Zaporozhye State Medical University

Department of Otorhinolaryngology

OTORHINOLARYNGOLOGY

Guide to practical studies

for English-speaking students of higher medical education insitutions

Zaporizhzhia

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Кафедра оториноларингології

ОТОРИНОЛАРИНГОЛОГІЯ

Навчальний методичний посібник

до практичних занять для англомовних студентів вищих медичних навчальних закладів

Запоріжжя

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та рекомендовано для використання у навчальному процесі

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Т 70 **Троян В. І.**
Оториноларингологія : навч. метод. посіб. до практичних занять для англомовних студентів вищих медичних навчальних закладів / В. І. Троян, О. М. Костровський, О. В. Лобова. – Запоріжжя : ЗДМУ, 2017 – 89 с.

Навчально-методичний посібник з оториноларингології присвячений актуальним питанням оториноларингології. Матеріал навчального посібника включає структуру дисципліни, що викладається на кафедрі оториноларингології та 8 практичних занять.

Використання наведеного матеріалу дозволить підвищити загальний рівень професійної підготовки студентів 4 курсу вищих медичних навчальних закладів з англійською формою навчання при вивченні анатомії, фізіології та методів дослідження ЛОР- органів, найбільш розповсюджених ЛОР - хвороб, їх сучасних методів лікування та профілактики.

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Contents

Introduction

Otorhinolaryngology deals with the study of the upper respiratory tract and ear problems. There is a large number of analysers: the olfactory, auditory and vestibular in these organs. Auditory analyser is an important element in the formation of voice and speech, which is the basis of the second signal system. The vestibular analyser provides orientation in space.

Insufficient number of available textbooks and the lack of various authors consensus on issues of clinical anatomy, diseases of ENT organs were the reasons for writing this guide and reflect its relevance. Special attention was devoted to the modern methods of ENT organs research and treatment.

The guide is intended for English-speaking students of higher medical education institutions.

Structure of the discipline

Topic	Lectures	Practical lessons	USW
Semantic modulus 1. Clinical anatomy, physiology and examination of ENT organs			
1. Clinical anatomy, physiology and examination of the nose, paranasal sinuses	1	4	2
2. Clinical anatomy, physiology and examination of the pharynx, larynx, trachea, bronchi	1	4	2
3. Anatomy, physiology, methods of examination of auditory analyser and vestibular analyser, external and middle ear, structure of the cochlea	1	4	2
Semantic modulus 2. Diseases of upper respiratory tract and ear			
4. Diseases of the nose and the paranasal sinuses	2	4	5
5. Diseases of the pharynx	1	4	5
6. Diseases of the larynx	2	4	10
7. Diseases of the external and middle ear. General clinical aspects of cochlear and retrocochlear hearing loss	1	4	5
Semantic modulus 3. Emergencies and primary measures			
8. The traumas, foreign bodies, bleedings of the ENT organs and first aid	1	2	5

Final test. Final module		2	
Preparation for the workshops - theoretical preparation and processing of practical skills. Preparing for the final control of the otolaryngology module.			12
Total – 90	10	32	48

The practical lessons

No.	Topic	Hours
1.	Clinical anatomy, physiology and examination of the nose, paranasal sinuses	4
2.	Clinical anatomy, physiology and examination of the pharynx, larynx, trachea, bronchi	4
3.	Anatomy, physiology, methods of examination of auditory analyser and vestibular analyser, external and middle ear, structure of the cochlea	4
4.	Diseases of the nose and the paranasal sinuses. Rhinogenous orbital and intracranial complications	4
5.	Diseases of the pharynx	4
6.	Diseases of the larynx	4
7.	Diseases of the external and middle ear. General clinical aspects of cochlear and retrocochlear hearing loss. Otogenic intracranial complications	4
8.	The traumas, foreign bodies, bleedings of the ENT organs and first aid	2
	Final test. Final module	2
	Total hours	32

Topic 1. Clinical anatomy, physiology and examination of the nose, paranasal sinuses

The number of hours – 4

Actuality of the topic. In practical work, physicians often meet the pathology of the nose, paranasal sinuses and complications. External nose is the main part of the cosmetic ensemble of the face and so the changes of its shape often lead to the patient's moral sufferings. The diseases of the nose and paranasal sinuses — rhinitis, nasal bleedings, sinusitis, rhinogenic orbital and intracranial complications are often met by the doctors of different specialties (otorhinolaryngologists, therapeutists, surgeons, neuropathologists, oculists, neurosurgeons, stomatologists). Knowledge of the structure and functional peculiarities of the nose, paranasal sinuses will help the physician to choose better methods of treating the patient when these organs are damaged. The physician must also know about the last achievements of science (computer X-ray tomography, magneto-resonance tomography, etc.), their indications, the methods of use, essence and priority, as they are widely used in the leading Ukrainian clinics.

Purpose of the lesson. After studying the topic, a student must have a clear understanding of topological relationships of the nose, paranasal sinuses and other adjacent organs, endoscopy, x-ray and CT examination of the nose and paranasal sinuses.

A student must know

- clinical anatomy, physiology of nose and paranasal sinuses;
- topographo-anatomical features of facial skeleton, its formations, embryogenesis;
- basic information about the contemporary methods of investigation of paranasal sinuses.

A student must be able to

- carry out traditional endoscopic examination (front and back rhinoscopy);

- estimate the data of traditional roentgenological observation (survey roentgenography, contrast tomography for the investigation of paranasal sinuses);
- determine the indications, contraindications for the computer X-ray tomography, magneto-resonance tomography.

Questions for practical lessons:

1. Clinical anatomy of the external nose
2. Clinical anatomy of the nasal cavity
3. Clinical anatomy of the lateral nasal wall
4. Structure of the nasal septum
5. Blood supply and innervation of the nasal cavity
6. Age peculiarities of development of paranasal sinuses
7. Clinical significance of paranasal sinuses. Clinical anatomy of maxillary sinus
8. Clinical anatomy of frontal sinus
9. Clinical anatomy of ethmoidal sinus
10. Clinical anatomy of sphenoid sinus
11. Clinical physiology of nasal cavity and paranasal sinuses
12. Significance of the nasal breathing for children's development
13. Methods examination of the nose and paranasal sinuses

Theoretical content

External Nose. *Bony Part.* The bony part consists of two nasal bones, which meet in the midline, rest on the upper part of the nasal process of the frontal bones, and are themselves held between the frontal processes of the maxillae.

Cartilaginous Part. It consists of:

a. upper lateral cartilages
b. lower lateral cartilages (alar cartilages)
c. lesser alar (or sesamoid) cartilages
d. septal cartilage

Nasal skin. The skin over the nasal bones and upper lateral cartilages is thin and freely mobile while that covering the alar cartilages is thick and adherent, and contains many sebaceous glands. It is the hypertrophy of these sebaceous glands, which gives rise to a lobulated tumour called rhinophyma.

Nasal cavities. The nasal cavities begin anteriorly at the nasal vestibule, which is bordered posteriorly by the internal nasal valve (limen nasi) located between the posterior border of the alar cartilage and the anterior border of the lateral cartilage. The anterior bony opening of the nasal cavity, called the piriform aperture, is bounded laterally and inferiorly by the maxilla and superiorly by the nasal bone. The interior of the nose behind the nasal valve is divided by the nasal septum into two main cavities. The nasal septum is composed of an anterior cartilaginous part (quadrangular cartilage) and two posterior bony parts. The choanae are the paired posterior openings through which the nasal cavities communicate with the nasopharynx.

Lining Membrane of Internal Nose

Vestibule. It is lined by skin containing hair, hair follicles and sebaceous glands.

Olfactory region. Upper one-third of lateral wall (up to superior concha), corresponding part of the nasal septum and the roof of nasal cavity form the olfactory region. Here, mucous membrane is paler in colour.

Respiratory region. Lower two-thirds of the nasal cavity form the respiratory region. Here mucous membrane shows variable thickness being thickest over nasal conchae especially at their ends, quite thick over the nasal septum but very thin in the meatuses and floor of the nose. It is highly vascular and contains erectile tissue (more in inferior turbinates). Its surface is lined by pseudostratified ciliated columnar epithelium, which contains plenty of goblet cells. In the submucous layer of mucous membrane, are situated serous, mucous, both serous and mucous secreting glands, the ducts of which open on the surface of mucosa.

Each nasal cavity has a lateral wall, a medial wall, a roof and a floor.

Lateral nasal wall. Three and occasionally four turbinates or conchae mark the lateral wall of nose. Conchae or turbinates are scroll-like bony projections covered by mucous membrane. The spaces below the turbinates are called meatuses.

Structures on lateral wall of nose. Inferior turbinate is a separate bone and below it, into the inferior meatus, opens the nasolacrimal. Middle turbinate is an ethmoturbinal — a part of ethmoid bone. It is attached to the lateral wall by a bony lamella called ground or basal lamella. The ostia of various sinuses draining anterior to basal lamella form anterior group of paranasal sinuses, while those, which open posterior and superior to it, form the posterior group.

Middle meatus shows several important structures, which are important in endoscopic surgery of the sinuses

Methods of examination of the nose

Position of a patient and an examiner. The patient is seated in a chair, and the source of light is placed above and behind the patient's left shoulder. The examiner sits in front of the patient, or at his left side. Should the examiner be left-handed and prefer to use the mirror over the left eye, then the light and the examiner must be on the patient's right. A rotating chair is a valuable aid when examining elderly patients, as they find it difficult to turn in a fixed chair for the examination of both ears.

Focusing the light. The examiner brings his head mirror down over his right eye and should be looking directly through the hole in the mirror with the right eye, and around its edge with his left eye. The light will generally be reflected on to a fairly small area of the patient's face, and by varying the position of the patient slightly (usually by bringing him a little forward) the beam will be brought to a sharp focus on the part to be examined. This gives bright illumination, and slight adjustment of the head mirror will bring the light exactly to the part required.

It will be appreciated that in examining a nose, which has a depth of possibly 7.5 cm or more, it is necessary for the examiner to move either his head or the patient's head as the examination proceeds from the outer part of the nose to the inner part, in order that the light may be kept correctly focused. It is the failure to

appreciate the fact that the light must be moved so that it may be thrown on to the each part in succession, which causes a great deal of difficulty in the examination of these cavities.

A patient, an examiner, a bull's eye lamp and a head mirror having been positioned as described earlier, the external appearance of the nose is first noted, after which the nasal speculum is taken up. All this requires considerable practice at first.

***Method of using the nasal speculum*.** Middle and ring fingers control the spring and the speculum is introduced obliquely in the plane of the nostril, and then lifted into the position shown. Note that the direction of view initially is along the floor of the nose. Many patients automatically throw the head back when they know the nose is about to be examined. Only later as the examination continues should the head be tilted in order to examine the upper parts of the nasal cavity. Then turn the attention to the turbinates.

Examine the inferior turbinates first; determine their size, their colour and the character of the membrane covering them — whether it is smooth or rough; if it is not smooth, where the roughness occurs — its distribution, its extent and character.

Next, try to examine the middle turbinate. If it cannot be seen, find out the reason. The septum may be deviated; the inferior turbinate may be oedematous. There may be polyps; the light may be badly focused.

The turbinates are sometimes confused with polyps, but unlike the latter they are pink, firm, sensitive to gentle probing and immobile. Then look for the uncinate process laterally in front of the middle turbinate. The superior turbinate cannot be seen on anterior inspection. The normal mucous membrane should be smooth, pink, slightly moist and glistening.

Posterior rhinoscopy is probably the most difficult examination procedure. The examiner has to cope with the difficulty of fixing his spot of light upon a very small mirror and then projecting the light with the mirror upon various structures in the nasopharynx. All these must be carried out without irritating or upsetting the patient and causing gagging or closure of the nasopharynx by the action of the soft palate.

A tongue depressor and a small post-nasal mirror are the instruments required. The mirror is first heated gently to prevent fogging and tested on the hand to avoid burning of the patient.

The tongue is depressed and the mirror is then slipped in behind the uvula, the handle of the mirror being usually passed from the left corner of the mouth. The mirror is then rotated gently and the light is made to traverse the nasopharynx. The mouths of the Eustachian Tubes are examined. The upper posterior wall of the nasopharynx is examined for the presence of adenoids. The posterior end of the septum shows as a white pillar and is the chief landmark in orientating the examiner.

The light is then thrown into the choanae and the posterior ends of the turbinates can be examined. The overgrowth of the epithelium, if present, may be noted, and the presence of pus or other secretion in relation to the turbinates is observed. If pus is seen, the position must be carefully noted; for instance, whether it is above or below the middle turbinate. The amount of obstruction caused can be judged and the source of the purulent material ascertained by its relation to the various structures.

From the description, this examination sounds comparatively simple, but many difficulties may be encountered.

Anatomical features of nasal cavity and paranasal sinuses are difficult in the diagnostics with the help of only traditional methods of investigation (observation, palpation, investigation of respiratory and taste functions; front and back rhinoscopy, diaphanoscopy).

According to the contemporary achievements of science and technics, basic methods of investigation are endoscopic, roentgenological ones, computer X-ray tomography, magneto-resonance tomography, and such additional methods as ultrasonar biolocation, distance infra-red thermography.

Questions for self-control:

1. Enumerate paranasal sinuses
   a); b); c); d)
2. Name sinuses, opening to the superior nasal meatus

a) maxillar

b) frontal

c) ethmoidal (back cells)

d) ethmoidal (middle and front cells)

e) sphenoidal

3. Name sinuses, opening to the middle nasal meatus

a) frontal

b) maxillar

c) ethmoidal (front and middle cells)

d) ethmoidal (back cells)

e) sphenoidal

4. What is opened to the inferior nasal meatus?

a) paranasal sinuses

b) nasolacrimal canal

Standard answers for the questions for self-control

1. a) maxillar, b) ethmoidal, c) frontal, d) sphenoidal
2. c)
3. a), b), d)
4. b)

Topic of the next lesson: Clinical anatomy, physiology and methods of examination of the pharynx and larynx

Topic 2. Clinical anatomy, physiology and examination of the pharynx, larynx, trachea, bronchi

The number of hours – 4

Actuality of the topic. During their practical work, doctors of different profiles (ENT specialist, physicians, neurosurgeons, dentists, etc.) often are confronted with diseases of the pharynx, larynx and their complications. In order to understand the mechanism for the development of these diseases, their clinical manifestations and for their subsequent diagnosis, a doctor should have the fundamental knowledge concerning the clinical anatomy of the pharynx and larynx and should know about the use of endoscopic methods of investigation in these organs.

Purpose. While studying the given topic, the student should deepen his knowledge in the clinical anatomy and the physiology of the pharynx and larynx, should be able of using the same for explaining the appearance and the subsequent course of pathological processes (parts of the discipline, dedicated to explanation of the clinical course of different diseases of the pharynx and larynx).

A student should know

- the external examination and palpation of the neck
- mesopharyngoscopy
- epipharyngoscopy
- hypopharyngoscopy
- indirect laryngoscopy
- describe the picture of different parts of the pharynx and larynx while their endoscopic examination

Questions for practical lessons

1. Clinical anatomy of pharynx, its parts
2. Anatomy of lymph circle of pharynx. Age peculiarities of lymph tissue of people

3. Structure of palatine tonsils, blood supply, innervation
4. Physiology of the lymph pharynx circle
5. Methods of examination of the pharynx
6. Topography of larynx
7. Cartilages and ligaments of larynx
8. Muscles of larynx
9. Innervation of larynx
10. Clinical anatomy of laryngeal cavity
11. Physiological functions of larynx
12. Methods of examination of larynx in adults and children.
13. Anatomy of oesophagus: topography, walls, physiological narrowing

Methods of examination of the pharynx and larynx

First stage — external examination and palpation

1. Check the neck region, mucous membrane of the lips.

2. Palpate the regional lymphatic nodes of the pharynx: submaxillary, in the retromandibular fosse, deep cervical, posterior cervical and in the supra and subclavicular fosse.

Second stage — oropharyngoscopy

1. Take a spatula in the left hand so that the thumb holds it from underneath and the index and middle fingers from the upper side. Place the right hand on the head of the patient.

2. Ask the patient to open his mouth and with the help of the spatula pull back first the left and then the right angles of the mouth and examine the vestibule: the mucous membrane, secretion ducts of the parotid glands, which are located on the inner surface of the check at the level of the second upper premolar.

3. Examine the oral cavity: teeth, gums, hard palate, tongue, the orifices of the secreting ducts of sublingual and submandibular glands, the oral floor. The oral floor can be examined by asking the patient to lift the end of the tongue or lift it with the spatula.

Third stage — mesopharyngoscopy

1. Holding the spatula in the left hand, press down the anterior 2/3rd of the tongue. The speculum is introduced through the right angle of the mouth; the tongue is pressed down not by the plain surface of the spatula, but by its end. On touching the root of tongue, immediately the vomiting reflex arises. Check the mobility and symmetry of the soft palate by asking the patient to say “a”. Normally the soft palate is quite mobile.

2. Examine the mucous membrane of the soft palate, the uvula, the anterior and posterior palatine arches. Normally the mucous layer is smooth, rosy and the arches contoured. Determine the size of palatine tonsils; for achieving this, mentally divide the distance between the anterior palatine arch and the vertical line crossing through the centre of the uvula and the soft palate. Size of the tonsils rising to 1/3rd of this distance, are put in the first level, those rising to 2/3rd – to the second level; and those rising to the level of the central pharyngeal line – to the third level of hypertrophy.

3. Examine the mucous layer of the tonsils. Normally it is rosy, damp, with a smooth surface.

4. Determine the lacunar contents. For this, take a second spatula in the right hand. With one spatula press down the tongue and with the other one, softly press the tonsil in its upper third region. While examining the right tonsil, the tongue should be pressed with the help of the spatula in the right hand, and on the other hand, while examining the left tonsil – with the spatula in the left hand. Normally, the lacunas contain epithelial corks or they may be absent.

5. Examine the mucous layer of the posterior wall of the pharynx. Normally it is rosy, damp, plain, and has rare up to the size of 1 mm lymphoid granules on its surface.

Fourth stage — epipharyngoscopy – posterior rhinoscopy

1. Take the nasopharyngeal mirror, fixing it in your hand, warm it and then clean it with a tissue.

2. The speculum being held in the left hand should be used to press down the anterior 2/3rd of the tongue. Ask the patient to breathe through the nose.

3. Holding the nasopharyngeal mirror in the right hand, like a pen, introduce it into the oral cavity. The mirror surface should be facing upwards, after which direct the mirror behind the soft palate, taking care not to touch the tongue root and the posterior pharyngeal wall. Slowly rotating the mirror, examine the nasopharynx.

4. While conducting posterior rhinoscopy, one should examine: the nasopharingeal roof, choanae, the posterior ends of the nasal conches, the pharyngeal opening of the Eustachian tube. Normally, the nasopharyngeal roof is free in adults, the mucous rosy, free choanae. On the lateral walls of the nasopharynx at the level of the posterior ends of the inferior nasal conch are located not very large depressions – the pharyngeal opening of the Eustachian tubes.

Fifth stage — finger nasopharyngeal examination

1. With the patient in a sitting position, the doctor stands behind him on his right-hand side. With the index finger of his right hand, the doctor lightly presses the left check of the patient between his teeth, while the latter is holding open his mouth. With the index finger of the right hand, the doctor rapidly passes beyond the patient's soft palate into the nasopharynx and feels the choanae, the nasopharyngeal roof, and the lateral walls. During this procedure, the pharyngeal (nasopharyngeal) tonsils are felt by the end of the index finger.

Hypopharyngoscopy

First stage — external examination and palpation

1. Check the neck and the configuration of the larynx.

2. Palpate the larynx and its cartilages: cricoid, thyroid. Normally, the larynx while palpation is painless. Passive lateral movement.

3. Palpate the regional lymph nodes of the larynx: submandibular, deep cervical, posterior cervical, prelaryngeal, pretracheal, paratracheal; in the supra- and subscapular fosse. Normally, the lymph nodes are not felt.

Second stage – indirect laryngoscopy

1. Take the laryngeal mirror, fix it in your hand, warm it in hot water for 2-3 seconds to 40-45^{o}C, wipe it with a tissue. By touching the heated mirror to the hand, determine the level of heating.

2. Ask the patient to open his mouth, show his tongue and to breathe through the mouth.

3. The tongue end should be covered superiorly and inferiorly with a cotton tissue and should be held by the fingers of the left hand in such a manner, so that the thumb is located on the upper surface, the middle finger on the lower surface and the index finger should be holding up the upper lip. Lightly pull the tongue towards yourself and slightly downwards.

4. Holding the laryngeal mirror in the right hand in the manner of a pen, introduce it into the oral cavity with the mirrored surface parallel to the plane of the tongue, taking care not to touch the root of the tongue or the posterior pharyngeal wall. On reaching the soft palate, lift with the help of the surface of the mirror the uvula and place the mirror at an angle of 45^{o} to the medial laryngeal axis, on necessity it is possible to lightly lift the soft palate, and direct the light rays from the reflector on to the mirror. Ask the patient to pronounce “e” and following which he should be asked to take in a breath. In such a manner, one can see the larynx in two phases of physiological activity: phonation and inspiration. The position of the mirror can be corrected until an image of the larynx is not formed in it.

5. Remove the mirror from the larynx and put it in disinfecting solution.

6. The picture during indirect laryngoscopy:

The laryngeal mirror forms image which differs from the true image in that the anterior parts of the larynx in the mirror are located superiorly (it looks as if they are posteriorly located), the posterior – inferiorly (it looks as if they are anteriorly located). The reflections of the right and the left sides of the larynx correspond to their real positions (they do not change).

1. The first thing seen in the laryngeal mirror is the tongue root with the superiorly located lingual tonsil; after that is seen the epiglottis in the form of an opened leaf. The epiglottic mucous layer is normally pale rosy or lightly yellowish in colour. Between the epiglottis and the tongue root are seen two not large depressions – valleculae, bounded by the middle and the lateral glossoepiglottic folds.

2. During phonation the vocal folds are seen, normally they are greyish in colour. The anterior ends of the folds at the points where they leave the thyroid cartilage form the anterior commissure.

3. Above the vocal folds are seen the vestibular folds having a rosy colour. Between the vocal and the vestibular folds, on each side are depressions – the laryngeal ventricles.

4. On the lower side the mirror shows the posterior parts of the pharynx: the arytenoid cartilages, having rosy colour with a smooth surface, presenting two tubercles, the posterior ends of the vocal folds are fixed to the vocal extensions of these cartilages; between the bodies of the cartilages is located the intraarytenoid space.

5. From the arytenoid cartilages superiorly to the outer ends of the epiglottic stem radiate the aryepiglottic folds, having a rosy colour with a smooth surface. On the lateral side of the aryepiglottic folds are located the pear shaped sinuses (the lower part of the larynx), whose mucous layer is also rosy and smooth.

6. On inspiration and phonation, the mobility of both the laryngeal halves is determined.

7. On inspiration between the vocal folds is formed a space known as the vocal space, through which the lower part of the larynx – the subvocal region is seen; quite often the upper rings of the anterior tracheal wall can be seen covered by rosy mucous layer.

8. On examining the larynx, it is needed to rate the condition of its different constituent parts.

Questions for self-control

1. The pharynx is divided into which parts?

   A) B) C)

2. Waldeyer’s ring consists of which tonsils?

   A) B) C) D)

3. The pharynx is communicated through how many openings?

A) B) C) D)

4. Name the boundaries between the following parts of the pharynx:

   A) between the upper and middle; B) between the middle and lower.

5. The retropharyngeal space is bounded by which vertebrae?
6. Does pharyngolarynx communicate with the oesophagus?
7. Blood supply of the palatine tonsils is carried out by the ascending palatine artery?
8. Does the *n. vagus* innervate of the palatine tonsils?
9. Which muscle forms the posterior palatine?

   A) palatopharyngeal; B) stylopharyngeal; C) upper pharyngeal constrictor.

10. What age is the nasopharyngeal tonsil located in a hypertrophy state?
11. Show what lymph tissue forms at the posterior wall of the pharynx?
12. What name of the cracks, which deeply cut through the palatine tonsils?
13. What bones form the upper wall of the pharynx?
14. What is between the tonsillar capsules and the wall of the pharynx?
15. What lymph nodes are responsible for lymph drainage of the palatine tonsils?

    A) B) C)

16. Write down which openings are there in the pharynx?

    A) B) C) D)

17. What anatomical formations are bounded by the lateral pharyngeal wall?
18. What layers are in the pharynx?

    A) B) C) D)

19. In what formation piriform sinuses continue?

20. Which pharynx correspond to the level of larynx in an adult?

A) C_3-C_6; B) C_4-C_6; C) C_3-C_5.

Answers to the questions for self-control

1. A) upper (vestibular); B) middle (plica); C) lower (subplical).

2. A) palatine; B) nasopharyngeal; C) tubarious; D) lingual.

3. A) by double choanal orifices with the nasal cavity; B) by two Eustachian tubes with the middle ear cavity; C) communicates through the pharyngeal opening with the oral cavity; D) with the oesophagus; E) with the larynx.

4. A) in the plane of the hard plate; B) hypothetical plane drawn through the upper edge of the epiglottis.

5. True.

6. True.

7. True.

8. True.

9. A).

10. 1–3 years.

11. Lymphoid granules.

12. Lacunas.

13. A) the main bone; B) part of the occipital bone.

14. Paratonsillar cellulose space.

15. A) submandibular; B) retromandibular fossae lymph nodes; C) deep cervical along the jugular vein.

16. A) choanae; B) fauces; C) laryngeal entrance; D) oesophageal entrance.

17. The main vascular and nerve trunks.

18. A mucous; B fibrous; C muscular; D fascial.

19. Into the oesophagus.

20. B).

The topic of the next lesson: Anatomy, physiology, methods of examination of auditory analyser and vestibular analyser, external and middle ear, structure of the cochlea

Topic 3. Anatomy, physiology, methods of examination of auditory analyser and vestibular analyser, external and middle ear, structure of the cochlea

The number of hours – 4

Actuality of the topic. Diseases of ear, upset of hearing function is one of the most frequent pathology of a human being. Determination of diagnosis, choice of rational tactics is impossible without the knowledge of clinical anatomy, physiology, and methods of examination of hearing function.

Auditory analyser plays the main role in the perception of the world and helps to form the speech function. The pathology of the auditory analyser often leads to dull hearing and deafness, which affect man's capacities for work and his moral state. Inflammatory diseases of the ear can have bad and dangerous complications for mental processes. It is necessary to comprehend clinical anatomy and physiology of the auditory analyser to master the main methods of its investigation. This will enable one to grasp how infection spreads from the ear into the scull cavity and the mechanisms of diminished hearing and deafness development.

A student must know

- Have an idea of anatomo-physiological relations of ear with surrounding formations, about effect of different factors on the organs of hearing; know modern methods of examination of hearing analyser.
- Clinical anatomy and physiology of external and middle ear.
- Methods of examination of ear: otoscopy, defining the passage Eustachian tube, mobility of tympanic membrane.
- Basic anatomy of temporal bone, have an idea of basic parts of external and middle ear.
- Clinical anatomy, physiology of the acoustic analyser.
- The latest developments in the field of clinical anatomy and physiology of the vestibular analyser.

A student must be able to

- conduct the investigation of the ear by speech and tuning fork

- draw up the acoustic passport and be able to do the conclusion about the condition of acoustic function
- estimate the findings of the threshold audiometry
- reveal spontaneous vestibular disturbances, methods of carrying out of vestibular tests (rotator test, caloric test, pressed tests, Voyachec`s tests).
- recognize the character, degree and reasons of dysfunction of vestibular analyser; evaluate the results of investigation of vestibular analyser and make vestibular registration card, compose vestibular passport and draw a conclusion about the condition of the vestibular function

Questions for practical lessons

1. Clinical anatomy of external ear.
2. Clinical anatomy of eardrum (membrane tympani). Normal otoscopy view. Peculiarities of eardrum in children of early age.
3. Clinical anatomy of tympanic cavity.
4. Clinical anatomy of internal wall.
5. Acoustic bones and muscles of tympanic cavity.
6. Clinical anatomy of processus mastoideus. Type of processus mastoideus. Age peculiarities.
7. Clinical anatomy, physiology of auditive tube. Its peculiarities in children.
8. Clinical anatomy of the cochlea of inner ear.
9. Structure of spiral organ. Equivalent irritant of acoustic analyser.
10. Mechanism of sound conduction (air, bone conduction).
11. Conductive tract of acoustic analyser.
12. Theories of sound reception.
13. Clinical anatomy of vestibulum of inner ear.
14. Clinical anatomy of semi-circular canals.
15. The structure of ampular receptor. Equivalent irritants.
16. The structure of otolithic apparatus. Equivalent irritants.
17. Vestibular nuclei and their connections.
18. Vestibular reflexes.

19. Evald's lows and lows of nystagmus reactions.
20. Definition of passableness of auditive tube.
21. Examination of hearing by speech and tuning fork.
22. Tone and speech audiometry.
23. Differential diagnosis of disturbance of sound conductive and sound perceiving apparatus.
24. Spontaneous vestibular disturbances.
25. Methods of examination of ampular apparatus (caloric, rotator, pressor tests).
26. Examination of otolithic function.

Methods of examination of external and middle ear

1. Divide into groups of two persons.
2. Check the presence of necessary instruments: frontal reflector, nasal mirror, spatula, auricle funnel, auricle probe with cut, Politzer balloon, Siegle's pneumatic funnel, otoscope, auricle catheter, olive, cotton, 3% solution of ephedrine, boric spirit.
3. Make the patient sit down in front of you, with his knees to the right from you.
4. Put the lamp near the right ear of the patient.
5. Put on and tighten the reflector on your forehead.
6. Start towards examination of external and middle ear.

Examination: Turn your attention to paraauricular and postauricular region, form of pinna, colour of skin, expression of lines of attachment of pinna with mastoid process, entrance into external acoustic meatus.

Palpation: Paraauricular region is examined by pressing with big finger this region and jaw joint, tragus, postauricular region in the points of projection of antrum, sigmoid sinus, apex of mastoid process, lymphatic nodes around acoustic meatus and at the apex of mastoid process.

***Otoscopy*:**

- Turn the head of patient with the corresponding ear towards yourself.
- Direct the ray of reflector to the entrance of external acoustic meatus.

- Take auricle funnel of corresponding size with big and index finger.
- Pull pinna back and upwards.
- With light circular movement, introduce the funnel into membrane-cartilaginous part of acoustic meatus.
- Define the recognising points of tympanic membrane, which as a whole compose the otoscopic picture.

Examination of mobility of tympanic membrane with the help of the Siegle's pneumatic funnel:

- Connect the pneumatic funnel with the balloon.
- Introduce the funnel in auditory channel and obturate it.
- Observe through the magnifying glass of the funnel the tympanic membrane, periodically pressing the balloon.
- Normally: the tympanic membrane will vibrate.

Examination of permeability of auditory tube

Method of Valisalvy:

- Take a deep breath, firmly press lips.
- Hold the nose tightly and do strong exhalation.
- Normally: patient feels light crackle and congestion of ears, which disappears after swallowing.

Method of Politzer:

- Take the otoscope, introduce the olive into own ear, another - into the ear of patient.
- Introduce into the nostrils of patient the olive of the balloon and press with another finger towards the olive.
- Request the patient to pronounce: "Pa- ra-hod" or "ku-ku". On the last word, quickly press the balloon.
- Normally: Doctor hears light blowing noise, patient - entrance of air into ear.

Questions for self-control:

1. Which anatomical formations compose the external ear?

a. pinna

b. tympanic membrane

c. external acoustic meatus

d. mastoidal processus

2. Which anatomical formations of pinna are deprived of cartilage?

   a. helix; b. anthelix; c. tragus; d. lobe.

3. Indicate the length of external acoustic meatus:

   a. 2 cm; b. 2.5 cm; c. 3.0 cm; d. 3.5 cm.

4. Does the external acoustic meatus consist of cartilaginous and bony tissues?

5. Choose from the enumerated, which part of the external acoustic meatus forms cartilaginous part:

   a. 1/3; b. ½; c. ¼; d; 1/5.

6. Is the entrance into the antrum located on the anterior wall of tympanic cavity?

7. Indicate how does the facial nerve pass in relation with the oval window:

   a. in front

   b. from behind

   c. from below

   d. from above

8. Which muscles among the enumerated are the muscles of tympanic cavity?

   a. *m.masseter*

   b. *m.stapedius*

   c. *m.tensor tympani*;

9. Choose amongst the enumerated, which is the length of auditory tube?

   a. 2.5 cm; b. 3.0 cm; c. 3.5 cm; d. 4.0 cm.

10. Choose accordingly, what is bounded with the wall of tympanic cavity?

    1) Anterior 2) Posterior

    a. Cavern of mastoid process

    b. Internal carotid artery.

11. Mention which recognising points of tympanic membrane are defined during otoscopy: a.; b.; c.; d.
12. Indicate in which part of auditory passage do furuncles arise.
13. Mention the walls of tympanic cavity.
14. Explain why during the introduction of the funnel into the acoustic meatus and during its cleaning does cough arise?
15. What does the tensed part differentiate from the flaccid part?
16. Which parts are present in the tympanic cavity?
    a.; b.; c.
17. Describe the location of auditory ossicles, starting from tympanic membrane?
18. Indicate, which variants of structure the mastoid process possesses.
19. Enumerate the quadrants of tympanic membrane.
20. Which are peculiarities of acoustic meatus in children?
21. Is membrano-cartilaginous part 2/3 the length of external acoustic meatus?
22. Does the softness of external acoustic meatus depend upon the Santorine fissures?
23. Are the walls of tympanic cavity covered by mucous layer?
24. Mention from the enumerated, changes of which wall of external acoustic meatus are the most important for diagnosis of mastoiditis:
    a. superior
    b. inferior
    c. posterior
25. To which direction the pinna should be pulled during otoscopy?
    a. in children
    b. in adults
26. Indicate, which part of external acoustic meatus contains glands:
    a. bony
    b. membrano-cartilaginous
27. Which anatomical formations join the tympanic cavity with nasopharynx?

a. auditory tube

b. round window

c. oval window

d. internal acoustic meatus

28. Blood supply of external ear is fulfilled from the system:

a. of external carotid artery; b. of external carotid and internal jaw artery;

c. internal carotid artery; d. external carotid and external jaw artery;

e. external jaw artery.

29. Enervation of external acoustic meatus is fulfilled by?

a. abducent nerve; b. trigeminal nerve;

c. facial nerve; d. n.vagus and

e. trigeminal nerves.

30. Choose methods of examination:

1) Auditory tube 2) Mastoid process

a. external examination; b. palpation;

c. cateterisation; d. X-Ray examination.

Standard answers for the questions for self-control:

1. a, c ; 2. d; 3. b; 4. Yes; 5. a; 6. No; 7. b, d; 8. b, c; 9. c; 10. 1-b, 2-a; 11. a) light cone; b) handle of malleus; c) short process; d) anterior and posterior folds; e) grey colour of tympanic membrane. 12. In membrane-cartilaginous part. 13. Anterior, internal, posterior, external, superior, inferior. 14. Reflex from n.vagus. 15. Presence of fibrous layer. 16. a) Epitympanum. b) Mesotympanum. d) Hypotympanum. 17. Malleus, incus, stapes. 18. Pneumatic, diploetic, sclerotic, mixed. 19. Anterio-superior, anterio-inferior, posterio-superior, posterio-inferior. 20. Shorter, wider than in adults. 21. No. 22. Yes. 23. Yes. 24. b. 25. a) back and downwards, b) back and upwards. 26. b. 27. a. 28. b. 29. d. 30. 1 - c, 2 - a, b, d.

The topic of the next lesson: Diseases of the nose (acute catarrhal rhinitis, lesion of the nasal mucosa in measles, scarlet fever and diphtheria, chronic rhinitis). Diseases of the paranasal sinuses (acute and chronic form sinusitis). Tumours of the nose

Topic 4. Diseases of the nose and the paranasal sinuses

The number of hours – 4

Actuality of the topic. The acute and chronic rhinitises result in the blockage of nasal respiration, violation of local immunodefence of a mucosa of upper respiratory tract, promotes the originating of acute and chronic sinuites, otitises, laryngitises, diseases of the broncho-pulmonary system and other violations in an organism. In this connection early diagnostics and adequately assigned treatment promotes the elimination of undesirable complications of a rhinitis. In some cases, the distress of functions of a nose has a non-perishable character, that is undesirable, and has an effect upon work capacity of the patient, his social adequacy. Differential diagnostics of rhinitises with other inflammatory and tumoral diseases of upper respiratory tract is important. The stated data prove the importance of the purpose of the given practical occupation.

Study of inflammatory diseases of paranasal sinuses of nose is of serious importance. This not only explains the relative frequency of pathology in question, but often-occurring serous period of such inflammation is especial in early child's period. Apart from this, according to the anatomo-topographic location of these sinuses and functional conditions depending on the age, this inflammation can threaten to vital organ, initiating intraorbital and intracranial problems. Treatment of such patients is done by ENT specialist.

Knowledge of this section in practice is necessary for otorhinolaryngologist, neuropathologist, neurosurgeon, ophthalmologist, paediatrician, PES (personnel of emergency service) and this can also be used by students for studying neural, paediatrics, optical diseases and neurosurgery material.

Educational purposes

The students should know

- anatomy, physiology, methods of examination of a nose, of paranasal sinuses;
- main signs of acute and chronic rhinitises;

- objective changes of a mucosa of a nose at rhinitis;
- differential diagnostics of rhinitises;
- aetiology and pathology of acute and chronic sinusitis;
- classification of chronic sinusitis;
- clinics, basis of disease treatment;
- additional analysis and diagnostic directives: (X-ray, puncture of maxillary sinus etc.);
- immediate cause and basic mechanism of nasal, intracranial and intraorbital complications;
- symptoms, differential diagnosis of nasal complications and sinuites.

The students should be able to

- correctly make the diagnosis of rhinitis
- carry out the differential diagnostics of rhinitises, utilizing the endoscopic methods of examination and X-ray examination
- assign the adequate course of treatment
- make the adrenalisation of a mucosa of a nose, insufflation of drug

Questions for practical lessons

1. Etiological factors of an acute rhinitis.
2. Pathogenesis and stages of an acute rhinitis.
3. Treatment of an acute rhinitis depending on a stage of the process.
4. Factors promoting the development of a chronic rhinitis.
5. Classification of chronic rhinitises.
6. Aetiology, pathogenesis, clinic, differential diagnostics and treatment of chronic hypertrophic rhinitis.
7. Aetiology, pathogeny, clinic, differential diagnostics and treatment of a chronic atrophic rhinitis.
8. Aetiology, pathogeny, clinic, differential diagnostics and treatment of a chronic vasculomotor rhinitis.

9. Aetiology, pathogeny, clinic, differential diagnostics and treatment of a chronic allergic rhinitis.

10. An aetiology, pathogeny, clinic, differential diagnostics and treatment of an ozena.

Acute sinusitis

1. Role of pathogenic flora causing sinusitis.
2. Exo- and endogenic factors responsible for sinusitis
3. Primary and secondary sinusitis.
4. Understanding of mono-, hemi and pansinusitis.
5. Generalised and local symptoms of acute sinusitis.
6. Clinics, diagnosis of acute maxillitis.
7. Clinics, diagnosis of acute ethmoiditis.
8. Clinics, diagnosis of acute frontitis.
9. Clinics, diagnosis of acute sphenoiditis.
10. Peculiarities of acute sinusitis in children.
11. Local treatment of acute sinusitis (vasoconstrictor and antiseptic drops in nose, anemisation of middle nasal meatus).
12. Antibacterial therapy.
13. Hyposensitive and dehydration therapy.
14. Puncture of the maxillary sinus, its location, complication.
15. Trepanopuncture or catheterization of frontal sinus.
16. Indications for surgical treatment of acute sinusitis.

Chronic sinusitis

1. Causes of the beginning of chronic sinusitis (C.S)
2. Classification based on location of pathological process
3. Pathologoanatomical classification of C.S.
4. Purulent, purulent- polypous form of C.S.
5. Which are the typical locations of polyps at early sinusitis
6. Understanding the allergic rhinosinusopathy
7. Cystic lesion of nasal sinuses: aetiology, clinics
8. X-ray and tomogram examination

9. Differential diagnosis of C.S and tumours of nasal cavity and sinus
10. Which forms of sinusitis need conservative treatment, their principles
11. Indications for surgical treatment
12. Operations of frontal, ethmoidal, sphenoidal and maxillary sinuses

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Theoretical contents

Chronic rhinitis. The main forms of chronic rhinitis are catarrhal, hypertrophic, atrophic, vasomotor and allergic. The disease is common.

Chronic catarrhal rhinitis. The onset of chronic rhinitis is connected, as a rule, with frequently recurring acute inflammation in the nasal cavity (including inflammations associated with various infections), irritating environmental effects such as dust, gas, dry or moist air, variations in ambient temperature, etc.

The main symptoms of chronic catarrhal rhinitis are the impeded respiration through the nose and rhinorrhoea; both signs are manifested moderately. Respiration through the nose becomes periodically difficult, mostly due to chilling. The passageway through one side of the nose is usually obstructed permanently. Nasal respiration is even more difficult when the patient lies on his side.

Chronic hypertrophic rhinitis. The main signs of hypertrophic rhinitis are the impeded respiration through the nose, mucous nasal discharge, and thickened and swollen nasal mucosa, mainly in the entire inferior and middle concha. The mucosa is usually red-blue, grey-blue and covered with mucus. In the presence of mucopurulent discharge, inflammation of the paranasal sinuses should be excluded. The posterior ends of the inferior conchae are usually thickened; application of vasoconstrictor drops does not causes the reduction of nasal concha.

Chronic atrophic rhinitis. Common chronic atrophic rhinitis can be diffuse or circumscribed. Mineral dust (silicates, cement) and that of tobacco produce a strong effect on the condition of the nose. Common symptoms of the disease are crusts in the nose. Meagre tenacious mucus (or mucopurulent discharge) adheres to the mucosa and dries into crusts. The patient complains of dryness in the nose and the pharynx, and impairment of olfaction. Separation of the crusts often causes nosebleed, usually from the Kiesselbach area.

Treatment of chronic rhinitis. Treatment of various forms of chronic rhinitis includes the following: elimination of possible factors, which cause and maintain rhinitis; specific medicamentous therapy of each particular form of rhinitis; surgical management for special indications; physiotherapy and climatic treatment.

Astringent substances are used for chronic catarrhal rhinitis. These are a 3-5 per cent protein silver or colloid silver solution and a 3-5 per cent silver nitrate solution. If the mucosa is swollen, it can be treated with an iodine-glycerol solution. The treatment with the mentioned preparations should not continue for more than 10 days. Physiotherapy is also recommended: UHF or microwaves on the nose and UV-therapy endonasally. Courses of instillation of peloidin, inhalations of balms should be alternated. If hypertrophy is insignificant, sparing surgical interventions are recommended: ultrasound disintegration, cauterization with chemical substances (silver nitrate, trichloroacetic acid, chromic acid), electric current, or extreme cold. If hypertrophy is significant and respiration through the nose is impeded, partial resection of the hypertrophied parts of the conchae (conchotomy) is recommended.

Treatment of atrophic rhinitis. The patient should take care of his nose so that crusts and nasal discharge should not accumulate in the nasal cavity. The nose should be cleaned once or twice a day by irrigating the nasal cavity with isotonic sodium chloride solution containing an additive of iodine (6-8 drops of a 5 per cent iodine tincture per 200 ml of the solution). Irritants should periodically be used: the mucosa should be treated with an iodine-glycerol solution once a day in the course of 10 days. This stimulates the secretion of the glands in the nasal mucosa. A 30 per cent potassium iodide solution (8 drops 3 times a day, for 2-3 weeks) should be given per os for the same purpose.

Ozaena is a pronounced atrophy of the nasal mucosa and the nasal bones marked by formation of fetid crusts, which produce a firm layer on the nasal mucosa. Metaplasia of the columnar ciliated epithelium into squamous epithelium associated with ozaena is characteristic for the major part of the nasal mucosa. It mainly occurs in women and begins in the young, its cause is unknown. The disease persists during the whole life. Ozaena patients complain of marked dryness in the nose, intensive crusting, and fetor. The respiration through the nose is impeded. Olfaction is lost

completely. *Diagnosis* is established by the fetid odour from the nose, the presence of many crusts and atrophy of the nasal mucosa and bony walls of the nose.

Allergic and vasomotor rhinitis

The aetiology of the *allergic* form depends on the allergen. Allergic rhinitis can be seasonal or permanent (non-seasonal). Seasonal allergic rhinitis recurs regularly at the same time of the year, when the specific plant is in blossom. Permanent (non-seasonal) rhinitis is caused by many various substances (allergens) with which the patient often comes in contact, e.g. house dust, fur of domestic animals, pillow feathers, book dust, some foods, various microflora.

Vasomotor rhinitis occurs due to disordered nervous mechanisms accounting for the normal physiology of the nose. Sympathetic stimulation causes vasoconstriction and shrinkage of mucosa, while parasympathetic stimulation causes vasodilation and engorgement. The long application of the vasoconstrictor drops, the deformation of the nasal septum may also cause this disease.

The main symptom of both forms of rhinitis is paroxysmal sneezing attended by nasal hydrorrhoea and difficult nasal breathing. This triad of symptoms is more or less pronounced in all cases. The rhinoscopic signs of rhinitis are oedema and pallor of the mucosa, and cyanotic or white spots on it.

The allergic form of the disease is characterized by increased eosinophil counts and appearance of eosinophils in the nasal mucus.

Treatment depends on the findings of the allergological examination and includes the elimination from the patient's environment of allergens, purulent foci or microbial allergy. Treatment includes specific and non-specific hyposensitization of the patient, local procedures, including surgery and action on the nervous system.

Specific hyposensitization is conducted in conditions of an allergological laboratory, because severe allergic reactions are possible following the administration of the allergens. The identified allergen should be highly diluted and administered to the patient in gradually increasing microdoses (subcutaneously or into the nose, on the mucosa, regularly during the course of several weeks). The body can thus produce protective antibodies to the allergen.

Non-specific desensitization is used in both allergic and vasomotor forms of rhinitis. Antihistaminics (suprastine, tavegyle, diazolyn, klaritin) and hormones (hydrocortisone, prednisolone, prednisone) are used for the purpose. Topical steroids such as beclomethasone, dipropionate and flunisolide acetate used as aerosols are very effective in the control of symptoms. Topical steroids have fewer systemic side effects but their continuous use beyond 3 weeks is not recommended. Sodium chromoglycate stabilises the mast cells and prevents them from degranulation despite the formation of IgE antigen complex. It is used as 4% solution for nasal drops or aerosol powder. It is useful both in seasonal and perennial allergic rhinitis.

Preparations of calcium, sulphur, and vitamins are also helpful. Local methods of treatment, including endonasal novocain block, submucous administration of corticosteroids, cauterization of the reflexogenic zones of the nasal mucosa with strong acids, silver nitrate, intranasal physiotherapy, sclerotherapy are used for treatment of both forms of rhinitis. Electrophoresis of various medicinal solutions is the most common method of physiotherapy for rhinitis. Endonasal electrophoresis with a 2 per cent calcium chloride solution is used most frequently. Long-standing vasomotor rhinitis often increases the volume of the conchae and imposes permanent difficulties in nasal breathing. Surgical treatment (sparing inferior conchotomy, submucous destruction of the inferior conchae with ultrasound) is most rational in such cases.

Questions for self-control

1. In case of chronic hypertrophic rhinitis correct surgical treatment (turbinoplasty) consists of
    a. complete removal of the lower turbinate
    b. only one side complete removal of the lower turbinate
    c. submucosal resection of the lower turbinate
2. In case of diffuse nose bleeding the following methods are used:
    a. anterior and posterior tamponades
    b. cauterization of nose mucus by nitro-acidic silver solutions, by trichloroacetic or chromic acid, electrocoagulation

c. electrocoagulation

3. Set correct sequences.

Types of chronic rhinitis	Types of treatment
1. catarrhal	a. conservative
2. hypertrophic	b. surgical
3. atrophic	c. half-surgical
4. vasomotor	

4. What surgical interferences are used for the treatment of nasal septum deviation?

a. ethmoidotomy

b. conhothomy

c. coagulation of lower nasal turbinate

d. septoplasty

5. Why in case of acute rhinitis the meal is often tasteless?

a. Due to the oedema of the mucous membranes lining the nasal cavity and blockade of olfactory area.

b. Due to acute atrophy of olfactory nerve.

c. Due to the development of such complication as inflammation or atrophy of tongue papillae.

6. What is a nose furuncle?

a. It is an inflammation of hair sacs, located in the middle meatus.

b. It is a local affecting the mucous membranes lining the nasal.

c. It is an inflammation of hair sacs, located in the area of nose vestibulum or on his external surface.

7. What is rhinolith?

a. Incrassated and stratified mucous membranes lining the nasal cavity as a result of laying of mineral salts, which are contained in the secret of mucus and lachrymal glands.

b. Old bloody clot.

c. Nasal stone, which forms due to deposition of mineral salts, which are contained in the secret of mucus and lachrymal glands around an extraneous body.

d. Cicatrical changes of mucus after operative treatment.

8. Variety of allergic rhinitises, which is observed in the period of flowering of cereals, herbares, trees, is called.....

9. Situational task.

A 57-year-old patient entered ENT department with complaints on pain, redness, oedema in nose tip, general weakness, and fever up to 38°C. He considers himself to be sick for 3 days. From the life story, it is known that he has diabetes. During the examination, it was revealed: that nose tip tissue is congested, swollen, and sharply painful on palpation. Front rhinoscopy: local swelling with area of necrosis in the centre in the left vestibulum. What diagnosis will you suggest?

1. Erysipelas of the nose
2. Ozena
3. Rhinoskleroma
4. Furuncle of the nose
5. Rhinofima

The topic of the next lesson: Diseases of the pharynx (adenoids and other inflammations of nasopharynx, acute and chronic pharyngitis, acute and chronic tonsillitis, space infections)

Topic 5. Diseases of the pharynx

(acute tonsillitis, peritonsillar abscess (quinsy), tonsillitis in patients with blood diseases, parapharyngeal and retropharyngeal abscesses, acute pharyngitis, chronic tonsillitis, chronic pharyngitis, pharyngomycosis, adenoids)

The number of hours – 4

Actuality of the topic. One can often come across throat diseases in the clinical practice and any physician must diagnose them. Tonsillar pathology is a common medical problem, which is interesting not only for otolaryngologists, but for physicians, infectionists, reumatologists etc. Socially, this disease is important due to a large number of people suffering from tonsillitis who constitute a great working group of population.

Tonsillitis can give serious complications and provoke many other diseases, in particular the diseases of the cardiovascular system, responsible for the highest death rate. The problem of chronic tonsillitis is very actual, because this disease is very frequent pathology of ENT organs, which gives many days of invalidity. Quite often, there are heavy complications in other organs and systems (rheumatism, endocarditis etc.). Rational and complex therapy helps in improving the prognosis of the disease if chronic tonsillitis is timely diagnosed. The volume of lymphadenoid tissue of pharynx is very changeable and it depends on its functional activity. Sometimes, the increase of volume is so steady, that it provokes the disorders of voice production, functions of nose, ear, whole organism's condition. In such cases, they give evidence of the pathological hypertrophy of lymphadenoid tissue or adenoidal vegetation. It is necessary to differ adenoidal vegetation from other processes in nasopharynx. The previously mentioned factors ground the importance of the theme for the students.

Purpose of the lesson. After studying the topic, a student must have a clear understanding of the aetiology and pathogenesis of throat diseases, the methods of surgical treatment; aetiology, clinical course, classification of chronic tonsillitis, adenoiditis, diagnosing the disease, using the special endoscopic methods of investigation and prescribing the rational therapy.

A student must know

- the classification of tonsillitis;
- the main clinical symptoms of acute tonsillitis;
- the complications and the diseases caused by them;
- the methods of conservative treatment, dispensary examination and prophylaxis, clinical manifestations of the other throat diseases.

A student must be able to

- make pharyngoscopy
- diagnose the throat diseases
- make correct differential diagnosis of acute initial tonsillitis with damaged tonsils affected by infections and pathology of the blood system.
- discover complications, choose the methods of treatment and carry out some diagnostical and medical manipulations
- identify the most informative symptoms of chronic tonsillitis, adenoiditis.
- interpret the latest classification
- conduct differential diagnosis of different forms of chronic tonsillitis, adenoiditis with the nasopharyngeal tumours
- prepare the treatment plan for chronic tonsillitis and adenoiditis
- carry out pharyngoscopy, anterior and posterior rhinoscopy
- make manual investigation of nasopharynx and estimate the obtained material
- apply medicines on mucus membrane of tonsils, wash lacuna of palatine tonsils

To achieve the purpose, it is necessary to interpret anatomophysiological characteristics of throat and pharyngeal lymphatic ring (Pirogov–Valdeier's) without which it is difficult to understand the complex mechanism of development of chronic tonsillitis and adenoiditis.

Basic initial knowledge of anatomo-topographical features of the throat, the vascularization, methods of examination (epi-, hypo- and mesopharyngoscopy) are necessary to realize the purpose of the lesson.

Questions for practical lessons

1. Classification of tonsillitis by Soldatov.
2. Acute primary tonsillitis: aetiology and contributing factors.
3. Clinical forms, pathomorphological changes in tonsils.
4. Clinical picture of the various forms of tonsillitis.
5. Objective data at tonsillitis.
6. Differential diagnostics of tonsillitis with secondary inflammation of tonsils.
7. Treatment of acute tonsillitis.
8. Complication of tonsillitis, reason, way of distribution of an infection.
9. Peritonsillitis: aetiology, classification, principles of treatment, probable outcomes.
10. Retropharyngeal, peripharyngeal abscesses, neck lymphadenitis, phlegmon of a neck. Aetiology, clinic, treatment.
11. Tonsillogenic sepsis: clinical attributes, treatment.
12. Simanovsky-Vensan's tonsillitis (ulcero-membranous).
13. Acute secondary tonsillitis at infectious diseases (diphtheria, scarlet fever, infectious mononucleosis, celiac typhus)
14. Acute secondary tonsillitis at diseases of blood (agranulocytosis, alimentary toxic aleukia, leucosis), principles of treatment.
15. What is chronic tonsillitis?
16. Causes and mechanism of chronic tonsillitis development.
17. Classification of chronic tonsillitis (by ac. Soldatov).
18. Clinical and endoscopic method of examination of tonsils in chronic tonsillitis.
19. Clinical features, differential diagnosis of different types of chronic tonsillitis.
20. Principles of etiopathogenetic and symptomatic therapy of chronic tonsillitis.
21. Methods of prevention of chronic tonsillitis.

22. The causes of hypertrophy of the pharyngeal tonsil, degrees of hypertrophy.
23. The symptoms of acute and chronic adenoidites. The age of patients.
24. Adenoidal type of face.
25. The data of the anterior and posterior rhinoscopy, manual examination in adenoidites.
26. Conservative treatment of adenoidites.
27. The indications for the adenotomy, preoperative preparation, instruments for the adenotomy.

Theoretical content

Acute inflammations of the pharynx can be divided into two main groups — acute tonsillitis and pharyngitis, which may be either independent or concomitant diseases.

Acute Tonsillitis

Acute tonsillitis is a common disease affecting mainly children and young adults; 75 per cent of the morbidity comprise persons aged under 30. According to a modern definition, acute tonsillitis is an acute systemic infectious-allergic disease with a severe lesion of the lymphadenoid tissue of the palatine tonsils. The pathogenic agent plays a decisive role in the onset and course of the disease; therefore, a person may be infected by air-droplet route or a direct contact with a sick person. Being an infectious disease, tonsillitis produces the immunity; relapses of acute tonsillitis within a year suggest a decreased immunity of a person. This should be borne in mind when selecting a therapy.

Cooling of the trunk, feet, and tonsillar mucosa are unfavourable factors facilitating the development of acute tonsillitis. Tonsillitis is commonly caused by the haemolytic streptococcus. Spirochetes of the oral cavity, fusiform bacillus, and sometimes staphylococcus, viruses, and anaerobic microorganisms may also cause acute tonsillitis. Palatine tonsils are mostly affected; pharyngeal, lingual, and laryngeal tonsils are less commonly involved. Occasionally, acute tonsillitis is closely related to the pathological condition in the teeth and oral cavity; acute

tonsillitis may combine with lesions of the gingival and buccal mucosa and accompany severe systemic diseases.

Classification of tonsillitis by I.B. Soldatov (1975)

I. Acute:

1) Initial: superficial, lacunar, follicular, Vincent's tonsillitis.

2) Secondary:

a) in acute infectious diseases, diphtheria, scarlet fever, tularaemia, abdominal typhoid, infectious mononucleosis

b) in blood vascular diseases – agranulocytosis, alimentary-toxical aleukaemia, leucosis.

II. Chronic

1) Nonspecific:

a) compensative form

b) decompensative from

2) Specific: having infectious granulomatous-tuberculosis, syphilis, scleroma.

Pathoanatomic classification of chronic tonsillitis by V.N. Zac 1933.

I. Chronic external tonsillar lacunitis ulcerated or non-ulcerated. Inflammation process locates mainly in tonsillitis lacuna.

II. Chronic parenchymatous tonsillitis (acute). Main changes are observed in lymphoid tissue (niduses of softening, the slurring of the folliculus border).

Superficial chronic parenchymatous sclerotic tonsillitis. The first sign is the exuberance of the connective tissue in the parenchyma of tonsils.

III. Deep chronic parenchymatous sclerotic tonsillitis. The development of sear tissue is observed mainly in the "capsule" and peritonsillar areas.

Peritonsillar abscess (quinsy)

Inflammation of the peritonsillar cellular tissue is called quinsy or peritonsillar abscess. The condition is caused by the spreading of inflammation from the tonsillar parenchyma or from the region of the eighth tooth (especially in difficult eruption with the 'hood' symptom) onto the cellular tissue of the tonsil. Diffuse peritonsillar inflammation has its specific features: (1) as a rule, it occurs soon after acute

tonsillitis; (2) acute unilateral sore throat is accompanied by sharp deterioration of patient's condition: fatigue, insomnia due to severe sore throat with pain radiating to the ear, inability to eat or drink. There may be chills; body temperature rises to 39-40 °C. Trismus and hypersalivation are present; the voice becomes nasal and the skin of the face grey. If the mouth of the patient can be opened, fetid odour is felt. Asymmetry of the soft palate due to displacement of one tonsil toward the midline is seen. There is a swelling and hyperaemia of the adjacent tissues above, laterally, and below the tonsil. Anterosuperior, antero-inferior, lateral, and posterior peritonsillar abscesses are distinguished, depending upon the location of abscess in the peritonsillar cellular tissue. The lateral one is considered to be the most dangerous, since it may spread to the parapharyngeal (pharyngomaxillary) cellular space.

Peritonsillar abscess belongs to emergency conditions. Prior to the formation of abscess, patients with diffuse suppuration of the peritonsillar cellular tissue should be given broad-spectrum antibiotics (injections are preferable because tablets are difficult to swallow).

Antihistamines (pipolphen, suprastin, dimedrol), warming compresses on the neck, warm gargles (nitrofurazone and potassium permanganate), antipyretics (aspirin, ami-dopyrine), and analgesics (analgin, baralgin) are recommended.
A ripe abscess must be opened as early as possible.

Chronic pharyngitis

Chronic pharyngitis is also a common disease; it comes at the head of the attendance list. The disease is characterized by a prolonged course and often is not an independent disease, but concurs with other pathological conditions, mostly of the gastro-intestinal tract. Chronic pharyngitis should not therefore be regarded as a local lesion of the pharyngeal mucosa, but an attempt should be made to relate it to the general causes. The latter can be revealed by the additional methods of examination, which include gastroscopy and biopsy of gastric mucosa. Several varieties of chronic pharyngitis are distinguished: catarrhal, hypertrophic, and atrophic pharyngites. Despite morphologic differences, the patient's complaints are quite similar: a feeling of an obstacle in the throat, mild but persistent pain during

swallowing of saliva, intensification of pain after taking spicy, hot, or cold food; a sensation of a foreign body in the throat, dryness or permanent flow of secretion by the posterior pharyngeal wall, and dry cough.

***Catarrhal pharyngitis*.** Hyperaemic and edematous mucous membrane of the posterior pharyngeal wall and the presence of mucus are typical. These symptoms intensify during common cold or exacerbation of gastrointestinal diseases.

Hypertrophic (granular) pharyngitis. Accumulation of lymphoid tissue in the form of large crimson granules and enlarged lymphoid bands behind the posterior tonsillar pillars are specific for the lateral hypertrophic pharyngitis.

Atrophic pharyngitis is the most severe form of the disease. The patient complains of acute dryness in the throat combined with pain and the formation of crusts.

Treatment is complex and directed at lessening the local manifestations and eliminating the underlying cause. All patients with pharyngitis, regardless of its form, should be examined by the otorhinolaryngologist, neuropathologist, and gastroenterologist.

Some occupational factors, such as dirty and extremely dry air and presence of gases irritating the mucosa, can affect the course of chronic pharyngitis. The properties of food (spicy, hot, or cold), smoking, or alcohol abuse are of particular importance.

Local medication includes the drugs that help to moisten the mucous membrane of the posterior pharyngeal wall and abate the sensations, which may be regarded as paresthesias — tickling and the feeling of a foreign body in the throat, etc. Chamomile and sage teas are recommended as gargles for prolonged use in patients with catarrhal pharyngitis. Alkaline gargles and silver nitrate preparations (protargol, collargol) are also used to render drying effect.

The treatment of hypertrophic forms consists in electrocautery of hyperplastic parts; the method of cryodestruction is also used.

The treatment of atrophic forms is mainly symptomatic and directed at lessening the dryness and pain in the throat. A 1 per cent Lugol's solution is used for the purpose.

Pharyngomycosis is a fungal infection of the pharyngeal mucosa. Patients do not usually present any complaints and may discover only by chance whitish-yellow cone-shaped formations elevated above the mucosal surface of the tongue, palatine tonsils, or tonsillar pillars. The disease is caused by *Leptothrix buccalis*, a saprophytic fungus inhabiting the buccal cavity. Cornification of the epithelium involves small parts of the mucosa where cone-shaped pillars, 2-3 mm high, occur that firmly adhere to the underlying tissue. They may be found on the tongue, soft palate, tonsils, and other parts of the oropharynx.

Treatment includes decamin, 1 caramel four times a day for two weeks, and quinosol solutions as a gargle.

Adenoids

Hypertrophy of the pharyngeal tonsil (adenoids) comes first in the list of nasopharyngeal abnormalities, which is indirectly related to the pathological condition of the maxillodental system. Adenoids are most frequently encountered in children, i.e., in the period when facial bones are shaping toward the adult configuration and during the period of dentition. Therefore, nasal breathing must be unobstructed to prevent developmental anomalies of the hard palate and teeth. Adenoids may cause stable nasal obstruction, congestive mucosa of the nasal cavity and paranasal sinuses, and also persistent rhinites and otitis media.

Symptoms include persistent nasal obstruction, chronic rhinites, headache, apathy, and deranged appetite. Pallor, apathetic facial expression, flattened nasolabial folds, and half-opened mouth with carious teeth are typical.

Diagnosis is based on the history findings and child's appearance. Posterior rhinoscopy shows adenoids (formations with a rough surface) in the vault of the nasopharynx that obstruct the choanae. Besides, palpation of the nasopharynx is of great diagnostic value. It is done by the right index finger inserted into the nasopharynx behind the soft palate; sometimes lateral x-ray examination is helpful.

Three degrees of adenoid growths are distinguished:

I. Adenoids extend to the upper edge of the choanae

II. Adenoids occupy a considerable part of the nasopharynx and half cover the vomer

III. Adenoids completely obstruct the choanae

The basic method to restore nasal breathing in patients with adenoids is surgery — adenoidectomy performed with the use of a special fenestrated knife called adenotome. Timely adenoidectomy prevents development of diseases of the nasal cavity, paranasal sinuses, and maxillodental abnormalities (stomatitis, gingivitis, dental caries, and malocclusion).

Questions for self-control of knowledge

1. Waldeyer's ring consists of which tonsils?
   A) B) C) D)
2. Blood supply of the palatine tonsils is carried out by the ascending palatine artery?
3. Does the n. vagus innervate of the palatine tonsils?
4. What is between the tonsillar capsules and the wall of the pharynx?
5. What lymph nodes are responsible for lymph drainage of the palatine tonsils?
   A) B) C)
6. What anatomical formations are bounded by the lateral pharyngeal wall?

Standard answers for the questions

1. A) palatine; B) nasopharyngeal; C) tubarious; D) lingual;

2. True; 3. True; 4. Paratonsillar cellulose space – Porou's cellulose tissue; 5. A) submandibular; B) retromandibular fossae lymph nodes; C) deep cervical along the jugular vein; 6. Nerve-vascular cervical bundle.

Task 1. Patient of 17 years complains of a strong pain in a throat amplifying at swallowing, the increase of temperature of a body, general indisposition, headache, absence of appetite. Was ill three days back after overcooling. Objectively: skin covers damp. Temperature of a body is 38.8°C. The pulse is 88 in minute, rhythmical. Bright hyperemia of a mucous of palate arches, tonsils and back wall throat. On the surface of tonsils are white patches, which are easily removed.

Submandibular lymph nodes are increased, painful at palpation. What diagnosis? How to treat the patient?

Task 2. For what day from a beginning of disease at peritonsillar abscess, its opening is made? How the place of opening is determined, if is not present of local protruding in peritonsillar area?

Task 3. The patient of 16 years complains of general indisposition, headache, pain in a throat. The second day is sick. Objectively: a condition of the patient is bad. Skin is pale, damp. Temperature of a body is 38.6^{o} C, pulse is 82 in minute. A mucous of the throat is red with a grey shade, tonsils are covered with dirty grey patches, which are spread on the palatine arches. Patches are removed difficulty, the underlying tissue bleeds. Soft tissues in a circle of tonsils are edematous. The smell from a mouth is determined. In submandibular area, the swelled soft tissue is defined. Regional lymph nodes are not increased. What diagnosis? What is necessary for confirming the diagnosis? What tactics of the doctor?

Answers for the tasks

Task 1. Lacunar tonsillitis. Anti-inflammatory treatment, desensibilisation, vitamins. Plentiful drinking, sparing diet, bed regime. Gargling by antiseptics.

Task 2. Opening of the abscess is made for the third day. The place of opening is in middle third of line connecting the basis of the uvula and posterior tooth of the mandibula.

Task 3. Diphtheria of the pharynx. For the diagnosis, it is necessary to make a bacteriological research. The urgent hospitalization of the patient to an infectious hospital is indicated.

The topic of the next lesson: Diseases of the larynx (acute and chronic inflammations of larynx, voice and speech disorders, oedema of larynx, acute and chronic stenosis of the larynx, stridor, laryngeal paralysis, larynx: benign tumour, cancer larynx; pharynx tumours: nasopharyngealfibroma, carcinoma, tonsilcarcinoma)

Topic 6. Diseases of the larynx

(acute laryngitis, subglottic laryngitis (false croup), submucous laryngitis (angina laryngea), phlegmonous laryngitis, chondroperichondritis of larynx, acute and chronic stenosis of the larynx)

The number of hours – 4

Actuality of the topic. Larynx being a part of the air conducting tracts of the organism, participates in fulfilling the main functions of breathing, phonation and speech. The violation of the normal anatomical and functional relationships in the larynx leads to different pathological processes, firstly discovered by the development of the nose, larynx and voice dysfunction. Chronic larynx diseases, running with the disturbance of breathing and vocal functions, are often met in the clinical practice. Sick persons with chronic laryngitis are subjected to differential diagnosis from other larynx diseases, benign and malignant tumours.

Stenosis of the larynx block the normal air pathway in the lower respiratory tract. Many diseases (infectious diseases, trauma, burns, allergy, purulent inflammation of the neck, neoplasm of the mediastinum, trachea and bronchi etc.) may cause acute and chronic laryngostenosis. That is why many specialists (therapeutist, pediatrist, anaesthesiologist, oncologist and others) should know the clinical features, methods of diagnostics and prophylaxis, principles of treatment of different kinds of stenosis, depending on their aetiology. Acute and chronic larynx diseases, running with the disturbance of breathing and vocal functions, are often met in the clinical practice. The most important problem is that of acute laryngotracheitis in children.

The students should know the definition of laryngostenosis; the causes of acute laryngostenosis; the cause of chronic laryngostenosis; the clinical features of stenosis; pathogenesis of laryngostenosis; the technique of intubation and tracheotomy; the complications of surgical treatment of laryngostenosis; the methods of prophylaxis of laryngostenosis, the main clinical symptoms of pharynx and larynx diseases.

The students should be able to determine the indications for conservative therapy; prescribe medicines for stenosis; determine the indications for tracheotomy and intubation; identify instruments used for tracheotomy; diagnose stenosis in atypical conditions and prescribe therapy depending on the aetiology; attend patients with tracheocannula.

Questions for practical lessons

1. Give the definition of laryngostenosis.
2. What are the differences between acute and chronic laryngostenosis?
3. Name the causes of acute laryngostenosis.
4. Which of the diseases of larynx and pharynx may cause laryngostenosis?
5. Which infectious diseases may cause construction of larynx?
6. Name the causes of chronic laryngeal constriction.
7. Name the specific diseases of larynx, which cause chronic stenosis.
8. Name the stages of laryngostenosis and describe them.
9. Pathogenetic mechanism of laryngostenosis.
10. With which diseases should laryngostenosis be differentiated.
11. Name the contents of the antiedemic inhalatory mixtures and their doses.
12. Specify the daily dose of corticosteroids.
13. Specify the contents of the lytic mixture, which is used to calm the patient.
14. Which medicines relieve acidosis?
15. What does “medicinal tracheotomy” mean?
16. Indications for tracheotomy in laryngostenosis.
17. Name the types of tracheotomy.
18. Name the complications of tracheotomy.
19. Prophylaxis of acute and chronic laryngostenosis.
20. Which stage of stenosis is characterized by white asphyxia?
21. Pharyngitis: clinical form, methods of treatment.
22. Acute laryngitis. Name the causes and main symptoms.
23. Acute laryngotracheitis in children. Enumerate key symptoms. Draw a laryngoscopic picture.
24. Chronic laryngitis: the main clinical forms, treatment.

Theoretical content

The majority of patients with disorders of the larynx and voice suffer from infectious and non-infectious inflammatory conditions. Some laryngeal inflammations of childhood may cause conditions that a physician of any specialty must be able to correct.

Acute laryngitis

Acute laryngitis is a common disease of the laryngeal mucosa. As an independent disease, it may be produced by vocal overstrain, but in the majority of cases it is a component of acute upper respiratory infections and influenza. Occasionally, the disease may develop because of irritating action of industrial dust or gases. Mucosal changes in acute catarrhal laryngitis are characterized by oedema and pronounced hyperaemia of the entire larynx, which is especially visible in the true vocal cords. Normal vocal cords have thin edges and join tightly during phonation; inflamed cords are thick, their edges become flaccid, and the cords fail to strain and join closely during phonation.

Accumulating in the lumen of the rima glottidis, the inflammatory secretion causes cough, which largely impedes junction of the vocal cords.

Symptoms include change of voice, sore throat, and cough. Dysphonia (voice impairment) may vary in severity. The voice is rough, low, and hoarse. Aphonia (loss of voice) may develop. Laryngoscopy demonstrates diffuse hyperemia over the entire larynx.

Treatment includes sparing conditions for the voice. If the occupation is associated with vocal overstrain, the patient must be given a sick leave until the vocal function is completely restored. Diet is of great importance: cold, hot, or piquant food is forbidden. Warming of the laryngeal mucosa is accomplished by drinking warm milk and mineral water, and by warming compresses on the neck. Hot footbaths and vapour inhalations are included. Antibiotic aerosols, particularly penicillin aerosol, are most effective. Alkaline inhalations soften the crusts and promote their separation; this, in turn, lessens the urge to cough. In patients with laryngeal oedema, drugs reducing permeability of the vascular wall (pipolphen, dimedrol, suprastin, and calcium chloride) are used; mustard plasters to the calves

are also recommended.

Subglottic laryngitis (false croup) is a variety of acute catarrhal laryngitis, which develops in the infraglottic space. It occurs in children ageing from 2 to 5 and is associated with the anatomy of their larynx (narrow lumen and loose connective tissue in the infraglottic space). The onset of the disease is as a rule connected with acute inflammation of the mucosa of the nose or the pharynx. False croup occurs mostly in children who tend to develop laryngospasm and suffer from diathesis. The onset of the disease is sudden: an attack of barking cough occurs during night sleep. The child wakes up and tosses in his bed. Breathing becomes very difficult and whistling; inspiratory dyspnoea is pronounced. The nails and the visible mucosa become cyanotic. The child is frightened and this intensifies coughing. Inspection of the child reveals retraction of the soft tissues of the jugular fossa, supra- and subclavicular spaces, and the epigastric region. This condition lasts from a few minutes to half an hour; the child then sweats excessively and his respiration becomes almost normal. The laryngoscopic picture in subglottic laryngitis is characterized by ridge-like swelling of hyperaemic mucosa in the infraglottic compartment.

Treatment includes common hygienic measures, ventilation in the room, and therapeutic measures. The child is given warm milk and mineral water. Poultice and mustard plasters should be applied to the neck. Hot footbaths are also effective. The attack of asphyxia can be aborted by touching the posterior wall of the pharynx with a spatula thus stimulating the vomiting reflex.

***Submucous laryngitis (angina laryngea*).** This is an acute inflammation of the lymphoid tissue of the larynx. These are substantially the same as in inflammation of the palatine tonsils. The patient complains of painful swallowing, painful turning of the head, and dry throat. The voice is changed in some cases; the larynx can be stenosed significantly to impede respiration. The body temperature is often 37.5-38^{0}C. Palpation of the neck reveals enlarged and very tender lymph nodes, usually on one side. Laryngoscopy shows hyperaemia and infiltration of the laryngeal mucosa on one side or over a circumscribed area. Separate follicles with punctate patches can sometimes be seen. If the disease runs a prolonged course, an

abscess can develop on the tongue surface of the epiglottis.

Treatment is the same as for acute catarrhal laryngitis, but antibacterial preparations should be given in bigger doses. Tracheostomy is indicated for significant stenosis.

Phlegmonous laryngitis is a suppurative inflammation of the submucous layer, possibly of the muscles, tendons, and the laryngeal perichondrium. Its aetiological factor is infection (staphylococcus, streptococcus, etc.). The disease occurs mostly in males ageing from 20 to 35. The affection can be circumscribed and diffuse. The patient complains of severe pain on swallowing, especially if the phlegmona is located on the tongue surface of the epiglottis and the arytenoid cartilages. If the glottis tissues are affected, the first symptom is hoarse barking cough and respiratory distress (to asphyxia). The body temperature is high. Examination reveals inflammation of the regional lymph nodes. Laryngoscopy reveals hyperaemic and infiltrated laryngeal mucosa with sites of necrosis. The formation of an abscess is characterized by circumscribed swelling; pus can be seen through the thinned mucosa. Mobility of some laryngeal structures is strongly restricted.

Treatment. The patient must be taken to hospital. Tracheostomy is indicated for increasing stenosis. Local and general antibacterial and anti-inflammatory therapy is started at the early period of the disease. If an abscess is present, it should be opened surgically. If the phlegmona spreads onto the soft tissues of the neck, external incisions are made to ensure adequate drainage of suppurative cavities.

Chondroperichondritis of larynx is associated with the spreading of the inflammation from the soft tissues onto the cartilage. Acute and chronic processes are distinguished.

Symptoms. These mainly depend on the location of the focus. Indurated soft tissues usually circumscribe the inflamed part of the cartilage; external and internal purulent fistulae are periodically formed. Laryngoscopy reveals indurated and oedematous areas of the mucosa, which narrow the lumen of the larynx. The disease is usually long-standing; it can persist for several months and even years.

Treatment of acute chondroperichondritis includes administration of big doses

of antibiotics and sulpha drugs, which eliminate inflammation. Physiotherapy should be prescribed, depending on the character of the inflammation: UV light, UHF- and SHF-therapy, ion-galvanization of the larynx with calcium chloride, chymotrypsin, and potassium iodide; warming compresses are effective. The patient with chondroperichondritis should be given pasty non-irritating food. Tube feeding is not recommended, because the gastric tube can irritate the laryngeal tissues. The general reactivity of the body can be increased by biological stimulants (aloe, vitreous body, etc.). Surgical intervention is indicated for an abscess, which should be emptied to remove the necrotized tissues. The presence of fistulae is also an indication for surgery, by which the fistula is opened and necrotized tissue removed.

The differences between larynx stenosis and tracheal one

Clinical indications	***Larynx stenosis***	***Tracheal stenosis***
The type of short breathing	Mainly of inspiratory type	Mainly of expiratory type
Position of the sick man's head	Tossed back	Lowered
Larynx movement	When observed forced	Hardly observed
Voice changes	Present	Absent
Rattling noises when breathing	On larynx	On trachea

How to differentiate the stages of larynx stenosis

Stages	***Symptoms***
The first stage of compensation	Deepened and restricted respiratory excursions, shortening or falling out of the respiratory pause
The second stage of untotal compensation	Deep respiratory expansion with the help of the auxiliary muscles: over and under collar bone muscles and rib interspaces pull in wings of nose are blown

The third stage of decompensation	Maximal excursions of the larynx and auxiliary muscles. A sick person in restless state jumps out of bed. Paleness, cold perspiration, cyanosis. Respiration is fast and superficial

Questions for self-control

1. White asphyxia is characteristic of:
   a) II stage of stenosis
   b) III stage of stenosis
   c) IV stage of stenosis
2. Which of the following steps will you take to cope with III stage of stenosis of tumoral aetiology?
   a) conservative therapy
   b) intubation
   c) distracting therapy
   d) tracheotomy
3. What will be your tactic in case of I stage of stenosis of inflammatory origin?
   a) advice
   b) expectation
   c) anti-inflammatory therapy
   d) distracting therapy
   e) tracheotomy
   f) intravenous injection of corticosteroids
   g) inhalation of antiedemic mixture
   h) intramuscular injection of corticosteroids
4. Name four diseases, which may cause the chronic laryngostenosis.
   a) scarlet fever
   b) cancer of the larynx
   c) papillomatosis of the larynx
   d) paratonsillar abscess
   e) foreign bodies of larynx

f) diseases of kidney

g) paresis of recurrent nerves after strumectomy

h) tuberculosis of larynx

5. How will you treat a child with laryngostenosis of IV stage?

a) superior tracheotomy

b) inferior tracheotomy

6. With which of the following diseases laryngostenosis should be differentiated?

a) inflammation of the lungs

b) rheumatism

c) tumour of the mediastinum

Task 1. A 2-year-old child with noisy breathing has been admitted to the hospital. Following symptoms were found: pale nasolabial triangle, acrocyanosis, cough, supplementary muscles participated in respiration. Sick for 5 days. Acute progression of symptoms. Body temperature is 37.8 C.

a) Your diagnosis

b) Aetiology

c) Treatment

Task 2. A patient has been transferred from surgical department to the ENT department after strumectomy. Following symptoms were found – stridor, quick superficial breathing, retraction of supraclavicular and jugular fosses, increased excursion of larynx. Indirect laryngoscopy shows stillness of laryngeal folds.

1. Name the stage.

2. Treatment.

Task 3. A 45 years old patient with II stage of laryngeal cancer was under observation of an ENT specialist for 2 years. Refused any sort of treatment. Objective findings: stridor, pallor, labial cyanosis, participation of accessory muscles in respiration. Indirect laryngoscopy shows tumour of the larynx, which block the laryngeal space. Width of the fissure larynges – 3 mm.

1. Name the stage.

2. Treatment.

Answers to the questions

1. b; 2. d; 3. c, d, f, h; 4.b, d, g, h; 5. b; 6.a, c, d.

The topic of the next lesson:

Diseases of the ear (inflammation of the ear canal, earwax plug, diseases of the tympanic membrane, disorders of the Eustachian tube, acute inflammation of the middle ear, acute otitis media in children, acute mastoiditis, antritis, chronic suppurative otitis media and it’s complications, otosclerosis, Meniere’s disease, sensorineural hearing loss, ear tumours: carcinoma, osteoma, exostoses, glomustumour)

Topic 7. Diseases of the ear

(inflammation of the external acoustic meatus, otomycosis, earwax plug, acute catarrh of the Eustachian tube, acute inflammation of the middle ear, acute otitis media in children, acute mastoiditis, antritis, chronic suppurative otitis media)

The number of hours – 4

Actuality of topic. Acute purulent middle otitis is called an inflammatory infectious disease of mucous layer of air containing cavities of middle ear.

Suffered acute otitis may be the reason of stable hardhearing, of development of chronic inflammation of middle ear, threatening intracranial complications. Probability of the latter is related with no diagnosis at right time, as well as with mistakes in treatment tactics of acute purulent middle otitis.

Above-mentioned facts form the base of importance of aim of study, placed before students. This knowledge of the topic may be used during study of infectious, paediatric, nervous diseases and in practice of doctor of general profile.

The frequency of chronic suppurative inflammation of the middle ear, its aggravation leading to a temporary and sometimes permanent loss of working ability, to the development of diminished hearing and other dangerous complications define social significance of the disease. Any physician must know the symptoms of chronic suppurative middle otitis and its complications. The physician must be able to prevent its development and, if necessary, send the patient to the hospital for urgent treatment.

Purpose of the lesson

Students should know

- aetiopathogenesis of acute middle otitis;
- clinics, diagnosis, principles of treatment of patient with given pathology;
- subjective and objective symptoms of inflammation of mastoid process, types of inflammation of mastoid process, types of mastoiditis, principles of treatment;

- general and local factors, which promote the development of the chronic inflammation of the middle ear;
- classification of the clinical forms of chronic otitis;
- clinical picture of different forms of chronic otitis;
- the methods of conservative and surgical treatment of chronic otitis;
- clinics, diagnostic methods, treatment of labyrinthitis.

Students should be able to

- examine patient with acute middle otitis;
- recognise presence of disease of middle ear in patient, give substantiated conclusion and define further general doctor's tactics;
- prescribe proper medical measures, used in different stages of acute middle otitis;
- evaluate and interpret the data of X-ray examination of mastoid process as per Shuller;
- conduct differential diagnosis of diseases of external and middle ear;
- possess practical skill "clearing of external acoustic meatus";
- choose information from the facts of anamnesis, which indicates on the chronic pathology of the middle ear;
- compose the individual scheme of diagnostic search;
- reveal the most informative signs of chronic pathology of the middle ear;
- make a differential diagnostics between different form of chronic otitis;
- make a differential diagnostics between labyrinthitis and pathology of cerebellum;
- choose the plan of individual treatment of a patient.

Questions for practical lessons

1. Hematoma and perichondritis of auricle.
2. Earwax: clinics, methods of removing.
3. External otitis: forms, aetiology, clinic, treatment.
4. Acute purulent middle otitis. Aetiology, pathogenesis, clinic.
5. Peculiarities of progression of acute purulent middle otitis in children.

6. Peculiarities of progression of acute purulent middle otitis in infection diseases: influenza, scarlet fever, tuberculosis.

7. Treatment of acute purulent middle otitis.

8. Treatment of acute purulent middle otitis in first stage. Indication and techniques of paracentesis.

9. Acute mastoiditis: clinic, diagnostic, treatment, antromastoidotomy.

10. Forms of mastoiditis. Peculiarities of clinic of antritis and mastoiditis in children.

11. Complications of acute purulent middle otitis.

12. Chronic inflammation of the middle ear: clinical signs, classification.

13. Chronic purulent mesotympanitis: clinic, treatment.

14. Chronic purulent epitympanitis. Cholesteatoma. Diagnosis, clinic, methods oh treatment.

15. Differential diagnosis of mesotympanitis and epitympanitis.

16. Conservative treatment of chronic purulent middle otitis.

17. Types of operations on the ear in chronic purulent middle otitis.

18. Labyrinthitis: forms, clinic, treatment.

19. Ways and steps of the spreading of infection from ear to cranial cavity.

20. Otogenic extra- and subdural abscesses: clinic, treatment.

21. Sinusthrombosis and otogenic sepsis: clinic, treatment.

22. Otogenic meningitis: clinic, treatment.

23. Otogenic abscess of brain: stages, clinic, treatment.

24. Otogenic abscess of cerebella: clinic, treatment.

25. Menier’s disease: aetiology, pathogenesis, clinic.

26. Treatment of Menier’s disease. Methods of treatment of acute vestibular dysfunction.

27. Cochlear neuritis: causes, clinic.

28. Treatment of acute and chronic cochlear neuritis.

29. Otosclerosis: pathogenesis, clinic, contemporary methods of surgical treatment.

30. Deafness and dumb. Rehabilitation of the hearing-impaired.

Theoretical content

Furuncle of the external acoustic meatus is an acute purulent inflammation of a hair follicle with circumscribed inflammation of the dermis and subcutaneous tissue of the cartilaginous part of the acoustic meatus. The general predisposing factors are metabolic disorders, for example, upset carbohydrate metabolism, malnutrition, avitaminosis, etc.

***Diffuse inflammation of the external acoustic meatus*.** If infection penetrates through minor injuries in the skin (that can be inflicted during manipulations in the ear), a diffuse inflammation can develop. Maceration of the skin in chemical and thermal bums also facilitates infection with pyogenic and other microbes. This form of otitis externa becomes diffuse and the tympanic membrane is involved. Inflammation spreads into deeper layers of the skin and subcutaneous cellular tissue. This process usually develops in the presence of allergy or metabolic disorders.

Otomycosis is a fungal disease characterized by the growth of moulds of the genus *Aspergillus, Penicilliwn, Rhizopus,* and also yeast-like fungi *Candida* on the walls of the external acoustic meatus. The promoting factors are general and local allergy, metabolic and neurohormonal disorders, and dysfunction of the ceruminous glands. Fungi grow to form a dense network of mycelium, which causes inflammation of the skin.

Earwax (cerumen) plug is produced because of upset function of the glands in the cartilaginous part of the external acoustic meatus. Earwax is the dried up secretion of the ceruminous glands mixed with desquamated epithelium. If the glands function normally, the cerumen dries into small crusts, which are then easily removed from the meatus due to movement of its anterior wall during movement of the jaw (in talking and chewing).

If the secretion remains in the ear for a long time, the epidermal plug dries into a dense clot that is firmly fixed in the meatus of the ear. The leading symptom of the earwax impaction is impairment of the hearing function, often noise in the ear, and autophonia (conduction of own voice into the ear). In this case, the acoustic meatus is obturated with ceruminous mass completely. Vertigo, headache, nausea, and cardiac dysfunction develop sometimes as well.

Acute Catarrh of the Eustachian Tube. Inflammations of the nasal and nasopharyngeal mucosa, as in acute coryza, influenza and other diseases, are very likely to extend to the mucous membrane of the Eustachian tube, which, together with the middle ear cavity, forms a kind of nasopharyngeal diverticulum.

Acute inflammation of the middle ear

Acute inflammation of the middle ear is quite common. Acute otitis media involves not only the tympanic cavity, but also the other parts of the middle ear, such as the auditory tube, the antrum, and the cells of the mastoid process.

Three periods are distinguished in a typical course of acute suppurative otitis media. The first period is characterized by the onset and development of inflammation in the middle ear, infiltration and exudation, and development of minor symptoms, such as hearing loss, noise, earache, hyperemia of the tympanic membrane, protrusion of the membrane due to the thrust of the exudate, and some general symptoms such as elevation of body temperature to 38-39 °C, deranged appetite and sleep, indisposition.

The second period is perforation of the tympanic membrane and discharge of pus. All reactions subside. Otopyorrhoea lasts 4-7 days. Perforation of the tympanic membrane sharply changes the course of acute otitis: earache subsides and disappears, temperature normalizes quickly, palpation of the mastoid process becomes less painful, and the general condition of the patient improves.

Inflammation subsides in the third period. Purulent discharge discontinues, perforation closes, and the anatomical and functional condition of the middle ear is restored.

Dynamics of basic symptoms of AMO in 3 stages of development of process

Symptoms	**I stage (before-perforate)**	**II stage (perforation or pus flow)**	**III stage (scaring or healing)**
Pain in ear	sharp	insignificant	absent
Noise in ear	moderate	less expressed	absent
Decrease in hearing	sharply	decreased	restores

Excretions	no	serous-blood, mucous-purulent	stops
Changes in tympanic membrane	infiltrated, hyperemised, protruded	perforation, pulsate reflex	tympanic membrane becomes distinct, appear recognising points (signs), at the beginning short process of malleus and at the end - light cone; scars of perforation of tympanic membrane
Temperature of body	high	subfebril	normal

Differentiate symptoms of AMO from external otitis

Symptoms	**AMO**	**External otitis**
Pain in ear	Sharp, pulsate, irradiate; accompanied with head ache, heaviness and pressure in ear	Strong, sometimes irradiate, not accompanied by headache; increases during chewing, movement of jaw
Decrease of hearing	Moderate	Hearing is not changed
Noise in ear	Of sharp intensity	Absent. May arise during sharp infiltration of skin of auditory passage and its felling with pus

Character of excretion in acoustic meatus (auditory passage)	Mucous-purulent, serous; blood.	Purulent
Touching of acoustic meatus and tragus	Painless	Sharply painful
Change in tympanic membrane	Depending upon stage of process	Unchanged

Acute mastoiditis is a complication of acute otitis media. This is inflammation of the bony tissue of the mastoid process, which occurs in malignant course of acute suppurative otitis media. The inflammation easily extends from the tympanic cavity onto the cells of the mastoid process through the entrance to the antrum due to the high virulence of the microbes.

Primary mastoiditis occurs in rare cases associated with injury to the mastoid process, tuberculosis, syphilis, actinomycosis and metastasis in general septicaemia.

Incorrect use of antibiotics therapy for acute otitis and also unreasoned abstention from paracentesis, blowing of tube auditive can cause secondary mastoiditis.

Changes in the mastoid process associated with typical mastoiditis vary depending on the stage of the disease. Mucoperiostal (I) and bone-alterative (II) stages of mastoiditis are distinguished.

Symptoms. The clinical signs of mastoiditis can be local and general. The general symptoms are impairment of the patient's general condition, fever, changes in the blood, etc. They do not differ substantially from those of acute suppurative otitis media.

The subjective symptoms are pain, noise in the ears, and hearing loss. Examination of a typical mastoiditis patient reveals hyperaemia and infiltration in the skin overlying the mastoid process (due to periostitis). The pinna is displaced either anteriorly or inferiorly.

The mastoid process, especially the apex, and sometimes its posterior margin,

are very tender to palpation. Inflammation in the mastoid process can be activated causing subperiosteal abscess due to passage of pus from the mastoid cells to the periosteum. The differential blood count shifts to the left; the leukocyte count is moderately high; the ESR gradually increases.

The specific otoscopic symptom of mastoiditis is sagging soft tissue of the posterior-superior wall of the bony part of the external acoustic meatus at the tympanic membrane (the anterior wall of the antrum). Otopyorrhoea is often pulsating and profuse. The consistency of pus is often creamy. Pus can fill the acoustic meatus immediately after its cleaning.

Zygomatic abscess. It is due to infection of zygomatic air cells situated at the posterior root of zygoma. Swelling appears in front of and above the pinna. There is associated oedema of upper eyelid. Pus in these cases collects superficial or deep to temporalis muscle.

The apex- cervical forms of mastoiditis:

Bezold's abscess. It is seen when pus breaks through the tip of mastoid into the sheath of sternomastoid muscle. A swelling is seen in the upper part of neck.

Citelli's abscess. In this case, pus breaks through inner table of mastoid tip and travels along posterior belly of digastric muscle. Swelling is seen in the digastric triangle of neck.

Orleansky. Pus spreads to the parapharyngeal space through the stylomastoid foramen.

Mure. Pus spreads through the medial plate of the mastoid tip to the retropharyngeal space.

Basic differential diagnostic symptoms of AMO and mastoiditis

Symptoms	**AMO**	**Mastoiditis**
General (overall) condition	Improves	Inspite of treatment deteriorates
Pain in ear	After perforation decreases	Inspite of perforation does not decrease

Noise in ear	Gradually decreases	Inspite of treatment does not decrease
Hearing	Improves	Does not improve
Excretion from ear	Stands less, after then disappears. From serous - blood and mucoid-purulent stands mucoid	Purulent; purulent-blood in very big quantities
Palpation of mastoid process	Painless, may be painful during the first days of disease (mastoidal reaction)	Sharply painful
Skin of postauricular region	Unchanged	Infiltrated, swollen mastoid process, smoothness of postauricular fold
Change in tympanic membrane and external acoustic meatus	Correlative to stages	Infiltrated, thickened (mastoidal type); hanging of posterio-superior wall of acoustic meatus
Percussion of mastoid process	Painless	Painful

Differentiative symptoms of mastoiditis and furuncul of external acoustic meatus

Symptoms	**Function of external acoustic meatus**	**Acute mastoiditis**
Spontaneous pain	Increase during chewing (mastication)	Does not increase while chewing (mastication)
Pain caused by pressing	Maximum while pressing on tragus	Maximum while pressing on mastoid process

Pain caused by pulling the auricle	Extremely painful	Painless
Condition of external acoustic meatus	Swelling of skin of cartilaginous part	Swelling of bony part (hanging of posterior wall)
Tympanic membrane	Normal	Changed
Hearing	Normal	Decreased
Temperature	Normal or slightly increased	Increased nearly always

Chronic purulent middle otitis is the most frequent disease of the ear and is encountered in 20-25 per cents of cases among the all pathology of ENT organs. However, asymptomatically running chronic otitis, especially epitympanitis, can suddenly cause the hard intracranial complications (meningitis, sepsis, brains abscesses, etc.). Otogenic intracranial complications are one of the most hard and complicated problems of the modern clinical medicine because of the hardness of their progression, difficulty of diagnostics and treatment and very high lethal outcome. That is why the knowing of aetiology, pathogenesis, clinics and diagnostics of these complications is necessary for doctors of different types (otolaryngologists, neuropathologists, therapeutists, infection disease doctors).

Sings	**Mesotympanitis**	**Epitympanititis**
Pathomorpho logic changes	Inflammation of mucous membrane of tympanic cavity	Inflammation of mucous, caries of ossicous ormations of middle ear
Excretions from the ear	Serous – mucous	Purulent with putrid smell
Localization of perforation	Central	Marginal
Test with probe	Negative	Positive

Pathomorfologic sings of epitympanitis and its symptoms

Sings	**Symptoms**
Obligatory Caries of the walls of tympanic cavity and acoustic bones	Purulent excretions with annoying smell; Progressive hardness of hearing; Gradual increasing of perforation
Growth of granulative tissue in the region of attic	Purulent – blood excretions. Formation of granulations, polypi
Development of cholesteatoma	Pus with stinking smell, containing scales of epithelium. There is frequent tendency to the lowering of hearing.
Destroying of labyrinth wall of tympanic cavity with formation of labyrinthus fistula and paresis of facial nerve	Giddiness, headache in the morning, unsteadiness of the step, nystagmus, positive pressor test, lagophtalmos, smooth of nasolabial fold, prolapsus of mouth angle

Questions for self-control

1. Indicate, which is the most probable path of entrance of infection into middle ear observed in patients with bilateral AMO, if from the anamnesis it is known, that for first time the patient felt pain in ear and decrease in hearing 3 days before during work in caisson: a) haematogenic; b) labyrinthogenic; c) lymphogenic; d) tubogenic; e) tympanogenic.

2. For I stage of AMO it is characteristic: decrease in hearing, noise in ears, increase in temperature of body, hyperaemia and infiltration of tympanic membrane. Which symptom is not named?

3. Patient from evening felt pressing pain in right ear, temperature of body raised up to 39°C, appearance of abundant cream like excretions from ear. In anamnesis, the patient has an acute purulent middle otitis, on which he unsuccessfully treated himself in household conditions. During examination - infiltration of tissue in post auricular region, mastoid process painful during palpation. Which decision should doctor accept?

4. Which dominate factors play role in pathogenesis of acute middle otitis?

a); b); c).

5. Beside the above indicated, enumerate the factors, contributing to the development of acute purulent middle otitis in children of breast age.

a); b); c); d); e).

6. Which complications can be observed during acute purulent middle otitis?

a); b); c).

7. Enumerate basic symptoms of first stage of acute purulent middle otitis

a); b); c); d); e).

8. Name indications of parascenthesis during acute purulent middle otitis.

a); b); c); d); e); f).

9. Enumerate basic otoscopic symptoms of second period of acute purulent middle otitis.

a); b); c).

10. Enumerate basic methods of treatment of acute purulent middle otitis, used in first stage.

a); b); c); d); e)

Standard answers to the questions for self-control of knowledge

1. e) tympanogenic.
2. Sharp pain in ear.
3. You must suspect the complication of acute otitis (mastoiditis) and hospitalise the patient to a specialised ENT ward.

4. a) High virulence of microorganism. b) Presence of accompanying diseases, leading to decrease of resistance. c) Disturbed ventilate and drainage function of auditory tube.

5. a) Frequent ARVI. b) Peculiarities of structure of auditory tube. c) Frequent hyperplasia of lymphadenoid pharyngeal ring.

6. a) Different types of acute mastoiditis. b) Intracranial complications. c) Serous and purulent labyrinthitis.

7. a) Pain in ear. b) Noise in ear. c) Decrease in hearing. d) High temperature. e) Otoscopically - hyperaemia, infiltration; protrusion of tympanic membrane.

8. a) Triad of symptoms: protrusion of tympanic membrane, sharp pain in ear, high temperature. b) Mastoidal reaction. c) Meningism. d) Paresis of facial nerve. e) Irritation of labyrinth. f) Parenteral dyspepsia, toxic pneumonia in children of breast feeding age.

9. a) Purulent excretion in acoustic meatus. b) Hyperaemia, infiltration of tympanic membrane. c) Perforation of tympanic membrane

10. a) General: antibiotics, sulphanilamide preparations, analgesics. b) Pathogenetic: sanation of nose & nasopharynx. c) Parascenthesis. d) Carbol-glycerine drops in ear. e) Heating compress, sollux, quartz.

Task 1. Woman patient, 32 years old, complains on strong pain in right ear, irradiating into teeth, temple, stiff nose, head ache, raise of temperature of body up to 37.8°C. Sick third day, disease preceded by a running nose. Objectively: auricle unchanged, external acoustic meatus is free, tympanic membrane is red, protrusion, recognising points are not defined. Palpation of tragus and mastoid process is painless. Whispering speech is perceived by the right ear at a distance of 1 m, and conversational speech — 3m. Put the diagnosis and prescribe the treatment.

Task 2. Patient (woman), 40 years old, complains on pain in right ear, pus flow from it, decrease of hearing, headache, raise in temperature to 37°C, overall (general) condition is bad. Patient is sick for last 12 days. After a running nose, stiffness of right ear, pain, fever appeared. After 2 days, pus flow from ear started, pain decreased, temperature lowered. Underwent treatment in polyclinic, but pus flow continued. Around two days before pain in postauricular fold, headache appeared, temperature in last days raised once again up to 37°C. Chills vomiting were absent. Objectively: the auricle unchanged, external acoustic meatus is narrowed in bony part due to hanging of posterior-superior wall, there is excretion of mucous-purulent character. Tympanic membrane is red, infiltrated; there is fissure perforation into anterior-inferior quadrants with pulsation of pus. Swelling of mastoid process is identified, smoothness of contours; soft tissues are swelled, painful during palpation. Whispering speech is perceived by the right ear at a

distance of 0.5 m, conversational – 2.5 m. Put the diagnosis. Prescribe the examination and treatment.

Task 3. Child, 8 months old, after undergoing ARVI for a period of 2 days stood restless, in a period of 2 days, frequently cries, swings with head from side to side, extends with hand towards right ear, refuses to suck breast. Temperature of body is 39.2°C. From the questioning of mother it was established, that the child suffered hard tremors of short period, multiple vomiting, diarrhoea. During otoscopy – right tympanic membrane is red, protruded, recognising points are not determined, pressing on tragus is painless. Left tympanic membrane is unchanged. Put the diagnosis, prescribe the treatment.

Task 4. Patient, 45 years old, complains on pain in the region of neck and in postauricular region, abundant excretions from the right ear. Pain developed in ear 2 days before, but purulent excretions are observed already 2 weeks. He underwent outpatient treatment. Objectively: In external acoustic meatus there are abundant mucous-purulent excretions, tympanic membrane is infiltrated, in the centre there is focal perforation, pain presence during palpation in apex of mastoid process and sternocleidomastoid muscle. Whispering speech is not heard by the patient by right ear. Left ear – without any changes.

What is the assumed diagnosis?

Which are the additional examinations necessary for verification of diagnosis?

How to treat the patient?

The topic of the next lesson: The traumas, foreign bodies, bleedings of the ENT organs and first aid (fractures of temporal bone, nasal bones, maxilla, epistaxis, fractures the traumas of the nose, foreign bodies of air passages and nasal cavity). Final module

Topic 8. The traumas, foreign bodies, bleedings of the ENT organs and first aid

The number of hours – 4

Actuality of the topic. The injuries of soft tissues and nasal bones are a quite frequent independent or combined trauma. Nasal haemorrhages, dangerous for human health and life, can occur under this condition, and every doctor and otolaryngologist must give a first aid. Besides, strong nasal haemorrhages can occur by the series of general diseases. That is why the deepening of students' knowledge is necessary for the urgent help. Presence of foreign bodies in respiratory tract and oesophagus is one of the serious problems for ENT specialists, paediatricians and physicians. Timely diagnosis and extraction of foreign bodies from the respiratory or alimentary tract significantly reduce the probability of lung and intestinal complications and death of patients. Patients with verified foreign body presence are firstly treated by the first aid doctor. Unfortunately, practically, we find that the medical personnel is unable to check the anamnesis, clinics and necessary first treatment tactics. A correct selection of methods of treatment and urgent aid provided in time will help the patients frequently and sometimes will save their lives.

Purpose of the lesson. The students must carry out the clinical investigation of the patients, master the skills of the first help in the dangerous conditions, use an adequate treatment and carry out the prophylaxis of the recurrent haemorrhages based on deepened knowledge of anatomy, aetiology, clinical signs of nasal haemorrhage.

The students must know

- clinico-topographical anatomy of the nose and paranasal sinuses
- the features of nasal vascularization and the points of the most frequent nasal haemorrhages
- the diagnostics of nasal and sinuses' injuries
- ways of penetration of foreign body into the respiratory and alimentary tract
- clinics and diagnosis of laryngeal foreign body

- diagnosis and clinical symptoms of foreign body in trachea
- clinics of bronchial foreign body depending on the type of its obturation
- clinics and x-ray symptoms of oesophageal foreign body
- treatment measures of foreign body of ENT-organs
- description of foreign body complication and its prophylaxis
- description of methods of oesophagus and respiratory tract examination, necessary for confirmation of diagnosis

The students must be able to

- carry out anterior and posterior rhinoscopy
- find the cause and the origin of nasal haemorrhage
- read the roentgenogram of nasal bones and paranasal sinuses
- carry out the application of silver to bleeding vessel of nasal septum
- carry out anterior and posterior tamponade
- make the nose bandage
- prescribe an adequate haemostatic therapy
- carry out the examination of the patients with suspicion on obstruction of the respiratory tract and oesophagus by foreign body
- read x-ray of oesophagus, bronchi foreign bodies
- define, on the basis of anamnesis, clinics and x-ray, the availability of respiratory and oesophagus tract foreign body
- define the stenosis stage in laryngeal foreign body, indication towards tracheotomy
- give the first aid in ear foreign body
- solve the situation problem using the acquired knowledge

Basic initial knowledge of anatomical-topographical features of the nose and paranasal sinuses, their vascularization, methods of investigation (anterior, middle and posterior rhinoscopy, roentgenography) are necessary to achieve the purpose of the lesson.

Questions for practical lessons

1. Foreign bodies of the nose. Methods of removing. Rhinolythes.

2. Traumas of the nose and paranasal sinuses: classification, clinic, treatment.
3. Nasal bleedings: causes, symptoms, methods of stopping.
4. Hematoma and abscess of the nasal septum: clinic, treatment.
5. Deformation of the nasal septum, synechias and athresia of the nasal cavity: clinic, treatment.
6. Foreign bodies of ear: methods of removing. Clinic of alive foreign bodies.
7. Foreign bodies of oesophagus: clinic, diagnosis, methods of removing.
8. Complications of foreign bodies of oesophagus: clinic, treatment.
9. Burns of oesophagus: causes, pathanatomy, clinical stages.
10. First aid in oesophageal burns.
11. Foreign bodies of throat: clinic, treatment.
12. Foreign bodies of respiratory tract: causes of aspiration, anamnesis, characteristic of foreign bodies.
13. Foreign bodies of larynx: clinic, methods of removing in adults and children.
14. Foreign bodies of trachea: clinic, methods of removing.
15. Foreign bodies of trachea: rinds of obstruction, clinic, methods of removing

Theoretical content

Classification of foreign body of the respiratory tract

Nature: 1) organic; 2) synthetic 3) metallic.

Size: 1) small; 2) medium; 3) large.

Quantity: 1) single; 2) primary multitude; 3) secondary multitude.

X-ray differentiation: 1) contrasting; 2) non-contrasting.

Indication of motion: 1) moveable; 2) fixed; 3) penetrating into the lung tissue.

Form: 1) spherical; 2) needle-shared; 3) cylindrical; 4) linear; 5) disc-shaped; 6) hook-shaped; 7) polymorphous.

Location in the tracheobronchial tree:

a) central

1. larynx
2. trachea
3. right lung
4. left lung
5. double (right and left bronchi)

b) peripheral

1. in the bronchi of right lung
2. in the bronchi of left lung
3. in the bronchi of left and right lungs (double-sided)

Bronchial obstruction by a foreign body:

1. Partial obstruction: air can pass in and out. Causes only wheeze
2. One-way obstruction. Air can go in (during inspiration) but not out. Causes emphysema of lungs.
3. Total obstruction. Air can go neither in nor out. Causes obstructive atelectasis.
4. Movement foreign body. We can auscultate the symptom of “crack”.

Fractures of the maxilla

Maxillary fractures are usually bilateral and are classified according to the Le Fort system. Le Fort I fractures essentially separate the palate from the remainder of the midface skeleton. Le Fort II fractures traverse through the nasal dorsum and sometimes through the infraorbital rim and orbital floor. The Le Fort III fracture is a craniofacial disjunction separating both maxillae from the cranial skeleton.

Frontal sinus fractures

Fractures of the frontal sinus may be classified according to which walls are fractured, displacement, and fracture severity. They may involve the anterior wall, posterior wall, nasofrontal duct, or corner or may be through-and-through. Each fracture may be linear or displaced, and the anterior wall fractures may be compound through the skin. The through-and-through fracture is the most complex and is characterized by involvement of all walls of the sinus in addition to intracranial

trauma. The injury tears the skin, and usually there are comminuted depressed anterior and posterior walls of the sinus, torn dura, and contused brain.

Nasofrontal-ethmoidal complex fractures

Fractures of the nasofrontal-ethmoidal complex result from a severe frontal blow. The complex is driven posteriorly and wedged under the nasal processes of the frontal bones. There is often an accompanying tear of the medial canthal tendon. The torn tendon, which inserts on the anterior and posterior lacrimal crests, often takes a small fragment of lacrimal bone with it. Because the major contributing anatomic structures to the tendon are the fibrous extensions of the preseptal and pretarsal parts of the orbicularis oculi, there is a displacement of the medial canthus laterally in such injuries.

Nasal bleeding is a symptom of a local nose injury or of a systemic disease. Causes of nasal bleeding are therefore classified as local and general. The most frequent site of bleeding is the anteroinferior part of the nasal septum (Kiesselbach's area). Haemorrhage into this area is usually mild and presents no special danger. The superior and posterior parts of the nasal walls are the sites where bleeding can be profuse.

The most common local cause of nasal haemorrhage is injury, which can be slight and thus cause only insignificant bleeding. General causes of nasal bleeding are diseases of the blood and the circulating system. Relapsing nasal bleeding often occurs in patients with hypertension and nephronecrosis or contracted kidney. Nasal bleeding can also be caused by blood congestion in heart diseases, lung emphysema, diseases of the liver and spleen, and in pregnancy.

Severe nasal bleeding occurs in haemorrhagic diathesis, including haemophilia, haemorrhagic thrombasthenia, thrombopenic purpura, haemorrhagic vasculitis, capillary toxicosis, and telangiectasia (Osler-Rendu syndrome). In some cases, bleeding is caused by disorders in the blood coagulation system and in others by the affections of the vascular walls. Diseases of the haemopoietic system (leucosis, reticulosis, haemocytoblastosis, etc.) can also be attended with bleeding from the nose and the mucosa of other organs.

Various other factors, such as hypo- and avitaminosis, especially vitamin C

deficiency, vicarious menstruation (instead of normally expected menstruation), and also low atmospheric pressure, physical overstrain, exposure to heat and some other factors, can also cause nasal haemorrhage.

Clinical picture. It should be remembered that blood can get into the nose from other parts of the upper airways, e.g. from the pharynx, larynx, trachea, oesophagus, the lung and sometimes even from the middle ear through the auditory tube. The diagnosis is established by rhinoscopy, pharyngoscopy, and inspection of the other related organs.

Mild, moderate, and profuse nasal bleedings are distinguished. Mild nosebleed usually originates from the Kiesselbach area. The bleeding is and only a few millilitres are lost. Such bleedings stop spontaneously. Moderate nasal bleeding is characterized by discharge of larger amount of blood, which, however, does not exceed 200 ml in adults. Measures should be taken in such cases to arrest bleeding rapidly and completely. If blood enters the pharynx and is swallowed, profuse haematemesis can occur with a fall of arterial pressure and tachycardia.

In profuse haemorrhage (from anterior and posterior ethmoidal artery), the blood loss exceeds 200 ml a day. In severe cases, one litre and more of blood can be lost. Such haemorrhage is a direct danger to the life of the patient.

Treatment includes the arrest of nasal bleeding. Whenever necessary, the circulating blood volume should be replenished. The protein, electrolyte, and acid-base balance of the body should be corrected.

Insignificant nasal bleeding can in most cases be easily arrested by putting for 15-20 minutes a sterile cotton ball soaked in a 3 per cent hydrogen peroxide solution into the anterior part of the involved side of the nose. The cotton in the nostril should be compressed by the finger against the nasal septum. The patient should be seated upright and ice applied to the nose. If insignificant bleeding from the anterior parts of the nose recurs, the bleeding site should be infiltrated with a 1-2 per cent novocain solution or cauterized with strong trichloroacetic acid, silver nitrate, or chromic acid. Recurrent bleeding from the Kiesselbach area can be managed by separating the mucosa in the area between two incisions. If this measure fails, or if bleeding originates from deeper structures, anterior tamponade is required. A 10 per cent

lidocaine or a 2 per cent dicaine solution can be used (2 or 3 times) for anaesthesia. Anterior tamponade of the nose is performed by means of a 60-70-cm long turunda, nasal forceps, haemostatic paste, or emulsion.

A turunda is prepared from a 4-cm wide and 1-1.5-m long strip of gauze or roller bandage. The sterile turunda is taken with two forceps and unrolled into a container filled with a haemostatic solution. The tamponade of the nose is performed by placing the turunda on the floor of the nasal cavity, from its vestibule to the choanae. The turunda is taken by the forceps at a distance of 6-7 cm from its end and is placed on the floor of the nasal cavity to the choanae. The forceps is then used to press the turunda to the floor of the nasal cavity. Then the next loop of the turunda is placed, and so on. The anterior pack should be removed in 24 hours after preliminary wetting it with a hydrogen peroxide solution. In cases of severe bleeding, the tampon should be left in place for 3-4 days, but it should be wetted each day with antibiotic.

A finger of a rubber glove is often used for anterior tamponade (instead of gauze). The glove finger should be stuffed with foam rubber. One or more such rubber fingers are inserted into the bleeding nasal cavity to ensure its tight filling. Inflatable balloon (with a breathing pipe passed inside) is also used for the purpose. Foam rubber encased in a rubber sheath can be used for anterior tamponade as well.

If nosebleed is profuse and does not stop, posterior tamponade is indicated. The blood group of the patient and his Rhesus factor should be established for immediate blood transfusion.

These measures prove ineffective in some cases. The external carotid artery should then be ligated not only on the involved but also on the opposite side. Destruction of cells of the ethmoidal labyrinth is an effective surgical method of arresting profuse nasal bleeding. In some cases, for example, in the presence of the Osler-Rendu syndrome, this operation should be done on both sides.

Posterior tamponade is done with special sterile tampons. Gauze is folded several times into 3 x 2.5 x 2 cm tampon, which is then tied up crosswise with two 20-cm long silk threads. One end is cut off, while the other three ends remain. The posterior tamponade is begun with passing a thin rubber catheter into the bleeding

side of the nose until its end enters the nasopharynx to appear in the middle of the pharynx. The end of the catheter is taken with a forceps and pulled outside through the mouth. Two threads of the tampon are tied up to this end of the rubber catheter and pulled back through the nose. The second finger of the right hand should be used to help to seat the tampon behind the soft palate in the nasopharynx and press it tightly to the corresponding choana. The next manoeuvre is to pull the two threads through the nose. The threads should be held strained while the nose is packed with the turunda and the thread ends are then tied tightly over a gauze pad at the nasal vestibule. The thread in the mouth will be used to withdraw the tampon. Its free end is fixed on the cheek with an adhesive tape.

Posterior tampon is removed in 24 hours. However, if bleeding resumes, the tamponade should be repeated and the tampon remains for 3-4 and in some cases for 7-8 days. Antibiotic therapy and antiseptic solution should be used to wet the tampon. It should be remembered that the drainage of the auditory tube is impaired in posterior tamponade and inflammation of the auditory tube and the middle ear can develop.

When the anterior and posterior tamponades are used in combination, it is necessary to see that the tampon closing the entrance to the nose should not compress too tightly the wing of the nose; otherwise, necrosis can develop due to impaired blood supply. Antibacterial preparations should be administered in common doses immediately after tamponade is applied. Vitamins K (or vikasol), C and P, rutin, dicinon, solution of aminocaproic acid, and calcium gluconate should be given per os or injected to increase blood coagulation. A 10 per cent calcium chloride solution should be injected intravenously (3-5 per cent solution to children). Blood transfusion is a strong haemostatic means. It should also be conducted as a replacement therapy. Oxygen therapy is indicated, because oxygen deficiency develops in the body after blood loss.

If bleeding originates from a vascular tumour in the nose, it should be removed. A bleeding malignant tumour should be removed with underlying healthy tissue, and with subsequent radio- and chemotherapy of the main disease.

Trauma of the larynx

The position of the larynx in the neck, protected by the mandible superiorly and the clavicles and sternum below, shields it from falls and blows. Although the cartilaginous framework provides protection to the larynx, once this framework has been violated by trauma, the tight space defined by the laryngeal skeleton makes rapid airway compromise possible.

External laryngeal trauma is a relatively uncommon injury. The incidence of blunt trauma to the larynx has been reported as 1 in 137,000 in an analysis of 54 million inpatients over a 5-year period in 11 US states. In addition to the obvious possibility of acute airway obstruction, the complications of late diagnosed or undiagnosed laryngeal injuries can be severe, including glottic insufficiency, aspiration, and laryngeal stenosis. Furthermore, studies have demonstrated that early diagnosis and surgical management result in improved functional outcomes.

Biomechanics of laryngeal trauma. The larynx may be injured by blunt and penetrating trauma. In motor vehicle trauma, the head is often in extension. During deceleration, the larynx and neck are pulled forward, while the thorax is held in restraint. The larynx is decelerated against blunt objects, such as the steering wheel and dashboard, and is crushed against the vertebral column. The other major causes of blunt trauma to the larynx are of the "clothesline" type. Injuries of this type occur when the anterior part of the neck strikes a clothesline, chain, or tree branch during bicycling, snowmobiling, or riding in all-terrain vehicles. In clothesline injuries, the possibility of cricotracheal separation is a special concern.

Types of laryngeal trauma. Soft tissue injuries to the larynx from blunt trauma include laryngeal oedema, hematoma, and mucosal tears. Often oedema or hematoma involves the aryepiglottic folds and false vocal cords owing to the supraglottic submucosal distensibility. In the course of a laryngeal trauma, the thyroid cartilage may be compressed against the vertebral column. This pressure against the thyroid cartilage will splay the angle of the thyroid cartilage to a more obtuse angle. Therefore, most fractures of the thyroid cartilage occur in the midline, with loss of the normal acute angulation of the thyroid alae. A similar force applied to the cricoid cartilage against the vertebral column will result in a comminuted fracture of the signet ring-shaped cartilage. Because of the prominence of the thyroid

cartilage and its thyroid notch, it is the cartilage most usually fractured.

Gunshot and knife wounds account for the majority of penetrating injuries. Gunshot wounds produce a greater degree of soft tissue injury depending on the velocity and mass of the bullet. The higher-velocity bullets will result in greater injury to the surrounding soft tissues. Knife injuries usually result in less soft tissue damage but can be associated with injuries of vessels and nerves at some distance from the wound of entrance.

Laryngeal trauma in children tends to be less severe because of the higher position of the larynx in the neck in the paediatric population. Furthermore, owing to the pliable cartilage of a child's larynx, there is a lower incidence of laryngeal fractures. In addition, there is a lower incidence of laryn-gotracheal separation in the paediatric population because of the narrow cricothyroid membrane.

External ear

Auricular hematoma

Hematoma of the auricle usually develops after blunt trauma and is common among wrestlers and boxers. The mechanism usually involves traumatic disruption of a perichondrial blood vessel. Blood accumulation in the subperichondrial space results in separation of perichondrium from the cartilage. The most effective treatment for auricular hematoma is adequate incision and drainage with through-and-through suture-secured bolsters such as dental rolls.

Frostbite

The auricle is particularly susceptible to frostbite because of its exposed location and lack of subcutaneous or adipose tissue to insulate the blood vessels. The frostbitten ear should be rapidly warmed. Wet sterile cotton pledgets at 38 to 42˚C are applied until the ear is thawed. The ear should be treated gently owing to the risk of further damage to the already traumatized tissue. Necrotic tissue is débrided, the topical thromboxane inhibitor aloe vera is applied, and antiprostaglandin drugs such as ibuprofen may be beneficial.

Burns

Burns caused by scalding liquids or fire are often full thickness. Untreated,

they may lead to perichondritis. It is important to avoid pressure on the ear, and gentle cleansing and topical antibiotic applications are advocated. Prophylactic use of antipseudomonal antibiotics is recommended. The antibiotics may be injected subperichondrially at several different injection sites over the anterior and posterior surfaces of the auricle.

Foreign Bodies

Foreign bodies in the EAC are found most frequently in the paediatric age group or in mentally retarded institutionalized patients. The removal of a foreign body can be safely done under direct visualization, preferably under an operating microscope with the patient in a supine position. A live insect in the EAC should be immobilized before removal by instilling mineral oil or alcohol into the canal. The best chance for removal of a foreign body in the EAC is the first attempt. When it fails, the ear may become extremely painful, and proper anaesthesia may be necessary. Four-quadrant canal skin injection with a local anaesthetic agent is sufficient in adults. In young children, it is best to use general anaesthesia.

Fractures of the External Auditory Canal

A strong blow to the mandible can drive the mandibular condyle into the ear canal, resulting in fracture of the anterior canal wall. Fractures of the canal can be a part of temporal bone fractures. Longitudinal temporal bone fractures may extend into the bony ear canal, usually passing through the bony tympanic ring at the junction of the scutum and the tympanomastoid suture. Fracture of the anterior wall can be treated with closed reduction with packing in the canal. Tympanoplasty may be needed to restore hearing in fractures of the EAC with ossicular disruption.

Trauma to the middle ear, inner ear and temporal bone

Two types of injury are likely to involve the external auditory canal: blunt and penetrating trauma and thermal and caustic burns. Isolated blunt trauma to the ear canal is most often caused by the insertion of a foreign object into the ear to scratch the skin or to remove wax. The skin of the canal is easily abraded. Infection may develop, and pain, hearing loss, or infected drainage causes the patient to seek help. The canal should be gently cleaned using a microscopic technique, and blood clots,

debris, and wax should be removed. The tympanic membrane should be inspected to determine the extent of injury. Ciprofloxacin and hydrocortisone otic drops are prescribed to control the infection.

Mandibular injuries, particularly those that drive the mandible posteriorly into the jaw joint, will occasionally fracture the anterior wall of the ear canal, resulting in laceration of the skin and exposure of bone. If exposed bone is found, it should not be débrided at this point but rather assessed later when the canal has healed. Squamous cell epithelium can be entrapped by the fracture fragments, leading to the development of a canal cholesteatoma. Débridement, grafting, reconstruction, or meatoplasty may be required to ensure a healthy, open ear canal.

Penetrating injuries of the external auditory canal are usually caused by gunshot or stab wounds. Facial nerve injury, tympanic membrane perforation, and ossicular dislocation can result from gunshot wounds of the external auditory canal. The facial nerve is most likely to be injured at the stylomastoid foramen, apparently because it is relatively fixed at that point. In the absence of any of these specific injuries, gunshot wounds of the ear canal require cleaning, a light dressing, and prophylactic antibiotics.

Burns and caustic injuries of the ear canal, if severe, can cause circumferential scarring and stenosis of the canal. Most of these injuries are caused by a thermal burn, a caustic burn, or a welding injury. Most thermal burns of the ear canal are caused by flash injuries, fires, lightning strikes, or hot liquids such as oil. Superficial thermal burns of the ear canal are usually treated with the application of antibiotic ointment. If more than one half of the ear canal is involved or has third-degree burns, in addition to the application of antibiotic ointment, the canal is stented with soft Silastic tubing to prevent stenosis. Stenosis of the canal is treated aggressively with corticosteroid injections, frequent dilations, and, in some cases, skin grafting or meatoplasty.

Caustic burns are usually caused by a chemical spill or a foreign object such as an alkaline battery. In the latter case, otic drops must be withheld as they provide an external electrolyte bath for the battery, enhancing leakage and generation of an external current with subsequent tissue electrolysis and hydroxide formation. The

foreign body should be removed as soon as possible, under general anaesthesia if needed.

Tympanic membrane and the middle ear

Trauma to the tympanic membrane and the middle ear can be caused by (1) overpressure, (2) thermal or caustic burns, (3) blunt or penetrating injuries, and (4) barotrauma.

Temporal bone fractures

Fractures of the temporal bone are caused by blunt injuries, and depending on the force and direction of the blow delivered, different types of fractures occur. Blunt trauma can be delivered by an object striking the head or by the head being thrown against a solid object. Traditionally, temporal bone fractures are classified as either longitudinal (extracapsular) or transverse (capsular) with respect to the long axis of the petrous portion of the temporal bone. Both are basal skull fractures and are associated with ecchymosis of the postauricular skin (Battle's sign).

Longitudinal fractures are, by far, the most common, accounting for 70 to 90% of temporal bone fractures, and typically result from a direct lateral blow to the temporal or parietal aspect of the head. The longitudinal fracture begins in the external auditory canal and extends through the middle ear and along the long axis of the petrous pyramid. Characteristically, there is bleeding from the ear canal owing to laceration of its skin and from blood coming through the perforated tympanic membrane. Facial paralysis occurs in 15%, and sensorineural hearing loss occurs in 35%.

Transverse fractures typically result from deceleration impacts in the occipital area. The fracture line traverses the long axis of the petrous portion of the temporal bone and usually extends through the cochlea and fallopian canal, resulting in sensorineural hearing loss and facial paralysis in most cases. There is bleeding into the middle ear, but the tympanic membrane remains intact and becomes blue-black owing to the hemotympanum.

Questions for self-control

1. Point the most frequent placement of nasal bleedings:

a) posterior parts of nasal septum; b) anterior parts of nasal septum;

c) nasal conches.

2. Point the local and general causes of nasal bleedings: a-x.

3. The methods of local, general and surgical stoppage of nasal bleedings: a-y.

4. Call the instruments, necessary for the posterior tamponade: 1-10

5. What methods of reposition of nasal bones are used? When?

a); b).

6. What methods of fragments' fixing are used?

a); b); c); d).

7. What splints are the most widespread for the fragments' external fixing?

a); b); c); d).

8. The classification of nasal traumas:

a); b); c).

9. When does the symptom of "glasses" occur?

a); b).

10. What is haemosinus?

a) the haemorrhage of the eye-socket

b) the haemorrhage of the perichondrial tissue

c) the haemorrhage in sinuses

Decide the following situational tasks:

Task 1. A patient of 46 is taken to ENT-clinic after the accident. Objective observation: the patient is conscious, he answers the questions adequately. His nose is replaced to the right, the back of the nose is fallen down on the left. There are many abrasions of soft tissues of the face there. There is moderate nasal bleeding from the left part of the nose. By the rhinoscopy we can reveal a sharp replacement of nasal septum to the right, a traumatic rapture of mucous membrane of the left lower nasal concha. AP - 120/80 mm of mercury column.

Your preliminary diagnose. Additional methods of diagnostics. Treatment.

Task 2. A patient of 36 complains of relapsing nasal haemorrhages, stopped by the pressing of nasal wings to the septum. He also complains of frequent headaches, in particular, of occipito-parietal region. Accompanying diseases: chronic hyperacidic gastritis, chronic pielonephritis.

Objective observation: nasal mucous membrane is rosy, vascular net is dilated in the anterior regions of nasal septum. There are some separate blood scabs there. Nasal breathing is not difficult.

Your preliminary diagnose. Additional methods of investigation.

Task 3. A patient of 23 is taken to ENT-clinic from district hospital. 5 day before he got into an accident. He had got a nasal trauma, which caused a strong bleeding on the right. The bleeding was stopped by the anterior and posterior tamponade in hospital. In some days after the removing of tampons, the bleeding had been occurred again. Anterior and posterior tamponades were repeated.

Objective observation: tampons, moistened by blood, are in the nasopharynx and nasal tracts. The signs of bleeding are absent.

Pulse - 110 beats per min., weak. AP - 90/60 mm of mercury column. General blood analysis: moderate anaemia.

Your additional methods of investigation. Treatment.

Bibliography

Basic

Otorhinolaryngology : textbook recommended by the Ministry of Education and Science of Ukraine, recommended by the Ministry of Public Health of Ukraine / Y. Mitin [et al.]; ed.: Y. Mitin, Y. Deyeva. - K. : Medicine, 2014. - 264 p.

Additional

1. Dhingra P.L. Diseases of Ear, Nose and Throat / P. L. Dhingra. -New Delhi: B.I.Churchil Livingstone Pvt Ltd, 2013.- 486p.
2. ProbstR. Basic Otorhinolaryngology/ R. Probst, G. Grevers, H. Iro. - Thieme, 2006. – 430p.
3. PalchunvT., Voznesensky N.L. Diseases of the ear, nose and throat / T. Palchunv, N. L. Voznesensky. - Moscow : Mir Publishers, 1994.- 287 p. (translated from the Russian)