it is big toothed.