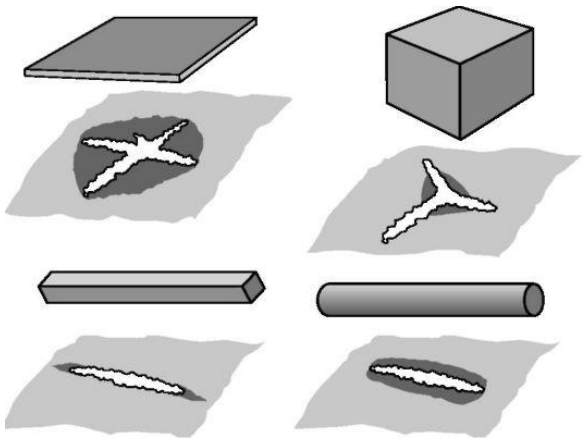
Module 1. The organization of forensic-medical examination and general problems of forensic medicine. Forensic-medical principles of examination violent and natural death

The sub module 4. Forensic-medical examination of damages and death caused by mechanical factors

Theme 8. The general problems of forensic-medical traumatology. Damages caused by blunt objects

Guidelines for students and interns



Модуль 1. Організація судово-медичної експертизи та загальні питання судової медицини. Судово-медичні засади експертизи насильницької та ненасильницької смерті

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Методичні вказівки
для студентів та лікарів інтернів

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
Харківський національний медичний університет

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Mykola Gubin
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Губін М.В.
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Сокол В.К.

Substantiation of the Topic. The medico-legal traumatology is the most important and the biggest part of the forensic medicine. These knoweldges are necessary not only for doctors which work in the forensic medicine and for other specialists in medicine (surgeon, neuropathologist and others) because effectiveness of the first aid depends on from the right diagnosis.

Forensic-medical examination of injuries caused by blunt objects is an important section of forensic medical traumatology, since such injuries are the most widespread. They can inflicted in situations of private life, work, sports activities, etc. Action of blunt hard objects can inflict death of an injured person.

Duration of practical classes: 3 academic hours

Purpose of the Practical Class: to teach to reveal describe, diagnose, and estimate injuries of skin, soft tissues, bones, and inner organs caused by blunt objects.

Direct purpose of study:

1. To be able to investigate and to describe injuries caused by blunt objects;
2. Determine the type of traumatic instruments;
3. Make medico-legal conclusions in cases of blunt trauma.

Basic level of knowledge and skills (before the practical class):

1. An essence about trauma and traumatism;
2. Morphological appearances of inflammation, healing, bleeding etc.;
3. Clinical and morphological characteristics of abrasions, scratches, bruises, wounds, fractures.

Visual Aids and Material Tools

1. Different natural specimens (human skin with abrasions, wounds, lacerations, internal organs injured due to blunt force application, fractured bones) are the objects of the investigation;
2. Studying tables, photos, and video.

Technological card of carrying out of practical classes

№	Level	Time (min)	Manuals	Place of carried
1	Control of initial level of knowledge on the topic	15	Oral answering	Class room
2	Analysis the scheme of the description of damages	10	Tables with scheme	Class room
3	Studying theme of classes, description of damages of a skin on natural preparations	30	Natural preparations	Class room
4	Conclusion about character of described damages	15	Natural preparations	Class room
5	Studying theme of classes, description of damages of a bones on natural preparations	30	Natural preparations	Class room
6	Conclusion about character of described damages	15	Natural preparations	Class room
7	The decision of situational tasks	15	Situational tasks	Class room
8	Classes summarising	5	-	Class room

BLOCK OF INFORMATION

Determine a conception "Damage". In the forensic medicine a damage is an injury of the integrity or function of organs or tissues of the human body at a result of traumatic external actions. Traumatic factor is an object or material action which can make the damages.

According a conception „trauma", damages can be divided in 3 groups: physical, chemical and biological.

Physical damages: mechanical (which were done by sharp or blunt thing, firearms, all kinds of mechanical suffocation); as a results of actions of high or low temperature; electrical; radiation.

Chemical damages: the chemical burns by caustic things and poisoning.

Biological damages: the consequences of actions of microbe (bacterial, viral), antigen factors, which can be during the infections of venereal diseases, the blood transfusion.

Injuries can be anatomical, which destroy of the integrity of tissues (abrasions, wounds, fracture of bones, lacerations of internal organs and others) and functional (pain, shock), which more often join with anatomical. More often injuries can arise from the weapon, the equipment or the object. The weapon is thing, specially made for an attack or active defense; it can be fire (a rifle, a carbine, a pistol, etc.), cold (blade shaped, percussion action, etc.). The equipment or tools are objects which are used in manufacture at the work, in a life. Objects have not special purpose as the weapon or the equipment (a stick, stones, etc.). Carrying, manufacturing and selling fire or a cold steel without the special license is a criminal offence.

Scheme of descriptions of injuries. For the consecutive and fuller description of injuries it is necessary to adhere to the certain scheme that facilitates perception of features at reading, promotes an establishment of character of damages and the decision of other questions.

The description of damages must include following data:

1. **Localization.** At definition of localization of damage it is necessary to specify **anatomic area** of a body in which it is located (for example, in the field of a forehead, on a forward surface of a thorax, on a stomach, etc.), and then to detail an arrangement (under condition of vertical position of a body). Detailed elaboration of an arrangement of damage should be made under the attitude (distance) to **anatomic reference points** (the lower angle of the scapula, the lower end of the xiphoid process, a junction between left clavicula and sternum, etc.) and if necessary in view of the conditional lines lead through a body of the person (for example, on a breast at the left in the fourth intercostal space on an axillary line is available...). At transport damages it is expedient to specify and height of an arrangement of injury, measuring it from plantar surface of the foot of the victim (the last can promote an establishment of a part of the machine which have caused damage).

2. **A kind of injury**. After an establishment of localization it is necessary to name a kind of injury. Thus it is necessary to use the definitions standard in medicine - a graze, a scratch, bruise, a wound, etc.

3. **The shape of injury.** It is necessary to specify the shape of injury with reference to **geometrical figures** (oval, round, triangular, rectangular and others). If the shape of injury not precisely corresponds geometrical, add a word **incorrectly** (is wrong-oval, is wrong-triangular and others). It is admissible also the specified forms of damage with reference to the form of letters of the Russian alphabet (the T-shaped form, the Y-shaped form, X-shaped, etc.).

4**. The sizes of injury.** It is necessary to specify the sizes of damage in centimeters. Thus if an injury has length and width it is necessary to specify all over at first and after smaller size (for example 3×0,5cm). To define length of a wound follows at its shown edges, that in some cases matters for an establishment of the sizes of an operated part of the instrument. Injury can sometimes have the form of two, three beams converging in one point. In these cases it is necessary to define length of beams and their direction.

5. **Direction of the length of injury.** In cases when length of damage more than its width, it is necessary to note a direction of the length. The direction of the length determines under its attitude to a vertical axis of the person (for example, a direction of the length of wounds vertical, horizontal, from top to down and from left to right, etc.).

6. **Color.** It is necessary to specify color at the description bruises and abrasions.

7. **Character of edges and the ends of a wound.** It is necessary to remember, that edges of a wound can be equal, smooth, rough, ragged smallnotched, bignotched, the ends of a wound – sharp, rounded off, rectangular, doubled (M-shaped). In some cases between edges of a wound, at its ends, in depth (at the bottom of a wound) can be observed in connective crosspieces (tags). It should be without fail noted at the description of injury.

8. **A condition of surrounding tissues**. After the description of character of edges and the ends of a wound it is necessary to note changes of surrounding tissues. Edges of a wound can be scratched, bruised. Thus it is necessary to note, on what edge (or where exactly) is available scratches, bruises, its sizes (width), etc.

Around of injury it is often possible to observe a various sort of imposing (a soot, a dirt, railway greasing, etc.). In these cases it is necessary to note a total area borrowed by imposings (sometimes with the instruction of a place of imposing – upwards, to the left, downwards, to the right from injury), with the instruction of color of imposings, their features. At absence of changes and imposings around of damages it is necessary to note, that a leather and tissues around of injury are not changed.

9. **Interposition of damages.** At presence of the several injuries which are settling down in one anatomic area, it is necessary to specify not only their localization, but also interposition under the attitude to each other.

THE DAMAGES FORMED FROM INFLUENCE OF BLUNT OBJECTS

Before to pass to studying the damages formed at influence of blunt objects, students should familiarize with classification of objects and the mechanism of their

action. The knowledge of these questions substantially predetermines an opportunity of an establishment of an origin of damage and an individualization of a object, its caused.

It is important to remember, that blunt objects (instruments) havn't the sharp end or edge and influence on beaten object more widespread surface, than the sharp instrument.

A variety of the injuries arising at influence of blunt objects, and their properties are caused by the form and the sizes of a striking surface, weight, durability and hardness of an operated object and a site of a body, attacked to influence, speed of movement of a object or a body, and accordingly, and kinetic energy during the moment of impact, a place of application of force, and also a direction of its influence.

Students must know following classification of blunt firm objects:

1. Parts of a body of the person (fingers, a fist, a palm, a leg, a teeth, other parts of a body) with which it is possible to cause damages.

2. Objects which the person can take in hands and cause damages. These instruments depending on the form of an operating surface in turn are subdivided into objects: a) with a flat striking surface; b) with rounded off (cylindrical, spherical);

c) with rough; d) with angular edge (two-sided, many-sided).

3. Larger objects (parts of moving mechanisms, vehicles, animals, etc.).

Except for such given classification blunt objects should be differentiated on the area beaten objects: if the sizes of a striking surface there is more than body of the person (for example, asphalt covering on which there was a falling from height) it name "unlimited". Limited striking surface name in the event that its sizes do not exceed the area of impact (a fist, a hammer, stone, etc.).

Thus it's necessary to take into account, that the form of a striking surface in some separate cases can be displayed in damage owing to what it can be defined without presence of a object.

The mechanism of damaging action of blunt firm objects

In practice it is necessary to consider presence of four kinds of influence of a blunt firm object: impact, pressing, stretching, friction. In each concrete case for occurrence of damaging movement of a object or a body or simultaneous movement of a object and a body (for example, collision of the running person with a moving car) should take place.

It is necessary to remember, that impact is a short-term process at which arise, as a rule, damages to a zone of direct influence of force. If impact is directed along an axis of a body (for example, falling from height on feets), damages can be formed on significant removal from a place of application of force. At enough strong impacts of the objects possessing in significant weight and the widespread striking surface there can be concussions of a body, which are characterized by occurrence of set of haemorrhages in places of fixing of internal bodies (the basis of heart, roots of lungs,

a gate of a spleen and a liver, mesentery of intestines, etc.), plural parallel breaks of parenchym's bodies.

It is necessary to consider, that during pressing on a body simultaneously not less than two objects act. Thus force of action of objects is directed towards each other and more often one of objects in this case is in movement, and another - is rather motionless (pressing at crossing by a wheel of the car, at pressing by a board of a body to a wall, etc.). As consequence can arise compression of the head, a thorax with the advent of on opposite parts of the squeezed sites of plural damages of bones, crushed of internal bodies and tissues.

It is important to know, that the stretching is characterized by long action on a body of two forces missing in an opposite direction. More often in practice such action is rendered with rotating mechanisms of machine tools, machine tools of moving vehicles. At a stretching there are lacerations, removing parts of a body, etc.

Characteristic thing of the friction is an mutual displacement under the attitude to each other damaging object and a part of a body therefore there is their superficial contact is characteristic and arise abrasions of the various area.

Character of damages

It is necessary to know, that from action of blunt firm objects there are following damages: abrasions, bruises, wounds (split lacerations, avulsion, stretch lacerations, cut laceration), fractures, breaks, crashing and rupture of internal organs, rupture and cut of separate parts of a body, detachment of the skin without its break, a stretching of ligaments, a bruise and concussion of a brain, a shock from impact in reflex zone, a syndrome of long squeezing and infringement of function of breath and blood supply (at mechanical asphyxia).

Most about operating objects, and also about circumstances and prescription of trauma it is possible to receive a trustworthy information at research of abrasions, bruises, wounds, fractures.

During medico-legal research of injury by a blunt firm object it is necessary to establish: character of damage (an abrasion, a bruise, a wound and its kind), the instrument of a trauma (feature of an injuring surface, its form, the size, etc.), a place of application of force and its action on a body, prescription of causing of damage, and during talking with alive person - a degree of damage.

THE CHARACTERISTIC OF SEPARATE DAMAGES

Abrasions

Describing abrasions, it is necessary to know that they are mechanical damages of superficial layers of a leather (epidermis) or epithelial layers of mucous membranes. The abrasion arises owing to movement of an injuring object, on the surface of bodies (at movement of a body in a object) or as a result of mutual sliding

and insignificant pressing them to each other during what there is a friction and are removed superficial layers of a leather.

The size of abrasions can be various, that depends on the area (sizes) of a part of an operating object contacting to a body, and also from length of a way of its movement on a body. The more the surface of contact and is longer a way moving on a tangent to a body of a object, the more considerably and wide abrasion.

It is necessary to consider, that the shape of abrasion quite often repeats in the certain shape of a contacting object, therefore it needs to be described most carefully in the expert document or to photograph. Presence of lines or specifies to intermittence rather long sliding of an operating object or a body or their mutual movement.

White flakes of epidermis on the surface of the abrasion can determine about direction of the blunt object, which are sometimes visible and with opened eye, but more often for their detection resort to survey of an abrasion by means of a good glass stereomicroscope. These flakes bend to the side of the direction of the object. Besides it is possible to judge a direction of movement of a object, on depth of trailer departments of an abrasion. In an initial part of an abrasion, as a rule, deeper and its edges more groove, while in a final part it's more superficial with flat edges. Quite often in a final part of an abrasion more expressed pollution can be found and owing to hit of the particles which are available on a surface of a object, including pollution due to removing the basis of a moved object if it was fragile. Research of these departments by means of special techniques (contactography, spectrography, etc.) Quite often allows to establish a chemical compound of imposings. Lined abrasions are result of the drawing a body (at transport traumas and other cases).

At the description of abrasions it is necessary to specify their exact localization as the abrasion arises only in a zone of direct contact to a blunt firm object; thus, it specifies a place of direct application of force.

If movement of a object on a surface of a body was insignificant, abrasion will display not only the shape and the sizes of an influencing object, but also the area of contact in this connection at the description it is necessary to specify the sizes of an abrasion or the area with which it borrows.

It is necessary to consider, that on appearance it is possible to establish also time of occurrence of abrasion. It is known, that abrasions heal with formation of a crust after which tearing away scar it is not formed. During cicatrizing abrasions it is possible to allocate 4 stages which definition allows to solve the problem on prescription of an origin.

It is necessary to know, that abrasions, formed after death or directly ahead of approach of death, owing to dry out get yellowish waxlike painting, are condensed. On them their background quite often vessels appear through light transparent skin. Such sites are called "perchament spots". In difference from lifetime abrasions in a zone of "perchament spots" do not find the expressed haemorrhages in deeper layers of a skin, and also the inflammatory reaction peculiar to lifetime damages.

Bruises

Investigating this kind of damages, it is necessary to consider, that bruises are the hypodermic haemorrhages arising from influences of blunt objects owing to break fine arteries or veins. In the sizes bruises can be different - from spots up to extensive, locating at the greater area of a body. They can extend on hypodermic subcutaneus fat, between fascies to spaces on the sites which are being near from direct influence of force and consequently specify not a site, and on area of its application.

Bruises, as well as abrasions, quite often reflect the shape of a striking surface of a blunt object. Pressure of a teeth, influences of the blunt objects having are characteristic enough bruises from action of tips of fingers with the limited surface. It is recommended to photograph them with a scale ruler.

Color and intensity of painting fresh bruises depend both on volume of the grown lazy blood, and from thickness of those tissues, under which this blood settles down. Fresh bruises can be reddish, bluish, dark blue, brownish and others colors. In particular, they have reddish color on sites thin skin, on mucous. It is necessary to remember also, that painting bruises can be shown not at once, and later a little hours after their formation that is connected with promotion of the grown lazy blood to a surface of a leather. It is known, that painting bruises changes in due course communications with the certain transformations of hemoglobin. More often initial color passes in greenish, that is connected with transformation of bilirubin in biliverdin. Greenish painting, as the rule, appears in the beginning on periphery of bruise, and then extends further on its surface. Green painting is replaced yellow, that is connected with transformation of biliverdin in haemosiderin. However in practice "flowering" of the bruise can press and in another way. Not seldom in a zone of bruise doctor observes connection in the beginning yellow (instead of green) painting which then is replaced green.

It is important to remember, that on mucous membranes bruises, as a rule, keep the initial painting long enough time.

Bruises can be or the only thing after influence blunt firm object or to accompany other damages, testifying about their lifetime origin.

Wounds

It is necessary to mean, that from all damages from blunt things the greatest inform gives for the forensic expert wounds. Wounds name mechanical damages skin than covers on all thickness or is deeper. Unlike abrasions, a wound heal with formation of scar. Features of the wounds caused by blunt objects are caused less uniform and more the widespread influence of a blunt object on a tissue, than at action of sharp instruments.

It is important to know, that at impact the blunt solid object renders strong pressure upon a tissue, displaces it, causes its stretching, which increases more deep into tissues, also leads to their break. At action on a tangent a object, fixing a tissue in

any limited place, exfoliate it on other extent, promoting formation of rags and pockets. The rags formed as a result of such action, as a rule, are separated from a object bones. On edge such scrappy wounds quite often find a zone of abrasion which shows the tangential action of a object. The zone of abrasion is more, than sharply a corner of influence of the instrument on a tissue. It is necessary to consider, that the wounds caused by blunt solid objects, possess the characteristic attributes, allowing to distinguish them from wounds, caused by sharp objects (see the table).

Table

Differential diagnostics between wounds caused by blunt and sharp objects

The name	The wounds caused by influence of a object	
	Blunt	Sharp
Edges of wounds	Non straight	Straight
Tissue crosspieces(tags)	Present	Absent
Grazes and bruises in a circle	Present	Absent
Bulbs of hair	Pulled out	Hair was entangled
Bleeding	Small	Strong
Healing	Secondary tension	Initial
Gaping wound	It is poorly expressed	May be
Opening in wound	May be not clear	Clear and considerable

So the most typical are split lacerated wounds. They can to have the various form that depends on the shape of a striking surface of a object, a place, application of force and it, an orientation in relation to a body. Their depth depends on force of influence of a object, a degree of roughness of a surface. For these wounds the attributes peculiar to wounds from blunt objects are characteristic all. Significant abrasion and bruises quite often settle down not only on edges of a wound, but also on some distance from them. The size of abrasion, as a rule, is underlined the area of an influencing object and a concrete site of this influence, in this connection the wound should be described in detail with reduction the size of abrasion, places of its arrangement and the form of a site, so as last can display and the shape of a contacting part of object. Bulbs of the damaged hair in a zone of such wounds are turned out, pulled out. On them a doctor can find parts of environments, and on hair - their traces of pressing in the form of clutched formations with stratification (splitting, fragmental).

Quite often in a zone of wounds (around of them and in depth) forensic expert can find the pollution which have got from a blunt object, a fibre of clothes, etc. At their presence the wound and all the found out inclusions to be a object special to

research.

It is necessary to know attributes of avulsion. It is formed at tangential influence of a object on a body. Its characteristic attribute is presence of exfoliations, breaks of a skin and others soft tissues (in the literature it quite often call scrappy wound). As well as previous, the wound has rough edges, tissue crosspieces(tags).

Changes around of a wound can be absent, if the influencing object the ridge surface separates tissues at impact, and then starts to operate in depth of tissues tangent. Quite often such wounds have the form arcuate or coming nearer it. Abrasions at such wounds more often are located on the one side and also show that blunt firm object operated on a tangent. This zone quite often displays the form of an influencing surface, therefore an attribute it is necessary to describe most carefully. At research of abrasion it is necessary to pay attention of a zone to presence and an orientation of flakes of epidermis.

The cut laceration is formed from influence of the blunt firm object having the expressed edge (files can be carried to such objects, boards, and also narrow metal rods). The second indispensable condition of its formation is presence a bone which is located closely. Edges of cut laceration as a rule, more equal, than at other wounds caused by blunt firm objects. In depth of such wound and between its edges a little tissue fibres or they are absent, find them only in the ends wounds. At perpendicular action of such object contusion and bruise surrounding fabrics can be absent, at action under a corner a contusion and bruise appear from a sharp corner of an action of a object. This wound reminds minded, differing from it presence of tissues fibres and especially character of damage of bones. In depth of such wounds can find out fractures of the bones, sometimes the pressed fractures, but never in their depth find minded bones, holed fractures, trimed places on bones that is characteristic for cutting wounds.

Fractures

Damages of bones of a skeleton are one of the important objects in forensic examination in cases of influence on a body of the person of various mechanical factors. Fracture is a break of the integrity of the bones. Depending on a point of application of force fractures in forensic medicine divide into straight lines (local) applications of force located in a point, and indirect (remote), settling down on a distance from a place of application of force. Fractures are often accompanied by cracks which are the separation of bone substance without significant displacement of the disconnected parts under the attitude to each other.

Direct (local) fractures of a skull. At influence of the same objects with various force foraminous fractures can be generated in one case pressed, and in other case, and an obligatory condition of formation of foraminous fractures is presence of the limited injuring surface by the area no more than 16 cm^2. On a place of influence of such object the defect corresponding the sizes and the form of the injuring surface of a blunt firm object by which blow is striked is formed. Foraminous fractures are more

often formed from influence of the limited flat surface and less often from a spherical, trihedral and cylindrical surface.

The pressed fractures are formed more often from impacts spherical, cylindrical, trihedral and dihedral angular surfaces. At slanting impacts (under a corner to a damaged bone), as a result of non-uniform influence of the limited surface, arise terraced shaped fractures in which fragments are located in the form of the steps-terraces leading to a place of influence of a side of a object. At action spherical and angular surfaces of a terrace can be formed and on edges of foraminous fractures.

The indirect (remote) fractures concern to constructional destructions of a complex of bones of a skull, these damages appear on the certain extent from a point of application of force (or impact) they are extensive and are accompanied by formation of large fragments and splinters of a bone. Such fractures, as a rule, are formed owing to impacts by a massive blunt firm object with a prevailing “unlimited” flat surface (or at falling on those, for example (at falling from height on asphalt) or at pressing of skull between blunt objects (for example at crossing wheels of the car). These kinds of influences cause the general deformation of a skull which can be considered approximately as sphere.

Direct (local) fractures of long tubular bones are formed owing to application of force on any site (more often diaphysis) bones. These damages are formed from two types of deformation: owing to a bend when the bone is fixed in the field of epiphysis, and impact is put in diaphysis or owing to shift, in the same conditions of fixing, but at sharper impact. Human bones are arranged in such a manner that they are more steadier against compression and less steady against a stretching. Therefore at bending a bone under action of a blunt firm object all over again occurs break compact substance on the party opposite to a place of impact, and then from here, the crack or a line of crisis, testing resistance of a bone on compression, is moved apart or branches, leading to a point of application of force.

It is as a result formed a fracture of the pyramidal form by the basis turned to a place of impact, and top in a direction of impact by a blunt firm object. An example of similar damage is the so-called "bumper-fracture" arising in a place of impact by a bumper of the car at collision of the car or other vehicle with the pedestrian. The height and the location of such damage can specify a kind of a vehicle and a direction of its movement during the moment of a trauma in relation to the victim.

The indirect (remote) fractures of tubular bones also can arise from bending a bone, but not owing to impact in area of diaphysis, and from loading on epiphysis of bones, in these cases also there is a formation of pyramidal fragment, however absence of the soft tissues located outside of damages allows to make differential diagnostics of this damage from local fractures. Indirect fractures arise also owing to longitudinal compression of a bone which causes destruction of epiphysis with formation of the splintered driven fractures.

For example, at falling from height on legs there are splintered driven fractures of distal epiphysis and distal parts of diaphysis of long bones of the lower extremity. The remote fractures should carry the so-called "spiral" fractures formed as a result of fixation of one end of a bone and rotation opposite around of axis of a bone. For this

kind of fracture a spiral line of a break is present which grasp some surfaces of the bone. On such fractures there is an opportunity to establish a direction of rotation of a trunk at the fixed finiteness that plays a greater role at examination of a transport trauma.

QUESTIONS FOR STUDENT'S INDEPENDENT WORK

1. Conception "trauma". Factors of an environment which operate on an organism
2. Classification of damages. Anatomic and functional damages. A traumatism and its kinds. Features of the description of damages of a skin
3. Damages caused by blunt objects, their classification, the mechanism of action
3. Abrasion, its medico-legal importance
4. Bruises, its medico-legal importance
5. Lacerations, its medico-legal importance
6. Fractures of flat and tubular bones which caused by blunt objects
7. The brain injury: its kinds
8. Features of damages at falling from height of own growth/on a plane / and at falling of a body from height

TESTS AND SITUATIONAL TASKS FOR SELF-ASSESSMENT

1. During healing process in bruise, livid bluish color appears:
   A. Before greenish
   B. After greenish
   C. After reddish
   D. After yellowish
   E. Before yellowish

2. When did the bruise possibly occur if its greenish shade is seen?
   A. 1-2 days ago
   B. 3-4 days before
   C. 5-6 days ago
   D. 7-9 days before
   E. 10-12 days ago

3. On forensic autopsy of G., aged 49, an abrasion is revealed on the anterior surface of the left femur in its middle third, of an irregular-spherical form, covered with scab, which is located above uninjured skin. Identify the time of formation inflicting injury:
   A. 10-12 hours.
   B. 12-24 hours.
   C. 1-3 days.

D. 4-5 days.
E. More than 7 days.

4. Patient K. addressed the trauma surgery with two wounds on the head having crushed, bruise, grazed and rough edges, and tissue intersections between them. The character of these wounds suggests that they are:
A. Incised
B. Laceration
C. Chopped
D. Stab
E. Gunshot

5. On forensic autopsy the fractures of the IV-VII ribs are revealed. The fractures are located on the left side of the thoracic cavity along the anterior axillary line with massive haemorrhages in the surrounding tissues. At detailed examination of fractures it has been revealed that the internal osteal table of each of the injured ribs is with large jags, its edge is rough with jagged osteal tissue. The external osteal table has a serrulated and even edge. The character of these fractures suggests that they are:
A. Local (direct).
B. Indirect.
C. Terrace-like.
D. Impressed.
E. Compressive.

ANSWERS

1 — C; 2 — C; 3 — C; 4 — B; 5 — B

After the practical class every student should know:

1**.** Forensic-medical classification of blunt objects
2. The mechanism and morphogenesis of the injuries caused by blunt objects
3. Common and typical signs of the wounds caused by blunt objects
4. Type and signs of the fractures caused by blunt objects

should be able to:

1. Describe wounds caused by action of blunt objects.
2. Determine a kind of traumatic blunt objects according to definite morphological features of the wounds
3. Make up complete forensic-medical conclusions in cases of action different blunt objects

THE RECOMMENDED LITERATURE

Basic:

1. Babanin A.A. Forensic medicine: Textbook / A.A. Babanin, O.V. Belovitsky, O.Yu. Skrebova. – Simferopol, 2007. – 464 p.
2. Franchuk V.V. Forensic Medicine: practical guide / V.V. Franchuk. – Ternopil: TSMU, 2011. – 2004 p.

Additional:

1. Anderson W.R. Forensic Sciences in Clinical Medicine: A Case Study Approach / W.R. Anderson - USA: Lippincott Williams & Wilkins, 1998. – 225 p.
2. DiMaio V.J.M. Forensic Pathology, Second Edition (Hardcover) / DiMaio V.J.M.. - USA: CRC Press, 2001. – 565 p.
3. McLay W. D. S. Clinical Forensic Medicine 2E / W. D. S. McLay . – London: Greenwich Medical Media, 1996. - 336 p.
4. Jason P. Forensic Medicine: Clinical and Pathological Aspects / P. Jason, B. Anthony, S. William. - London: Greenwich Medical Media, 2001. – 832 p
5. Shepherd R. Simpson's Forensic Medicine / Shepherd R. - London: A Hodder Arnold, 2003. – 208 p.
6. Stark M.M. Physician's Guide to Clinical Forensic Medicine (Forensic Science) / M.M. Stark– USA: Humana Press, 2000 - 326 p.

Навчальне видання

Модуль 1. Організація судово-медичної експертизи та загальні питання судової медицини. Судово-медичні засади експертизи насильницької та ненасильницької смерті.
Змістовний модуль 4. Судово-медична експертиза ушкоджень та смерті від механічних чинників.

Тема 8. Загальні питання судово-медичної травматології. Ушкодження тупими предметами

Методичні вказівки

для студентів та лікарів інтернів

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