MINISTRY OF HEATH OF UKRAINE
POLTAVA STATE MEDICAL UNIVERSITY

Department of general surgery

METHODICAL INSTRUCTIONS
FOR STUDENT SELF-DIRECTED WORK WHEN PREPARING FOR AND DURING PRACTICAL CLASS

Study discipline	**General surgery**
Module №1	**INTRODUCTION TO SURGERY. SURGICAL EMERGENCY CONDITIONS. FUNDAMENTALS OF ANESTHESIOLOGY AND INTENSIVE CARE**
Content module 4.	**Injury and damage.**
Lesson theme №13	Closed injuries of soft tissue: bruise, concussion, rupture. Clinic, diagnosis of closed soft tissue injuries, first aid, principles of treatment..
Years of study	***III***
Faculty	**International**

Poltava

Content module 4.	**Injury and damage.**

Lesson theme №13	Closed injuries of soft tissue: bruise, concussion, rupture. Clinic, diagnosis of closed soft tissue injuries, first aid, principles of treatment..

1. Relevance of the topic :

Diagnosis and treatment of various injuries (injuries) is one of the largest sections of surgery. Injuries with cancer takes 2-3 places in the overall mortality. The effects of many sudden damage (in transport , natural and industrial disasters) are often settled for several minutes after the incident , and depend on the timeliness and quality of the first medical aid . Therefore, the skills to quickly diagnose and provide emergency medical care and first at various injuries must possess not only surgeons and other doctors .

2 . Learning Objectives :

1. The concept of the injury .

2 . Know the types , clinical signs of closed soft tissue injuries : a bruise , sprain , tear, concussion , and compression .

3 . Know the types , clinical signs of open and closed cranial injuries : a concussion , brain contusion , and compression of the brain, damage to the bones of the skull.

4 . Know the types , clinical signs of open and closed chest injury : injury, rib fractures , penetrating and nonpenetrating wound , hemothorax , pneumothorax .

5 . Know the types , clinical signs of pneumothorax .

6. Be able to provide first aid to the victims of open pneumothorax .

7. Know the types , clinical signs of open and closed abdominal injury .

8. Know the volume of first medical aid to the victims with various traumatic injuries and methods of transportation.

9. Causes, clinical features , diagnosis , treatment, prevention of traumatic toxicosis.

10 . To be able to carry out differential diagnosis of open and closed soft tissue injury , skull , chest, and abdomen.

11. Conduct a temporary stop bleeding in open injuries of the head, neck, chest .

12. The concept of traumatic shock .

13. Know the anti-shock plasma expanders .

14. Select means of transport for immobilization.

15. To be able to organize the transport of the wounded depending on the nature of traumatic injury .

3 . Basic knowledge , **skills , habits, necessary for studying the topic (inter-disciplinary integration)**

The names of the preceding disciplines	**The skills**
1. anthropotomy	Know the anatomy of different parts of the body
2. microbiology	Own the elements bakteriologichnyh research
3. biochemistry	Know metabolism. To be able to interpret an. cerebrospinal fluid, blood, urine glucose levels in blood and urine.
4. pharmacology	Know the dose of painkillers, anti-shock drugs.
	Violation of trophic tissue in injuries.
5. pathological anatomy	Possess the skills of writing prescriptions.

The student must have an idea :

- The mechanism of injury ;
- Modern classification of injuries;
- The clinical features of closed soft tissue injuries : bruises, sprains ,break , concussion , compression ;
- The clinical features of traumatic brain injury
- About the damage of the chest and its organs ;
- The injury abdomen and abdominal organs ;
- Traumatic shock;
- Compression syndrome .

The student should know :

- The structure of transport tires ;
- Bases transport immobilization ;
- Certain types of transport immobilization ;
- The volume of the first medical aid to the victims with various traumatic injuries and methods of transport ;
- Instrumental diagnosed with various injuries ;
- Causes, clinical features , diagnosis , treatment and prevention of traumatic toxicosis ;
- The causes , classification, clinical features , diagnosis , treatment and prevention of traumatic shock ;
- desmurgy .

The student should be able to:

- To provide transport for immobilization of various traumatic injuries ;
- Give the patient functionally advantageous position in bed ;
- Arrange proper transportation of patients in a medical institution ;
- To carry out the basic techniques of resuscitation;
- To carry out a temporary stop bleeding;
- To carry out prevention of anaerobic infections ;

The mastery of the practical skills of students:

- To prepare the bus Cramer for use;
- Splint Diterix ;
- Learn to apply tourniquet ;
- With an open pneumothorax impose occlusive dressing ;
- Prepare a kit for performing pleural puncture ;
- To master certain techniques for bandaging patients (keep tweezers, use the clip and so on);
- To carry out an audit of the wound probe ;
- Master the classical techniques of bandaging patient compliance with aseptic and antiseptic ;

- To organize the transport of the wounded depending on the nature of traumatic injury .

4. Tasks for self-study in preparation for the lesson .

4.1. The list of basic terms , parameters, characteristics, which the student must learn in preparation for the class:

Term	**definition**
Trauma (acute)	Single-stage, a sudden effect on the body outside Trauma agent that causes the tissues or organs anatomical or biological disorders accompanied by local and general reaction of the organism
bus	Special tool for immobilization in injuries or diseases of bones, joints, etc.
immobilization	Measures aimed at ensuring the property damaged part of the body and the surrounding joints to it.
pneumothorax	The accumulation of air in the pleural cavity.
	When cardiac tamponade: decreased blood pressure, increased central venous pressure, cardiac tone deafness.
	Closed mechanical damage to tissues or organs without explicit violation of their anatomical integrity.
Beck's triad	Soft tissue injuries with partial tears while maintaining the anatomical integrity.
Bruising (lat.sontusio)	Formed due to excessive stretching of tissue that exceeds the limits of their flexibility and endurance.
Stretching (Latin distorsio)	Closed mechanical damage to certain organs and tissues, which is characterized by the violation of their functions with no gross morphological changes.

4.2 In theoretical questions for the class :

1. Give determination of injury.
2. Politravma .
3. Peculiarities of examination of the patient with trauma .
4 . Clinical signs closed soft tissue injuries .
5 . Clinical signs of closed injuries of skull , chest, and abdomen.
6. Volume of provide first medical aid to the victims with various traumatic injuries and methods of transportation.
7. Define hemothorax , pneumothorax , chylothorax .
8. Causes, clinical features , diagnosis , treatment, prevention of traumatic toxicosis.
9. Differential diagnosis of open and closed soft tissue injury , skull , chest, and abdomen.
10 . How to conduct a temporary cessation of bleeding with open head injuries , neck and chest .
11. Provide assistance to the victims of open pneumothorax .
12. Arrange transportation of the wounded in traumatic injury .
13. Clinical signs of intra-abdominal bleeding.
14. Haw treat of abdominal trauma with damage to internal organs.
15. What are the periods of prolonged compression syndrome .
16. What are the principles of treatment of prolonged compression syndrome .
17. Define the position of compression syndrome .
18.Travmatic shock, treatment principle .

4.3.Practicall work (tasks), which are carried out in class :

1. Organization of transportation of the victims ;
2 . The use of tires Cramer ;
3 . The use of bandages Delbo ;
4 . Splinting Diterixs ;
5 . Prepare a kit for pleural puncture ;
6. Establish drainage of pleural cavity for Byulau ;
7. Technique of the dressings (bandages previous removal , treatment of the surgical field , and so on);
8. Caring for drainage of pleural cavity for Byulau ;
9. Specimen collection for bacteriological control ;
10 . Prepare a kit for spinal puncture ;
11. Conduct a physical examination of the victim;
12. Technic of pleural puncture ;
13. Simulate the actions of the medical staff is suspected or the diagnosis of normal body infection in a patient .

5 . The content of the topic.

CLOSED SOFT TISSUE INJURY

Bruising (sontusio) - Closed mechanical damage to tissues or organs without explicit violation of their anatomical integrity . This is one of the most common soft tissue injury closed . Most often damaged the exposed parts of the body (head, limbs) . The severity of injury depends on the force of the blow , protection of the clothing of the body , subcutaneous fat .

First aid for injury : cold on the site of injury (towel soaked with cold water , a bubble with ice) , the exalted position of the injured part of the body , the imposition of a pressure bandage .

Stretching (distorsio) - it's soft tissue injury with partial tears while maintaining the anatomical integrity . Stretching usually occurs when a sudden sharp dvizhenii.Lechenie in the case of extension is the same as in the injury .

The gap (ruptio, ruptura) occurs when excessive stretching of tissue that exceeds the limits of their flexibility and endurance. As the skin has a large number of elastic fibers and easily stretched more common gap of muscles, ligaments , nerves , and tendons.

With a partial rupture of the muscle limb immobilization is carried out for 2-3 weeks. A complete break only operative treatment - stitching muscles followed by immobilization of the limb for 2-3 weeks.

Concussion (commotio) - Closed mechanical damage to certain organs and tissues, which is characterized by the violation of their functions with no gross morphological changes. The greatest importance is the concussion of the brain and chest .

Clinical signs of concussion consist mainly of violating the function of damaged organs and tissues, which are accompanied by slight pain.

Compression (compressio). With this type of damage to the soft tissues are pressed down to a solid object or squeezed between two solid objects. In the case of compression of the soft tissues , particularly the extremities, develops dangerous complication known as syndrome of prolonged compression .

Head injury

Concussion of the brain. Relatively easy brain injury, without organic damage to the brain substance . Characteristic signs : brief loss of consciousness , retrograde amnesia , simultaneous vomiting , headache , sleep disturbance, unsteady gait .

Brain injury . More severe brain injury, which is accompanied by anatomical changes in the medulla (local damage to brain tissue , hemorrhage, edema). Characteristic signs : severe cerebral symptoms (loss of consciousness lasting , reusable vomiting , respiratory failure and cardiac activity , dilated pupils , and a violation of their reaction to light , headache, dizziness) , depending on the location of the injury determined by the local symptoms of disorders of the central nervous system. When lumbar puncture - in the cerebrospinal fluid can be determined by blood.

Compression of the brain occurs due to compression of the brain in intracerebral hematoma . The clinical picture develops gradually over the growing hematoma. This time interval is called a "bright " (several hours) . Gradually increasing cerebral and local symptoms cause slow pulse , dilated pupils , loss of consciousness, convulsions occur , paresis and paralysis , impaired reflexes.

Damage to the bones of the skull . Distinguish arch fractures and skull base fractures and comminuted fractures . Depressed fractures cause localized injury or compression of the medulla . Cause damage to the base of the skull , usually plight of the patient . The common symptoms of a brain joins respiratory failure , bleeding from the nose , nasopharynx , ears , and the outflow of cerebrospinal fluid . Under the skin around the eyes accumulate hemorrhage (a symptom of " points ") .

The first medical aid . When closed injuries of the skull and the brain affected urgently need to bring in a medical institution . With traumatic brain injury at the time of the evacuation victim's head on the pillow (coat), and fix the tires only when combined injuries of skull and cervical spine. To prevent the ingress of blood, vomit in the airway victim's head is turned to one side.

Some suggest the head during transport immobilized using sling bandage , which is fixed under the chin. If the victim is unconscious state, as well as the risk of the tongue , the head is fixed in position with bandages on his side .

When wound veins, especially the neck , it may be air embolism . Venous bleeding stops pressure bandage . If the hand is not a pressure bandage , then you can stop the bleeding finger pressing a bleeding vessel in the wound or over .

Damage to the chest

Bruised chest : signs - pain that increases during respiratory movements . Severe injury is accompanied by the development of plevropulmonalnogo shock (pale skin , shortness of breath , coughing up blood , rapid and weak pulse, low blood pressure , and sometimes - subcutaneous emphysema , which is determined by palpation as a " crackling ") .

First aid. Put the patient on a stretcher with a turn on the damaged side in a semi-sitting position , adequate pain relief .

Rib fractures . Symptoms : Pain in the corresponding half of the chest, behind her in the respiratory motion, tenderness at the fracture site of the corresponding edge . Complicated fractures of the ribs with damage to the pleura and intercostal arteries are the cause of hemothorax (hemoptysis , subcutaneous emphysema, plevropulmonalny shock).

First aid. Rest. Thick circular patch (only during transport) . In severe cases - anesthesia , cardiovascular drugs , inhalation of oxygen.

Wound to the chest . Penetrating and non-penetrating (with injury or without injury pleura) . Tags: plevropulmonalny shock, pneumothorax, hemothorax , subcutaneous emphysema, hemoptysis (with damage to lung tissue).

Pneumothorax - accumulation of air in the pleural cavity . A distinction is closed, open the valve pneumothorax

Gemopnevmotoraks - accumulation of blood and air in the pleural cavity.

First aid. With an open pneumothorax impose oklyuzionnuyu bandage , with valve - drainage of the pleural cavity by Byulau . Transport patients in semi-sitting position

Damage to the stomach

Closed abdominal injury . Often accompanied by damage to the hollow organs (intestines , stomach , urinary bladder) or parenchymal (liver , spleen , kidneys) , which are accompanied by bleeding into the abdominal cavity with the rapid development pattern of acute anemia. Symptoms : pain, bloating, symptoms of peritoneal irritation , muscle tension abdominoplasty , signs of increasing anemia. The patient often lies on his back or on your side with knees bent and feet hip joints .

First aid. Chill on the abdomen and emergency hospitalization in a surgical hospital .

Open abdominal injury . Also, there are penetrating into the abdominal cavity and penetrating (the damage without damaging the peritoneum or peritoneal) . Penetrating often include damage to internal organs. Signs of similar damage covered with the additional presence of a wound on the anterior abdominal wall.

First aid. When a penetrating wound of the abdomen is applied to the affected aseptic bandage the wound (fallen bodies of the abdomen did not reduce a !) And transported in a prone position in the surgical hospital .

Compression syndrome (syndrome of prolonged compression , crush syndrome) - a kind of pathological condition that is caused by prolonged compression of the soft tissues of the extremities, which is based on ischemic necrosis of muscle toxicity products with the development of hepatocellular necrosis , renal insufficiency.

Occurs after the release of the affected limb from the rubble of destroyed homes, buildings, soil , etc. Pathogenetic factors that contribute to the development of traumatic toxicosis : 1) pain stimulus , 2) traumatic toxemia , and 3) plasma and blood loss .

Periods of clinical course :

Period of increasing edema and circulatory failure (early , lasts 1-3 days), clinical signs of pain, inability movements , a few hours there is swelling of the limb , which progressively increases as it becomes purplish skin - the color of lead to the gradual formation of bleeding and blistering use serous - hemorrhagic content , nazrastaet body

temperature, pale skin , weakness, and the picture of shock. Oliguria occurs (70-100 ml of urine per day). Urine acquires lacquer- red content of protein in it - 600-1000 mg / l.

The period of acute renal failure (in between runs from the third day before the 9-12 days); clinical signs : the restoration of blood flow, but the progression of renal failure (anuria in transition oliguria , increase in urea , creatinine in the blood) with the development of severe uremia by 5 - 7 day.

The period of convalescence (later , after 12-14 days); clinical signs victim's condition improves, reduced azotemia , reduced daily urine output , reduced edema , reduced sensitivity, but determined pockets of soft tissue necrosis , atrophy of muscles.

Treatment. At the site of injury is conducted adequate pain relief with narcotic analgesics , bandaging the limb with an elastic bandage , immobilization of the transport bus , emergency hospitalization in a surgical hospital . In the hospital conduct anti shock and detoxifying therapy. Intravenous antishock plasma expanders , albumin solutions , plasma bicarbonate solution (total amount of liquid 3000-4000 ml / day). Broad-spectrum antibiotics . Local taxation limb ice pack for 2-3 days with the removal of bubbles every 3-5 hours. If symptoms of acute renal failure nazrastayut - carrying out a wide cross-section of soft tissues , and in cases of traumatic toxicosis , which threatens the life of the victim hold an emergency amputation . For the treatment of renal failure can be used on the testimony of hemodialysis ;

During the period of convalescence are treated with festering wounds, necrosis , gangrene of the general rules .

6. Materials for self-control.

A. The tasks for self-control .

questions :

1.What types of injuries you know.

2.Give definition of polytrauma .

3.How classified traumatic injuries .

4.Osobennosti examination of the patient with trauma .

5 . What are the clinical signs of closed soft tissue injuries .

6. Clinical signs of closed injuries of skull , chest, and abdomen.

7. The volume of first medical aid to the victims with various traumatic injuries and methods of transportation.

8. Define hemothorax , pneumothorax , hilotoraksa .

9. What is a crash - a syndrome .

10.Nazovite causes, clinical features , diagnosis , treatment and prevention of traumatic toxicosis.

11.Provedite differential diagnosis of open and closed soft tissue injury , skull , chest, and abdomen.

12.How to conduct a temporary cessation of bleeding with open head injuries , neck and chest .

13. Provide assistance to the victims of open pneumothorax .

14.Opishite clinic intra-abdominal bleeding.

15.How to treat abdominal trauma with damage to internal organs.

16 .. What are the periods of prolonged compression syndrome .
17. What are the principles of treatment of prolonged compression syndrome .
18. Define the position of compression syndrome .
19.Stepeni traumatic shock , the principle of its treatment.

assignments :

1. Method overlay occlusive bandages with an open pneumothorax .
2. Methods temporarily stop of bleeding.
3. Choice of a method of transport immobilization .

6.3 . Tests for self-control (basic knowledge) .

1. Identify the major pathogenetic factors of traumatic toxicosis :
A. Pain irritation
B. Fat embolism of the internal organs
B. Plasma- that blood loss
G. Mioglobinemiya
D. Traumatic toxemia

2 . Identify the major periods of the clinical course of traumatic toxicosis :
A. Reactive period
B. The period of rise of edema and vascular insufficiency
B. Toxic period
The period of acute renal failure
D. Shock period

3 . The clinical picture of a concussion is characterized by:
A. Loss of consciousness at the time of injury
B. Retrograde amnesia
B. fall-out features of this or other brain structures
G. Breach of sensitivity, hemiparesis
D. conjunctival hemorrhage in the eye

4 . Define the overall localization of posttraumatic intracranial hematomas :
A Epidural
B. Subdural
B. Intraventricularis
G. intracerebral
D. The parietal

5 . Symptom with epidural hematoma include:
A. Expansion of the pupil on the affected side
B. tachycardia
B. bradycardia
G. Increased muscle tone , loss of motor reflexes
D. Loss of consciousness

6. In a closed lung injury may be observed all the complications , except for :
A. Closed pneumothorax
B. Open pneumothorax
B. Valvular pneumothorax
G. Emphysema of soft tissues
D. paralysis of respiratory muscles

7. What does not happen in isolated external penetrating wound of the chest ?
A. haemoperitoneum
B. hemothorax
B. Open pneumothorax
G. External (busy) pneumothorax
D. peritonitis

8. Rupture of a hollow body with a closed abdominal trauma accompanied by :
A. peritonitis
B. hematuria
B. The presence of free gas in the pelvic cavity
D. The presence of free gas in the dome diaphragm
D. haemoperitoneum

9. Damages may be:
A. partially
B. Full access
B. Opening
G. incomplete
D. Closure of the

10 . Damages may be:
A partially penetrating
B. Penetrant
B. penetrative
G. superficiality
D. The deep

11. By mechanical damage include:
A. burn
B. Frostbite
B. Wound
G. electrocautation
D. Concussion

12. The following types of accidents :

A non-manufacturing
B. Hospital
B. Children
G. Aircraft
D. Production

13. Trauma can be caused by the following factors:
A. Microbial invasion
B. The electric current
B. Occlusion of the great vessels
G. thermal factors
D. Allergens

Case studies for emerging knowledge

1. What are the stages of first medical aid to the victim with long-term compression syndrome .

2 . What are the stages of first medical aid to the victim with a penetrating wound to the abdomen.

3 . What are the stages of first medical aid to the victim with a penetrating wound to the chest.

4 . A woman , aged 40, was hit by a car. Condition was extremely grave . Consciousness away. Pulse frequent and 100 beats per 1 min. , Weak filling . There anisocoria with the increase of the left pupil and fixation of the left. In the fronto- parietal region of bruising . In the parietal- occipital region of the left - contused wound , the bottom of which is the fascia .

Determine the volume of the first medical aid .

5 . Man , 23 years old, have caused injury to the unknown . A serious condition . Consciousness is retained. Pulse weak to 120 aftershocks for 1 min. On examination identified two stab wounds of the chest at the level of the second intercostal space case on mid-clavicular line. Wounds sucked air.

Determine the volume of the first medical aid .

6. Male 32 years old , suffered when worked in the stairwell of the house unknown explosive device . Said a short loss of consciousness. Retrograde amnesia is not. Pulse 84 beats . for 1 min. , satisfactory quality . The left side of the neck, in the projection m. sternocleidomastoideus have three shrapnel wounds 2x diameter of 3 mm. The left half of the neck swollen , highlighted by a hematoma that is not throbbing and gradually increases in volume.

Determine the volume of the first medical aid .

7. Man, 26 years old, in a conflict situation was a penetrating wound in the stomach with a knife . Condition progressively deteriorated. Increasing pallor of the skin. Pulse frequent , weak filling .

Determine the volume of the first medical aid .

8. The victim identified men incised stab wound to the anterior- medial aspect of the right thigh , which he received during the scuffle . The wound is defined by massive bleeding pulsating character. The wound is in the middle third of the thigh. What kind of help should be provided to the victim before the arrival of the ambulance crew ?

9. The victim after examining the ambulance diagnosis - fracture of the left femur in the lower third . Specify the mode of transportation of the injured to the hospital .

10 . Boy , 14 years old, fell from a gymnastic and hit his head . There has been a short-term (a few seconds) loss of consciousness. As soon as arrived at was a one-time vomiting . To recall the circumstances of what happened are not mozhet.Poyavilas swelling in the neck area , skin intact, pale . The patient flimsy . Pulse - 84 stroke per minute. High blood pressure - 115/75 mm Hg. Art. Cranio -cerebral and meningeal simtomov not.

Your preliminary diagnosis ? What kind of help you will find yourself the victim ?

11. In rural hospitals , which is 35 cl from the district center , passing transport from the place of road adventure delivered a man at the age of 20 years. Unconscious. Abrasions on his face , the asymmetry of the folds. Anisocoria . Local soft tissue swelling in the right temporo- parietal region . Pulse - 52 stroke per minute. High blood pressure - 100/ 70 mm Hg. Art. Signs of damage to the chest and abdomen is not established.

What is the preliminary diagnosis in this patient ?

Which will you do?

12. Patrol police detachment induced by ambulance . Arriving on the scene, saw a man lying on his back , which in the chest in the VI intercostal space on the left front of the subclavian line is sticking a knife. The consciousness of the victim is violated, contact almost impossible . Pupils are narrow. Pulse - 120 beats per minute , is defined only for large vessels . Blood pressure - 70/ 40 mm Hg. Art. The breath left sharply reduced.

How to deal with a knife that sticks in the wound ?

What assistance do you provide to the victim?

7. References:

General:

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8. The distribution points are awarded to students:

At mastering topic number 13 to content module 4 for training activities for students rated a 4-point scale (traditional) scale, which is then converted into points as follows:

rating	Points
5 (excellent)	5
4 (good)	4
3 (satisfactory)	3
2 (poor)	0

Guidelines prepared
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