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TOPOGRAPHIC ANATOMY OF THE HEAD

Study guide



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This manual is intended for the students of medical higher educational institutions of IV accreditation level, who study Human Anatomy in the English language.

Посібник рекомендований для студентів вищих медичних навчальних закладів IV рівня акредитації, які вивчають анатомію людини англійською мовою.

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TOPOGRAPHIC ANATOMY OF THE HEAD

The head is subdivided into two following departments: the brain and facialohes. They are shared by line from the glabella to the supraorbital edge along the zygomatic arch to the outer ear canal. The brain part consists of fornix and base of the skull. The fornix is divided into fronto-parieto-occipital region, paired temporal and mastoid area. The facial region consists of frontal and lateral area. Regions of the frontal area include nasal, orbital, oral, mental regions. Regions of the lateral area include buccal and parotideomasseteric regions.

FRONTO-PARIETO-OCCIPITAL REGION

Borders:

- in front– supraorbital edge of the frontal bone;
- behind – external occipital protuberance and the upper nuchal line;
- sideways – superior temporal line.

Layers:

The skin is thick, covered by hair. It has sweat and sebaceous glands. Sebaceous cysts or atheroma are formed by blockage of the sebaceous gland ducts or by swelling of the hair follicle which then disrupts the emptying of the sebaceous gland through the pore. Folliculitis is a superficial infection of single hair follicles. A carbuncle is a deeper skin infection that involves a group of infected hair follicles in one skin location. Skin is firmly adherent to the subcutaneous tissue, m. epicranii and aponeurotic helmet because it has vertical connective tissue septa. Connective tissue septa divide the subcutaneous tissue into separate cells which are filled by fat. (The septa divide fat cells in the subcutaneous layer into columns). Therefore hematoma in this region has the form of limited swelling.

In the subcutaneous tissue of the frontal region are:

- supratrochlearis;
- supraorbitalis;
- ophthalmica-branch of the internal carotid artery system.

A. supratrochlearis comes out of the orbit through the incisura frontalis to the intersection of the supraorbital margin with vertical line drawn through the medial corner of the eye. A. supraorbitalis comes out of the orbit through the foramen supraorbitalis or incisura supraorbitalis between the middle and medial parts of margo supraorbitalis. Its terminal

branches anastomose with branches of the supratrochlear artery and the superficial temporal arteries. Outflow of venous blood is carried out by the v. supratrochlearis, v. supraorbitalis that flow into v. angularis. Vessels escort the nerves of the same name, branch n. frontalis from n. ophthalmicus. There are also rr. temporales from n. facialis, that innervate the venter frontalis of m. epicranii and m. orbicularis oculi, so their damage causes lagophthalmos "rabbit eye" – the eye is open and tearing. The lymphatic vessels of the frontal region are sent to nodi lymphatici parotidei superficialis et profundi.

In the parietal area in the subcutaneous tissue are:

- a/v. temporalis superficialis;
- n. auriculotemporalis.

A. temporalis superficialis is the terminal branch of the external carotid artery. It is located in front of the tragus of the auricle. It can be pressed to the bone to stop bleeding. V. temporalis superficialis is located near the same artery. It flows into v. retromandibularis and accepts v. emissaria parietalis. N. auriculotemporalis is a branch of n. mandibularis. It is accompanied the temporal artery and located in front of the vessels. Lymph flow is carried out in nodi lymphatici retroauricularis.

In the subcutaneous tissue of the occipital region are:

- a/v. auricularis posterior;
- a/v. occipitalis;
- n. occipitalis major/minor;
- n. auricularis posterior.

A. auricularis posterior is projected onto the skin on the posterior edge of the attachment of the auricle. A. occipitalis is projected in the middle of the distance between the mastoid process and occipital protuberance. Arteries are accompanied by the veins of the same name that flow into v. jugularis externa. The skin of the occipital region is innervated by major and minor occipital nerves. N. occipitalis major is a posterior branch of the second cervical nerve. It accompanies the occipital artery of n. occipitalis minor from the cervical plexus and passes 3 cm behind from the attachment of the ear. It is located at the rear edge of the m. sternocleidomastoideus, near mastoid process. N. auricularis posterior is a branch of n. facialis. It passes in the subcutaneous tissue behind the auricle and innervates the muscle of the same name, venter occipitalis and m. epicranii. Lymphatic vessels flow into nodi lymphatici occipitales.

PARTICULAR QUALITIES OF BLOOD FLOW

1. The presence of great quantity of anastomoses between these arteries facilitates good regeneration of damaged tissues. Therefore, injuries of the head are healed faster than other parts of the body. It makes possible to accept pieces of scalped wounds of soft head tissues.

2. The blood flow to the area is carried out by branches of the internal and external carotid arteries. At the insufficient blood supply of the brain between the branches of these arteries, for the account of the main way, the back collateral way of blood flow from external carotid artery into internal one is formed supplying the brain. It occurs due to anastomoses between branches of these arteries. Normally, the blood flow in the artery a. supratrochlearis is sent from the skull to the pool of the external carotid artery. When a patient has stenosis or occlusion of the internal carotid artery it acquires a retrograde direction. We can see it with the help of ultrasonic doplerography.

2. The vessels are in the subcutaneous tissue above the aponeurosis, so they are often injured.

3. Adventitia of vessels is fixed with fibrous membrane. Therefore, the vessels at the time of injury of the cranial vault gape and bleed much.

4. Vessels are directed radially from the periphery to the vertex that must be taken into consideration at incision.

5. The damaged vessel is absent in injury. That's why it can't be captured with the hemostatic clamp. Therefore, we use special neurosurgical clips with pointed ends. The one end of the clamp is applied to the edge of the tendon of the helmet, and the other one – on the wall of the vessel.

PARTICULAR QUALITIES OF VENOUS OUTFLOW

The veins of the head are arranged into three layers:

1. Surface layer – covers veins of head that accompany the arteries of the same name. They carry out venous blood outflow into facialis, v. retromandibularis and v. jugularis externa.

2. The middle layer – intraosseous. It is diploic veins of the cranial vault.

3. The third layer – intracranial – the sinuses are located between the sheets of the dura mater.

All three layers are linked with emissary veins.

The largest of them:

- v. emissaria parietalis connects sinus sagittalis superior with v. temporalis superficialis;

- v. emissaria occipitalis connects sinus transversus with vv. occipitales;

- v. emissaria mastoidea connects sinus sigmoideus with v. auricularis posterior.

The links between the superficial and deep veins facilitates the outflow of blood from the brain at increased intracranial pressure or at obstruction to the main way. Besides, they can cause the penetration of infection at injury and diseases of the soft tissue of the cranial vault (furuncle) into the bone with the development of osteomyelitis, on the dura mater with the development of meningitis, brain abscess, sinus thrombosis. Such retrograde (in the reverse way) blood flow with the spreading of infection is possible due to the lack valve head in veins. Next layer is m. epicranius. Venter frontalis and venter occipitalis of m. epicranius connect tendon helmet. This layer of fibrous membranes is strongly linked with the skin. Thus, skin, subcutaneous tissue and tendon helmet are integrated and are a part of the flap at the scalped head injuries. There is subgaleal fiber under the tendon helmet. It doesn't have any membranes. The scalped injuries in the cranial vault are possible due to a strong link of the skin with tendon helmet and with the periosteum. Hematomas and suppurative processes in the subgaleal tissue look like spilled swelling and occupy the entire surface of the cranial vault. The next layer is the periosteum. The periosteum is firmly soldered to the bones in the joints and loose on other sites. One should treat carefully to the periosteum at operations, because it consists of the vessels feeding lamina externa of the skull bones. The subperiosteal tissue is located deeper. The periosteum is easily scaled off, and hematomas are limited with line of bones and joints and are located within the separate bone due to the subperiosteal tissue. The subperiosteal hematomas disrupt the blood flow to the bones and they can lead also to necrosis of the outer part of the cranial vault. Therefore we remove them. All cellular spaces of fronto-parieto-occipital region are linked with each other through the anastomoses of external veins, sinuses of the dura mater and diploic veins through emissary veins. They can serve as pathways of inflammatory processes. Bone basis of the region form the frontal, occipital and parietal bones. They are connected to each other by means of ligamentous joints. The bones are plane, their inner surface is smooth and it has holes for vessels. Their inner surface is rough, has grooves and recesses from arteries, sinuses of the dura mater, granulation and gyri.

Bones of the skull are composed of three layers.

1. Lamina externa, the outer bone plate, consists of solid substance.
2. The second layer – diploe, in intraosseous diploic channels of which

(Bréchet channels) vv. diploicae are located.

3. The third layer is the inner bone plate – lamina interna. It is more thin and brittle and that's why is called the vitreous – lamina vitrea.

It is broken oftener than the outer lamina. And it is broken with the formation of plenty of fragments. Its fragments often damage the vessels of the dura mater and the substance of the brain causing the epidural or subdural hematomas. Cranial bones regenerate slowly. So, it is possible to observe the bone defects on the X-ray photographs of the skull bones on the former site of fracture. In the frontal region between the outer and inner plates is the frontal sinus. The injury of frontal bone is subjected to a secondary infection of the nasal cavity.

TEMPORAL REGION

Borders:

- from above and behind – superior temporal line;
- from below – zygomatic arch;
- in front – the frontal process of the zygomatic bone and the zygomatic process of the frontal bone.

Layers:

I. The skin is thin. It is covered with hair. The skin is innervated by n. auriculotemporalis, n. zygomaticotemporalis and n. occipitalis minor.

II. Subcutaneous layer is small.

It consist of:

- mm. auricularis anterior et superior;
- a./v./n. temporalis superficialis;
- n. zygomaticotemporalis;
- a./v. auricularis posterior;
- n. occipitalis minor.

Mm. auricularis anterior et superior are innervated by rr. temporales of facial nerve. A. temporalis superficialis is accompanied by the v. temporalis superficialis and n. auriculotemporalis. n. zygomaticotemporalis, a branch of n. zygomaticus from n. maxillaris passes at the outer edge of the orbit. A. auricularis posterior, v. auricularis posterior and n. occipitalis minor are behind the auricle. The superficial fascia has the form of a thin plate. It is the extension of the tendon helmet. The superficial fascia forms a fascial sheath for the muscles of the ear, blood vessels and nerves. The own temporal fascia or the temporal aponeurosis splits into superficial and deep plate before the zygomatic arch. The surface plate of the own

temporal fascia is attached to the outer edge of the zygomatic arch. The deep plate of the own temporal fascia is attached to the inner edge of the zygomatic arch. The interaponevrotical temporal space is between the plates, in adipose tissue of which are a. temporalis media, v. temporalis media and n. zygomaticotemporalis. The subaponevrotical tissue is located under the deep plate of the own temporal fascia and passes to the Bichat fat pad behind the zygomatic arch. Hematomas and abscesses of subgaleal space can go down and move to the lateral area of the face. m. temporalis fills the temporal fossa. It is attached to the coronoid process of the mandible. The deep musculoskeletal cellular spaces of the temporal region is located under the temporalis muscle. It contains the deep temporal vessels and nerves: a. temporalis profunda (a. maxillaris), n. temporalis profundus (n. mandibularis).

III. The periosteum is localized deeper than subcutaneous adipose tissue. The subperiosteal cellular space is under the periosteum. The subperiosteal cellular space is involved into the inflammatory process of deep temporal phlegmons. The pus of deep abscesses may penetrate down into the pterygopalatine fossa and infratemporal fossa and then through the lower orbital fissure into the tissue of the orbit. It has a connection with the temporal – pterigoideus cellular spaces of the lateral facial area.

IV. The osteal base consists of the greater wing of the sphenoid bone, scales of the temporal bone, parts of the frontal and parietal bones. Cancellous bone is developed weakly. It is absent in temporal scales. Sulcus arteriosus is located on the inner surface of the temporal bone scales. There is a middle meningeal artery in sulcus arteriosus. The damage of the middle meningeal artery causes the epidural hematomas.

MASTOID REGION

Borders:

- in front – line of attachment of the ear;
- from above – line of the extension of the zygomatic arch;
- from below and sideways – line corresponds to the outline of the mastoid process, which can be probed through the skin.

Layers:

1. The skin is thin. It is covered with hair in the posterior part of the area. The skin is spliced with the deeper tissues.
2. The subcutaneous tissue.

There are:

- a. auricularis posterior;
- v. auricularis posterior;
- lymphatic vessels and nodes (nodi lymphatici mastoidei, which are linked with lymph from the auricle and parietal area);
- n. auricularis magnus;
- n. occipitalis minor;
- m. auricularis posterior, which are innervated by n. auricularis posterior, branch of n. facialis.

The superficial fascia forms a fascial sheath for m. auricularis posterior. The own fascia is the extension of the tendon helmet. It extends to the neck where is involved into the formation of the sheath for m. sternocleidomastoideus, m. trapezius and venter posterior of m. digastricus. The interfascial cellular space is localized between m. trapezius and venter posterior of m. digastricus. The interfascial cellular space goes into the lateral triangle of the neck and into the sheath of m. sternocleidomastoideus. It is the major pathway for the pus spread at Bezold's abscess. Symptoms of Bezold's abscess are swelling and soreness in the neck.

1. The periosteum is firmly spliced with the bone, especially in the attachment of m. sternocleidomastoideus, m. splenius capitis, m. longissimus capitis and venter posterior of m. digastricus.

2. The subperiosteal tissue is developed weakly.

3. The mastoid process of the temporal bone is located behind and below from the outer ear canal. It has conelike shape. Its lateral surfaces are rough. In the middle of the mastoid process is smooth surface which is called Shypo's trepanation triangle.

The borders of the mastoid process:

- in front – a vertical line from the top of the mastoid process through the mastoid spina suprêmeatum (spine of Henle) on the posterior edge of the outer ear canal;

- behind – crista mastoidea;

- from above – the horizontal line is the extension of the zygomatic arch.

The cellulae mastoidea are inside the mastoid bone. The upper part of cellulae mastoidea forms the mastoid cave – antrum mastoideum. The mastoid cave communicates with the tympanic cavity through the aditus ad antrum. It opens in recessus epitympanicus. All the cells of the mastoid process open into the antrum mastoideum. Mastoid cells and antrum

mastoideum are covered by the mucous membrane. The mucous membrane is continuation of the mucosa of the tympanic cavity. Thus, the tympanic cavity and its additional cavities form a pneumatic system. This pneumatic system is filled with air through the Eustachian tube. Inflammatory exudate cannot escape through the inner opening of the auditory tube at otitis because it has adhesion oedematous mucosa. As a result, the middle ear cavity forms closed space. The purulent exudate accumulates there. It is directed through aditus ad antrum to the cave and overflows the cells of the mastoid process. It causes mastoiditis. We can remove pus from the middle ear through the posterior wall of the tympanic cavity dissecting the antrum mastoideum, which is projected at the Shypo's triangle. The outer wall of the mastoid cave is about 1.5 – 2 cm. The inner wall separates it from the sulcus sigmoideus and sinus sigmoideus. The upper wall of the cave is a continuation of the mastoid tegmen tympani (roof of the tympanic cavity) and separates it from the middle cranial fossa. The lateral semicircular canal and the facial nerve are located more anteriorly from the cave. Thus, purulent exudate from the tympanic cavity may penetrate to the antrum mastoideum. It destroys the inner wall of the mastoid cave and goes into the cranial cavity or into the sigmoid sinus.

It causes meningitis, sepsis, thrombophlebitis of the sigmoid sinus which are displayed clinically as McKenzie syndrome (dysphagia, aphonia, torticollis). It is caused by damage of IX, X and XI pairs of cranial nerves. The doctors make mastoidectomy in all these cases. The rupture of pus to the area of the triangle of the neck causes Bezold's mastoiditis.

MENINGES

The cranial cavity is lined by dura mater inside which is easily separated from the bones in the fornix and firmly fixed in the skull base. Therefore, at traumas of skull epidural hematomas more prevail in the fornix (vault) of the skull. The dura mater consists of two sheets. Between them are thin layer of tissue, blood vessels and nerves.

N. Burdenko used this feature of the structure for removal of defect in damaged sinus. The dura mater separates at dural reflections (also known as dural folds), places where the inner dural layer is reflected as sheet-like protrusions into the cranial cavity. There are tentorium cerebelli, falx cerebri, cerebellar falx, sellar diaphragm.

The tentorium cerebelli exists between and separates the cerebellum

and brainstem from the occipital lobes of the cerebrum. It is attached, behind, by its convex border, to the transverse ridges upon the inner surface of the occipital bone, and there encloses the transverse sinuses; in front, to the superior angle of the petrous part of the temporal bone on either side, enclosing the superior petrosal sinuses. At the apex of the petrous part of the temporal bone the free and attached borders meet, and, crossing one another, are continued forward to be fixed to the anterior and posterior clinoid processes respectively. Its anterior border is free and concave, and bounds a large oval opening, the tentorial incisure, for the transmission of the cerebral peduncles. The brain can get pushed down partly through the tentorium. It is very bad for the patient because there are vital centers of respiration and circulation of blood. Therefore it is impossible to produce a large amount of cerebrospinal fluid at lumbar puncture. The sinuses are located in the splitting of the dura mater. The blood from the veins of the brain flows off there. Sinuses are linked with the diploic veins and veins of the fornix and base of the skull. The walls of the sinuses are tight, taut and they don't have valves. Such structure of the venous sinuses provides free outflow of venous blood from the brain, independently from fluctuations of intracranial pressure. If the sinus is damaged it doesn't close, but gapes causing severe bleeding. The neurosurgeons pay special attention to the superior and cavernous sinuses.

The superior sagittal sinus is an unpaired area along the attached margin of falx cerebri. Commencing at the crista galli and the foramen cecum, through which it receives a vein from the nasal cavity, it runs from anterior to posterior, grooving the inner surface of the frontal, the adjacent margins of the two parietal lobes, and the superior division of the cruciate eminence of the occipital lobe. The infections can pass sinus with chronic inflammatory processes in the nasal cavity. The superior sagittal sinus connects with v. temporalis superficialis through v. emissaria parietale and transverse sinus between Trolar's vein. There are blood lakes (small cavities that communicate with the lumen of the sinus) on the both sides from superior sagittal sinus between the sheets of the dura mater. The veins of the dura mater, the veins of the brain, diploic veins and Pacchionian granulations fall into the lakes. The doctors have to remember about deviation of sinus to the right or to the left, sinus splitting, the presence of blood lakes when they perform craniotomy.

The cavernous sinus is on the base of the skull on both sides of the sella

turcica. Both cavernous sinuses are connected through intercavernous sinuses. The cavernous sinuses and intercavernous sinuses form Ridley's ring. It receives blood from the:

- inferior ophthalmic vein (anastomoses with facial veins through profunda facial vein);
- superior ophthalmic vein (anastomoses with facial veins through the angular vein) (they collect blood from the forehead);
- superficial middle cerebral vein;
- inferior cerebral veins;
- sphenoparietal sinus and occasionally, central retinal vein, frontal tributary of the middle meningeal vein.

Drainage of the cavernous sinus is via:

- superior petrosal sinus to the transverse sinus;
- inferior petrosal sinus directly to the jugular bulb;
- venous plexus on the internal carotid artery to the pterygoid plexus;
- emissary veins passing through the sphenoidal foramen, foramen ovale, foramen lacerum.

The cross section of cavernous sinus has a triangular shape. The cavernous sinus transmits multiple cranial nerves to the superior orbital fissure and foramen ovale.

They are:

In the superior wall:

- oculomotor nerve (CN III)
- trochlear nerve (CN IV)

In the lateral wall:

- trigeminal nerve (CN V) of ophthalmic branch.

Traversing the lateral sinus to the ICA:

- abducent nerve (CN VI) (and a. carotis interna).

The presence of these links explains the rapid spread of the infection from the soft tissues of the skull into the cavernous sinus with the development of severe diseases – meningitis, sepsis, brain abscess. At cavernous sinus thrombosis the Foix syndrome appears. The main symptom of cavernous sinus thrombosis is ophthalmoplegia (paralysis of the muscles of the eyeball). It is the result of paralysis of the III, IV and VI pairs of cranial nerves. The other symptoms are exophthalmia (exophthalmos), swelling of the eyelids, ptosis (drooping of the upper eyelid), immobility of the eyeball. The damage of sinus occurs with pulsating exophthalmos. Cavernous sinus is connected with the superior sagittal sinus through the Trolar's vein. And it is connected with transverse

sinus through the Labbe's vein. (The Trolar's vein (v. anastomotica superior) connects v. cerebri media superficialis with sinus sagittalis superior, and v. Labbe (v. anastomotica inferior) connects v. cerebri media superficialis with sinus transversus). The doctors can make bandaging of the superior sagittal sinus in its posterior parts due to these links.

The middle meningeal artery branch of the first part of the maxillary artery provides blood supply of the dura mater. It penetrates into the cranial cavity through the foramen spinosum. It lies on the inner surface of the sphenoid, parietal and temporal scales into special bone sulcus (sulci a. menigeae). The artery is divided into a frontal (anterior) and parietal (posterior) branches. The anterior branch goes upwards forming arc. It forms arc. The posterior branch goes backwards or horizontally. Artery passes in the thickness of the dura mater. It is closer to its outer sheet. Artery is accompanied by two veins. The anterior branch of artery is located in the bone canal at "pterion" (place of joint of the frontal, parietal, temporal and sphenoid bones). We must remember this when performing craniotomy. a. meningea media and its branches are often damaged. It causes the formation of epidural and subdural hematomas. The course of the anterior branch corresponds to the position of gyrus precentralis. The course of the posterior branch corresponds to the localization of temporal lobe. It is important for the diagnosis of epidural hematoma.

The symptoms of an intracranial hematoma:

1. Mydriasis is the dilation of the pupil in the region of hematoma, that is anisocoria – condition characterized by an unequal size of the eye pupils. It is the result of brain injury and damage of the III pair of cranial nerves. Mydriasis is accompanied by ptosis of the upper eyelid.

2. Hemiparesis is paresis of the muscles of one half of the body on the opposite side of hematoma. It is the result of compression of the motor cortex and pyramidal tract intersection.

3. Bradycardia is strictly defined in adults as a pulse rate below 60 beats per minute. It is the result of brain stem injury, oedema, hypoxia of the brain, damage of sympathetic fibers, increase of a vagal tone.

4. The presence of "lucid intervals." The consciousness is gradually suppressed with increasing hematoma.

Innervation of the dura mater is carried by r. tentorii of n. ophthalmicus, r. meningeus medius of n. maxillaris, r. meningeus (branch of n. mandibularis), which penetrates into the cranial cavity through the foramen spinosum and r. meningeus of n. vagus, that enters the cranial cavity through the foramen jugulare. Under the dura mater is the arachnoid membrane of the brain –

arachnoidea mater. The subdural space is located between arachnoidea and the dura mater. The superficial veins of the brain go through the subdural space. They pour into the sinuses of the dura mater. Their damage causes subdural hematomas. They are more extensive and grow slowly unlike epidural hematomas. The arachnoid mater covering the brain is referred to as the "arachnoidea encephali," and the portion covering the spinal cord as the "arachnoidea spinalis." There are two subdivisions of arachnoid mater surrounding the subarachnoid space, the dorsal layer and the ventral layer. Cerebrospinal fluid circulates in the subarachnoid space (between arachnoid and pia mater). Cerebrospinal fluid is produced by the choroid plexus. The total amount of liquor in adults ranges from 100 to 150 ml. The pressure in the supine position is 120 – 150 ml of water column. It rises to 200 – 250 ml of water column when it is measured in sitting position. Pressure of cerebrospinal fluid and its composition are examined at lumbar puncture.

Queckenstedt-Stookey test is a test for detecting the blockage of subarachnoid channels in which the jugular vein is compressed; when there is blockage of the channels, compression causes little increase or it is absent in the pressure of the spinal fluid. The opening pressure is measured. Then, the clinician's assistant compresses both jugular veins (if increased intracranial pressure is not suspected then one may exert pressure on both external jugular veins but usually pressure is first exerted on the abdomen, this pressure causes an engorgement of spinal veins and in turn rapidly increases cerebrospinal fluid pressure), which leads to a rise in the intracranial pressure. The intracranial pressure will be reflected as rapidly rising pressure measured from the lumbar needle, within 10 – 12 seconds. The one jugular vein compression can produce an increase in pressure, and compression of the other – does not increase the pressure with Queckenstedt's symptoms. In this case may occur obturation of the jugular vein, transverse or sigmoid sinus (thrombosis) on the side where the pressure is not increased. The majority of cerebrospinal fluid is produced in the choroid plexus of two lateral ventricles. From here, the CSF passes through the interventricular foramen (of Monro) to the third ventricle, then the cerebral aqueduct (of Sylvius) to the fourth ventricle. The fourth ventricle is an outpouching on the posterior part of the brainstem. From the fourth ventricle, the fluid passes through three foramen to enter the subarachnoid space. It passes through the foramen of Magendie on the midline, and two foramina of Luschka laterally. The subarachnoid space covers the brain and spinal cord. Hydrocephalus is an

abnormal accumulation of cerebrospinal fluid (CSF) in the ventricles of the brain. It causes increased intracranial pressure inside the skull and may cause progressive enlargement of the head if it occurs in childhood, at convulsions, tunnel vision, and mental disability.

SIDE AREA OF FACE

Borders:

- from above – the zygomatic arch and the lower edge of the orbit;
- from below – the lower edge of the lower jaw;
- in front – nasobuccal fold and nasolabial fold;
- behind – the rear edge of the lower jaw.

Side area of face is divided into buccal and parotideomasseteric regions by line of the anterior margin of the masseter muscle.

Layers:

The skin is thin and mobile. It has a lot of sweat and sebaceous glands, blood and lymphatic vessels and nerve endings. The facial muscles, facial artery and veins, branch of the trigeminal and facial nerves, lymph vessels, and parotid salivary gland are localized in the subcutaneous tissue. The superficial fascia forms a fascial sheath for facial muscles and neurovascular structures of the face. Facial muscles begin from bones and are embedded into the skin. They form folds. The folds help surgeons to perform the operation. The surgeons make cuts along the folds, then the postoperative scar will be hardly noticeable. Facial muscles express our emotions. They are involved in the act of eating, breathing and speech. The facial artery and vein are located between the facial muscles. The facial artery lies at the anterior margin of masseter m. on the face. It turns round the edge of the lower jaw. It is pressed to the bone to stop bleeding at wounds of the face. The facial artery arises in the carotid triangle from the external carotid artery a little above the lingual artery and, sheltered by the ramus of the mandible, passes obliquely up beneath the digastric and stylohyoid muscles, over which it arches to enter a groove on the posterior surface of the submandibular gland. It then curves upward over the body of the mandible at the antero-inferior angle of the masseter; passes forward and upward across the cheek to the angle of the mouth, then ascends along the side of the nose, and ends at the medial commissure of the eye, under the name of the angular artery.

The facial branches:

- inferior labial artery;
- superior labial artery;
- lateral nasal branch to nasalis muscle;
- angular artery – the terminal branch.

The facial vein accompanies the facial artery. It begins at the medial angle of the eye as the angular vein. The facial v. begins after the confluence of supraorbitalis v. and supratrochlearis v. It anastomoses with the ophthalmic veins (vv. ophthalmica superior et inferior). The facial v. connects to retromandibular v., when it passes round the edge of the lower jaw. V. facialis communis is formed in the result of this. It empties into the internal jugular vein. The facial vein anastomoses with ophthalmic vv. and sinus cavernous, and with pterygoid plexus through deep facial vein. These anastomoses are important at the spread of inflammation on face. The retrograde blood flow is possible from facial v. into the angular v., ophthalmic inferior v. and sinus cavernosus at thrombophlebitis or furuncle or from facial v. into the deep facial vein, pterygoid plexus through v. emissaria foraminis laceri into sinus cavernous. The septic embolus penetrates into the cavernous sinus. And it causes thrombosis, meningitis, brain abscess, sepsis. The prognosis of these complications is very serious. Own fascia is a continuation of the temporal aponeurosis. It is divided into superficial and deep layers. The superficial layer forms fascial sheath for cheeks fat. The deep layer of own fascia goes into fascia buccopharyngea and continues in fascia pharyngobasillaris. Bichat fat pad is enclosed in its own capsule and is located at the front edge of the m. masseter and lateral muscle of cheek. It is turned round by ductus parotideus outside and in front of it. The cheeks fat consists of three parts, from which the temporal, orbital and pterygopalatine processes spring. Temporal process penetrates under the zygomatic arch and has a connection with subgaleal cellular space of the temporal region. Orbital process enters the infratemporal fossa. It adheres to fissura orbitalis inferior and often joins adipose body of the orbit. Pterygopalatine process has a connection with the temporal pterygoid space and penetrates through fissura pterygomaxillaris into the pterygopalatine fossa. It surrounds n. maxillaris and ganglion pterygopalatinum. Often it passes through fissura orbitalis superior in the internal base of the skull reaching the cavernous sinus. Thus the cheeks fat connects subcutaneous tissue of buccal region with temporal pterygoid space, subgaleal space of

temporal region, with cellular tissue of pterygopalatine fossa and orbit. Such joint has great significance at the spread of inflammation. We can say that the Bichat fat-pad is the main conductor of inflammatory processes in the face. The buccinator muscle is located between the jaws. It is covered by bucco-pharyngeal fascia. It begins from the upper and lower jaw and weaves into the facial muscles of mouth opening. Parotid duct permeates the cheeks. Buccinator m. is a sphincter of the duct. It is covered by the mucous inside and supplied by buccal artery from the maxillary artery. It is innervated by rr. buccalis of facial nerve. So at injury of this nerve the cheek muscle atrophy is observed. The upper and lower jaw with the infraorbital and mental foramen (with vessels and nerves of the same name) are localized deeper than facial muscles. The infraorbital neurovascular bundle comes out of the same hole at 0.5 cm below the middle of the infraorbital edge into the soft tissue of canine fossa to the anterior wall of the maxillary sinus. The infraorbital artery is a branch of maxillar a. The suborbital v. empties into v. ophthalmica inferior or pterygoid plexus. The infraorbital nerve is a continuation of n. maxillaris. It is divided into a number of branches outside the front surface of the upper jaw.

The branches:

- rr. palpebrales inferiores innervate the skin of the lower eyelid;
- rr. nasales externi innervate the skin of the nose ;
- rr. labiales superiores innervate the skin of the upper lip, form the so-called small goose leg, pes anserinus minor.

It gives off anterior, middle and posterior alveolar branches on its way to the infraorbital groove and channel. They form the superior dental plexus, plexus dentalis superior, the branches of which innervate the teeth of the upper jaw. The infraorbital regional anesthesia is carried out during operations on the upper jaw and at dental extractions. The mental neurovascular bundle comes out of the mental foramen. Valleix points are places of pain in the projection of the trigeminal nerve branches. Lymph flow from the buccal region is carried out into the submandibular lymph nodes and nodes under the chin. Their inflammation can cause compression of excretory duct of the parotid gland and stasis of saliva. It is a factor causing the development of inflammation of the parotid gland.

PAROTID-MASTICATORY AREA

Layers:

The skin is thin and mobile. It is covered with hair.

The subcutaneous tissue

The branch of the ear nerve, great auricular nerve (n. auricularis magnus) and auriculotemporal nerve (n. auriculotemporalis), the buccal nerve of mandibular nerve, branch of the facial nerve, transverse facial artery (a. transversa faciei) and zygomaticofacial nerve are in the superficial fascia (fascial compartment). The own fascia (fascia parotideomasseterica) is under superficial fascia. It is attached to the zygomatic arch, and to the lower edge side of the lower jaw. It splits into two sheets and forms the capsule of the parotid gland (fascia parotidea). It penetrates into the gland between its segments. Parotid fascia moves to masseter muscle and is called masseteric fascia. In the anterior part of the parotid-masticatory area is located the masseter muscle (it begins from the zygomatic bone and the zygomatic arch and is attached to masseteric tuberosity). The muscle elevates the mandible at contraction and moves it forward. It is located in the bone and fibrous sheath. The inner surface of the muscle is adjacent to the branches of the mandible in the submasseteric space. The submasseteric space is located between the branches of the mandible and masseter muscles. There are masseteric artery, vein, nerve in the submasseteric space. The submasseteric space communicates with temporopterygoid space, interpterygoid space and Bichat fat-pad. The phlegmons can develop here. To the middle from the masseter muscle is a branch of the lower jaw. The condylar process of mandible completes temporomandibular joint. There are main components of the TMJ: caput mandibular fossa and tuberculum articulare. Dislocations of jaw occur when two bones that originally met at the joint detach. The parotid gland is located in the posterior part of the parotid-masticatory area. It is the largest salivary gland of serous type. It is surrounded by sheets of fascia parotis and muscles. It performs parotid space with arteries, veins and nerves.

The borders of parotid space are:

- superior – the ear canal (external auditory meatus);
- inferior – the submandibular salivary gland;
- anterior – rear and outer surface of masseter m., a branch of the lower jaw and medial pterygoid muscle;
- posterior – sternocleidomastoid muscle, posterior belly of the digastric muscle and mastoid process;

- medial – styloid process with muscles of Rioloan's bouquet (m. stylohyoideus, m. styloglossus and m. stylopharyngeus) and tissue of the anterior parapharyngeal space. In this place spatium parotideum is not closed. Pharyngeal process of gl. parotis fills the space between the styloid process and medial pterygoid muscle.

It is deprived of fascial compartment (weak spot in the capsule) and is adjacent to the anterior part of the parapharyngeal space. This explains the possibility of penetration of pus from the parotid gland into the parapharyngeal cellular space, when the process is inflamed.

Laterally to the parotid gland is adjacent subcutaneous fat. Fascial capsule is weakly developed. It can break at mumps (purulent parotitis). The inflammatory process spreads to the middle ear.

The parotid gland is supplied with blood from parotid branches of superficial temporal artery. Venous outflow is carried out in retromandibular vein. Lymph flow is carried out in nodi lymphatici parotidæ superficialis et profundi. It is innervated by parotid branches of auriculotemporal n. The secretory parasympathetic preganglionic fibers come to gland from lower salivary nucleus. The secretory parasympathetic fibers consist of n. glossopharyngeus, n. tympanicus, n. petrosus minor to ganglion oticum. The postganglionic fibers are composed of n. auriculotemporalis and reach the gland. Excretory duct of parotid gl. (Stenon's duct) begins from the front edge of the gland. It is directed forward, at a distance of 1 – 1.5 cm below and parallelly to the zygomatic arch on the outer surface of the masseter muscle. It lies on the top of the Bichat fat-pad and passing round front edge of the masseter muscle, turns inward. Excretory duct pierces the buccal muscle, passes under the buccal mucosa and opens in the buccal cavity between 1 and 2 upper molars. Excretory duct is projected on a line drawn from the outer ear canal to a point midway between the wing of the nose and angle of the mouth. The a. carotis externa, v. retromandibularis, n. auriculotemporalis and n. facialis are passed through the parotid gland. The external carotid artery is divided into terminal branches: a. temporalis superficialis and a. maxillaris. The retromandibular vein is a continuation of v. temporalis superficialis. It passes in front of the auricle, goes down behind the branches of the mandible laterally to the external carotid artery. It completes with facial vein behind of posterior belly of the digastric muscle. Their common trunk – v. facialis communis empties into the internal jugular vein. The auriculotemporal nerve is a branch of n. mandibularis. It begins with two roots which cover a. meningea media and are connected to one trunk. It extends along the inner surface of the

mandibular articular process and penetrates into the gland case. It is located medially from a. temporalis superficialis. The Frey-Baillarger syndrome develops in patients undergoing surgery on the parotid gland as a result of postoperative scarring involving trophic vasomotor fibers of auriculotemporal n. It is a complex of vegetative-vascular disorders. The symptoms of diseases are skin flushing and sweating while eating. The neuralgia of auriculotemporal nerve is manifested by burning pain in the temporal region, the external auditory canal, the temporomandibular joint. The attack is accompanied by flushing of the skin, hyperhidrosis (excessive sweating) and hypersalivation. Nodi lymphatici parotidei superficialis et profundi collect lymph from the frontal, temporal and cheek areas and from periodontal molars. They are located under the fascia on the surface of the gland.

THE FACIAL NERVE

Motor nucleus VII pair is located in the front part of the bridge (pars anterior pontis). The axons of the cells of the nucleus go out in the cerebellopontine angle parallel to the intermediate nerves that carry out afferent fibers from the geniculate ganglion. Both of them come into the internal auditory canal of the pyramid and enter into the facial nerve canal about 3 cm long. The channel has a bend in which the geniculate ganglion is located. The fibers of geniculate ganglion are the main part of intermediate nerve ("nerve of Wrisberg"). They are accompanied with the motor trunk of facial nerve. The intermediate nerve divides the greater petrosal nerve and the chorda tympani. The chorda tympani contains secretory fibers from the submandibular and sublingual nodes. The greater petrosal nerve goes out from the pyramid of the temporal bone through the hiatus for greater petrosal nerve (hiatus canalis n. petrosi majoris). It proceeds towards the foramen lacerum where it joins the deep petrosal nerve to form the nerve of the pterygoid canal which passes over the foramen lacerum. The nerve of the pterygoid canal passes through the pterygoid canal to reach the pterygopalatine ganglion. Chorda tympani goes out from the pyramid of the temporal bone via the petrotympanic fissure. It is a part of the n. lingualis. It contains flavoring and secretory fibers to the submandibular and sublingual salivary glands. The inflammation of geniculate ganglion is Ramsay Hunt syndrome (RHS). The type 2 is also known as herpes zoster oticus. The symptoms and signs include acute facial nerve paralysis, pain in the ear, taste loss in the front

two-thirds of the tongue, dry mouth and eyes, and eruption of an erythematous vesicular rash in the ear canal, the tongue, and/or hard palate, hearing loss, and vertigo. Part of the motor fibers of the trunk of the facial nerve go to the stapedius muscle. The main trunk emerges from the pyramid through the stylomastoid hole (foramen stylomastoideum) at the attachment of the lower end of the ear. It gives the posterior auricular nerve to the muscle of the same name and venter occipitalis m. epicranii, r. stylohyoideus and r. digastricus to the posterior belly of the digastric muscle (to the entrance of glandula parotis). The pes anserinus ("goose's foot") is the branch point of the facial nerve (extratemporal) after leaving the stylomastoid foramen. It is also known as the "parotid plexus". This division takes place within the parotid gland. The branches of the pes anserinus are rr. temporales, rr. zygomatici, rr. buccales, r. marginalis mandibulae and r. colli. The upper branch rr. temporales is the most constant. Its projection is a line from the earlobe to the outer corner of the eye. The average branches rr. zygomatici and rr. buccales repeat course of the salivary duct. The most variable in its position is a marginal branch (ramus marginalis mandibulae). It goes at 0.5 – 1 cm below the lower edge of the mandible. This fact must be taken into consideration at operation of submandibular abscesses. The close relationship between the branches of the facial nerve and the parotid gland parenchyma explains the paralysis of mimic muscles at inflammation of the parotid gland. Knowledge of the topography of the facial nerve and its branches has practical importance at operations on salivary gland. In the fallopian canal facial nerve lies at a great distance from the periosteum. The inflammation of the periosteum can cause compression of the nerve, as a result appears ischemia. The leading factor in the development of peripheral facial paralysis (Bell's palsy) is the disorder of its blood supply. The main source of blood supply to the facial nerve canalis stylomastoid artery, branch of posterior auricular artery. Spasm of the artery causes ischemia and degeneration of nerve fibers.

THE DEEP AREA OF THE FACE

The deep face area is named by Pirogov as intermaxillary space. It is accessed by removing the zygomatic arch, the branches of the mandible and the temporal muscle. It is localized in infratemporal fossa.

The borders of intermaxillary space are:

- superior – ala major os sphenoidale;

- inferior – the medial and lateral walls converge;
- anterior – facies infratemporalis tuber maxillae;
- posterior – the parotid gland; medial – lamina lateralis processus pterygoideus.

The contents of the deep areas of the face are pterygoid muscles (mm. pterygoideus medialis et lateralis). The pterygoid venous plexus and adipose tissue surround them. There are the maxillary artery and the mandibular nerve. The lateral pterygoid muscle begins with two heads. The superior head begins from facies infratemporalis os sphenoidale. The inferior one begins from lamina lateralis processus pterygoideus. They are attached to the neck of the mandible to the joint capsule of the temporomandibular joint and the articular disc. Together lateral pterygoid muscles protract (or protrude) and depress mandible. Individually, they move the mandible side to side. The medial pterygoid muscle begins from medial surface of lateral pterygoid plate and palatine bone. The insertion attachments are medial surface of ramus and angle of mandible. Together medial pterygoid muscles elevate and protract (or protrude) mandible. Individually, they move mandible side to side.

The blood supply: aa. pterygoideus medialis et lateralis of maxillary artery.

Innervation: nn. pterygoideus medialis et lateralis of n. mandibularis. Venous outflow is carried out in pl. pterygoideus. There are temporoptyergoid space and interptyergoid space in the deep face area.

The temporoptyergoid has the borders:

- superior – bottom surface of the greater wing of the sphenoid bone (ala major os sphenoidale);
- inferior – tissue of temporoptyergoid space becomes to interptyergoid space;
- anterior – tuber maxillae;
- posterior – processus condylaris mandibulae; medial – medial pterygoid muscle;
- lateral – temporal muscle.

In the temporomandibular pterygoid space are: the deep temporal and chewing nerves, nn. temporales profundi, n. massetericus of n. mandibularis, buccal nerve, n. buccalis of n. mandibularis, outer part of the pterygoid venous plexus, a. maxillaris and its branches. Pterygoid plexus surrounds pterygoid muscles. It contains: vv. parotideae – from the parotid gland, vv. temporales profundae of the temporal muscle, veins accompanying a. sphenopalatina from the nasal mucosa, veins from mm. pterygoidei, veins from m. masseter, veins accompanying a. alveolaris

inferior, vv. meningeae mediae. The vv. meningeae mediae carry out blood outflow from the dura mater and diploe. Venous outflow from the pterygoid plexus is carried out by v. maxillaris into v. retromandibularis, and from it into the internal jugular vein. There is maxillary a., the main artery of external carotid artery in the temporomandibular space. The maxillary a. supplies the deep area of the face with the blood. It begins at the neck of the mandible, bends around the medial side, lies between m. temporalis and m. pterygoideus lateralis and reaches fossa pterygopalatina.

On its way a. maxillaris gives a number of branches.

In the first compartment, pars mandibularis, i. e. a. maxillaris is divided into:

- the deep auricular artery (a. auricularis profunda), supplies the temporomandibular joint, the external auditory canal and the eardrum;

- the anterior tympanic artery (a. tympanica anterior) passes through fissura petrotympanica (fissura Glaseri) in the tympanic cavity;

- the inferior alveolar artery (a. alveolaris inferior) enters the channel of the lower jaw through the mandibular foramen, which gives rr. dentales to the teeth of the lower jaw. It sends r. mylohyoideus to the muscle of the same name. It appears from the channel called mental branch of inferior alveolar artery which supplies the muscle of the same name and skin of the chin;

- the middle meningeal artery (a. meningeae media) comes up to the medial surface of the lateral pterygoid muscle (m. pterygoideus lateralis). It passes through the foramen spinosum into the cranial cavity, which is divided into rr. frontalis et parietalis.

In the second compartment, pars pterygium (between m. temporalis and m. pterygoideus lateralis), i. e. a. maxillaris is divided into:

- masseteric artery (a. masseterica) – to the muscle of the same name;

- rr. pterygoidei – to the medial and lateral pterygoid muscle;

- aa. temporales profundae – to the temporalis muscle;

- a. buccalis – to m. buccinator;

- aa. alveolaris superiores posteriores – through the tuber maxillae go back to the upper teeth.

Cellular tissue of temporo-ptyergoid space is combined with buccal fat pad, with pterygopalatine fossa through fissura pterygomaxillaris, with cellular tissue of the orbit through fissura orbitalis inferior, with the cavity of the skull and sinus cavernosus through foramen ovale and foramen spinosum. Along the way of a. maxillaris – with the bed of parotid gland, along the way of a. et v. masseterica – with submasseteric space, and

through pharyngeal appendix of parotid gland – with the anterior parapharyngeal space. Downwards cellular tissue of temporopterygoid space turns into cellular tissue of interpterygoid space. Spatium interpterygoideum is located between pterygoid muscles.

It is limited:

- outside – with a branch of the mandible and medium surface of m. pterygoideus lateralis;
- inside – with lateral surface of m. pterygoideus medialis;
- at the top – with the base of the skull;
- behind – with the parotid gland;
- in front – with tuber maxillaris and buccal fat pad;
- at the bottom – with m. pterygoideus medialis.

There are n. mandibularis, a. maxillaris, plexus pterygoideus in spatium interpterygoid. There is fossa pterygopalatina, pterygopalatine fossa, which contains adipose tissue in which are: a. maxillaris, n. maxillaris, ganglion pterygopalatinum. At the inflammation of the maxillary sinuses (sinusitis) the ganglioneuritis of pterygopalatine node, which is clinically manifested as Sluder's syndrome: burning pain and autonomic dysfunctions (epiphora, ptialism, rhinorrhea, swelling and redness of the eyelids, swelling of the face) can occur. Inwards from the deep area of the face on the lateral wall of the pharynx the parapharyngeal space is located. It is divided into two compartments: anterior and posterior. The anterior one is limited:

- medially – with mm. levator and tensor velli palatini, m. constrictor pharyngis superior, fascia pharyngobasilaris and tonsils;
- laterally – with m. pterygoideus medialis and pharyngeal appendix of parotid gland;
- behind – with muscles of anatomical Riolan's bouquet (m. styloglossus, m. stylopharyngeus, m. stylohyoideus) and aponeurosis, which cover the m. stylopharyngeus (aponeurosis stylopharyngeus);
- in front – with lateral and medial wall which are interconnected;
- at the top – with the base of the skull;
- at the bottom – with submandibular salivary gland capsule that goes into the tissue of the mouth floor.

There are a. palatina ascendens, the branch of a. facialis which supplies with blood the soft palate; pharyngeal veins, vv. pharyngeae et pl. pharyngeus; v. palatina externa, which drains blood from the tonsil in cellular tissue of anterior parapharyngeal space. It anastomoses with vv. pharyngeae and flows into the facial vein. The anterior parapharyngeal space combines with: bed of parotid gland and through

it along the way of artery – with interpterygoid space; with cellular tissue of mouth floor, and through it – with the bed of submandibular salivary glands; along the way of n. tensoris velli palatini – with interpterygoid space; along the way of pl. pharyngeus – with posterior parapharyngeal space. Posterior parapharyngeal space is located between the lateral wall of the pharynx and parotid glands. It is limited:

- on the medial side – with aponeurosis pharyngoprevertebralis that separates the posterior parapharyngeal space from retropharyngeal one;
- on the lateral side – styloid process, m. digastricus (venter posterior), m. sternocleidomastoideus;
- behind – fascia prevertebralis;
- in front – styloid process and muscles from it (m. stylopharyngeus, m. styloglossus, m. stylohyoideus), fascia stylopharyngeus (aponeurosis stylopharyngeus or Zhonesko's diaphragm) that separates the anterior and posterior parapharyngeal spaces;
- at the top – with the base of the skull with located here canalis caroticus and foramen jugulare;
- at the bottom – transfers through the vessels and nerves into spatium vasonervorum of the neck.

There are: a. carotis interna; behind and at the side of it – v. jugularis interna; between them – n. glossopharyngeus (IX), n. vagus (X), n. accessorius (XI), n. hypoglossus (XII) in the posterior parapharyngeal space. Behind and medially from the artery under prevertebral fascia is located superior cervical sympathetic node. The internal jugular vein is surrounded by deep cervical lymph nodes.

Posterior parapharyngeal space combines with: upper mediastinum – along the way of vessels; posterior mediastinum – along the n. vagus; spatium vasonervorum of the neck – along the vessels and n. vagus; bed of parotid salivary gland – along the external carotid artery; posterior cranial fossa – along v. jugularis interna; middle cranial fossa – along a. carotis interna; sinus cavernosus – along a. carotis interna; bed of submandibular salivary gland – along the way of a. facialis; cellular tissue of upper back neck area – along the way of a. et v. occipitales. Inflammation can occur in this tissue (furuncles or carbuncles of the neck) spreading manure into the posterior parapharyngeal space. At the inflammation of the tissue of posterior parapharyngeal space the Villaret's syndrome occurs – Horner's syndrome union (miosis, enophthalmos, stenosis of the optic fissure) with unilateral paralysis of the muscles of the soft palate, pharynx, larynx, vocal muscle with paresis or paralysis of sternocleidomastoid and trapezoid muscles. This symptom occurs at damage of the IX, X, XI and XII pairs of

cranial nerves and the cervical sympathetic trunk.

Retropharyngeal space is a gap which is filled with loose fiber and located behind the pharynx, between the fascia buccopharyngea (covers posterior wall of the pharynx) and fascia prevertebralis. There are: retropharyngeal lymph nodes, inflammation of which leads to the formation of retropharyngeal abscesses, branches a. pharyngea ascendens and plexus venosus pharyngeus.

The space is limited:

at the top – with the base of the skull;

at the bottom – at the level of the VI cervical vertebra transfers into retrovisceral space of the neck;

laterally – with aponeurosis pharyngoprevertebralis (Charpy's partition);

in front – with pharynx and fascia buccopharyngea, that covers it;

behind – with fascia prevertebralis.

The first symptom of inflammation of the deep tissue of the face are tonic contractions of masticatory muscles (trismus), because into pyoinflammatory process involves the medial pterygoid muscle. In further inflammatory process spreads on all cellular spaces and through round, oval and spinous holes – to the dura mater and through the inferior orbital fissure – into the cavity of the orbit. Purulent inflammation on the face in the form of the furuncle or carbuncles of the upper lip or corner of the mouth, complicated by venous thrombophlebitis of the face, spreads inevitably on the orbit veins, sinus cavernous and pterygoid venous plexus, then through anastomoses reaches dura mater sinuses, and it causes sinus thrombosis followed by meningitis. Inflammatory processes in the area of the face are too complicated, sometimes they end with the death of the patient. The reasons of this are:

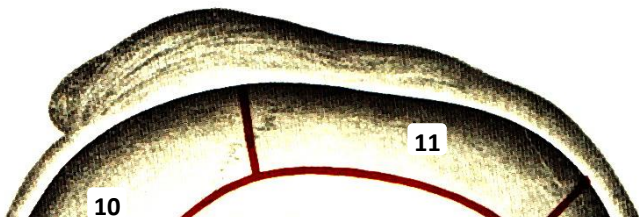
- close location of vital formations;

- venous plexus and veins without valves.

The septic emboli spread quickly into the venous sinuses of the dura mater with development of intracranial complications. The most dangerous in this respect are the inflammatory foci in the area of the upper lip. One distinguishes "triangle of death" between the two nasolabial folds and upper lip, the manipulation on soft tissues of which are carried out with special care.

3) presence of the linked cellular spaces in the lateral face area causes the spreading of inflammation in the neighboring areas of the body (orbit, parapharyngeal space, mediastinum).

APPENDIX



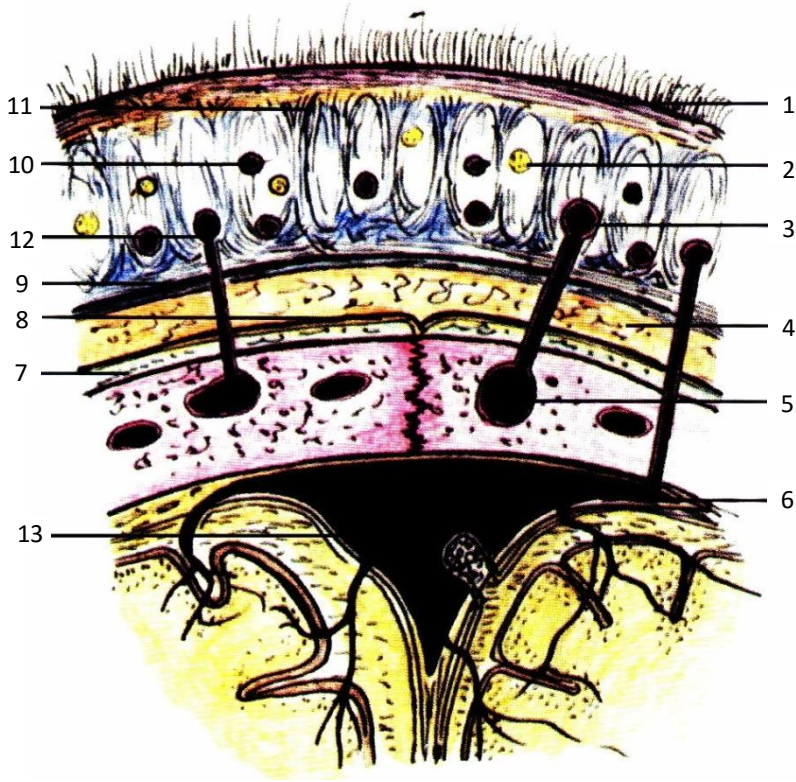


Figure 2 – Layer structure of fronto-parieto-occipital region:
 1 – skin and subcutaneous tissue; 2 – subcutaneous nerves; 3 – superficial nerves;
 4 – subgaleal tissue; 5 – diploic veins; 6 – sagittal sinus; 7 – infraorbital tissue; 8 –periosteum;
 9 – galea aponeurotica; 10 – superficial arteries; 11 – fascial partitions in subcutaneous
 tissue; 12 – emissary veins; 13 – sinus sagittalis superior

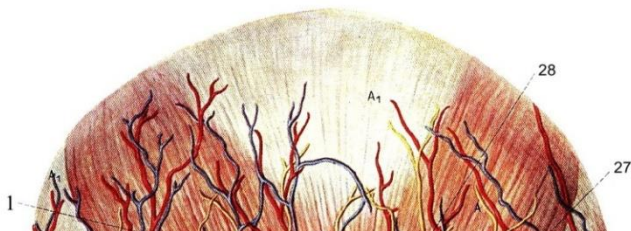
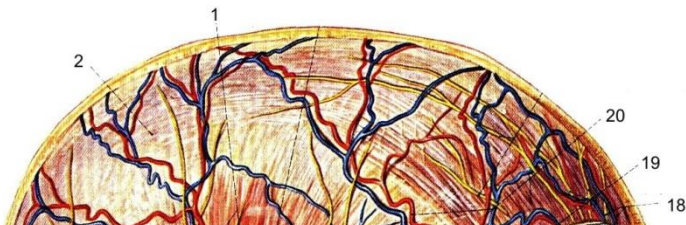


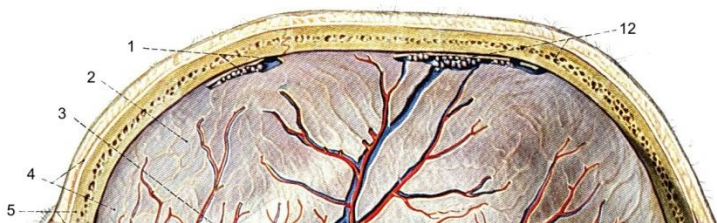
Figure 3 – Nerves and vessels of cerebral and facial regions of head:

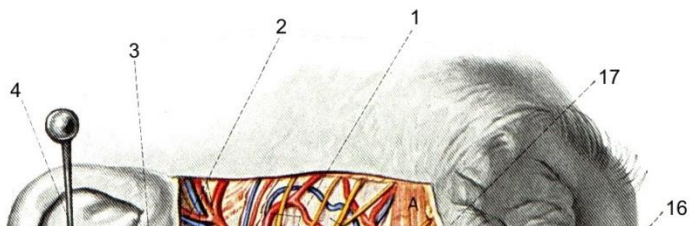
1 – a., v., n. supraorbitalis; 2 – a. temporalis superficialis (anast. with art. supraorbit.); 3 – n. supraorbitalis (ram. lat.) arcus palpebralis superior; 4 – n. n. supraorbitalis (VI), a., v. zygomatico-orbitalis; 5 – a., v. temporalis superficialis, n. auriculotemporalis; 6 – ramus zygomaticofacialis (V II); 7 – n. infratrochlearis, a. dorsalis nasi, rr. palpebrales n. infraorbit. (V II); 8 – n. nasalis externus; 9 – rr. zygomatici et temporales (V II); 10 – rr. buccales (V II); 11 – fascia masseterica, capsula gland. parotis, n. auricul. magnus; 12 – a., n. mentalis (rr. labial. et mental.); 13 – a. labialis inferior (ram. superfic.); 14 – a. labialis inferior (ram. prof.); 15 – a., v. facialis, r. marginalis mandib. (V II); 16 – a., v. labialis superior; 17 – rr. buccales (V II), ductus parotideus, parotis; 18 – n. buccalis, corpus adiposum; 19 – n. facialis (rr. zygomatici); 20 – a., v., n. infraorbitalis (anastomosis cum n. fac.); 21 – a. temporalis superfic.; 22 – a., ram. zygomaticofacialis (V II); 23 – a., v. angularis; 24 – rr. temporales n. facialis; 25 – a. temporalis superfic. (ramus parietalis); 26 – a. temporalis superfic. (ramus frontalis); 27 – a., n. supraorbitalis (ram. lat.), n. lacrimalis (ramus palpebralis); 28 – a. supratrochlearis, n. supraorbitalis (ram. med.)

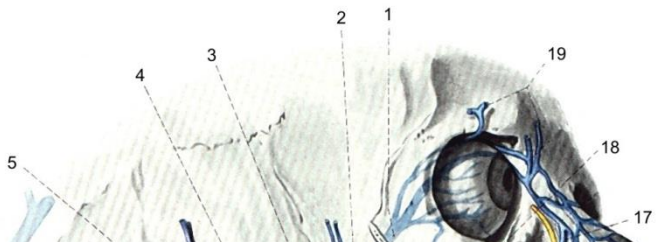




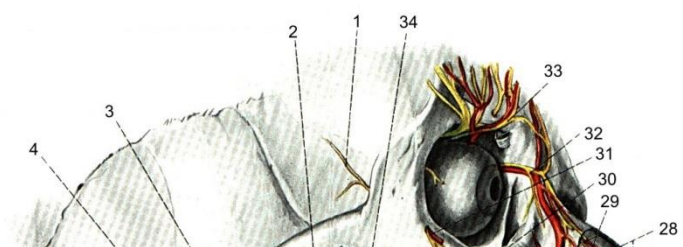


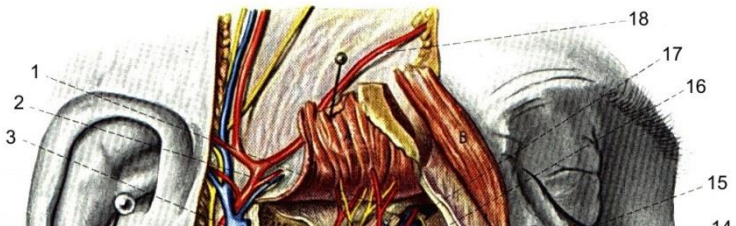


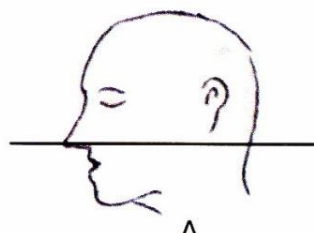


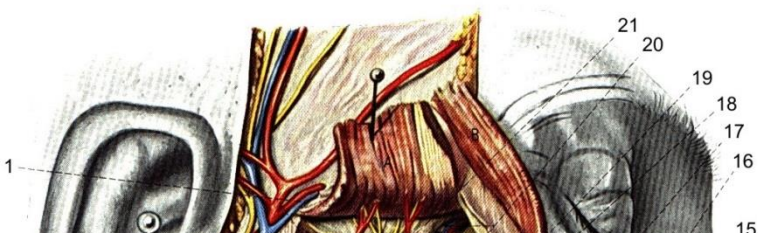


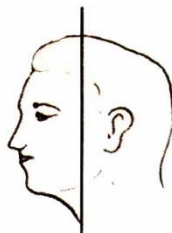
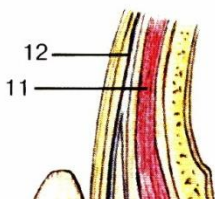












TEST QUESTIONS

1. Choose what regions are identified within the calvarium?

+Frontal parietal occipital region, temporal, mastoid process.

- Frontal, parietal, occipital, calvarium.
- Temporal, mastoid process region, parietal.
- Mastoid process region, occipital, temporal, calvarium.

2. What layers of the calvarium compose scalp flap?

+Skin, subcutaneous fat, tendinous aponeurosis.

- Subcutaneous fat, tendinous aponeurosis, periosteum.
- Skin, tendinous aponeurosis, periosteal cellular tissue.
- Skin, subcutaneous fat, subaponeurotic cellular tissue.

3. How many layers of adipose tissue are identified in the calvarium?

+Three.

- One.
- Two.
- Four.

4. Which layer of cellular tissue is composed of main vessels and nerves of the calvarium?

+Subcutaneous cellular tissue.

- Subaponeurotic cellular tissue.
- Tendinous aponeurosis.
- Periosteum.

4. What vessels and nerves are identified in the subcutaneous cellular tissue of the frontal region?

+A., v. et n. supratrochlearis, a., v. et n. supraorbitalis, rr. temporales (n. facialis).

- A. et v. temporalis superficialis, n. auriculotemporalis.
- A. et v. auricularis posterior, n. auricularis magnus, n. auricularis posterior.
- A., v. et n. supraorbitalis, rr. temporales (n. facialis).

5. The branch of what nerve is frontal nerve (n. frontalis)?

+N. ophthalmicus.

- n. facialis.
- N. auriculotemporalis.
- N. mandibularis.

6. What vessels and nerves are identified in the subcutaneous cellular tissue of the parietal region?

+A. et v. temporalis superficialis, n. auriculotemporalis.

- A. et v. auricularis posterior, n. auricularis magnus, n. auricularis posterior.
- A., v. et n. supratrochlearis, a., v. et n. supraorbitalis, rr. temporales (n. facialis).
- A., v. et n. auricularis posterior, a. et v. occipitalis, n. occipitalis minor, n. occipitalis major.

7. What vessels and nerves are identified in the subcutaneous cellular tissue of the occipital region?

- +A., v. et n. auricularis posterior, a. et v. occipitalis, n. occipitalis minor, n. occipitalis major.
- A. et v. occipitalis, n. occipitalis minor, n. occipitalis major, n. auricularis magnus.
- A. et v. temporalis superficialis, n. auriculotemporalis.
- A., v. et n. supratrochlearis, a., v. et n. supraorbitalis, rr. temporales (n. facialis).

8. Identify the projection of a. supratrochlearis into the frontal region:

- +At the point of crossing of margo supraorbitalis with the vertical line through the medial eye angle.
- At the border of middle and medial third part of margo supraorbitalis.
- 3 cm outside of medial third part of margo supraorbitalis.
- 1 cm below glabella.

9. Identify the projection of a. supraorbitalis into the frontal region:

- +At the border of middle and medial third part of margo supraorbitalis.
- At the point of crossing margo supraorbitalis with the vertical line through the medial eye angle.
- Along the lateral margin of the orbit.
- At the anterior margin of the chewing muscle.

10. Identify the projection of the exit of a. temporalis superficialis where it can be attached to the bone for temporary stop of bleeding:

- +In front of auricle tragus.
- Along the lateral margin of the orbit.
- On the front margin of the chewing muscle.
- Behind the auricle tragus.

11. Identify the projection of exit of the large occipital nerve:

- +At the point of the middle distance between mastoid process and external occipital tuber.
- At the point of the middle distance between mastoid process and upper cervical vertebrae.
- In front of the auricle tragus.
- At the posterior margin of auricle attachment.

12. The branch of what nerve is the large occipital nerve (n. occipitalis major)?

- +Posterior branch of the second cervical nerve.
- Cervical flexus.

- N. facialis.
- N. auricularis magnus.

13. The branch of what nerve is the small occipital nerve (n. occipitalis minor)?
+Cervical flexus.

- Posterior branch of the second cervical nerve.
- N. opthalmicus.
- N. facialis.

14. What muscles are penetrated with the large occipital nerve?
+Semispinal muscle, trapezius muscle.

- Sternocleidomastoid muscle.
- Superior oblique muscle.
- Inferior oblique muscle.

15. Lymphatic vessels of frontal parietal occipital region enter the following lymph nodes:

- +Parotidei superficialis et profundi, retroauricularis, occipitals.
- Auricularis posterior, retroauricularis, temporalis superfacialis.
- Supraorbitalis, supratrochlearis, occipitals.
- Mandibularis, maxillaris, retroauricularis, occipitals.

16. How are external cranial hematomas classified into?
+Subcutaneous, subaponeurotic, subperiosteal.

- Epidural, subdural, subarachnoid.
- Subcutaneous, epidural, subdural.
- Subaponeurotic, subperiosteal, subarachnoid.

17. What layers of the connective tissue of the external calvarium are anatomically suitable for the formation of hematomas?

- +Subaponeurotic cellular tissue, subperiosteal cellular tissue.
- Subcutaneous cellular tissue, subarachnoid space.
- Inside the bone, subdural space.
- Subcutaneous cellular tissue, subaponeurotic cellular tissue.

18. In what layer of the calvarium is hematoma in a shape of bunion localized?
+Subcutaneous cellular tissue.

- Subaponeurotic cellular tissue.
- Subperiosteal cellular tissue.
- Inside the bone.

19. What are hematomas in the subcutaneous cellular tissue of the calvarium like?
+In a shape of bunion.

- Limited swelling.

- They spread occupying the total surface of the calvarium limited by the line of attachment to the epicranial muscle.
- Limited by the line of attachment of cranial sutures.

20. What are hematomas in the subaponeurotic cellular tissue like?

- +They spread occupying the total surface of the calvarium limited by the line of attachment to the epicranial muscle.
- Limited swelling.
- Limited by the line of the attachment of cranial sutures.
- In a shape of bunion.

21. A patient with an injured head is diagnosed with spreading of hematoma of the calvarium soft tissues. It overhangs the eyebrows. In what layer is it located?

- +Subaponeurotic cellular tissue.
- Subperiosteal cellular tissue.
- Subcutaneous cellular tissue.
- Periosteum.

22. What are subperiosteal hematomas like?

- +Limited by the attachment line of cranial sutures.
- Occupy the total surface of the calvarium.
- Limited by the attachment line of epicranial muscle.
- Limited swelling.

23. What incision of the calvarium is the suitable and less traumatic?

- +Radial.
- Vertical.
- Transverse.
- Z-like.

24. The following reasons can cause profuse bleeding at frontal parietal occipital injury:

- +The vessels are located in the subcutaneous cellular tissue above aponeurosis, vascular adventitia is fixed with fibrous membrane.
- Blood supply is provided by the branches of the external carotid artery, vessels are located beneath the aponeurosis, marked cellular tissue, relatively large lumen of the vessels of this very region.
- Fixation of cranial vessels with the other parts of the head and neck, the walls of blood vessels are fixed with the fibrous membranes, vessels are located beneath the aponeurosis, fixation of cranial vessels with the sinuses of dura mater.
- Blood supply of occipital region is provided only by the branches of external carotid artery and the other regions are supplied with blood by internal carotid artery.

25. What layers is the venous system of frontal parietal occipital region composed of?

- +Superficial veins, diploic veins, sinuses of dura mater.
- Diploic veins, emissary veins, superficial cerebral veins.
- Superficial veins, emissary veins, deep cerebral veins.
- Diploic veins, venous plexus of oval foramen, sinuses of dura mater.

26. What joins sinus sagittalis with v. temporalis superficialis?

- +V. emissaria parietalis.
- V. emissaria mastoidea.
- V. emissaria occipitalis.
- Plexus venosus foraminis ovalis.

27. What does v. emissaria occipitalis join?

- +Sinus transversus and vv. occipitales.
- Sinus sigmoideus and v. auricularis posterior.
- Sinus sagittalis superior and v. temporalis superficialis.
- Sinus sigmoideus and vv. occipitales.

28. What does v. emissaria mastoidea join?

- +Sinus sigmoideus and v. auricularis posterior.
- Sinus transversus and v. temporalis superficialis.
- Sinus sigmoideus and vv. occipitales.
- Sinus sagittalis superior and v. temporalis superficialis.

29. How can the infection from the wounds and suppurated lesions of soft tissues of the head spread to the sinuses of dura mater of the brain?

- +Through vv. emissariae.
- Through vv. diploicae.
- Through Trolar's vein.
- Through inferior anastomotic vein (Labbe's vein).

30. How can the bleeding from the bone vessels be stopped?

- +Rubbing with the wax, stitching, electrocoagulation, pressing with bone rongeur.
- Electrocoagulation, ligatures, clipping.
- Moistening with the solution of hydrogen peroxide, electrocoagulation, clipping, tamponade with hemostatic sponge.
- Tamponade with hemostatic sponge, interrupted sutures, Bruning-Burdenko plasty, ligation.

31. Which layer of the bone is more often damaged at broken bones of the calvarium?

- +Internal plate.

- External plate.
- Spongy plate.
- All the plates.

32. How many layers are the bones of the skull composed of?

+Three.

- Two.
- Four.
- Five.

33. How can the bleeding from the dura mater be stopped?

+With the help of ligatures, clipping.

- With the help of rubbing with the wax, stitching, electrocoagulation, pressing with bone rongeur.
- Moistening with the solution of hydrogen peroxide, electrocoagulation, clipping, tamponade with the hemostatic sponge.
- Tamponade with the hemostatic sponge, interrupted sutures, Bruning-Burdenko plasty, ligation.

34. How can the bleeding from the vessels of pia mater be stopped?

+Moistening with the solution of hydrogen peroxide, electrocoagulation, clipping, tamponade with the hemostatic sponge.

- Tamponade with the hemostatic sponge, interrupted sutures, Bruning-Burdenko plasty, ligation.
- Tamponade with the hemostatic sponge, tamponade with catgut thread, with the help of clamps.
- With the help of clamps.

35. What sinuses of dura mater are more often damaged when the brain of the skull is injured?

+Sinus sagittalis superior.

- Sinus transverses.
- Sinus rectus.
- Sinus sigmoideus.

36. How can the bleeding from the venous sinuses be stopped?

+Tamponade with the hemostatic sponge, interrupted sutures, Bruning-Burdenko plasty, ligation.

- Moistening with the solution of hydrogen peroxide, electrocoagulation, clipping, tamponade with the hemostatic sponge.
- Tamponade with the hemostatic sponge, tamponade with the catgut thread, with the help of clamps.
- With the help of clamps.

37. During the operation in the cranial cavity sinuses of the dura mater are damaged. How can the bleeding from the sinuses of dura mater be stopped according to Burdenko method?

+Suturing of P-announcement bit of external leaf of dura mater.

- Tamponade with a piece of muscle.
- Tamponade of cavity with catgut.
- Both ends of the sinus should be ligated.

38. When the head injuries are considered to be penetrating?

+When dura mater is damaged.

- When arachnoid mater is damaged.
- When external plate of the skull is damaged.
- When pia mater is damaged.

39. A surgeon is performing the final stage of the operation. According to the classification of surgical instruments, which of the following instruments refers to needle holders?

+Trojanov's needle holder, Mathieu needle holder, Hegar's needle holder.

- Pier's needle holder, Doyen needle holder, Bogush's needle holder.
- Farabeff's needle holder, Olie's needle holder, Olivekronie's needle holder.
- Trojanov's needle holder, Mathieu needle holder, Dullgren's needle holder, Gigli's needle holder.

40. What symptoms of intracranial hematomas are more often evident?

+Mydriasis, hemiparesis, bradycardia, lucid interval.

- Dysphagia, anesthesia of the mucous membrane of the pharynx, dysgeusia.
- Aphonia and cardiac disturbances.
- Hemiglossoplegia, dysphagia, dysarthria and deviation of the tongue.

41. What foramen does a. meningea media penetrate through?

+Through foramen spinosum.

- Through foramen rotundum.
- Through foramen ovale.
- Through foramen lacerum.

42. What convolution of brain does the passage of the frontal branch of the middle meningeal artery regard?

+Precentral gyrus.

- Postcentral gyrus.
- Angular gyrus.
- Upper limbic lobe.

43. What convolution of brain does the passage of posterior branch of the middle meningeal artery regard?

+Temporal lobe.

- Precentral convolution.
- Postcentral convolution.
- Parietal lobe.

44. In what projection is falx cerebri located ?

+In sagittal.

- In frontal.
- In vertical.
- In horizontal.

45. What does falx cerebri separate?

+Hemispheres of the brain.

- Occipital part of the brain from the cerebellum.
- Hemispheres of the cerebellum.
- Medulla oblongata from the cerebellum.

46. What is falx cerebri attached to?

+Margins of sulcus sinus sagittalis.

- Margins of sulcus sinus transversus.
- Internal occipital crest.
- Upper margin of the pyramid.

47. In what direction is tentorium cerebelli localized?

+Horizontal.

- Vertical.
- Frontal.
- Sagittal.

48. Where does tentorium cerebelli penetrate?

+In transverse fissure of cerebrum.

- Between the hemispheres of the brain.
- Between the hemispheres of the cerebellum.
- In cerebellar fissure.

49. What passes through tentorial fissure?

+Brain column.

- V. cerebri magna.
- Sinus sagittalis inferior.
- Sinus rectus.

50. Where is sinus sagittalis superior located?

- +On the upper margin of falx cerebri, in sulcus sinus sagittalis.
- On the low margin of falx cerebri, in sulcus sinus sagittalis.
- At the point of falx cerebri fixation with tentorium cerebella.
- Along sulcus transversus of occipital bone.

51. What is the sinus of dura mater which is directly connected with venous system of the face?

- +Cavernous.
- Sinus rectus.
- Superior petrosal sinus.
- Sigmoid.

52. Where does sinus sagittalis superior drain into?

- +Sinus transversus.
- Sinus rectus.
- Sinus sigmoideus.
- Sinus cavernosus.

53. Where is sinus sagittalis inferior located?

- +Along the low margin of falx cerebri.
- Along the upper margin of falx cerebri.
- At the point of internal occipital protuberance.
- At the point of falx cerebri fixation with tentorium cerebelli.

54. Where does sinus sagittalis inferior drain into?

- +Sinus rectus.
- Sinus transversus.
- Sinus sigmoideus.
- Sinus occipitalis.

55. Where is sinus rectus located?

- +At the point of falx cerebri fixation with tentorium cerebelli.
- Along the upper margin of falx cerebri.
- Along the low margin of falx cerebri.
- Along the internal occipital crest.

56. Where does sinus rectus drain into?

- +Sinus transversus.
- Sinus sigmoideus.
- Sinus cavernosus.
- Sinus sagittalis inferior.

57. Where is sinus transversus located?

+At the point of fixation of tentorium cerebelli with sulcus of occipital bone.

- In sulcus sinus sagittalis.
- In sulcus sinus sigmoideus.
- On crista occipitalis interna.

58. Where is sinus occipitalis located?

+Along the posterior margin of falx cerebelli, on crista occipitalis interna.

- On sulcus transversus of occipital bone.
- On both sides of sella turcica.
- At the point of falx cerebelli fixation with tentorium cerebelli.

59. Where does sinus occipitalis drain into?

+Sinus sigmoideus.

- Sinus transversus.
- Sinus rectus.
- Sinus sagittalis superior.

60. Where is sinus cavernosus located?

+On both sides of sella turcica.

- Along superior margin of the pyramid of the temporal bone.
- Inferior margin of the pyramid of the temporal bone.
- On crista occipitalis interna.

61. On what account is the connection of cavernous sinus with superior sagittalis sinus performed?

+Trolar's vein.

- Labbe's vein.
- V. cerebri magna.
- Vv. ophthalmicae.

62. On what account is the connection of cavernous sinus with the venous system of the face performed?

+V. ophthalmica superior et inferior.

- Plexus venosus foraminis ovalis.
- Trolar's vein.
- Labbe's vein.

63. What vein connects sinus cavernosus with sinus transversus?

+Labbe's vein.

- Trolar's vein.
- V. cerebri magna.
- V. cerebri media superficialis.

64. What passes through the upper wall of sinus cavernosus?

- +N. oculomotoris and n. trochlearis.
- N. ophthalmicus.
- N. abducens and a. carotis interna.
- N. facialis.

65. What passes in the lateral wall of sinus cavernosus?

- +N. ophthalmicus.
- N. oculomotorius.
- N. trochlearis.
- N. abducens.

66. What passes through sinus cavernosus?

- +N. abducens and a. carotis interna.
- N. ophthalmicus.
- N. oculomotorius and n. trochlearis.
- N. opticus.

67. What is observed at thrombosis of sinus cavernosus?

- +Foix – Thevenard's sign.
- Behr's symptom.
- Mackenzie's syndrome.
- Sluder's syndrome.

68. What are clinical signs of thrombosis at sinus cavernosus?

- +Complete ophthalmoplegia, protrusion, ptosis.
- Pulsing protrusion, dysphagia, amaurosis.
- Torticollis.
- Aphonia.

69. What is observed at sinus cavernosus damage?

- +Pulsing protrusion.
- Dysphagia.
- Aphonia.
- Foix – Thevenard's sign.

70. What artery supplies dura mater of anterior cranial fossa?

- +A. meningea anterior.
- A. meningea media.
- A. ophthalmica.
- A. carotis interna.

71. What artery supplies dura mater of the middle cranial fossa?

- +A. meningea media.
- A. meningea anterior.
- A. meningea posterior.
- A. carotis interna.

72. What artery supplies dura mater of posterior cranial fossa?

- +A. meningea posterior (a. pharyngea ascendens branch).
- A. meningea posterior (a. occipitalis branch).
- A. meningea posterior (a. auricularis posterior branch).
- A. meningea posterior (a. maxillaris branch).

73. What nerves is dura mater innervated by?

- +R. tentorii (n. ophthalmicus branch); r. meningeus medius (from n. maxillaris); r. meningeus (from n. mandibularis); r. meningeus (from n. vagus).
- R. meningeus medius (from n. maxillaris); r. meningeus (from n. mandibularis); r. auricularis (from n. vagus).
- N. olfactorius; rr. ganglionares ad ganglion pterygopalatinum (from n. maxillaris); radix cranialis, radix spinalis (from n. accessorius).
- R. tentorius, r. meningeus recurrens, r. meningeus anterior (n. ophthalmicus branches); r. meningeus medius (from n. maxillaris).

74. What is the pressure of cerebrospinal fluid at lying position?

- +120–180 ml of water column.
- 120–180 ml of mercury column.
- 200–250 ml of water column.
- 200–250 ml of mercury column.

75. What is the pressure of cerebrospinal fluid at sitting position?

- +200–250 ml of water column.
- 200–250 ml of mercury column.
- 120–180 ml of water column.
- 120–180 ml of mercury column.

76. Which liquid dynamic tests are used to estimate patency of subarachnoid space?

- +Queckenstedt's test.
- Delbe-Pertes test.
- Trojanov-Trendelenburg's test.
- Hackenbruch's test.

77. What are the possible ways of cerebrospinal fluid circulation?

- +From the fourth ventricle through aqueduct of cerebrum into the third ventricle.
- From the fourth ventricle through Magendie's and Luschka's foramen into the

third ventricle.

- From the fourth ventricle through Monro's foramen into the third ventricle.
- From the fourth ventricle through aqueduct of cerebrum into the lateral ventricles.

78. What arteries form anterior arterial circle of brain?

- +A. communicans anterior.
- A. carotis interna.
- A. communicans posterior.
- A. cerebri anterior.

79. What arteries form lateral arterial circle of brain?

- +A. communicans posterior.
- A. cerebri posterior.
- A. cerebri anterior.
- A. communicans anterior.

80. What arteries form the circle of Willis?

- +A. cerebri posterior.
- A. cerebri anterior.
- A. communicans anterior.
- A. communicans posterior.

81. What veins of brain form collateral circulation and are of practical significance at ligation of superior sinus sagittalis?

- +Trollar's vein and Labbe's vein.
- V. cerebri media superficialis.
- Vv. cerebri superiores.
- Vv. cerebri inferiores.

82. What is observed when the first pair of cranial nerves is damaged?

- +Anosmia.
- Amaurosis.
- Amblyopia.
- Aphonia.

83. What is observed when the second pair of cranial nerves is damaged?

- +Amblyopia and amaurosis.
- Strabismus divergens, ptosis et mydriasis.
- Strabismus convergens.
- Aphonia.

84. What is observed when the third pair of cranial nerves is damaged?

- +Strabismus divergens, ptosis et mydriasis.
- Amblyopia and amaurosis.

- Aphonia and anosmia.
- Hemianopsia.

85. What is observed when the fourth pair of cranial nerves is damaged?

- +Squint, diplopia.
- Dysphagia.
- Strabismus divergens.
- Strabismus convergens.

86. What is observed when the sixth pair of cranial nerves is damaged?

- +Strabismus convergens.
- Strabismus divergens.
- Mydriasis.
- Amaurosis.

87. What is observed when the seventh pair of cranial nerves is damaged on the exit of the channel?

- +Hemimimia, disproportion of oral fissure towards a healthy side, smoothing of the nasolabial fold, lagophthalmos.
- Aphonia.
- Hemimimia, oligoptyalism, dysgeuzia.
- Hemimimia and disorders of lacrimal excretory system.

88. In a female patient with sinister suppurating mumps developed symptoms of smooth nasolabial and nasobuccal folds. The diagnosis is paresis of mimic muscles of the face on the left side. What nerve is involved into the inflammatory process in this case?

- +Facial nerve.
- The second branch of trigeminal nerve.
- The third branch of trigeminal nerve.
- N. auriculotemporalis.

89. What is observed when the facial nerve in the channel above the branch of chorda tympani is damaged?

- +Hemimimia, oligoptyalism, dysgeuzia.
- Hemimimia, disproportion of oral fissure towards a healthy side, smoothing of the nasolabial fold.
- Hemimimia and disorders of lacrimal excretory system.
- Hemimimia and hyperacusia.

90. What is observed when the facial nerve in the channel above the branch of n. stapedius is damaged?

- +Hemimimia and hyperacusia.

- Hemimimia, oligoptyalism, dysgeuzia.
- Hemimimia and disorders of lacrimal excretory system.
- Anosmia.

91. What is observed when the facial nerve in the channel above the branch of n. petrosus major is damaged?

- +Hemimimia and disorders of lacrimal excretory system.
- Hemimimia and hyperacusia.
- Hemimimia, oligoptyalism, dysgeusia.
- Amaurosis.

92. What symptoms are typical for rr. temporales and n. facialis damage?

- +Lagophthalmos.
- Mydriasis.
- Ptosis.

93. What is the broken skull at the point of foramen jugularis characterized by?

- +Mackenzie's syndrome.
- Behr's symptom.
- Foix-Thevenard sign.
- Villaret's symptom.

94. What is the damage of the ninth pair of cranial nerves characterized by?

- +Dysphagia, anesthesia of mucous membrane of the larynx, dysgeusia.
- Aponia and cardiac disturbances.
- Hemiglossoplegia, dysphagia, dysarthria and deviation of the tongue.
- Hemimimia and disorders of lacrimal system.

95. What is the damage of the tenth pair of cranial nerves characterized by?

- +Aponia and cardiac disturbance.
- Dysphagia, anesthesia of mucous membrane of the larynx, dysgeusia.
- Hemiglossoplegia, dysphagia, dysarthria and deviation of the tongue.
- Haemimimia, oligoptyalism, dysgeuzia.

96. What is the damage of the eleventh pair of cranial nerves characterized by?

- +Torticollis.
- Amaurosis.
- Aponia.
- Anosmia.

97. A female patient is diagnosed with the damage of foramen jugularis. Which of the following nerves does penetrate through it?

- +Vagus nerve, accessory nerve, glossopharyngeal nerve.

- Vestibulocochlear nerve and intermediate nerve.
- Trigeminal nerve and vagus nerve.
- Sublingual nerve and facial nerve.

98. What is the damage of the twelfth pair of cranial nerves characterized by?

- +Hemiglossoplegia, dysphagia, dysarthria and deviation of the tongue.
- Dysphagia, anesthesia of mucous membrane of the larynx, dysgeusia.
- Hemimimia, oligoptyalism, dysgeuzia. Torticollis.

99. What intracranial hematomas and what spaces are more often formed when A. meningeal media is damaged?

- +Epidural space and epidural hematomas.
- Epidural space and subdural hematomas.
- Subdural space and subdural hematomas.
- Subdural space and subarachnoid hematomas.

100. A patient is diagnosed with craniocerebral injury resulted from the punch on the face. What is the broken base of the brain at frontal cranial fossa characterized by?

- +Nasal bleeding, liquorrhea from the nose, fruises and subcutaneous emphysema in the orbit, scent disorders.
- Complete ophthalmoplegia, protrusion, ptosis.
- Squint, diplopia.
- Hemimimia, disproportion of oral fissure towards a healthy side, smoothing of the nasolabial fold, lagophthalmos.

101. What is the break at the middle cranial fossa with the damaged pyramid of the temporal bone characterized by?

- +Bleeding, liquorrhea from meatus acusticus externus and damage of the seventh and eighth pairs of craniocerebral nerves.
- Nasal bleeding, liquorrhea from the nose, fruises and subcutaneous emphysema in the orbit, scent disorders, aphonia and cardiac disturbance.
- Hemiglossoplegia, dysphagia, dysarthria, deviation of the tongue.
- Hemimimia, disorders of the lacrimal system and damage of the ninth and tenth pairs of cranial nerves.

102. Identify boundaries of temporal region:

- +From above and behind – superior temporal line, from below – zygomatic arch, in front – frontal process of zygomatic bone and zygomatic process of frontal bone.
- In front – supraorbital margin of frontal bone, behind – external occipital protuberance and superior nuchal line, laterally – superior temporal line.
- From above – the line that meets the continuing zygomatic arch, in front – the line

of attachment of the auricle, from below and laterally – corresponds to the shape of mastoid process.

- Boundaries of temporal muscle.

103. What is located in the subcutaneous cellular tissue of temporal lobe?

+M. m. auricularis anterior et superior, a. et v. temporalis superficialis, n. auriculotemporalis, n. zygomaticotemporalis, A. et v. auricularis posterior, n. occipitalis minor, rr. temporales (n. facialis).

- A., v. et n. auricularis posterior, a. et v. occipitalis, n. occipitalis minor, n. occipitalis major.

- M. auricularis posterior, a. et v. auricularis posterior, n. auricularis magnus, n. occipitalis minor, n. auricularis posterior, lymphatic vessels and nodes.

- A., v. et n. supratrochlearis, a., v. et n. supraorbitalis, rr. temporales (n. facialis).

104. How many layers of adipose tissue are in the temporal lobe?

+Five.

- Four.

- Three.

- Two.

105. Where is the superficial abscess of temporal lobe located?

+Between the skin and superficial leaf of temporal aponeurosis.

- Between temporal aponeurosis and external surface of temporal muscle.

- Between superficial and deep leaves of temporal aponeurosis.

- Between periosteum and bone.

106. Identify possible ways of further spread of infection from the temporal lobe:

+Into subtemporal fossa, parotid- masticatory region, space under masticatory region, frontal part, into the orbit, temporal bone, into the cranial cavity.

- Into buccal part, temporal-pterygoid and interpterygoid space, parapharyngeal space, into parotid-masticatory part.

- Into lateral triangle of the neck, in frontal parietal occipital part, into mastoid process, into cranial cavity.

- Limited by temporal lobe.

107. What incision is used more often to reveal superficial abscesses of the temporal lobe?

+Anterior inclined incision behind the frontal process of zygomatic bone.

- Arciform incision alongside the lower temporal lines of temporal bone.

- Horizontal incision over zygomatic arch.

- Posterior vertical incision through the centre of inflammatory infiltrate.

108. What incision is most frequently used to reveal interaponeurotic abscesses of temporal lobe?

+Horizontal incision over zygomatic arch.

- Horizontal incision under zygomatic arch.
- Posterior vertical incision through the centre of inflammatory infiltrate.
- Zigzag incision above zygomatic arch.

109. What passes through the interaponeurotic temporal space?

- +A. et v. temporalis media, n. zygomaticotemporalis.
- A. et v. temporalis superficialis, n. auriculotemporalis.
- V. retromandibularis.
- Ductus parotideus.

110. What is deep temporal cellular space limited by?

- +Temporal muscle and periosteum.
- Periosteum and bone.
- Temporal aponeurosis and external surface of the temporal muscle.
- Superficial and deep leaves of temporal aponeurosis.

111. What incision is used more frequently to reveal deep temporal abscesses?

- +Arciform incision along the lower temporal lines of temporal bone.
- Horizontal incision under zygomatic arch.
- Posterior vertical incision through the center of the inflammatory infiltrate.
- Two vertical incisions.

112. What does deep temporal cellular space contain?

- +A. et v. temporales profundae, deep temporal nerves.
- A. et v. temporalis media.
- A. et v. temporalis superficialis.
- N. auriculotemporalis.

113. What does the osseous basis of temporal lobe contain?

- +A big wing of cuneiform bone, scale of temporal bone, part of the frontal bone, part of the parietal bone.
- A small wing of cuneiform bone, frontal scale, frontal margin of parietal bone, ethmoid bone.
- Temporal bone, maxilla, zygomatic bone, mandible.
- A big wing of cuneiform bone, mastoid process of temporal bone, part of frontal bone.

114. What is character for the structure of temporal bone?

- +Absence of spongy layer – squamous structure.
- It contains airway sinus – pneumatic structure.
- It is composed of spongy and compact layers – diploetic structure.
- It has three-layer structure, contains collars.

115. Which anatomical formation is the temporal muscle tendon attached to?

- +To the branch and coronoid process of mandible.
- To the cervix of the mandible.
- To the zygomatic process of maxilla.
- To the condylar process.

116. Identify one of the first signs of the inflammation of deep cellular tissue of temporal lobe:

- +Trismus.
- Lagophthalmos.
- Dysphagia.
- Rigidity of occipital muscles.

117. What can be damaged at the dissection of the temporal abscess?

- +Rr. temporales n. facialis, rr zygomatici n. facialis, a. et v. temporalis superficialis, n. auriculotemporalis, deep temporal vessels and nerves.
- A., v. et n. supratrochlearis, a., v. et n. supraorbitalis, rr. temporales (n. facialis).
- A., v et n. auricularis posterior, a. et v. occipitalis, n. occipitalis minor, n. occipitalis major.
- M. auricularis posterior, a. et v. auricularis posterior, n. auricularis magnus, n. occipitalis minor, n. auricularis posterior.

118. What is located in subcutaneous cellular tissue in the area of mastoid process?

- +M. auricularis posterior, a. et v. auricularis posterior, n. auricularis magnus, n. occipitalis minor, n. auricularis posterior, lymphatic vessels and nodes.
- M. m. auricularis anterior et superior, a. et v. temporalis superficialis, n. auriculotemporalis, n. zygomaticotemporalis.
- A. et v. auricularis posterior, n. occipitalis minor, rr. temporales (n. facialis).
- A., v et n. auricularis posterior, a. et v. occipitalis, n. occipitalis minor, n. occipitalis major et v. temporalis superficialis, n. auriculotemporalis.

119. Note the front border of Chipault's triangle?

- +Vertical line which passes along the posterior margin of external auditory meatus from the apex of mastoid process through spina suprameatum.
- Crista mastoidea.
- Horizontal line which is a continuation of zygomatic arch.
- Crista supramastoidea.

120. Identify the back border of Chipault's triangle:

- +Crista mastoidea.
- Horizontal line which is a continuation of zygomatic arch.
- Vertical line which passes along the posterior margin of external auditory meatus from the apex of mastoid process through spina suprameatum.

- Above supramastoid crest.

121. Identify the upper border of Chipault's triangle?

+Horizontal line which is a continuation of zygomatic arch.

- Crista mastoidea.

- Vertical line which passes through the posterior margin of external auditory meatus from the apex of mastoid process through spina suprameatum.

- Porus acusticus externus.

122. Where can pus penetrate destroying the posterior wall of antrum mastoideum?

+Into sinus sigmoideus.

- Into middle cranial fossa.

- Into posterior cranial fossa.

- Into the cavity of the middle ear.

123. Where can pus penetrate destroying the upper wall of antrum mastoideum?

+Into middle cranial fossa.

- Into sinus sigmoideus.

- Into posterior cranial fossa.

- Into the cavity of the middle ear.

124. Identify the projection of central sulcus of cerebrum according to Kronlein's scheme:

+From the intersection of back vertical line with sagittal line to the intersection of front vertical line with the upper horizontal line.

- From the intersection of back vertical line with the upper horizontal line to the intersection of front vertical line with the lower horizontal line.

- From the intersection of upper front vertical line with the upper horizontal line to the intersection of back vertical line with the lower horizontal line.

- From the intersection of front vertical line with sagittal line to the intersection of back vertical line with the lower horizontal line.

125. Where is the column of a. meningea media located according to Kronlein's scheme?

+At the intersection of lower horizontal line with front vertical line.

- At the intersection of top horizontal line with front vertical line.

- At the intersection of lower horizontal line with middle vertical line.

- At the intersection of lower horizontal line with back vertical line.

126. Where is the projection of anterior branch of a. meningea media determined according to Kronlein's scheme?

+At the intersection of upper horizontal line and front vertical line.

- At the intersection of the lower horizontal line with middle vertical line.
- At the intersection of lower back horizontal line with back vertical line.
- On the bisectrix of the angle formed by the projection of central sulcus and upper horizontal line.

127. Identify the projection of lateral (Sylvius) sulcus according to Kronlein's scheme:

- +Bisectrix of the angle formed by the projection of central fissure and horizontal line.
- Intersection of the upper front horizontal line and front vertical line.
- Intersection of lower horizontal line and middle vertical line.
- Intersection of lower horizontal line and back vertical line.

128. What foramen does a. meningea media penetrate into the cranial cavity through?

- +Foramen spinosum.
- Foramen rotundum.
- Foramen ovale.
- Foramen lacerum.

129. What convolution of the brain does the course of the anterior branch of the middle meningeal artery correspond to?

- +Precentral convolution.
- Postcentral convolution.
- Angular convolution.
- Upper temporal convolution.

130. What convolution of the brain does the course of the back branch of the middle meningeal artery correspond to?

- +Temporal part.
- Precentral convolution.
- Postcentral convolution.
- Parietal part.

131. How is the method of trepanation of the skull called at which a cutaneous aponeurotic flap is separately dissected with a wide basis and further its scalping and sawing the separate osseous flap?

- +Osteoplastic craniotomy according to Olivecrona's method.
- Osteoplastic craniotomy according to Wagner-Wolfe's method.
- Osteoplastic craniotomy according to Cushing's method.
- Decompressive craniotomy according to Olivecrona's method.

132. What tissues compose the first flap at osteoplastic craniotomy by Olivecrona's method?

- +Skin, subcutaneous cellular tissue, aponeurosis

- Skin, subcutaneous cellular tissue, aponeurosis, subaponeurotic cellular tissue, periosteum, bone.
- Skin, subcutaneous cellular tissue, muscle, periosteum, bone.
- Skin, subcutaneous cellular tissue.

133. What tissues compose the second flap at osteoplastic craniotomy by Olivecrona's method?

- +Muscle, periosteum, bone.
- Skin, subcutaneous cellular tissue, aponeurosis.
- Skin, subcutaneous cellular tissue, aponeurosis, subaponeurotic cellular tissue, muscle, periosteum, bone.
- Skin, subcutaneous cellular tissue.

134. What vessel is adjacent to the internal surface of the temporal bone?

- +A. meningia media.
- Temporalis profunda.
- A. cerebri media.
- A. cerebri anterior.

135. What incisions are used for dissection of abscesses of the temporal lobe?

- +Front oblique section, rear vertical section, horizontal section above zygomatic arch.
- Two vertical sections, horizontal section under zygomatic arch along the upper and lower edge of the orbit.
- Zigzag section above zygomatic arch.

136. Which of these methods does correspond to decompressive trepanation of the skull?

- +Cushing's technique.
- Wagner-Wolf's technique.
- Olivecrona's technique.
- Bogaert's technique.

137. Patient with the increased intracranial pressure the decompressive trepanation of the skull was appointed. Where is it performed?

- +In the right temporal region.
- In the right parietal region.
- In the left parietal region.
- In the right and left occipital regions.

138. Head injury resulted in increased intracranial pressure. In what part of the calvarium is decompressive trepanation of the skull performed at the known localization of the pathologic process?

- +Directly above the focus of the pathological process.
- In the left temporal region.
- In the occipital part in symmetrically opposite region.
- In the right parietal region.

139. A patient is appointed to perform trepanation of the mastoid process. Which of the special Instruments are used at craniotomy of mastoid process?

- +Voyachek's chisel or gouge.
- Liston's forceps.
- Dahlgren's forceps.
- Doyen's forceps.

140. What complications can occur at craniotomy of mastoid process in postoperative period if at the operation the front border of Chipault's triangle was damaged?

- +Peripheral paralysis of n. facialis on the side of the operation.
- Central paralysis of n. facialis on the opposite side of the operation.
- Damage of the internal ear.
- Damage of sigmoid sinus and its hemorrhage.

141. What complications can occur at craniotomy of mastoid process in postoperative period if at the operation the upper border of Chipault's triangle was damaged?

- +Infection of the cranial cavity.
- Peripheral paralysis of n. facialis on the side of the operation.
- Central paralysis of n. facialis on the opposite side.
- Central paralysis of n. facialis on the side of the operation.

142. What complications can occur at craniotomy of mastoid process in postoperative period if at the operation the posterior border of Chipault's triangle was damaged?

- +Damage of sigmoid sinus and its hemorrhage.
- Peripheral paralysis of n. facialis on the side of the operation.
- Infection of the cranial cavity.
- Damage of the internal ear.

143. A female patient got a blunt injury of the temporal part of the head. She was diagnosed with epidural hematoma and as a result the osteoplastic craniotomy was performed. What surgical instruments are used to perform craniotomy?

- +General surgical instruments, trepan, bone cutter, electrocoagulator, Dalhren's forceps, Polenov's conductor, Gigli wire saw.
- General surgical instruments, trepan, bone cutter, electrocoagulator, dissecting blade saw.
- General surgical instruments, trepan, bone cutter, electrocoagulator, arc saw.

- General surgical instruments, trepan, bone cutter, electrocoagulator, Dalhren's forceps.

144. Identify the boundaries of lateral part of the face:

- +From above – zygomatic arch and lower margin of eye fossa, at the bottom – lower margin of mandibular base, in front – nasolabial and nasobuccal folds and behind – posterior margin of the lower jaw.
- In front – supraorbital margin of frontal bone, behind – external occipital protuberance and the upper nuchal line, and laterally – temporal top line.
- From above – the line that meets the continuing zygomatic arch, in front – the line of the ear, at the bottom and laterally – missiles the shape of mastoid process.
- From above and behind – top temporal line, at the bottom – zygomatic arch, in front – temporal process of zygomatic bone and zygomatic process of frontal bone.

145. What is the skin of buccal part innervated by?

- +N. zygomaticofacialis, n. buccalis (from n. mandibularis), n. infraorbitalis, n. mentalis.
- N. zygomaticotemporalis, n. auriculotemporalis, n. auricularis magnus, rr. buccalis (from n. facialis).
- N. auricularis magnus, n. occipitalis minor, n. auricularis posterior.
- N. supratrochlearis, n. supraorbitalis, rr. temporales (n. facialis).

146. What is located externally and in front of fat body of cheek?

- +Parotid duct.
- Arcus zygomaticus.
- Mandibular field.
- M. buccinator.

147. What arteries accompany ductus parotideus?

- +A. transversa faciei.
- A. temporalis media.
- A. facialis.
- A. temporalis superficialis.

148. Identify the processes of body fat of cheek.

- +Temporal, orbital, pterygopalatal.
- Temporal, orbital, coronal.
- Nasal, orbital, pterygopalatal.
- Submasseteric, orbital, pterygopalatal.

149. What cellular spaces does the body fat of cheek bind?

- +All the listed below.
- Cellular tissue of buccal region, interpterygoid region, temporal pterygoid region,

subaponeurotic space of temporal region.

- Cellular tissue of pterygopalatal fossa.
- Orbital cellular tissue.

150. What is m. depressor labii inferioris innervated by?

+R. marginalis mandibulae.

- N. mentalis.
- N. infraorbitalis.
- N. mylohyoideus.

151. On examination of the patient's lateral superficial wound of the face, there was not revealed pulse of the facial artery. Where is the facial artery palpated?

+Near the front margin of the masseteric muscle of the lower mandibular margin.

- Above the ear.
- Near lobule of the ear.
- Near tragus.

152. Identify veins capable to retrograde blood stream and transmit infection to cavernous sinus at furunculosis of soft tissues of the facial skull:

+V. facialis → v. angularis → vv. ophthalmicae → sinus cavernosus; or v. facialis → v. faciei profunda → plexus pterygoideus → v. emissaria foraminis laceri → plexus venosus foraminis ovale → sinus cavernosus.

- V. facialis → v. temporalis superficialis → v. auricularis posterior → v. jugularis externa v. facialis → v. supratrochlearis, → v. supraorbitalis, → vv. ophthalmicae.
- V. facialis → v. supratrochlearis, → v. supraorbitalis → v. faciei profunda → plexus pterygoideus.

153. Identify the projection of infraorbital neurovascular fascicle:

+0.5 cm below the middle of the lower orbital margin.

- 0.5 cm below the point situated between medial one third of the lower orbital margin.
- Vertical line via medial angle of the eye.
- 1.0 cm outside the wing of the nose.

154. Identify the projection of mental neurovascular fascicle:

+The same vertical line of supraorbital and infraorbital foramina.

- The region of the angle of mouth.
- The middle of basis mandible
- Front margin of m. masseter.

155. Identify the projection of supraorbital neurovascular fascicle:

+The border of medial and middle third of margo supraorbitalis.

- The middle of margo supraorbitalis crossing vertical line through medial angle of

the eye with margo supraorbitalis.

- 0.5 cm above the mid-margo supraorbitalis.

-

156. What is the skin of parotid masseteric region innervated by?

+N. zygomaticofacialis, n. buccalis (from n. mandibularis), n. auriculotemporalis, n. auricularis magnus.

- n. buccalis (from n. mandibularis), n. infraorbitalis, n. mentalis.

- N. auriculotemporalis, n. auricularis magnus, rr. buccalis (from n. facialis).

- N. auricularis magnus, n. supratrochlearis, n. supraorbitalis, rr. temporales (n. facialis).

157. What is located in the subcutaneous cellular tissue of parotid masseteric region?

+N. auricularis magnus, as well. et v. transversa faciei, branches of n. facialis, n. auriculotemporalis.

- Mm. auricularis anterior et superior, a. et v. temporalis superficialis, n. auriculotemporalis.

- N. zygomaticotemporalis, a. et v. auricularis posterior, n. occipitalis minor, rr. temporales (n. facialis).

- A., v et n. buccalis (from n. mandibularis), n. infraorbitalis, n. mentalis.

158. Identify the front boundary of spatium parotideum:

+Posterior and external surface of m. masseter, branch of mandible, m. pterygoideus medialis.

- m. pterygoideus lateralis.

- Submandibular salivary gland.

- Styloid process, m. stylohyoideus, m. styloglossus, m. stylopharyngeus, cellular tissue of front parapharyngeal space.

159. Identify the lower border of spatium parotideum:

+Submandibular salivary gland.

- Back and foreign surface of m. masseter, branch of mandible, m. pterygoideus medialis.

- Styloid process, m. stylohyoideus, m. styloglossus, m. stylopharyngeus, cellular tissue of front parapharyngeal space.

- M. sternocleidomastoideus, rear venter of m. digastricus, zygomatic process.

160. Identify the back boundary of spatium parotideum?

+M. sternocleidomastoideus, rear venter of m. digastricus, mastoid process.

- Posterior and foreign surface of m. masseter, branch of mandible, m. pterygoideus medialis.

- Zhonesko's diaphragm.

- Styloid process, m. stylohyoideus, m. styloglossus, m. stylopharyngeus, cellular tissue of front parapharyngeal space.

161. Identify medial border of spatium parotideum?

+Styloid process, m. stylohyoideus, m. styloglossus, m. stylopharyngeus, cellular tissue of front parapharyngeal space.

- Subcutaneous adipose tissue.
- External acoustic passage.
- Posterior and foreign surface of m. masseter, branch of mandible, m. pterygoideus medialis.

162. Identify lateral border of spatium parotideum?

+Subcutaneous adipose tissue.

- M. sternocleidomastoideus, rear venter of m. digastricus, mastoid process.
- Posterior and foreign surface of m. masseter, branch of mandible, m. pterygoideus medialis.
- M. pterygoideus lateralis.

163. Identify the top border of spatium parotideum.

+External acoustic meatus.

- Skull base.
- Ala major ossis sphenoidale.
- Zygomatic arch.

164. What passes through gl. parotis?

+A. carotis externa, v. retromandibularis, n. facialis, n. auriculotemporalis.

- A. carotis interna, v. jugularis interna, v. jugularis externa, v. facialis.
- A., v. et n. buccalis (from n. mandibularis), n. infraorbitalis, n. mentalis.
- N. auricularis magnus, n. supratrochlearis, n. supraorbitalis, rr. temporales (n. facialis).

165. Identify the branches of n. facialis entering gl. parotis?

+N. auricularis posterior, r. stylohyoideus, r. digastricus.

- Rr. temporales, n. auriculotemporalis, n. buccalis.
- Rr. temporales, rr. zygomatici, rr. buccales, marginalis mandibulae, r. colli.
- Rr. parotidei, rr. labiales, rr. mentales.

166. Identify branches of pes anserinus major?

+Rr. temporales, rr. zygomatici, rr. buccales, r. marginalis mandibulae, r. colli.

- rr. parotidei, rr. labiales, rr. mentales.
- N. auricularis posterior, r. stylohyoideus, r. digastricus.
- Rr. temporales, n. auriculotemporalis, n. buccalis.

167. Identify the projection of temporal facial nerve branches.

+From lobule of the ear to the external angle of the eye.

- From mastoid process to the angle of mouth.

- Along the vertical line in front of the tragus.
- From lobule of the ear to the external angle of the nose.

168. Identify the projection of marginal branch of mandible.

- +0.5–1 cm below the bottom edge of the mandible.
- 0.5–1 cm above the lobule of the ear to the lateral angle of the mouth.
- 1 cm below and parallel to zygomatic arch.
- From external acoustic meatus to the point located in the middle between wing of the nose and mouth angle.

169. Identify the projection of excretory duct of parotid salivary gland:

- +From external acoustic passage to the point located in the middle between the wing of the nose and angle of mouth.
- 0.5–1 cm above the lobule of the ear to the wing of the nose.
- 1 cm below and parallel to the bottom of the mandible.
- From the lobule of the ear to external angle of the eye.

170. What tissues are tightly dissected at purulent parotitis?

- +All the listed below.
- Skin.
- Subcutaneous cellular tissue.
- Parotid fascia.

171. What tissues are tightly dissected at purulent parotitis?

- +Glandular parenchyma.
- Subcutaneous cellular tissue.
- Mimic muscles.
- Parotid fascia.

172. Identify possible complications of dissections at purulent parotitis:

- +All the listed below.
- Damage of external carotid artery and v. retromandibularis.
- Broken branches of n. facialis.
- N. auriculotemporalis.

173. An injured bottom of the patient's oral cavity caused motor speech disorders.

What nerve could be damaged in this case?

- +Sublingual nerve.
- Lingual nerve.
- Glossopharyngeal nerve.
- Chorda tympani.

174. Identify the sphincter of parotid duct:

- +M. buccinator.
- Oddi's sphincter.

- M. masseter.
- Medial pterygoid muscle.

175. Identify the fibers of Wrisberg's nerve:

- +N. petrosus major, chorda tympani.
- N. petrosus minor, n. canalis pterygoidei.
- N. tympanicus, n. stapedius.
- There's no right answer.

176. Identify motor fibers of the facial nerve which innervate into fallopian tube:

- +N. stapedius.
- N. petrosus major
- N. petrosus minor.
- Chorda tympani.

177. How is the excretory duct of parotid gland called according to its author?

- +Stenon duct.
- Wharton's duct.
- Bartholin's duct.
- Walter's duct.

178. In a patient developed thrombosis of the facial vein resulted from the involvement of it into the inflammatory process. What vein can thrombus from the facial vein get directly into the system of intracranial sinuses and veins through?

- +V. angularis.
- V. jugularis interna.
- V. jugularis externa.
- V. transversa faciei.

179. What is temporal pterygoid space externally limited by?

- +M. temporalis.
- M. pterygoideus lateralis.
- M. pterygoideus medialis.
- M. masseter.

180. What is temporal pterygoid space medially limited by?

- +M. pterygoideus lateralis.
- M. pterygoideus medialis.
- Branch of mandibular.
- Lamina lateralis processus pterygoideus.

181. What is temporal pterygoid space from behind limited by?

- +Processus condylaris mandibulae.
- M. sternocleidomastoideus.

- Mastoid process.
- Posterior belly of m. digastricus.

182. What is temporal pterygoid space in front limited by?

- +Tuber maxillae.
- M. masseter.
- Branch of mandible.
- M. temporalis.

183. What is temporal pterygoid space from above limited by?

- +Lower surface of the large wing of styloid bone.
- Zygomatic arch.
- Tuber maxillae.
- External acoustic meatus.

184. What is temporal pterygoid space from below limited by?

- +Passes to interpterygoid.
- M. pterygoideus lateralis.
- M. pterygoideus medialis.
- Submandibular gland.

185. What is temporal pterygoid space composed of?

- +Plexus pterygoideus, nn. temporales profundi, n. massetericus, n. buccalis, n. maxillaris.
- N. maxillaris, n. mandibularis, v. retromandibularis.
- M. pterygoideus lateralis, m. pterygoideus medialis, submandibular gland.
- Plexus pterygoideus, a. auricularis profunda, a. tympanica anterior, a. alveolaris inferior, a. meningea media.

186. What are the branches of the first part of a. maxillaris?

- +A. auricularis profunda, a. tympanica anterior, a. alveolaris inferior, a. meningea media.
- A. masseterica, a. buccalis, a. alveolaris superior posterior.
- A. masseterica, aa. pterygoideus medialis et lateralis, aa. temporales profundae, a. buccalis, a. alveolaris.
- Superior posterior.

187. Identify the branches of the second part of a. maxillaris?

- +A. masseterica, aa. pterygoideus medialis et lateralis, aa. temporales profundae, a. buccalis, a. alveolaris.
- Superior posterior.
- A. meningea media, a. alveolaris inferior, palatina descendens.
- A. auricularis profunda, a. tympanica anterior, a. alveolaris inferior, a. meningea

media.

188. Identify the branches of the third part of a. maxillaris?

- +A. palatina descendens, a. infraorbitalis, a. sphenopalatina.
- A. masseterica, a. buccalis, a. meningea media, a. alveolaris inferior.
- A. alveolaris superior posterior.
- A. auricularis profunda, a. tympanica anterior, a. alveolaris inferior, a. meningea media.

189. Identify the external border of interpterygoid space?

- +Branch of mandible, m. pterygoideus lateralis.
- M. pterygoideus medialis.
- M. temporalis.
- M. masseter.

190. What is interpterygoid space internally limited by?

- +M. pterygoideus medialis.
- M. pterygoideus lateralis.
- Lamina lateralis processus pterygoideus.
- Branch of mandible, m. pterygoideus lateralis.

191. What is interpterygoid space from above limited by?

- +Base of the skull.
- M. pterygoideus medialis.
- M. pterygoideus lateralis.
- External acoustic meatus.

192. What is interpterygoid space from behind limited by?

- +Parotid gland.
- Branch of mandible, m. pterygoideus lateralis.
- M. sternocleidomastoideus.
- Venter posterior m. digastricus.

193. Identify the front border of interpterygoid space?

- +Buccal fat pad of cheek, tuber maxillae.
- M. pterygoideus medialis.
- M. pterygoideus lateralis.
- M. masseter.

194. What is interpterygoid space composed of?

- +N. mandibularis, a. maxillaris, plexus pterygoideus.
- Adipose tissue, n. maxillaris, a. maxillaris, ganglion pterygopalatinum.
- M. pterygoideus lateralis, m. temporalis.
- N. mandibularis, v. retromandibularis, glandula parotis.

195. Identify the anterior wall of fossa pterygopalatina?

- +Tuber maxillae.
- Processus pterygoideus.
- M. masseter.
- Branch of mandible.

196. Identify the posterior wall of fossa pterygopalatina?

- +Processus pterygoideus.
- Glandula parotis.
- Tuber maxillae.
- Branch of mandible.

197. Identify the medial wall of fossa pterygopalatina?

- +Lamina perpendicularis ossis palatini.
- Processus pterygoideus.
- Tuber maxillae.
- Lamina lateralis processus pterygoideus.

198. What does fossa pterygopalatina communicate with?

- +Canalis palatinus major.
- Infracranial fossa.
- Canalis pterygoideus.
- Temporal pterygoid space.

199. Identify the contents of fossa pterygopalatina?

- +Adipose tissue, n. maxillaris, a. maxillaris, ganglion pterygopalatinum.
- n. mandibularis, a. maxillaris, plexus pterygoideus.
- M. pterygoideus lateralis, m. temporalis.
- N. mandibularis, v. retromandibularis, glandula parotis.

200. Though what foramen of the skull does n. maxillaris penetrate into pterygopalatine fossa of n. maxillaris?

- +Foramen rotundum.
- Foramen ovale.
- Foramen spinosus.
- Fissura orbitalis superior.

201. Identify the branches of n. maxillaris?

- +N. zygomaticus, n. infraorbitalis, nn. pterygopalatini.
- N. supraorbitalis, n. auriculotemporalis, n. lingualis.
- N. alveolaris inferior.
- Nn. palpebrales inferiores, rr. nasales, rr. labiales superiores.

202. Identify the branches of pes anserinus minor?

+Nn. palpebrales inferiores, rr. nasales, rr. labiales superiores.

- Rr. temporales, rr. zygomatici, rr. buccales, r. marginalis mandibulae, r. colli
- N. zygomaticus, n. infraorbitalis, nn. pterygopalatini.
- N. supraorbitalis, n. auriculotemporalis, n. lingualis.

203. What is the anterior parapharyngeal space internally limited by?

- +M. levator velli palatini, m. tensor velli palatini, m. constrictor pharyngis superior, fascia pharyngobasilaris, tonsilla palatina.
- M. pterygoideus medialis.
- M. pterygoideus lateralis.
- Pharyngoprevertebral aponeurosis.

204. What is the anterior parapharyngeal space externally limited by?

- +M. pterygoideus medialis.
- M. pterygoideus lateralis.
- M. levator velli palatini, m. tensor velli palatini, m. constrictor pharyngis superior, fascia pharyngobasilaris, tonsilla palatina.
- M. temporalis.

205. What is the anterior parapharyngeal space from behind limited by?

- +Aponeurosis stylopharyngeus.
- Aponeurosis pharyngoprevertebralis.
- M. levator velli palatini, m. tensor velli palatini, m. constrictor pharyngis superior, fascia pharyngobasilaris, tonsilla palatina.
- M. sternocleidomastoideus.

206. Identify the upper border of the front parapharyngeal space?

- +Base of the skull.
- External acoustic meatus.
- Zhonesko's diaphragm.
- Aponeurosis pharyngoprevertebralis.

207. Identify the lower border of the front parapharyngeal space?

- +Capsule of submandibular salivary gland.
- Aponeurosis stylopharyngeus.
- Aponeurosis pharyngoprevertebralis.
- Gl. parotis.

208. What is the anterior parapharyngeal space composed of?

- +A. palatina ascendens, vv. pharyngea, pl. pharyngeus.
- n. mandibularis, a. carotis interna, v. jugularis interna.

- N. vagus, n. accessorius.
- All the listed above.

209. What is the posterior parapharyngeal space internally limited by?

- +Aponeurosis pharyngopevertebralis.
- Styloid process, muscles of anatomical Riolan's bouquet (m. stylopharyngeus, m. styloglossus, m. stylohyoideus), aponeurosis stylopharyngeus.
- Prevertebral fascia.
- Aponeurosis stylopharyngeus.

210. What is posterior parapharyngeal space externally limited by?

- +Styloid process, m. digastricus, m. sternocleidomastoideus.
- M. pterygoideus medialis.
- M. pterygoideus lateralis.
- M. masseter.

211. Identify the posterior wall of posterior parapharyngeal space?

- +Prevertebral fascia.
- Aponeurosis stylopharyngeus.
- Styloid process, m. digastricus, m. sternocleidomastoideus, gl. parotis.
- Aponeurosis pharyngopevertebralis.

212. Identify the anterior wall of posterior parapharyngeal space?

- +Styloid process, muscles of anatomical Riolan's bouquet (m. stylopharyngeus, m. styloglossus, m. stylohyoideus), aponeurosis stylopharyngeus.
- Tuber maxillae.
- Aponeurosis pharyngopevertebralis.
- Prevertebral fascia.

213. What is the posterior parapharyngeal space composed of?

- +All the listed below.
- A. carotis interna, v. jugularis interna.
- N. glossopharyngeus, n. vagus, n. accessorius, n. hypoglossus.
- Upper cervical ganglion of truncus sympathicus.

214. Identify the author of extraoral anesthesia of upper and lower mandibular nerves?

- +Weisblatt.
- Lukashevych-Oberst.
- Kulenkampff.
- Braun-Usoltseva.

215. What vessels pass through the thickness of the anterior wall of maxillary sinus?

- +Aa. alveolares superiores anteriores.

- A. infraorbitalis.
- Palatina ascendens.
- Palatina descendens.

216. Which vessels are attached to the posterior wall of maxillary sinus?

- +A. infraorbitalis, a. palatina descendens, a. alveolaris superior posterior.
- A. facialis.
- A. palatina ascendens.
- A. sphenopalatina.

217. What passes through the thickness of the upper wall of maxillary sinus?

- +Infraorbital nerve and arteries.
- Supraorbital nerve and arteries.
- A. et v. angularis.
- A. et v. sphenopalatina.

218. Identify the most widely spread method of maxillary sinusotomy at chronic maxillitis?

- +Caldwell-Luc operation.
- Killian's operation.
- Ritter-Janson's operation.
- Limberg's operation.

219. What method is the most frequently used to dissect frontal fossa when it is suppurated?

- +Ritter-Janson's technique.
- Caldwell-Luc technique.
- Killian's technique.
- Limberg's technique.

220. In a patient with maxillitis developed burning pain in the lateral region of the face, rhinorrhea, lacrimation, ptialism, swelling and hyperemia of the eyelids.

What complication is likely to occur?

- +Ganglioneuritis of pterygopalatine node, Sluder's syndrome.
- Full ophthalmoplegia, exophthalmus, ptosis, Foix syndrome.
- Mackenzie's syndrome.
- Villaret's syndrome.

221. Where is masseteric cellular space located?

- +Between the branch of mandible and masseteric muscle.
- Between external pterygoid and masseteric muscles.
- Between internal pterygoid and masseteric muscles.
- Between buccal and masseteric muscles.

222. What is located in submasseteric cellular tissue?

- +N. massetericus, a. et v. masseterica.
- A. et v. masseterica and n. buccalis.
- R. marginalis mandibulae.
- There is no right answer.

223. What anatomical formation connects temporal pterygoid space with cellular tissue of pterygoid fossa?

- +Fissura pterygomaxillaris.
- Foramen rotundum.
- Fissura orbitalis superior.
- Foramen ovale.

224. What anatomical formation connects temporal pterygoid space with cellular tissue of the orbit?

- +Fissura orbitalis inferior.
- Fissura orbitalis superior.
- Canalis pterygoideus.
- Foramen rotundum.

225. What anatomical formations join temporal pterygoid space with the cranial cavity?

- +Foramen ovale and foramen spinosum.
- Foramen rotundum and fissura orbitalis superior.
- Fissura orbitalis inferior.
- Fissura pterygomaxillaris.

226. What anatomical formations join temporal pterygoid space with submasseteric space?

- +A. et v. masseterica.
- A. maxillaris.
- Foramen ovale.
- Fissura orbitalis superior.

227. What anatomical formation joins temporal pterygoid space with the bed of parotid gland?

- +A. maxillaris.
- Ductus parotideus.
- Fissura pterygomaxillaris.
- Fissura orbitalis superior.

228. What joins cellular tissue of anterior parapharyngeal space with the bed of parotid gland?

- +Pharyngeal process of gl. parotis.

- Fissura pterygomaxillaris.
- Ductus parotideus.
- A. maxillaris.

229. What anatomical formations join cellular tissue of posterior parapharyngeal space with upper mediastinum?

- +A. carotis interna, v. jugularis interna and n. vagus.
- N. accessorius.
- N. hypoglossus.
- N. glossopharyngeus.

230. What anatomical formation joins cellular tissue of posterior parapharyngeal space with posterior mediastinum?

- +N. vagus.
- Gullet.
- N. hypoglossus.
- Pharynx.

231. What anatomical formations join cellular tissue of posterior parapharyngeal space with spatium vasonervorum?

- +A. carotis interna, v. jugularis interna and n. vagus.
- N. glossopharyngeus and n. accessorius.
- V. jugularis externa.
- N. auriculotemporalis.

232. What anatomical formation joins cellular tissue of posterior parapharyngeal space with the posterior cranial fossa?

- +V. jugularis interna.
- A. carotis interna.
- A. vertebralis.
- N. facialis.

233. What anatomical formation joins cellular tissue of posterior parapharyngeal space with the middle cranial fossa?

- +A. carotis interna.
- V. jugularis interna.
- N. vagus.
- N. facialis.

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