Plan of practical classes VI semester

Contents

Lesson 1 "*Study of the surgical instruments. Separation and connection of the tissues.*"

Control questions.

1. Surgical instruments: groups, destination, instruction for use.
2. Types of knots (Granny`s, Reef (sea), surgeon`s, triple). Technique of tightening.
3. Types of sutures (ordinary, interrupted, continuous, blanket, matress). The rules of its imposing and removal.
4. The rules of separation and connection of the tissues.
5. Infiltrating anesthesia technique.
6. Preparation of the field of operation.
7. Techniques to stop the bleeding within a wound and on an extent.

Self-work. To master the rules of using the surgical instruments, technique of local anesthesia (by Vishnevsky A.V.), of separation and connection of the tissues by different kinds of the sutures.

To perform the method of stitches removal, of the bleeding arrest within a wound.

The self-control tests:

1. List the clamps, which stop the bleeding (haemostatic forceps). 1-5
2. Explain right way to grasp a needle by a needle-holder.
3. Explain the right correlation between the ligature ends length for suturing.
4. How should be situated points of needle pricks at imposing of the interrupted suture?
5. List what tissues the surgical tweezers (pincers) grasp. 1-2
6. List the kinds of knots used in surgery. 1-3
7. Specify main requirements for the surgical tools.
8. Name two main kinds of the scalpels.
9. Specify the ways of a scalpel holding at the skin cutting. 1-2
10. Name the kinds of the surgical scissors, which are common surgical tools. 1-3
11. Name the forceps for stopping the bleeding, which are common surgical tools. 1-4
12. Specify the technique of aseptic skin suture removal.

Educational material

I. Lecture

II. Recommended literature

1. Somen Das. A practical guide to Operative surgery. 4th ed/ 1999. P.13-26, 494-503
2. Robert M. Zollinger, E. Christopher Ellison. Atlas of surgical operations. 9th ed/ 2011. P. 1-3
   https://www.academia.edu/8326284/ZOLLINGER_S_ATLAS_OF_SURGICAL_OPERATIONS

3. Greg R.McLatchie, David J.Leaper. Operative surgery. 2nd ed/2007. P/92-139
https://www.academia.edu/34978950/Operative_Surgery_2nd_Ed_pdf
4. V.K.Gostishcev. General surgery. 2003. P. 24-31

III. Videos

Basic surgical skills

Iinstrument handling https://youtu.be/eICH1xWKCUY

Knotting https://youtu.be/R3QztUpW_9w

Suturing https://youtu.be/osgndmRBjsM

Vessel ligation https://youtu.be/MBbmJb2X1Nk

Vessel ligation_ https://youtu.be/5-E57ttwyUI

Lesson 2. "*Topographic anatomy of the shoulder (scapular, deltoid, axillary regions), the shoulder joint and the upper arm.*"

Control questions.

1. Topographic anatomy of scapular region. The osteo-fascial beds (sheaths). The vessels and nerves.
2. Topographic anatomy of deltoid region. Incisions in phlegmons of deltoid region.
3. Surgical anatomy of the shoulder joint. The joint capsule, its weak places. The blood supply and innervation. The aspiration of the shoulder joint.
4. Topographic anatomy of the axillary region. The axillary fossa. The axillary cavity: anterior wall, the clavipectoral, pectoral and subpectoral triangles. Posterior wall, the trilateral and quadrilateral foramina. The contents of the axillary cavity: lymph nodes, vascular and nervous bundle.
5. Surgical anatomy of the axillary artery. Its exposure and ligation. The ways of collateral circulation development.
6. Surgical anatomy of the brachial plexus.
7. Topographic anatomy of the arm. The fascial compartments and their clinical sighificance.
8. Topography of the vascular and nervous structures in upper, middle and lower thirds of the arm. The radial nerve exposure in the middle third of the arm.
9. The fascial spaces of the shoulder and arm. Anatomic ways of the inflammatory processes spread.
10. Incisions in phlegmons.

Self-work. To study on a corpse, the surgical anatomy of the axillary and brachial arteries.

To master the technique of approaches and ligating of the axillary and brachial arteries on an extent.

To master the technique of the shoulder joint puncture.

Self-control tests:

1. List secondary cords of the brachial plexus: 1-3
2. List the nerves formed from posterior cord of the brachial plexus: 1-2
3. List the nerves formed from lateral cord of the brachial plexus: 1-2
4. List the nerves formed from medial cord of the brachial plexus: 1-3

5. Name, muscles that form the walls of the trilateral foramen of axillary cavity. Specify what vessel passes through it.
6. Name the correlations between axillary artery, axillary vein and brachial plexus at the pectoral triangle level.
7. Name which of nerves may be damaged at fracture of the surgical neck of humerus.
8. Name a projective line of axillary artery by Pirogoff.
9. Name the layers, which are passed through at approach to axillary artery.
10. Name the arteries forming collateral arterial circle by anastomosing with each other at the region of scapula.
11. Indicate the correlations between radial nerve and humerus at the level of middle third of the arm.
12. Specify what anatomic landmarks correspond with projective line of brachial artery.
13. Show the position that the upper limb accepts in the radial nerve damage in middle third of the arm.
14. What fascial compartment is the ulnar nerve located at the lower third of the arm?

Situation tasks.

1. The patient having lower medial dislocation in the shoulder joint was admitted to the traumatology first aid department. Specify why the head of the humerus may be displaced downward and medially.
2. The thrombosis of the axillary artery developed above the place of branching the subscapular artery in connection with hard contusion. Give explanation the ways of supplying the upper limb.
3. The thrombosis of the axillary vein developed at the level of the pectoral triangle. What operative approach should be performed for exposing the vein? What external and internal landmarks are necessary to define the vein position under the relation to other elements of axillary vascular-nervous bundle?
4. The patient suffering from a phlegmon of the axillary region as a hydradenitis complication was admitted to the surgical infection department. Name the possible ways of the infection spread.
5. Ligation of the axillary artery was made on the pectoral triangle level (above the place of branching the subscapular artery) concerning a wound. Explain the way to restore the upper limb blood supply.
6. Name the elements of the vascular-nervous bundle, which it is necessary to allocate for accessing to the radial nerve in the axillary cavity. What muscle tendon may help to find the radial nerve within the operational wound?
7. The subclavian vein was damaged during the operative reposition of the clavicle fragments that caused the danger of air embolism. What topographic and anatomical correlations between the subclavian vein and adjacent tissues may make for this complication?
8. The patient who has been admitted to the surgical department has a knife wound in the right scapular region at a level of the acromion base. The strong bleeding developed at the wound expansion for revising. What vessels were damaged?
9. The patient being admitted to the traumatology department has a fracture of the humerus at the surgical neck level and an extended haematoma of the deltoid muscle. Specify what damaged vessels might cause the haematoma in the subdeltoid space.

10. The patient has to be operated for removing the thrombus from the axillary vein. List consistently the tissues, which must be allocated for exposing the vein at a level of the lower clavicle border in the clavi-pectoral triangle.
11. The patient having a fracture of the humerus in the upper third was admitted to the traumatology department. How will the proximal and distal fragments be located in result of muscular contraction?
12. The symptoms of the ulnar nerve damage developed at a fracture of medial epicondyle of the humerus. What tissue should be cut for accessing to the ulnar nerve? What anatomic landmarks should be used?
13. The big nervous trunk was found in the operative wound after cutting the proper fascia during accessing to the brachial artery in the cubital fossa. What is this trunk? May it serve as a landmark for finding the brachial artery in the wound?
14. The thrombosis of the brachial artery developed at a level of the upper third of the arm. Name the collaterals, which will supply the upper limb?
15. The olecranon traction and displacement upward have taken place when the patient fell. What muscle contraction caused the olecranon displacement?
16. The exposing of the ulnar nerve was made at the boundary of the middle and lower thirds of the arm. The incision followed a projective line of brachial vascular-nervous bundle, but the ulnar nerve hasn't been found in anterior fascial compartment. Why? Where may it be located?
17. Where brachial artery should be press for temporary stopping of the bleeding from a wound in the elbow region?
18. The patient arm leaned on the border of operative table during prolonged anaesthesia. The move restriction of thumb and IInd fingers extension developed in the patient during postoperative period. How may this pathology be explained?
19. The symptoms of skin innervation failure in the forearm posterior region and the hand dorso-lateral surface developed in the patient after plaster cast removing, due to imposing by the fracture in the middle third of the humerus. How may this pathology be explained?
20. The strong bleeding in the subcutaneus tissue began during exposing to the brachial artery at the boundary between the middle and lower thirds of the arm. What vessel was damaged? What should be done to stop the bleeding?
21. The approach to the brachial artery is made at the level of the middle third of the arm. The large vessel and nerve trunk were found in a splitting of the proper fascia on a projective line of brachial vascular-nervous bundle. Name consistently the vessels and nerves, which were exposed during accessing.

Educational material

I. Lecture
II. Recommended literature

1.Richard S.Snell. Clinical anatomy by regions 9th ed/ 2012. P.337-378

2.B.D.Chaurasia. Human anatomy 3th ed/2003. Vol.1 P.1-28, 41-50, 57-92, 131-138

III. Interactive 3D atlas "Visible body" https://www.visiblebody.com/anatomy-and-physiology-apps/human-anatomy-atlas
IV. Videos

1. Septic Arthritis of Shoulder Joint Aspiration

https://youtu.be/LR5K2YLiX_U

2. Shoulder joint aspiration (puncture) posterior approach

https://youtu.be/OAeOEc-X0kU https://youtu.be/HvH__fP__RU

Lesson 3.**"*Topographic anatomy of the elbow region, forearm and hand.*"**

Control questions.

1. Topographic anatomy of the cubital fossa and its vascular-nervous structures. The exposing and ligating of the brachial artery in the cubital fossa. The arterial collaterals in the elbow region. The ulnar nerve.
2. Surgical anatomy of the elbow joint. The joint capsule, its weak places. The blood supply and innervation. The aspiration of the elbow joint.
3. Topographic anatomy of the forearm anterior region. The muscular layers. Topography of the vascular and nervous structures in the upper, middle and lower thirds of the forearm. The Parona-Pirogoff's fascial space, its communications with the closest spaces.
4. Topographic anatomy of posterior aspect of the forearm. The vessels and the nerves.
5. Surgical anatomy of the wrist. The wrist joint.
6. Topographic anatomy of the palm. The fascial compartmentes, the cellular spaces of the palm. The vascular-nervous structures.
7. Topography of the flexor synovial sheaths and the synovial bursae. Their structure and value in spread of the hand inflammatory processes.
8. Topographical and anatomical substantiation of the incisions in the hand phlegmons and the felon or whitlow (panaritium).

Self-work. To prepare on a corpse and to study on ready-made preparations:

a) topographic anatomy of the elbow region, forearm, and wrist;
b) show on a corpse vascular-nervous bundles of the elbow region, forearm and wrist;
c) perform on a corpse the ulnar artery ligation in the middle third of the shoulder and in the cubital fossa;
d) perform the aspiration of the elbow joint;
e) study the ways of the purulent inflammatory processes spread in the elbow region, forearm and hand;
f) show on a corpse fascial compartments of the palm, the superficial and deep palmar arterial arches, the median nerve, the radial and ulnar nerves, the digital nerves and arteries, the synovial sheaths of the palm;
g) study the features of current and spread of the hand inflammatory processes;
h) study the surgical anatomy of the superficial and deep palmar arterial arches;
i) master the technique of the incisions in purulent diseases of the fingers and the hand.

Self-control tests:

1. Name the muscles, which the ulnar nerve supplies on the forearm. 1-2
2. Name what nerves innervate the muscles of the anterior compartment of the forearm.
3. Name the main ways of pus spread from the Parona-Pirogoff's fascial space. 1-3
4. Explain the symptoms, which may be caused by the median nerve damage in the arm and in the upper third of the forearm. 1-2
5. Explain what symptoms characterize the ulnar nerve damaging. 1-2
6. Name what nerve innervates the muscles of posterior compartment of the forearm.
7. Specify what symptoms prove the diagnosis of the radial nerve deep branch damage.2
8. Explain where and in what position the elbow joint puncture is performed.
9. Show where and between what muscles the median nerve is located in the middle third of the forearm. 1-2
10. Name the fascial spaces of the palm. 1-3
11. Name the muscles of the thenar, which are innervated by the median nerve.
12. Show the nerve, which passes through the wrist canal.
13. Name the anatomic structures which the superficial palmar arterial arch 1-2
14. and the deep palmar arterial arch are located between. 1-2
15. List the muscles of the hypothenar. 1-4
16. Specify what synovial sheaths have the end in the lower third of the forearm. 1-2
17. Specify what incisions are used at the phlegmons of the palm median fascial compartment.
18. List the kinds of the felon or whitlow (panaritium). 1-8

Situation tasks

1. The olecranon traction and displacement upwards developed when the patient fell. What muscle contraction has caused the olecranon displacement?
2. Explain where the brachial artery should be pressed for temporary the bleeding stop from a wound in the elbow region.
3. After the elbow injure the spheroid swelling with the precise borders has formed in the olecranon area. Explain what tissues this swelling is located in. Is this swelling connected with the elbow joint cavity?
4. Show the external landmarks for the brachial artery and the median nerve in the cubital fossa.
5. A haematoma developed in the subcutaneous tissue, surrounding the vein, during a puncture of the median cubital vein. As a result the pain developed irradiating along anterior-medial surface of the forearm. Specify what nerve was damaged or squeezed by this haematoma.
6. The purulent leakage developed in posterior surface of the upper arm in patient who suffered from intermuscular phlegmon of lateral cubital fossa compartment. Explain the anatomic ways of the infection spread.
7. The patient having a deep incised wound in the anterior-lateral part of the cubital fossa was admitted to the surgical department. The wound 2 cm in size was located at the level of the elbow

fold (bend) outside of the biceps tendon. Specify what muscles could be damaged. What nerves function is necessary to be checked for diagnosing?

8. What collaterals will provide the upper limb supply in case of the brachial artery thrombosis within the cubital fossa?
9. The radial artery was ligated at the level of the lower forearm third caused by its damage. What arteries will supply the hand?
10. The patient having a deep incised wound (by glass) in the lower forearm third was admitted to the surgical department. The wound has transverse direction on anterior medial surface of the forearm. The strong bleeding developed in the wound. List the tissues, which may be damaged. Mention the possible sources of bleeding. Which nerve function is necessary to be checked at surgical debridement of a wound?
11. Sharp glass splinter damaged the soft tissues in the lower third of anterior surface of the forearm. The wound is located between the styloid processes of the ulna and radius. List the tissues, which may be damaged. Which muscles function is necessary to be checked for diagnosing?
12. The patient had a fracture of both bones of the forearm in the middle third. How will the fragments be situated? What muscles act to its?
13. The purulent leakage developed in dorsal surface of the forearm in patient who suffered from Parona-Pirogoff's deep space phlegmon. Specify: a) anatomic ways of the pus spread; b) what intermuscular fissure should be drained for the pus removal on dorsum of the forearm?
14. The skin sensation failures developed on dorso-lateral surface of the hand after healing of the incised wound, which was located on lateral surface of the forearm 2 cm above the styloid process of the radius. What structure damage may cause these symptoms?
15. The radius fracture in the upper third developed at falling on the extended hand. How will the fragments be situated? What muscles act to its?
16. The painful swelling developed along the lateral boder of the posterior wrist surface in patient who suffered from suppurative inflammation of the wrist joint. The purulent leakage is suspected. Explain what kind of the leakage took place from the wrist joint cavity?
17. Sharp glass splinter damaged the tissues of the middle third of anterior-lateral surface of the forearm. The strong bleeding occurs from the wound. Point to the possible source of bleeding. What nerve function is necessary to be checked?
18. The patient had the radius neck fracture. It was found after removal of POP bandage: a) function failure of the extensors of the fingers and hand (the fingers are flexed in the metacarpo-phalangeal joints); b) the skin sense of posterior surface of the forearm is kept. Explain what nerve is squeezed by osseous callus; which nerves are intacted.
19. The ulnar artery was ligated at the level of upper third of the forearm. What arteries will supply the hand?
20. The patient has the diaphyseal fracture of both bones of the forearm in the upper third. How will the fragments be situated? What muscles act to its?
21. The fracture of the radius in the typical place developed as a result of the fall on the extended hand. How will the fragments be situated? What muscles act to its?
22. The pus has spread into the commissural aperture of the palm as a result of callosity abscess (corn abscess) of the 2nd finger. Where may the leakages be located?
23. What may complicate the felon (panaritium) of the distal phalanx if the connective tissue fibers between the skin and periosteum aren't enough cut and the injured tissues aren't removed during operation?

24. The operation was performed for the thumb tenosynovitis and radial tenobursitis. The absence of the thumb opposition was found after operation. Specify what mistakes could cause this complication.
25. The patient having a stab wound outside the pisiform bone was admitted to the surgical department. The strong bleeding from the wound aggravated his condition. What nerve function is necessary to be checked at surgical debridement?
26. Necrosis of the tendons of flexors digitorum superficialis and profundus was found on the opening and revising of the synovial sheath during operation for the 3rd finger tenosynovitis. What is a cause of necrosis?
27. The patient complaining of the suppurative inflammation of the callosity at the head of 3rd metacarpal bone has addressed to polyclinic. Point to the possible ways of pus spread. What operative method should be used?
28. The patient has U-shaped phlegmon of the palm. Show the incisions that should be used for draining this type of phlegmon.
29. The periungual nail wall (fold) suppurative inflammation developed after manicure. What is the name of this kind of felon?
30. The patient has incised wound on the hand in the "anatomical snuffbox" area. The bleeding occurs from the wound. Point to the possible source of bleeding.
31. The patient has a phlegmon of the hand dorsally. Specify what structures the pus accumulation may be located between. How should the drain incisions be performed?
32. The patient has U-shaped phlegmon of the palm as a result of trauma of the thumb palmar surface. What variant of structure of the flexors tendons sheaths may cause this spread of the suppurative infection?
33. The arterial bleeding developed during operation caused by a phlegmon of the palm median fascial compartment. What can be injured on the opening the phlegmon?
34. The patient has the 2nd finger tenosynovitis. What structure may be injured on inserting a rubber strip behind the tendon?
35. The strong pain irradiating in the palmar surface of the hand developed in the pisiform bone area while falling on the right hand. Specify what structure damage may cause this symptom.

Educational material

I. Lecture

II. Recommended literature

1. Richard S.Snell. Clinical anatomy by regions 9th ed/ 2012. P.378-434
2. B.D.Chaurasia. Human anatomy 3th ed/2003. Vol.1 P.93-130, 138-146

III. Interactive 3D atlas "Visible body" https://www.visiblebody.com/anatomy-and-physiology-apps/human-anatomy-atlas

IV. Videos

Elbow Joint Aspiration (puncture) https://youtu.be/O7VLsf_i8_8

Purulent processes of the fingers https://youtu.be/5BX7-3J7Id8

Paronychias and Felons surgery https://youtu.be/G9CBKoKEvRM

Lesson 4. "***Topographic anatomy of the gluteal region and thigh. Ligation of the femoral artery. The hip joint puncture. Incisions in the hip phlegmons. Femoral hernias***"

Control questions.

1. Topographic anatomy of the gluteal region. Fasciae and fascial spaces, their clinical value. Anatomical ways of spread of the inflammatory processes in the gluteal region.
2. Surgical anatomy of the hip joint. The puncture of the hip joint.
3. Topographic anatomy of anterior region of the thigh. Fascia lata of the thigh. The obturator canal. Hunter's canal (adductor).
4. Femoral canal. Surgical anatomy of the femoral hernias.
5. Surgical anatomy of the femoral artery. The exposing and ligating of femoral artery in the upper and lower thirds of the thigh. The ways of collateral circulation development.
6. Surgical anatomy of posterior aspect of the thigh. The exposing of the sciatic nerve, the ways of the pus spread. Incisionsin in the phlegmons.

Self-work.

a) to separate on a corpse and to study on the ready-made material topographic anatomy of the gluteal region and thigh;
b) to be able to show on a corpse the femoral canal walls and its rings, the vasculo-neural bundles of the thigh at different levels;
c) to study surgical anatomy of the femoral artery, to master the technique of accessing and ligating of the femoral artery;
d) to perform the hip joint puncture;
e) to develop theoretically the ways of the inflammatory processes spread in the gluteal region and thigh, to be able to perform the incisions for its opening;
f) to explain topographo-anatomic basis of the hernias formation on the femoral hernia example.

Self-control tests:

1. Name the vasculo-neural structures of the suprapiriform foramen. 1-3
2. List the nerves, which pass through the infrapiriform foramen. 1-4
3. Name the vasculo-neural structures passing through the lesser ischial foramen. 1-3
4. List the possible ways of the pus spread at the gluteal region phlegmons. 1-3
5. Name the vessels and nerves passing through the adductor canal anterior opening. 1-3
6. Specify the canal where the pus spread may take place from the pelvic cavity into the compartment of adductor muscles.
7. List the ligaments, which strengthen the hip joint. 1-4
8. Specify what structures form the walls of the adductor canal. 1-3
9. Specify why Ken's line is used in clinical practice.

10. Name the landmarks of the upper and lower points of Ken's line (projective line of femoral artery). 1-2
11. Name the femoral artery branches, which take part in collateral circulation after the femoral artery occlusion at the level of inguinal ligament. 1-4
12. Name the walls of the deep ring of the femoral canal. 1-4
13. Specify what structures form the walls of the femoral canal. 1-3
14. Specify what structures form the superficial ring of the femoral canal.
15. Specify what structures form the borders of the femoral triangle. 1-3

Situation tasks.

1. The patient has a varicose extension of the greater saphenus vein that limits his working capacity. Where the valve is located, which failure may lead to this disease? What external and internal landmarks should be used for finding this valve?
2. The surgeon decided to operate on the patient with comminuted fracture of the femur on the middle third under Novocain block. He chose the anterior approach for this procedure. Show anatomic structure, which the needle will pass through. Why the surgeon chose anterior approach?
3. The patient suffers from the lumbar vertebra tuberculosis, which was complicated by the tuberculous leakage (abscess) up to the lesser trochanter. Specify what muscle compartment provides the tuberculous leakage spread on the anterior aspect of the thigh.
4. The purulent leakage was formed into the fascial space of the femoral triangle in patient suffering from intermuscular phlegmon of the adductors bed. Explain the possible ways of infection spread.
5. Obliterating endarteritis (Arterial occlusive disease) of the femoral artery was complicated by arterial thrombosis at the level of the lacuna vasculorum. Specify what arterial collaterals will supply the lower limb.
6. The patient having an incised wound was admitted to the surgical department. The wound sized 5 cm was located on the boundary between the middle and lower thirds of anterior medial surface of the thigh, on projection of the femoral vessels, and was transverse-directed. Skin sense was broken downward from this level and on medial surface of the leg. The bleeding was moderate. Specify what vessels and nerves may be damaged in this type of wounds.
7. The profuse bleeding developed during femoral herniotomy during of the hernial sac separating within the femoral canal walls. Specify what vessel forming the femoral canal wall the surgeon may damage.
8. The woman addressed to a neurologist with complaints of the pains on the thigh medial surface. There wasn't any pathology in this region. Neurologist recommended the patient to consult at the gynecologist. Why did doctor advise to do that?
9. The patient is suffered from a phlegmon of the deep fascial space of the gluteal region. The purulent leakage formed into the ischiorectal fossa and posterior aspect of the thigh. Explain the possible ways of the pus spread into these regions.
10. The purulent leakage formed on anterior lateral surface of the thigh in patient suffering from a phlegmon of the deep fascial space of the gluteal region. Explain the possible ways of the pus spread.
11. The purulent leakage formed into the fascial space of the femoral triangle in patient suffering from suppurative coxitis. Explain the possible ways of the pus spread and the internal landmarks, which may help to get to the infection source.

12. The metastases of melanoma in the inguinal lymph nodes were found in patient. Specify what should be removed for withdraw all inguinal lymph nodes; what anatomic structures may be found at the bottom of the postoperative wound?
13. The patient was admitted with a wound in the gluteal region at the level of upper vascular-nervous bundle. The surgeon found the superior gluteal artery damage at inspection and decided to ligate it in a wound. What structure should the surgeon cut for exposure the artery in the wound?
14. The operative reposition was necessary in the patient with the femur neck fracture. What topographo-anatomic relations between the synovial capsule of the hip joint and the femur neck should the surgeon take into account for choosing the right strategy of reposition?
15. The solution of magnesii sulfate was injected intramuscularly into the gluteus maximus muscle to the patient suffering from hypertension. This cause occurrence of the abscess in the gluteal region. What topographo-anatomic relations between the gluteal fascia and the gluteus maximus muscle should the surgeon take into account for radically draining the abscess?
16. The patient has the obturator hernia. Show the external and internal landmarks, which the surgeon should take into account for exposing the hernial sac from the adductor muscles compartment.
17. The neurologist decided to perform Novocaine block of the sciatic nerve from side of posterior region of the thigh in patient suffering from ischialgia (pain along of the sciatic nerve). Name the external landmark, which may help to definite the point of the needle entering.
18. The patient having the femur fracture at a level of the middle third was admitted. The fracture is accompanied by increasing haematoma in posterior compartment of the thigh. Specify what vessels damage may lead to it, what internal landmarks can help the surgeon to find these vessels for final stopping of the bleeding.
19. The sciatic nerve is damaged in the middle third of the thigh. Name the external and internal landmarks, which the surgeon should take into account for exposing the sciatic nerve. What structure should be saved during the operative approach?

Educational material

I. Lecture

II. Recommended literature

1. Richard S.Snell. Clinical anatomy by regions 9th ed/ 2012. P.435-469
2. B.D.Chaurasia. Human anatomy 4th ed/2004. Vol.2 P.45-94, 129-142

III. Interactive 3D atlas “Visible body” https://www.visiblebody.com/anatomy-and-physiology-apps/human-anatomy-atlas

IV. Videos

Hip joint puncture (how to perform) https://youtu.be/LwZBAvPDNac

Ultrasound guided hip joint fluid aspiration https://youtu.be/vbqIMK7iH7M

Lesson 5. *"Topographic anatomy of the knee region, the leg, the ankle joint. Morphological and functional substantiation of the nerve suture."*

Control questions.

1. Topographic anatomy of anterior region of the knee. The synovial bursae of the knee joint.
2. Topographic anatomy of posterior region of the knee. The popliteal fossa. Topography of the vascular-nervous structures.
3. Surgical anatomy of the knee joint. The joint capsule, its "weak" places. The synovial recesses and its value in the pus spread at arthritis. Blood supply and nerve supply. The joint puncture.
4. Topographic anatomy of anterior region of the leg. Topography of the vascular-nervous structures in the upper, middle and lower thirds of the leg. The cruro–popliteal canal. Communications of the fascial spaces of the leg with the ones of the popliteal fossa and foot.
5. Topographic anatomy of the ankle joint region.

Self-work.

a) to study on a corpse and on the prepared material topographical anatomy of the knee region, the leg, the ankle joint;
b) to be able to show on a corpse the vasculo-neural bundles of the popliteal fossa and leg;
c) to study surgical anatomy of the popliteal artery, to master the technique of accessing and ligating the popliteal artery;
d) to perform the knee joint puncture;
e) to develop theoretically the ways of the inflammatory processes spread from the popliteal fossa and leg;
f) to master the technique of the nerve suture.

Self-control tests:

1. Name the knee joint capsule parts where the synovial fluid accumulates.
2. Specify how many synovial recesses the knee joint capsule has.
3. Specify what canals the pus may pass through from the popliteal fossa. 1-2
2. Name the walls of the lower musculo-fibular canal. 1-3
3. Name the walls of the cruro-popliteal canal. 1-4
4. Name the contents of the cruro-popliteal canal in the lower third of the leg.
5. Name main branches of the sciatic nerve. 1-2
6. What elements form walls of the popliteal fossa? 1-4
7. Name the main branches of the popliteal artery.
8. Specify what approach are used for exposing the popliteal artery. 1-2

9. Name the apertures of the cruro-popliteal canal, and structures that pass through its. 1-6
10. List the muscles of anterior fascial compartment of the lower third of the leg in direction outside inside. 1-3
11. Show the projection of the main vasculo-neural bundle of posterior compartment of the leg, their syntopy. 1-3
12. Show the projection of the main vasculo-neural bundle of anterior compartment of the leg.
13. Name syntopy of the main vasculo-neural bundle of anterior compartment of the leg in the upper third, middle third, lower third.
14. Name what structures form the walls of the upper musculo-peroneal canal, and structures that passe through it. 1-3
15. Specify what nerve damage leads to the foot position, so-called “pes equinus” (“horse” foot).
16. Specify what nerve damage leads to the foot position, so-called “pes calcaneus”.
17. Name the points where the knee joint puncture is performed. 1-2
18. Name the lines of the skin incisions at arthrotomy of the knee joint. 1-4
19. Name bones that form the ankle joint.
20. Name main vessels and nerves of the foot.

Situation tasks

1. The popliteal artery occlusion developed above branching the superior genicular branches. What arterial collaterals will restore the leg supplying?
2. The patient addressed to the surgeon with the complaints on the “tumors” (swellings), which have precise borders, are located on anterior surface of the knee: in front from the patella, in front from the tibial tuberosity, in medial surface of medial epycondyle of the femur. There aren’t the signs of an inflammation process in this area. The fluctuation is found at palpation of the “tumors”. Explain what structures may simulate the “tumors” in the knee region.
3. The surgeon found the tibial nerve at accessing to the popliteal artery by the vertical incision on the middle of the popliteal fossa. May this nerve be used as internal landmark for exposing the popliteal artery?
4. The purulent leakage developed in the fascial compartment of the popliteal muscle in patient, who suffers from the suppurative gonitis. What are the topographo-anatomic conditions of this complication?
5. The nurse of the traumatology department hit the knee lateral surface (at the level of the fibular head base) to the metallic corner of a chair. The pain was so sharp that she has lost consciousness in moment. What structure injure may cause this reaction?
6. It is decided to ligate the vena saphena parva at its draining into the popliteal vein for the varicosity. What external and internal landmarks should the surgeon use for exposing the place of drainage of the vena saphena parva.
7. The injured man, who was admitted to the traumatology department from a road accident, had the open fracture of both bones of the leg, crushed soft tissues at the level of the upper third of the leg, strong bleeding from the tibial artery. The surgeon decided to stop bleeding by ligation on an extent. Prove topographo-anatomically choice of the approach to the popliteal artery for its ligation at the same time having saved the arterial anastomoses of the knee region.
8. The patient suffering from hard serious (grave) gonitis was admitted. He should be operated on immediately. Why is the anterior approach to the knee joint better than the posterior one?
9. It was decided to perform extraarticular economical resection of the joint (closely to a place of the synovial scapsule attachment) for serious disease of the knee joint. Prove topographo-anatomically what level the surgeon should saw the femur, tibia and patella on for executing this operation.

10. The common peroneal nerve is damaged at the level of the popliteal fossa. It is decided to perform primary surgical debridement with the nerve suturing. What external and internal landmarks should the surgeon use for exposing the ends of the damaged nerve?
11. The patient has the leg lateral surface blow (trauma) at the level of the fibular head. The foot is flexed and rotated outside (supitated). What structure damage may cause this pathology?
12. The patient has a deep incised wound on anterior surface of the lower third of the leg outside of the tibia. The strong bleeding accompanies this injure. The position of the foot is plantar flexion. What structures are damaged?
13. The purulent leakage was seen within anterior fascial compartment of the leg in patient suffering from the popliteal fossa phlegmon. Explain the way of the pus spread.
14. The greater saphenous vein was removed and the varicose nodes were dissected on the leg for the varicosity. What anastomoses will provide the blood outflow?
15. The patient addressed to the surgeon with the complaints on the sense failure in lateral surface of the leg lower third and in dorsum of the foot. A thick scar exists on the boundary between the middle and lower thirds of lateral surface of the leg. The scar is located in transverse direction, by the size 5 cm. Are the complaints connected with the wound? What structure could be damaged, what layer it is located in?
16. The pus spread into the deep fascial space of the leg in patient suffering from suppurative gonitis. Explain the possible ways of the pus spread.
17. The injured man was admitted to the traumatology department with a fracture of both bones of the leg in the middle third and the fragments have diastasis. How will the fragments be situated? What muscles contraction causes its location?
18. The strong bleeding developed both in anterior fascial bed and in the deep part of posterior fascial bed close to the fibula during the wound revising at the open fracture of both bones of the leg in the middle third. What vessels could be damaged by fragments of the leg bones?
19. The osseoplastic amputation of the leg was performed to the patient. The transplant from the calcaneus closed the section. Necrosis of the osseous transplant took place in postoperative period. What vessels failure may cause this complication?
20. The patient with the bimalleolar fracture of the leg bones and the extended haematoma in the medial malleolus area was admitted to the traumatology department. What vessels damage may cause this complication?
21. The patient has the endarteritis of the lower limb that is accompanied by pulse absence both on the dorsal pedis artery and the posterior tibial artery. Name the level where main artery was occluded that caused the failure of blood supply.

Educational material

I. Lecture

II. Recommended literature

1. Richard S.Snell. Clinical anatomy by regions 9th ed/ 2012. P.470-526
2. B.D.Chaurasia. Human anatomy 4th ed/2004. Vol.2 P.95-128, 143-162

III. Interactive 3D atlas “Visible body” https://www.visiblebody.com/anatomy-and-physiology-apps/human-anatomy-atlas

IV. Videos

Knee joint puncture (aspiration)

https://youtu.be/TSJTOaOVcQM https://youtu.be/cLmfIvdToPE

Lesson 6. *"The limbs amputation, the operations on the limbs joints, on the vessels. The vascular suture, nerve and tendon suture."*

Control questions.

1. Surgical approaches to main vessels of the limbs (direct and indirect).
2. Venesection on the upper limb.
3. Manual and mechanical suture of the vessels (by Carrel, Polyantsev-Gorsley, Soloviev). Grafting of vessels.
4. Technique of imposing the tendon suture (by Cuneo, Lange, Kazakov, Bunnell).
5. Suturing technique of peripheral nerve (suture sciatic, median strength and radial nerves).
6. Arthrotomy of the shoulder, elbow and knee joints.
7. Amputation of the thigh, upper arm, forearm. Osteoplastic amputation of the leg by Pirogoff. Amputation of the thigh by Gritti-Stokes-Shimanovsky.

Self-work.

1. To study special surgical instrumens. To master the rules of using the surgical tools, which are used at the operations on the vessels, nerves, tendons, bones and joints, of the Cuneo's tendon suture.
2. To know theoretically and to be able to perform exposing of the vessels and nerves, ligation of the vessels on an extent, venesection technique, Carrel's suture. To know imposing the vascular and tendon suture.
3. To master the principles of the operations on vascular system. To made the knee joint arthrotomy. To study technique of is often used amputations.

Self-control tests:

1. Specify what approach is used (direct or indirect) for the axillary, brachial, radial arteries.
2. Specify what muscles fascial compartment it approaches through to the brachial artery in the middle third of the upper arm, to the femoral artery in the middle third of the thigh.
3. Name the muscles tendons, which it finds the radial artery in the lower third of the forearm between. 1-2
4. Name the special surgical instruments that help to carry out the ligature under the artery.
5. Name main ways of the vessels ligation. 1-2
6. List main acquirements for the vascular suture. 1-4
7. Explain the direction of the skin incision at exposing the radial nerve in the middle third of the upper arm. Name the external landmarks, which are used for it. 1-2
8. Specify what approaches are used for exposing the sciatic nerve. 1-2
9. Name main features of technique of the peripheral nerve suture. 1-3

10. Name the specific features of technique of the digital flexors tendon suture that prevents rupture of the tendons ends.
11. Name the nerve, which is located in anterior compartment of the lower third of the forearm and is similar to the muscle tendon.
12. Give definition of the term “the limb amputation”.
13. List the kind of the limb truncation. 1-2
14. List the kinds of operations depending on the time of operation. 1-3
15. Specify main steps of amputation performing.
16. List the amputation methods in dependence from the tissues types, which are used for closing the bone section. 1-4
17. Name the leg amputation that developed by Pirogoff.
18. Give definition of the term “arthrotomy”.
19. List the steps of performing the knee joint arthrotomy.
20. Specify main steps of the thigh amputation by Gritti-Stokes-Shimanovsky.

Educational material

I. Lecture

II. Recommended literature

1. Robert M. Zollinger, E. Christopher Ellison. Atlas of surgical operations. 9th ed/ 2011. P. 322-345
2. Somen Das. A practical guide to Operative surgery. 4th ed/ 1999. P.48-123

III. Videos

Carrel's Triangulation Vascular Anastomosis https://youtu.be/z0GAkT6ugUI
Microsurgical arterial end-to-end anastomosis; basic technique https://youtu.be/sEky_awLq_g
Venesection https://youtu.be/qiZTJ6JHuVs
Arterial anastomosis https://youtu.be/U2gAnr4Pp24
Amputation indications and principles https://youtu.be/xFyO24K5GhI
Below elbow amputation https://youtu.be/aWgRFGncLYU
Through the Knee Guillotine Amputation https://youtu.be/V-wcRHfRXNE
Below knee amputation https://youtu.be/7CR-j-3o27E
Pirogov’s amputation https://youtu.be/wuXFzNqvhxE (russian language)

Gritti Stokes amputation https://youtu.be/zj83_XijS3E
Acute nerve repair https://youtu.be/mr15EIap_08
Digital nerve repair https://youtu.be/CNBlDlI44HE
Median nerve grafting https://youtu.be/FimsW_j1rQY
Flexor digitorum profundus finger tendon repair https://youtu.be/boMlEa3P43g
Flexor tendon repair . modified Kesser https://youtu.be/YYJ6iTzefsk
Cuneo tendon suture https://youtu.be/vSlCCKvcKCY
Anterior Shoulder Approach https://youtu.be/FUUem_dtDUE
Lateral Elbow Exposures https://youtu.be/wu6JsabmvyA
Medial Parapatellar Approach to the Knee https://youtu.be/pK--OEnqH4E

Lesson 7. ***"Topographic anatomy of the cerebral part of the head and lateral region of the face."***

Control questions.

1. Topographic anatomy of the fronto-parieto-occipital region.
2. Topographic anatomy of the temporal region. The fascial spaces.
3. Internal base of the skull. The cranial fossae and its contents.
4. Topographic anatomy of the mastoid process, trepanation triangle. Trepanation of the mastoid process.
5. Meninges of the brain and spaces between.
6. Topographic anatomy of lateral region of the face (buccal, parotid, masseteric and deep regions).

Self-work. to separate on a corpse and to study on the ready-made material topographic anatomy of the cerebral part of the head and lateral region of the face;

Self-control tests:

1. Explain why the scalp wound formation takes place in the hairy part of the head.
2. Specify what tissues include of the scalp flap. 1-4
3. Explain the cause of strong the bleeding at damaging of the soft tissues of the skull calvaria.
4. Specify how infection may spread into the dura mater sinuses from the soft tissues of the head.
5. Place of trepanation at mastoiditis.
6. Specify what head soft tissues layers the haematomae may arise in. Characterize its spread. 1-4
7. Name the intracranial haematomae that may be formed at the head injure. 1-3
8. Explain why the bleeding from the dura mater sinuses doesn't tend to stop.
9. Specify the methods of stopping the bleeding from the dura mater sinuses. 1-4
10. Name the artery of the dura mater, which may be damaged at the temporal region injure.
11. List the fascial spaces of the temporal region. 1-3
12. List main sinuses of the dura mater. 1-7
13. Specify what direction and shape of the incisions of scalp allow to avoid damaging the vessels and nerves. 1-2
14. List the soft tissues layers that should be pierced at suturing of the cerebral part wounds.1-3
15. Name the regions that are included in lateral region of the face. 1-3
16. Explain where the Bichat fatty body (buccal) is located.
17. Specify what layer of the cellular tissue of the temporal region connects with the Biesch fatty body (buccal) and its clinical value. 1-2

18. Name boundaries of the parotido-masseteric region and its important anatomic structures. 1-4
19. Specify what dangerous complications may arise at suppurative inflammation of the parotid gland. 1-2
20. Name the weak places in the fascial capsule of the parotid gland and its clinical value. 1-2
21. Explain topographic anatomy of the duct of the parotid gland.
22. Name the fascial spaces of the deep region of the face. 1-3
23. Name main vessels and nerves of the deep region of the face. 1-4
24. Explain what may cause anesthesia (lost of innervation) of the lower lip half and chin, what causes of its development.
25. Name main methods of the skull trepanation.: 1-2.
26. Specify main methods of the skull osteoplastic trepanation: 1-2.
27. Specify consecutive change of color of the bones fragments during the skull trepanation: 1-3.
28. Specify why Polenov`s wire saw guide (introducer) is used at the skull trepanation.
29. Name the instruments for the skull trepanation.

Educational material

I. Lecture

II. Recommended literature

1. Richard S.Snell. Clinical anatomy by regions 9th ed/ 2012. P.539-584
2. B.D.Chaurasia. Human anatomy 3th ed/2004. Vol.3 P.1-49, 68-93, 108-134, 175-202, 211-222, 244-246
3. Somen Das. A practical guide to Operative surgery. 4th ed/ 1999. P.167-173, 179-190

III. Interactive 3D atlas “Visible body” https://www.visiblebody.com/anatomy-and-physiology-apps/human-anatomy-atlas

IV. Videos

Lesson 8. ***"Topographic anatomy of the neck".***

Control questions.

1. The neck boundaries, division on the regions (neck triangles), vessels and nerves projection.
2. Fascial spaces.
3. Topographic anatomy of the neck organs (larynx, trachea, thyroid gland, cervical part of esophagus).
4. Trepanation of the skull: resection and osteoplastic methods. Surgical tools.
5. Phlegmons of the face and the incisions for its opening.

Self-work.

a) to separate on a corpse and to study on the ready-made material topographic anatomy of the fasciae, fascial spaces and the neck organs;
b) to study the ways of pus spread.

Self-control tests:

1. Name the boundaries and the contents of Pirogoff's triangle: 1-2.
2. Explain why the lymphadenitis or lymph nodes painless infiltrations may arise in the submental triangle: 1-2.
3. List the vessels contacting with the submandibular salivary gland: 1-2.
4. List main fascial spaces of the neck: 1-7.
5. Name the elements of main vascular-nervous bundle of the neck: 1-4.
6. Specify the features of the external carotid artery, which distinguish it from the internal carotid artery: 1-3.
7. Name main reflexogenic areas of the neck.
8. Explain where (between what branches) the external carotid artery should be ligated: 1-2.
9. Explain why the veins of the neck are not collapsed at damaging. What may this lead to?
10. Name the triangles of the infrahyoid region of the neck: 1-2.
11. Name intermuscular spaces of the neck: 1-2.
12. Name anatomic space that the subclavian artery passes through.
13. Name artery that gives off the vertebral artery. How does vertebral artery correspond to the cervical part of the vertebral column? 1-3
14. Explain the causes of hoarseness at damaging of the inferior laryngeal nerve.
15. Name the nerve that is located on the anterior surface of anterior scalenus muscle. What nervous plexus is the source of this nerve? What types of fibres this nerve is made? 1-3.
16. Which of the cervical fascial spaces communicate with the mediastinum: 1-2.
17. Name the arteries supplying the thyroid gland: 1-3.
18. What branches of the vagus nerve innervate the larynx and what is its function: 1-3.

Situation tasks.

1. Where should the external carotid artery be ligated (between what branches) for prevention the internal carotid artery thrombosis?

2. The surgeon exposed the common carotid artery bifurcation during ligating the external carotid artery in the carotid triangle. What topographo-anatomic features may help to distinguish the external and internal carotid arteries? What additional method with using the pulsative points on the face may be used?
3. The suppurative mediastinitis developed in patient suffering from the neck phlegmon. What fascial spaces phlegmons are dangerous by development of this complication? Explain anatomic ways of infection spread.
4. The malignant tumor of the parotid gland was complicated by the arrosive bleeding from the external carotid artery on a site of its passing through the gland. It was decided to ligate the external carotid artery on an extent. What landmarks may be used for finding the artery on the neck?
5. A patient suffers from the tongue cancer. The strong bleeding began from the wound during the radical operation. It was decided to ligate the lingual artery on an extent. What neck triangle may be used for exposing and ligating the artery? What landmarks may be used?
6. Timbre of a voice sharply changed after removal the left lobe of the thyroid. What structure damage may cause this complication?
7. The chylothorax (lymph accumulation within the left pleural cavity) developed in patient with the neck wound in the left omoclavicular triangle. Give the topographo-anatomic explanation of this complication.

Educational material

I. Lecture

II. Recommended literature

1. Richard S.Snell. Clinical anatomy by regions 9th ed/ 2012. P.585-661
2. B.D.Chaurasia. Human anatomy 3th ed/2003. Vol.3 P.50-67, 94-107, 128-174, 203-210

III. Interactive 3D atlas “Visible body” https://www.visiblebody.com/anatomy-and-physiology-apps/human-anatomy-atlas

IV. Videos

Lesson 9. ***"Operations in the areas of the head and neck. Primary surgical treatment of traumatic brain injuries. Craniotomy. Tracheostomy. Phlegmon sections at the neck. Operations on the thyroid gland. Exposure and ligation of the main vessels of the neck. Vago-sympathetic block by Vischnevsky".***

Control questions.

1. Trepanation of the skull: resection and osteoplastic methods. Surgical tools.
2. Phlegmons of the face and the incisions for its opening.
3. Neck phlegmons and incisions.
4. Nikolaev's operation at goiter.
5. Tracheostomy, the tools, technique, types (upper, lower, atypical).
6. Surgical approach to the cervical part of the esophagus and suturing its wound at damaging and removing of the foreign bodies.

Self-work.

a) to master the principles of wound surgical debridement in the cerebral part of the head;
b) to master the principles of the haemostasis at damaging of the soft tissues, the bones of skull calvaria and the venous sinuses of the dura mater;
c) to study the principles of the skull trepanation (surgical instruments and technique of the resection method) and the mastoid trepanation;
d) to master the principles of opening the abscesses and phlegmons on the face.
e)
f) to study special instruments, which are used at tracheostomy;
g) to master the technique of the external carotid artery ligation and lower tracheostomy;
h) to be able to perform surgical approach to the cervical part of the esophagus and to suture its wound;
i) to master the operations on the thyroid gland in goiter;
j) to be able to perform vago-sympathetic block by Vischnevsky.

Self-control tests:

1. Name main methods of the skull trepanation.: 1-2.
2. Specify main methods of the skull osteoplastic trepanation: 1-2.
3. Specify consecutive change of color of the bones fragments during the skull trepanation:1-3.
4. Specify why Polenov`s wire saw guide (introducer) is used at the skull trepanation.
5. Name the instruments for the skull trepanation.
6. Explain aim and effect of vago-sympathetic block by Vischnevsky. What indicates the correctly made block: 1-3.
7. Name the main types of tracheostomy: 1-3.

Situation tasks.

1. The strong pain had developed in the cervical part of vertebral column while Novocain einjecting during the vago-sympathetic block. What caused this pain? What is the defect of performing the block? What should be made with the needle after its entering the tissues for prevention this complication?
2. The surgeon presses crossing of the sterno-cleido-mastoid muscle posterior border with the external jugular vein by 2nd finger and inserts the needle in direction to the vertebral column anterior surface during the vago-sympathetic block. Where is the vascular-nervous bundle of the neck moved? The aim of this block, the layer where is solution of Novocain is introduced.
3. The internal jugular vein was casually damaged at dissection the aneurysmatic sac from the scars during the operation for chronic traumatic aneurysm of the common carotid artery. The typical whistling sound, which coincided with the act of a breath, developed after the strong bleeding; the difficulty breath, tachycardia had developed, pulse filling decreased. What is the complication? What is its development mechanism? Why is the neck veins damage dangerous by possibility of this complication development?
4. The hoarseness has developed at clipping the thyroid vessels and allocation of the thyroid lobes lower pole during thyroidectomy with local anaesthesia. What nerve damage causes this symptom? What topography features of the nerve should be taken into account for prevention this complication?
5. Posterio-medial parts of the thyroid gland lobes are not removed at subtotal subfascial thyroid resection by Nikolaev. What complication does this method help to prevent?

Educational material

I. Recommended literature

1. Robert M. Zollinger, E. Christopher Ellison. Atlas of surgical operations. 9th ed/ 2011. P.392-407

2. Greg R.McLatchie, David J.Leaper. Operative surgery. 2nd ed/2007. P.640-643, 646-649, 670-675, 678-683, 816-821
3. Somen Das. A practical guide to Operative surgery. 4th ed/ 1999. P.200-220

II. Videos