

**UKRAINIAN MINISTRY OF HEALTH
Odessa National Medical University**



**GUIDELINES for practical lesson
from the academic discipline**

Dentistry Faculty, course 4
Academic discipline – orthodontics

Discussed and approved at meetings of the
orthodontics department
Odessa National Medical University
Protocol № 1 from 31.08. 2023 y.
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Practical Lessons Practical Lesson №1

Topic: Modern treatment for teeth anomalies

Goal: student of the Faculty of Dentistry must clearly master the basic methods used in the treatment of dental-maxillofacial anomalies and deformities, know the biological, functional method. To be able to carry out preventive measures to prevent the occurrence of orthodontic pathology and draw up a plan for orthodontic treatment.

Basic concepts: in the process of mastering the material, the student must apply his knowledge on the periods of development of the ABA histological structure of hard tissues of temporary and permanent teeth, anatomical signs of different groups of temporary and permanent teeth.

To be able to determine the group belonging of temporary and permanent teeth.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

- 1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
- 2. Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
- 3. Questions (test tasks) to check basic knowledge on the topic of the seminar:**
 1. A teenager applied to an orthodontist complaining about tooth malposition. Objectively: the face is without peculiarities. Occlusion of permanent teeth is present. There are no abnormalities of jaw correlation in three planes. The 23 tooth is vestibularly over the occlusal plane; the space in the dental arch is less than $\frac{1}{3}$ of crown size. How is it possible to make room for the malpositioned 23 tooth?
 - A. To remove the 24 tooth
 - B. To enlarge sagittal jaw dimensions
 - C. To enlarge vertical dimensions
 - D. To remove the 23 tooth
 - E. To enlarge transversal jaw dimensions
 2. A 12-year-old male patient consulted an orthodontist about disposition of canine. Objectively: the face is symmetric and proportional. In the oral cavity: permanent occlusion, occlusal relationship is orthognathic in the lateral parts, the 13 tooth is located off dentition on the palate, biometric measurements show that the width of the 13 tooth is 11,4 mm, the distance between the 12 and 14 teeth is 4,6 mm, the width of the 14 tooth is 7,6 mm. Suggest the treatment plan:
 - A. Extract the 14 tooth and move the 13 tooth into its place
 - B. Extraction of the 14 tooth
 - C. Move the 13 tooth into its place without bite opening
 - D. Open the bite and move the 13 tooth into its place
 - E. No treatment is required
 3. Examination of a 13-year-old patient allowed to make a final diagnosis: vestibular position of the 13 and 23 teeth with the total space deficit, narrowing of maxillary dental arch, tortoposition of the 12 and 22 teeth. To eliminate this pathology it was suggested to widen the dental arch and to extract some teeth. What teeth have orthodontic indication for their extraction?
 - A. First premolars
 - B. Second premolars
 - C. First molars
 - D. Canines

E. Second incisors

4. A 12-years-old patient presents with abnormal position of canine on the upper jaw. The 13 tooth is in the vestibular position, above the occlusal plane. Space between the 14 and the 12 tooth is 6,5 mm. Choose a rational treatment method:

- A. Surgical and instrumental
- B. Instrumental
- C. Surgical and physiotherapeutic
- D. Surgical and myogymnastics
- E. Instrumental and myogymnastic

5. A 17-years-old patient consulted an orthodontist about improper position of an upper canine. Objectively: permanent occlusion, class I Angles relationship of the first molars, the 13 tooth has vestibular position above the occlusal line, there is a 6,5 mm gap between the 14 and 12 teeth. What period of orthodontic treatment will reduce the time of lidasephonophoresis therapy?

- A. Active period
- B. Preparatory period
- C. Retention period
- D. Passive period
- E. -

6. Parents of a 12-years-old child consulted an orthodontist about improper position of the child's upper teeth. Objectively: the face is narrow, elongated; the developing occlusion is present (temporary second molars). The 13 and 23 teeth are located beyond the dental arch, they deviate to the lips above the occlusal plane, there is a 2,5 mm gap between the 12 and 14 teeth, and a 1,5 mm gap between the 22 and 24 ones, 45 degree rotation the 33 and 43 teeth is present. Choose the most rational method of treatment:

- A. Extraction of the premolars and relocation of the canines
- B. Extraction of temporary premolars and expansion of dental arches
- C. Expansion of dental arches in the region of canine apices
- D. Compact osteotomy and expansion of dental arches
- E. All the answers are wrong

7. A child is 7 years old. He has early transitional dentition. There is overcrowding of the lower front teeth: the 42 and 32 teeth erupted orally with a complete lack of space. Make a plan of treatment:

- A. Serial consecutive extraction by Hotz's method
- B. Extraction of the 41 and 31 teeth
- C. Extraction of the 84 and 74 teeth
- D. Extraction of the 83 and 73 teeth
- E. Extraction of the 42 and 32 teeth

8. Parents with a child 12- years -old complains about the absence of tooth on the upper jaw. In anamnesis: temporary tooth was removed at the age of 4 as a result of injury. Objectively: bite of permanent teeth, the 21 tooth is absent. The gap between 11 and 22 is 4 mm. On the X-ray: 21 is located at an angle of 45 degrees to 11. Choose a rational method of treatment:

- A. Combination treatment method [surgical and apparatus]
- B. Surgical
- C. Physiotherapy
- D. Orthopedic E. Hardware

9. A 4-years-old child got a face trauma 2 hours ago. A dentist on duty made a diagnosis: intrusive luxation of the 61 tooth. What is the tactics of choice?

- A. Extraction of the 61 tooth
- B. Observation
- C. Reposition of the 61 tooth
- D. Splinting of the 61 tooth
- E. Removal of pulp of the 61 tooth

10. Parents of 4-years-old child complains about the defect of the language, the wrong pronunciation of the sound "R". Objectively: the tongue is limited to movements, when pushed forward pushes downward, the lower edge of the tongue bristle is attached to the front of the streaks of the submandibular salivary glands. The nipple is thin, clear. Specify the terms of surgery:

- A. After the diagnosis is established
- B. After the end of growth of maxillo-facial hips
- C. -
- D. After the formation of a permanent bite
- E. After eruption of permanent molars

4. Discussion of theoretical issues:

Methods for the treatment of dentoalveolar anomalies are divided into:

- Preventive
- Hardware
- Combined (physiotherapy and surgical methods of intensification)
- Surgical
- Prosthetic

In order to correct malocclusion or anomalies in the position of individual teeth, orthodontists mainly use the apparatus method of treatment. The main method is instrumental, all the rest are auxiliary. Orthodontic appliances are a source of force, applied to the tooth to be moved, and cause a certain tension in the periodontal tissues. There is a corresponding restructuring in all components of the periodontium - tissue of the alveoli, periodontal tissue, tooth cement and gums.

Treatment is carried out with the help of special standard devices or devices made by a dental technician, called ortho-dontic devices.

Preventive treatments:

- Basic principles of prevention of dentoalveolar anomalies and deformities in children
- - ensuring the optimal course of pregnancy;
- - ensuring the correct technique of breastfeeding the child, timely introduction of bait, correct artificial feeding using an elastic nipple with a small opening, the transition to feeding from a spoon, cup, as well as the consumption of solid food from 10-11 months;
- prevention of childhood and infectious diseases;
- elimination of bad habits by conducting sanitary educational work among parents, educators and children;
- normalization of the functions of sucking, swallowing, chewing, breathing; sanitation of the oral cavity, prevention of caries and its complications;
- elimination of anomalies of the frenulum of the lips and tongue, deepening of the bottom of the oral cavity;
- prevention of inflammatory processes in the maxillofacial region;

- timely removal of milk teeth;
- identification and clinical examination of children with early signs of dentoalveolar anomalies and deformities. Preventive measures should be taken at all times during the growth and development of the child.

apparatus first method of treatment

The apparatus method of treatment consists in continuous, fragmentary or alternating pressure on the teeth, alveolar processes and jaws with the help of special mechanical devices called orthodontic appliances . The devices are activated by sliding screws, a spring wire, rubber rings, ligatures or efforts of the chewing or facial muscles, as well as changes in the movements of the lower jaw using occlusal or biting pads, inclined planes, labial pads, cheek shields.

Continuous acting force - pressure on the tooth without a resting phase, as a result of which hyalinization occurs. The forces must be weak. An alternating force is characteristic of the regular onset of the resting phase, due to the fact that the equipment is not worn for a certain time during the day, but bone resorption is currently continuing. Osteoblast activity does not stop after the end of the pressure phase.

The choice of orthodontic treatment is carried out taking into account the patient's age and the severity of the anomaly. During the period of milk and early bite, removable equipment is shown. In case of late changeable and permanent occlusion, it is also possible to use nonremovable mechanical devices.

Orthodontic treatment stimulation methods

Stimulation of osteoreparation processes is a set of measures aimed at resorption of bone tissue of the alveolar process and the formation of new layers of bone in places that are not subject to pressure.

The mechanisms of stimulation of the processes of osteoreparation include: drug therapy, physiotherapy (massage, vacuum, use of various types of currents, magnetic and ultrasonic fields), surgical interventions in the area of the teeth being moved.

Surgical treatments

can be used both independently and in combination with the instrumental method for the treatment of tooth-jaw pathology. The main factor accelerating the remodeling of bone tissue is the intensity of enzymatic processes that develop after bone damage.

Surgical methods can be divided into the following groups:

- a) on soft tissues:
 - - plastic bridle
 - - move the city of attachment of the bridle
 - - plastic in the area of the mucous membrane
 - - deepening of the vestibule of the oral cavity
 - - alignment of the suprumental skin fold b) on the teeth and dentition:
 - - exposure of the crown of a ratinated tooth
 - The separation of I the teeth in,
 - removal of supernumerary and individual complete teeth; c) on the alveolar bone
 - compactosteotomy d) on the jaws:
 - osteotomy
 - osteoctomy
- 2) a prosthetic treatment method.

If it is impossible to correct dentoalveolar pathology by orthodontic methods, prosthetics are sometimes used according to specific indications in accordance with age and pathology . **Clinical examination in orthodontics**

Clinical examination - the system of work of medical institutions in our country ensures the prevention of diseases, their early detection and treatment with systematic observation of patients. It is carried out by district children's

dental clinics and in particular by an orthodontist, who is allocated a preventive day a week. Held in organized childcare facilities.

The first stage is registration of all children. Age, gender and general health are taken into account.

The second stage is a specialized examination of each child.

The third stage is their distribution among dispensary groups.

The fourth stage is monitoring patients, sanitizing the oral cavity, conducting hygiene lessons and other mass preventive measures.

The fifth stage is the study of the effectiveness of orthodontic medical examination.

The complex of therapeutic and prophylactic measures planned during the examination of the child is registered in the medical examination card, after which the children are assigned to dispensary groups. Osadchy identified 4 dispensary groups:

The 1st group includes children with correct closure of the lips, normal functioning of the dentoalveolar apparatus and correct bite. These are practically healthy children, they are examined once a year.

The 2nd group includes children with risk factors, that is, with functional disorders of breathing, swallowing, speech, chewing, facial expressions, bad habits, having shortened frenulum of the lips, and a shallow vestibule of the mouth. In such children, it is necessary to eliminate the causes of deviations and create favorable conditions for the normal growth of the jaws and the formation of the bite. Sanitation of the oral cavity is carried out, methods of combating bad habits, therapeutic myogymnastics, consultation of specialists are recommended: ENT, orthopedist, pediatrician, etc. such children should be supervised by parents and educators, medical personnel of the children's institution. An orthodontist's review is half a year.

The 3rd group includes children with mild morphological changes and anomalies in the position of teeth or their groups, changes in the shape of dental arches, malocclusion caused by functional changes. To assist such children, measures are taken to eliminate the cause of the development of violations, including the use of orthodontic appliances. After treatment, observation is carried out once a year.

Up to 4 dispensary groups include children with pronounced changes in the dentition. Impaired breathing, swallowing, speech, biting and chewing food. Such children need specialized help in complex therapeutic measures, leading to the normal function of the dentition and the whole organism. The choice of orthodontic apparatus for the treatment of various dentoalveolar anomalies is carried out taking into account the patient's age and the severity of the anomaly. During the period of milk and early bite, mainly removable equipment is shown. With a late changeable and permanent bite, you can also use non-removable mechanical devices, especially with pronounced anomalies.

5. Topics of reports/abstracts:

1. What dispensary groups do you know?
2. What is the prevention of HSPA & D?
3. What groups can be divided into orthodontic treatment methods?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.

2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/> 2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України <http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №2

Topic: Etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of tooth abnormalities (color, hard tissue structure, shape, size), number of teeth anomalies (aedentia, supernumerary teeth) . Specifics of orthopedic treatment with multiple adentia. Prospects for implantation at adentia.

Goal: to study etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of tooth abnormalities (color, hard tissue structure, shape, size), number of teeth anomalies (aedentia, supernumerary teeth). Specifics of orthopedic treatment with multiple adentia. Prospects for implantation at adentia.

Basic concepts: etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of tooth abnormalities (color, hard tissue structure, shape, size), number of teeth anomalies (aedentia, supernumerary teeth). Specifics of orthopedic treatment with multiple adentia. Prospects for implantation at adentia.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**
4. 1. Parents of Olga M. (7 years old) noticed that the her central incisors are erupting orally and primary teeth are already fell out. What reason could lead to the location of the teeth? A - Rachitis.

B - Speech pathology.

C -supernumerary tooth.

Ans. C.

D -Primary central incisors.

E -Adentia.

5. Which teeth abnormalities can cause the early removal of milky canine, if the permanent canine germ is present?

A – Makrodentia of the canine.

B – Adentia.

C – Dystopia of the canine

Ans. C.

- D – Prognathism.
- E – Progenia.

6. What anomaly of teeth can occur because of the syphilis of a newborn? A – The anomaly of the crown shape.

B – Dental retention.

C – Diastem.

Ans. A.

D – Prognathism.

E – Progenia.

7. During the routine inspection of a 4.5 years old child revealed premature absence of upper molars. The lower incisors are in the contact with the mucous membrane of the palate. Determine the tactics of the doctor?

A – To make a removable laminar dental prosthesis.

B – To observe 1 time per year till the eruption of permanent teeth.

C – To observe every 6 months till the eruption of permanent teeth.

D – To provide a miogymnastics.

E – Medical intervention is not required.

Ans. A

8. A girl of 8 years old does not have the 12 and the 22 teeth. There is no place for them in the dental arch. There are no germs of these teeth on the X-Ray. The girls father does not have the 12 tooth, and his 22 tooth is spicular. What is the etiology of this pathology?.

A. Caries.

B. Teeth extraction.

C. Heredity.

Ans. C

D. Trauma.

E. Bad habits.

9. Parents with a child of 3 years addressed to the orthodontist. In anamnesis: severe toxicosis during pregnancy of the mother, the baby was born premature. Objectively: the child is astenic, stooping, with the elongated face, the mouth is half opened. The upper incisors protrude from under the lip. Enamel hypoplasia of incisors is observed. Identify the leading causative factor of the anomaly.

A. Rachitis.

B. Bad habits.

C. The pathology of pregnancy.

D. Incorrect posture.

E. The mouth breathing.

Ans. C

10. A girl of 8 years old has dark yellowish permanent first molars and incisors. There are all teeth and germs on the X-Ray. A girl's father does not have the 12 tooth. Tell the possible etiological factor of the pathology.

A – Receiving of antibiotics.

Y.- Teeth extraction.

C.- Heredity.

D.- Trauma.

E.- Rachitis

Ans.A

11. A 9 years old boy's mother appealed a doctor with complains on fast erasure of his frontal teeth crowns. Objectively: the crowns of the frontal teeth are erased on $\frac{3}{4}$ of their length, the enamel is dirty-gray. Choose the most possible diagnosis..

A. The Steinton-Capdepon's syndrome.

B. The pathological teeth erasure.

C. The acid teeth dissolution.

D. The amelogenesis imperfecta.

E. The dentinogenesis imperfecta.

Ans. A

12. The parents of the 5 years old girl appealed to the orthodontist with complains on slow food mastication. Anamnesis: primary molars on the low jaw were extracted because of caries complications at the age of 3. Objectively: the lower one third of the face is short, a deep supramental sulcus is observed, 85, 84, 74, 75 teeth are absent. The distal occlusion complicated with the deep one is forming. Which method of treatment is the most important on the first stage?

- A. Prothetic.
- B. Instrumental.
- C. Surgical.
- D. Surgical-instrumental.
- E. Biological.

Ans. A

13. The parents of the 9 years old boy applied with complains on defects of the frontal teeth crowns. Objectively: there are fosses, strips and brown spots on the enamel of the frontal teeth. Choose the most possible diagnosis.

- A. Fluorosis.
- B. The pathological teeth erasure.
- C. The acid teeth dissolution.
- D. The amelogenesis imperfecta.
- E. The dentinogenesis imperfecta.

Ans. A

14. The parents of the 19 years old boy applied with complains on the aesthetic shortage: overcrowding of teeth on the upper and lower jaws. Objectively: the sum of mesio-distal sizes of the 4 upper incisors is 40mm. Choose the most possible diagnosis.

- A. The enamel hyperplasia of the upper incisors.
- B. The enamel hypoplasia of the upper incisors.
- C. Fluorosis
- D. Macrodontia.
- E. Microdontia.

Ans. D.

4. Discussion of theoretical issues

Anomalies Tooth. Dental anomalies include different size teeth, their shape, structure of solid tissue, number of teeth, their eruption.

Anomalies of teeth (macro and mikrodontiya). This teeth larger or smaller compared with the average norm. However, it should be emphasized that the harmonic formation dentition ratio of the width of crowns of teeth and face shape (the ratio of its length and width) is not violated. Important rozrinyaty individual macro and mikrodontiyu given face shape, and absolute makrodontiyu in which the amount size width mediolateralnyh four crowns of upper incisors is 35 mm or more. Excessively large teeth, upper central incisors often called giant.

Etiology. Genetically due to the size of the teeth. Inheritance broad crowns of teeth and a narrow face, narrow crowns or teeth, wide face leading to individual discrepancy between these variables.

The clinical picture. Anomalies of shape and size of the teeth lead to incorrect position of teeth, which in turn causes malocclusion, functional and aesthetic deviations. In makrodontiyi adjacent teeth are rejected in the vestibular or oral directions, returning along the axis, are ratynovanymy, due to the deficit of space in the dental arch. Mikrodontiyi If there are gaps between the teeth.

Treatment. The only way to prevent violations caused makrodontiyeyu is removing some teeth in orthodontic indications. The best results can be achieved when using a consistent method for the removal of individual teeth Hotz. In mikrodontiyi available diaeresis between the teeth, often by eliminating dental prosthetics, rarely pull together some teeth and keep them in a new place, and the defects by eliminating dental arch prosthesis.

Anomalies various forms of teeth. They may be in the crown, the roots or both crown and root. Such deviations often occur in permanent teeth.

Etiology. Congenital anomaly rarely wrong formation of the crown and root of the tooth is marked as a result of:

-travmy;

-hronichnoho inflammation around the roots of deciduous teeth; -novoutvoru.

The clinical picture. When multiple congenital absence as milk and permanent teeth, especially in patients with ectodermal dysplasia anhydrotichnu, conical shape of the anterior temporal (milk), permanent teeth occurs quite often. In cone, shylovydnoyi form front teeth may have other abnormal forms. In the area of incisors are the teeth that are fused, for example, complex central and lateral incisors, complete central incisors and supernumerary. Fusion can be observed in the crowns of teeth, roots, crowns and roots. The pulp chamber of teeth often fragmented. Anomalies of tooth roots are expressed in their curvature, distortion, reducing or increasing the length and width of permanent teeth, and in their joined. The result of these anomalies is retynsiya teeth. Violation form lateral teeth often expressed in smoothing their occlusal tubercles, or increase their number. The most diverse forms of crowns found in nadkomplektnyh teeth that are located in the front section of the upper dental arch, but these teeth may be in other areas. When anomalies form front teeth pronounced aesthetic disorders.

Treatment. In konuso- shylovydny form or coronal tooth, to correct form, apply artificial crown. So make the correct form of the crown. If necessary, carry out tooth movement in an arc to the median plane of the face, and then replace the defective dentition, formed by the prosthesis. With relatively normal shape and size of crowns of teeth that have grown their store in the tooth row. In terms of possible complete removal of the tooth (lateral incisor, first premolar) which enables not violate closing of dentition in occlusion, the presence of supernumerary teeth. This measure prevents the aesthetic and functional disorders. If you can not preserve them accrete teeth removed, moved adjacent teeth, usually the upper lateral incisors to the midline of the face and then spend prosthetic crowns, creating the shape of the central incisors. In cases of significant defects denture replacing missing teeth with dentures.

Ugly teeth - have different irregular shape. Most are located in the front section of the upper jaw.

The etiology is unknown, it is supposed violations of dental germs.

The clinical picture. Aesthetic and functional disorders.

Treatment. In sharp infringement tooth form and the inability to normalize the shape of his crown by soshlifuvannya or dental prosthesis shown early tooth with subsequent orthodontic treatment if necessary correction form tooth crowns anomalynoho by direct or indirect restoration. Replacement of defect teeth done by prosthetics.

Anomalies structure of dental hard tissues including enamel hyperplasia (insufficient abrasion crowns milk, regular teeth), hypoplasia - increased abrasion permanent and others.

Enamel hypoplasia refers to tooth defects occurring during the formation of their germs during embryogenesis.

Etiology. This disorder can occur under the influence of various causes of general or local character. The most common causes are common metabolic disorder that leads to destruction (dehene-talkie) adamantoblastiv, which in turn lead to a change of mineralization of enamel and create disorder of protein structures; diseases of the mother during pregnancy - morning sickness, toxoplasmosis, rubella, etc., poor maternal nutrition deficiency of vitamins, salts, proteins. Such violations are also children who have suffered in the first 9 months of life rickets, acute infectious disease, dyspepsia and other toksychnuyu.

The clinical picture. The formation of tissues of different groups of teeth by the time neodynamovyy because hypoplasia seen in different parts of the crowns of all groups of teeth. For the number of teeth with enamel hypoplasia and localization of these changes can be judged on the time of metabolic disorders, their degree of difficulty and length. When possible defects of enamel and dentin defects, namely the border with enamel, dentinal tubules arched bent at an angle. Often there is hypoplasia tissue crowns of permanent teeth, at least - milk. It may be a violation of the enamel of teeth formed at a certain period of time, or all your teeth. It appears in the form of enamel hypoplasia

borozdochok, sockets located on the crowns of the teeth. The depth, width and length of borozdochok is different. Often grooves combined with indentations round or oval, sometimes pigmented. Hypoplasia often localized near the cutting edges of cutters and hillocks in the teeth. Such cutters often breaking off edges. In breach of contact of teeth with their antagonists in childhood is zuboalveolyarne extension and malocclusion. Often enamel hypoplasia observed in open bite hnatychnoyi shape caused by rickets transferred. For hypoplasia characterized by consistency, symmetry and localization experience.

Treatment. To prevent the development of enamel hypoplasia are important prevention and treatment of infectious and other diseases, clinical supervision for children in dental and sanitary educational work. The wavy shape and spotted enamel hypoplasia usually not accompanied by violation of the shape and structure of the crown, not to be treated. Helping patients with open bite depends on their age, degree of enamel hypoplasia. When hypoplasia edge cutters, after full eruption of the teeth to hold the grinding of 1 - 1.5 mm of intact enamel. This must be done carefully, well-centered diamond boron. In the process of grinding the tooth is hard to keep his index and forefinger of his left hand to reduce vibration and discomfort to the patient. After pryshlifovky crowns of teeth, they rubbed anesthetic paste and apply lacquer coating protykarizovnyy.

In cases of more severe enamel hypoplasia system in the presence of erosive and grooved form shown restore the crowns of teeth by prosthesis. Prefer crowns from plastic that is made after the preliminary preparation of the tooth. Crowns should restore the shape of the teeth and aproksymalni contacts.

For teens and adults prosthetics possible use of porcelain crowns.

In the presence of enamel hypoplasia system Orthodontist take children on dispensary registration.

Hyperplasia enamel. Hyperplasia enamel - enamel formation drops.

Etiology. Violation of morphogenesis.

The clinical picture. Enamel drops often localized in enamel-dentin border. Often they are in the palatal surfaces of the upper incisors.

Treatment. Not shown.

5. Topics of reports/abstracts:

Situational tasks.

1. The parents of a 9 years old child appealed to the orthodontist complaining at lack of the 11 tooth, and rotation around a vertical axis of the 21 tooth. From the anamnesis revealed that at the age of six she fell and hit her face. The 21 tooth erupted in time. There is enough place for the 11 tooth in the dental arch.

Complete the examination of the patient. Put the preliminary diagnosis. Outline a treatment plan

2. The parents of a 10 years old child approached the orthodontist with complaints at overcrowding of teeth on the upper jaw. The 11 and the 21 are turned around the vertical axis with the presence of diastema, lateral incisors are situated vestibularly. From the anamnesis it is revealed that in the period of aging of the milk occlusion there were no diaeresis and diastema in the frontal area of the upper and lower jaws.

Complete the examination of the patient. Put the preliminary diagnosis. Outline a treatment plan

3. The parents of a 7 years old child appealed to the orthodontist with complaints of disturbed pronunciation of certain sounds. An examination of the patient revealed: the lack of 12,11,21,22 teeth. In conversation with the child estimated that he paves the tip of the tongue between the upper and the lower alveolar ridge.

Complete the examination of the patient. Put the preliminary diagnosis. Outline a treatment plan

4. The mother with the girl of '12 addressed to the orthodontist with complains at plainness of the two frontal teeth. During the examination of the oral cavity revealed that 11 and 12 teeth are colored in the intense yellow color that is not normal, and have the defect of their enamel.

What reason could lead to such anomalies?
What is the tactics of the orthodontist in the case?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

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2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/> 2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України <http://library.gov.ua/>
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Practical Lesson №3

Topic: Etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of teeth eruption disorders. Clinical forms of tooth retention. Types of tooth retention, features and prognosis of orthodontic treatment.

Goal: to study etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of teeth eruption disorders. Clinical forms of tooth retention. Types of tooth retention, features and prognosis of orthodontic treatment.

Basic concepts: etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of teeth eruption disorders. Clinical forms of tooth retention. Types of tooth retention, features and prognosis of orthodontic treatment.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**

2. Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)

3. Questions (test tasks) to check basic knowledge on the topic of the seminar:

1. Parents of Olga M. (7 years old) noticed that the her central incisors are erupting orally and primary teeth are already fell out. What reason could lead to the location of the teeth? A - Rachitis.

B - Speech pathology.

C -supernumerary tooth.

Ans. C.

D -Primary central incisors.

E -Adentia.

2. Which teeth abnormalities can cause the early removal of milky canine, if the permanent canine germ is present?

A - Makrodentia of the canine.

B - Adentia.

C - Dystopia of the canine

Ans. C.

D - Prognathism.

E - Progenia.

3. What anomaly of teeth can occur because of the syphilis of a newborn?

A - The anomaly of the crown shape.

B - Dental retention.

C - Diastem.

Ans. A.

D - Prognathism.

E - Progenia.

4. During the routine inspection of a 4.5 years old child revealed premature absence of upper molars. The lower incisors are in the contact with the mucous membrane of the palate. Determine the tactics of the doctor?

A - To make a removable laminar dental prosthesis.

B - To observe 1 time per year till the eruption of permanent teeth.

C - To observe every 6 months till the eruption of permanent teeth.

D - To provide a miogymnastics.

E - Medical intervention is not required.

Ans. A

5. A girl of 8 years old does not have the 12 and the 22 teeth. There is no place for them in the dental arch. There are no germs of these teeth on the X-Ray. The girls father does not have the 12 tooth, and his 22 tooth is spicular. What is the etiology of this pathology?.

A. Caries.

B. Teeth extraction.

C. Heredity.

Ans. C

D. Trauma.

E. Bad habits.

6. Parents with a child of 3 years addressed to the orthodontist. In anamnesis: severe toxicosis during pregnancy of the mother, the baby was born premature. Objectively: the child is astenic, stooping, with the elongated face, the mouth is half opened. The upper incisors protrude from under the lip. Enamel hypoplasia of incisors is observed. Identify the leading causative factor of the anomaly.

A. Rachitis.

B. Bad habits.

C. The pathology of pregnancy.

D. Incorrect posture.

E. The mouth breathing.

Ans. C

7. A girl of 8 years old has dark yellowish permanent first molars and incisors. There are all teeth and germs on the X-Ray. A girls father does not have the 12 tooth. Tell the possible etiological factor of the pathology.

- A – Receiving of antibiotics.
Y.- Teeth extraction.
C.- Heredity.
D.- Trauma.
E.- Rahitis
- Ans.A

8. A 9 years old boys mother appealed a doctor with complains on fast erasure of his frontal teeth crowns. Objectively: the crowns of the frontal teeth are erased on $\frac{3}{4}$ of their length, the enamel is dirty-gray. Choose the most possible diagnosis..

- A. The Steinton-Capdepon's syndrome.
B. The pathological teeth erasure.
C. The acid teeth dissolution.
D. The amelogenesis imperfecta.
E. The dentinogenesis imperfecta.
- Ans. A

9. The parents of the 5 years old girl appealed to the orthodontist with complains on slow food mastication. Anamnesis: primary molars on the low jaw were extracted because of caries complications at the age of 3. Objectively: the lower one third of the face is short, a deep supramental sulcus is observed, 85, 84, 74, 75 teeth are absent. The distal occlusion complicated with the deep one is forming. Which method of treatment is the most important on the first stage?

- A. Prothetic.
B. Instrumental.
C. Surgical.
D. Surgical-instrumental.
E. Biological.
- Ans. A

10. The parents of the 9 years old boy applied with complains on defects of the frontal teeth crowns. Objectively: there are fosses , strips and brown spots on the enamel of the frontal teeth. Choose the most possible diagnosis.

- A. Fluorosis.
B. The pathological teeth erasure.
C. The acid teeth dissolution.
D. The amelogenesis imperfecta.
E. The dentinogenesis imperfecta.
- Ans. A

11. The parents of the 19 years old boy applied with complains on the aesthetic shortage: overcrowding of teeth on the upper and lower jaws. Objectively: the sum of mesio-distal sizes of the 4 upper incisors is 40mm. Choose the most possible diagnosis.

- A. The enamel hyperplasia of the upper incisors.
B. The enamel hypoplasia of the upper incisors.
C. Fluorosis
D. Macrodonia.
E. Microdonia.
- Ans. D.

4. Discussion of theoretical issues: Abnormalities of number of teeth

Supernumerary teeth are also called hyperdontieyu.

Etiology. Not clarified, provides an extra tab dental germs.

The clinical picture. Supernumerary teeth usually localized in the upper central and lateral incisors, at least - in the lower incisors, even less - in other areas zuboalveolyarnyh arches. Depending on their number and location, as well as the period of formation of these teeth bite can cause deformities dentition. The size and shape of the teeth nadkomplektnyh are different. Of course they are smaller neighbors and have a conical shape, sometimes their shape is similar to the shape of adjacent teeth or atypical. Wide nadkomplektnyh crowns of the teeth are rare in such cases they merge from complete. Retynovani supernumerary teeth located in the roots of incisors, canines, among whom are displaced in the vestibular, palate, lateral directions, rotated on an axis, tilted, arranged horizontally teeth. Sometimes their crown directed towards the Upper roots of adjacent teeth. This arrangement contributes to their stable retention. Supernumerary teeth can cause inclination of adjacent teeth and delay their eruption. If there nadkomplektnyh teeth located in the front section of the upper teeth, observed the following anomalies: 1) diastema; 2) the curvature of the roots of adjacent teeth; 3) turns on the axis of the teeth; 4) vestibular, palatine or lateral displacement of adjacent teeth, 5) retention of teeth; 6) size mismatch dentition, in which there is underdevelopment or excessive development of the anterior region of dental arches, open or deep bite. Among the anomalies associated with the presence nadkomplektnyh teeth, often a diastema. It is greater the more supernumerary tooth located between central. incisors. There is also a direct relationship between the width and number of nadkomplektnyh diastema teeth located between the central incisors.

Treatment. Supernumerary teeth can prorizatysya in the first months of life, which zatrudnyaye breastfeeding. This teeth injure not only the mother breast nipple and tongue and oral mucosa child.

In such cases, the teeth be removed normalizing process vyhodovuvanya child, and this in turn development. When milk bite should remove all supernumerary teeth erupted, is located outside a tooth number and tooth in a row. Retynovani supernumerary teeth detected on radiographs. Storey teeth are subject to removal. With deep occurrence of these teeth should wait until they move closer to the surface and erupt alveolar bone. If retynovani supernumerary teeth are not in the direction of eruption, or are irregular in shape, they must be removed because it may prevent eruption of permanent teeth, be cause diastem and other deformities dentition. The largest number of teeth nadkomplektnyh observed during alternating bite.

If the presence retynovanoho supernumerary tooth between the incisors central diastema width not exceeding 5 mm medial to the X-ray determined the location of the tops of the roots of the central incisors in lateral deviation of their crowns, the initial period of variable bite can rely on selfregulation diastema after removal nadkomplektnyh teeth. The central incisors can get close to the pressure side cutters that cut through. X-ray inspection to ascertain the number and location of retynovanyh teeth and evaluate the width and compactness of the median palatal suture. It is known that thick, wide and low palatal suture attached to the upper lip frenulum contribute to the development diastema, because when you delete nadkomplektnyh teeth should also move the insertion frenulum of the upper lip, vysikayuchy its base and destroying the density median palatal suture. This facilitates medial displacement of the central incisors through self-regulation and orthodontic devices. Under pressure from the roots of the central incisors, normalized axes incline nadkomplektnyh teeth, they are close to the surface of the alveolar bone, which facilitates their eruption and removal.

Sometimes supernumerary teeth located between the central incisors, their roots shifts toward the lateral incisors, the beginnings of the last back on the axis or rejected in Palatine area. In such cases, convergence of central incisors is quite a difficult task because it is necessary to move their roots in the mesial direction.

The delayed teeth (retention) in the jaw may be caused by the following reasons:

- a) the incorrect position of unerupted teeth;
- b) wrong position of neighbor teeth, resulting in reduce the place for noterupted tooth;
- c) late (early) baby teeth removal, followed by the formation of callus of the alveolar region.

The treatment of the nonerupted teeth.

- 1) if the position of the tooth is horizontal it can be treated;
- 2) if the position is incorrect and there is enough place a removable plate can be used. If here is still a milky tooth above the retented one, the first can be covered with an artificial crown for the pressure increasing and functional irritation of surrounded tissues.
- 3) supernumerary teeth can course the retention of permanent teeth, after investigations of their positions, supernumerary teeth can be carefully extracted.

- 4) The incorrect growth of teeth because of follicular cysts, can be determined with the X-Ray. A doctor can help the process of a tooth eruption by opening of the cyst.

5. **Topics of reports/abstracts:**

1. What is retention?
2. What types of retention do you know?
3. What methods of investigation are used for the diagnostics of the retention?
4. What is the reason of retention?
5. What is the plan for the treatment of retention?
6. What is the late teeth eruption? What is the difference between it and the retention of teeth?

6. **Summarizing the information received at the lesson.**

7. Main: **List of recommended literature:**

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

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Topic: An orthognathic occlusion, its characteristic. Angle's and Andrews's keys. Kinds of a physiological and pathological bite of children.

Goal: to study the concept of norm in orthodontics an orthognathic occlusion ,its chraracteristic ,Angle's and Andrews's keys.kinds of physiological and pathological bite of children .The periods of the establishment of a vertical dimension .Planes by L.J Boume and A.M.Schwarz

Basic concepts: in the process of mastering the material, the student must apply his knowledge about the features of the anatomy and physiology of the child's MFO, stages and timing of the development of temporary and permanent teeth. To master the topic, the student must use his knowledge and skills of methods of clinical examination of patients.

Equipment: cephalometric analys, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. Intraoral examination of a 5-years-old child revealed primary occlusion, tremas and diastemas, worn tubercles and cutting surfaces of teeth. The distal surfaces of the second lower molars are anteriory to the distal surfaces of the second upper molars. This stage of primary occlusion is called:

- A. Aging
- B. Stable occlusion
- C. Eruption
- D. There is no correct answer
- E. Formation

2. A visiting nurse examined a newborn child. Examination revealed that lower face part is shorten, chin is retrodeviated, teeth are missing, lower jaw is retrodisplaced.

What is the name of such mandible position of a newborn?

A. Physiological infantile retrogenia

- B. Mesial occlusion
- C. Distal occlusion
- D. Edge-to-edge occlusion
- E. Physiological occlusion

3. An infant was born full-term with body weight at a rate of 3200 g and body length at a rate of 53 cm. It was the first physiological delivery. What position of child's mandible is usually observed after birth?

- A. Physiological retrogenia
- B. Open bite
- C. Direct relation
- D. Physiological progenia
- E. Deep overbite

4. A child was born with body weight 3200 g and body length 53 cm, 9 points on Apgar score. It was the first physiological delivery. What position of child's mandible is usually observed after birth?

- A. Physiological retrogenia
- B. Central occlusion
- C. Posterior occlusion
- D. Direct relation
- E. Physiological progenia

5. The 16-years-old boy came to the doctor with complains of his aesthetic. Objectively: vestibular inclination of the upper and lower teeth, with minor overlapping, in the lateral sides - neutral teeth correlation. What kind of bite can you diagnose?

- A. Biprognatic
- B. Direct
- C. Orthognathic
- D. Opistignatychny
- E. Deep

6. Parents of the child 1-year-old complains with absence of teeth. Childbirth was uncomplicated. In anamnesis: pneumonia in early childhood and rickets disease. What number of teeth should be in this age?

- A. 8
- B. 12
- C. 14
- D. 16
- E. 20

7. What form of dentition is correct in the period of temporary occlusion? A. Semicircle

B. Parabola

C. U-like

D. Saddle-headed

E. Semiellips

8. During the examination of newborn: the lower part of the face is shorter than the middle one, the teeth are absent, the lower jaw is displaced back. What is the number of teeth in each jaw of a newborn?

A. 18

B. 12

C. 10

D. 16

E. 14

4. Discussion of theoretical issues:

Optimal individual norm” in orthodontics is defined as a state of morphological, functional and aesthetic balance in the dentition and in the facial skeleton as a whole, which is sufficiently guaranteed for a long time, which must be achieved in the process of orthodontic treatment (Yu.M. Malygin, 1979). It is characterized by extraoral and intraoral signs.

Extraoral signs. Facial - characteristics of the skin, proportionality of the face, symmetry of the face. Jaw - correct branch and body of the lower and upper jaw, angle value.

Intraoral signs - closing of the dentition - bite. The norm is an orthognathic bite, which ensures the optimal functioning of the dentoalveolar apparatus.

Description of facial features is of great importance for determining an aesthetic prognosis of treatment. Therefore, it is necessary to know the descriptive characteristics of the face with a physiological bite.

The face is divided into wide, medium and narrow in shape. In addition, they can be round, square, oval, triangular, frustoconical, or hexagonal. Studying the profile, they distinguish between medium, convex or concave faces. Conventionally, the face is divided into three parts: upper, middle and lower, which are formed as a result of drawing horizontal lines:

- upper - passes through the brow points;
- middle - passes through the pidnose point;
- lower - through the lower part of the chin.

According to the physiological bite, the middle and lower parts of the face are almost equal. The bridge of the nose is of the usual form, movable wings of the nose. The upper lip prevails over the lower lip , forming a "lip rung". The lips are closed without tension, the labio-chin sulcus is of medium depth. The angle of the lower jaw is within 117-124 ° in adults. The physiological asymmetry of the face is determined (up to 2 mm).

Physiological types of bite.

- orthognathic
- straight
- physiological biprognathia
- opistognathia

All these bites have the same signs of closure in the area of molars and premolars and different ones in the area of incisors and canines.

Physiological occlusion characterizes morphological signs, some of which relate to the entire dental arch, others - only the ratio of the anterior teeth or posterior teeth.

Signs that apply to the entire dental arch:

The upper dental arch is semi-elliptical, the lower is parabolic.

2. On the upper jaw the dental arch is larger than the alveolar arch, the alveolar arch is larger than the basal one. On the lower jaw, the dental arch is smaller than the alveolar arch, and the latter is smaller than the basal one. Therefore, the upper dentition overlaps the lower one, and in the complete absence of teeth, even with a slight degree of atrophy of the alveolar processes, the upper jaw is smaller than the lower one.

3. Each tooth is usually joined with two antagonists, with the exception of the upper third molars and lower central incisors. The teeth of each dentition are adjacent to each other, touching the contact points located on the proximal surfaces.

2. The height of the crowns of the teeth gradually decreases, starting from the central incisors and ending with the molars (with the exception of the canines).

3. The upper teeth are located with the crown tilted outward and the roots inward; and the lower ones, on the contrary, are tilted by the crowns orally, and by the roots outside.

Signs that concern the front teeth :

1. The midlines, which run between the central incisors of the upper and lower jaws, lie in the same sagittal plane and are a continuation of each other.

2. The upper incisors overlap the lower ones by 1/3 of the crown height. The lower incisors with their cutting edges are in contact with the dental tubercle on the palatal surface of the upper incisors.

Signs of chewing teeth closing in the buccal-palatal direction:

1. The buccal tubercles of the upper premolars and molars are located outwards from the similarly named tubercles of the lower ones, and the

buccal tubercles of the lower ones - inward from the similarly named tubercles of the upper ones, therefore the upper palatine tubercles fall into the longitudinal grooves of the lower teeth, and the lower cheeks into the longitudinal grooves of the upper teeth.

2. The lingual tubercles of the lower teeth are located inward from the same tubercles of the upper teeth.

The external (buccal) and internal tubercles of the chewing teeth on both sides of the upper and lower jaws are located at different levels. The cross section of the chewing teeth, which goes from right to left or in the opposite direction, is a transverse curve, convex at the bottom and concave at the top.

The upper dental arch is wider than the lower one by the size of the buccal tubercle, due to which the range of lateral movements of the lower jaw increases and the occlusal field expands.

Signs of occlusion of the chewing teeth in the anteroposterior direction:

1. The anterior buccal tubercle of the first upper molar is located on the buccal side of the first lower molar in the transverse groove between the buccal tubercles, and the posterior buccal tubercle is located between the distal-buccal tubercle of the first lower molar and the medial-buccal tubercle of the second molar.

2. The chewing surfaces of the lower teeth, from the premolars to the last molar, form a concave sagittal curved surface. The chewing surfaces of the upper chewing teeth also form a sagittal curve, but not concave, but convex, which follows the shape of the lower concave curve.

Orthognathic occlusion is characterized by a high aesthetic optimum, high indices of the chewing function, the best conditions for the formation of somatic swallowing and the full function of the tongue.

The second variant of the physiological bite is straight or orthogenic. It differs from the orthognathic one in that the cutting edges of the upper incisors do not overlap the lower ones, but are set in direct contact (in contact with the cutting surfaces). Physiological biprognathia - all

occlusal relationships are preserved, except for the frontal teeth - they have a vestibular slope with a slight overlap of the lower teeth by the upper teeth.

Opistognathia - the canines and incisors on both jaws are tilted into the oral cavity, the upper teeth overlap the lower ones at the level of the dental tubercles or by edge closure.

The bite is described in three planes : sagittal, transversal and vertical.

The mid-sagittal plane comes between the central incisors through the seam of the palate, the middle of the nose and divides the face into two parts. In this plane, it characterizes the location of the lower jaw relative to the upper in the anteroposterior direction (neutral, distal, medial). The frame's guideline for bite description is:

1. a) the presence of close contact of the incisors along the sagittal;
2. b) correct sagittal contact of the incisors, or reverse overlap; c) the presence of a sagittal slit (space between the incisors of both jaws); d) with the relation of the canines;
- e) the ratio of the first permanent molars or other temporary molars.

According to the physiological occlusion, the incisors have tight contact along the sagittal or the sagittal gap does not exceed 2 mm; tearing the hump of the upper canine protrudes between the lower canine and the first premolar (permanent bite) or between the canine and the first temporary molar (temporary and variable bite), the anterior buccal tubercle of the upper permanent molar is located in the mid-humped groove between the anterior and posterior tubercles of the lower first permanent molar. The vertical plane runs parallel to the plane of the forehead from top to bottom and characterizes the presence of incisal contact, the depth of its overlap (normal, deep) or the absence of incisal contact. An overlap of up to 1/2 of the crown height of the lower incisor is considered normal.

Transversal plane (horizontal, lateral), perpendicular to the sagittal plane, touching the masticatory tubercles of the first permanent molars and premolars. In this plane, the lateral displacements of the lower jaw are determined. Guidelines for the description of the bite is the ratio of the buccal tubercles of the upper and lower chewing teeth. According to the physiological occlusion, the upper dental arch is larger than the lower one by the size of the buccal tubercle. Displacement of the lower jaw is judged for the mismatch of the bases of the frenum of the lips. The degree of displacement is recognized in relation to the crown of the lower central incisor.

The Angle key of occlusion is fssous- ugric contacts between the first permanent molars of the upper and lower jaw with the correct inclination of the longitudinal axes of these teeth to the occlusal plane:

- mesio-buccal cusps of the first molars of the upper jaw should be located in the intertubular figure of the molars of the lower jaw;
- the distal-buccal cusps of the upper molars should be in close contact with the distal-buccal cusps of the first molars of the lower jaw and with the medial slope of the buccal cusps of the second molars of the lower jaw.

In 1972, L. Andrews described 6 keys that characterize optimal occlusion. Key I - correct hump-fissure contacts between the first permanent molars of the upper and lower jaws with the correct inclination of the longitudinal axes of these teeth to the occlusal plane. Key II - correct angulation (mesiodistal tilt) in degrees of the longitudinal axes of the crowns of all teeth. it is characterized by the value of the

angle, which is formed at the intersection of the axis of the clinical crown of each tooth and the perpendicular to the occlusal plane.

Key III - correct torque (vestibulo-oral tilt of the crowns and roots of the teeth).

Key IV - teeth located in the dentition should not be axially returned.

Key V - the presence of tight contacts between the teeth of each dentition without diastemas and three. Key VI - the concavity of the Spee curve should not exceed 1.5 mm, which is considered the largest distance between the plane, adjacent to the cutting edges of the central incisors of the lower jaw with the protruding distal tubercles of the last permanent molars and the lowest occlusal surface of the posterior teeth. The shorter the dental arch and the longer the apical arch, the deeper the concavity of the Spee curve, which leads to an incorrect position of the teeth and a deviation of their longitudinal axes.

According to physiological types of bite, movements in the temporomandibular joint are carried out evenly, smoothly, without accompanying noise effects.

Stages of the physiological rise of the bite height :

Stage 1 - 2-2.5 years old child (the end of the eruption of all permanent teeth) Stage 2 - 6 years (eruption of the first permanent molars

1

Stage 1 - 12-13 years old (after complete replacement of temporary teeth with permanent ones)

Stage 2 - 18-25 years old (eruption and correct articulation of wisdom teeth).

Pathological types of bite

Bites, in which there is an abnormal position of individual teeth, deformations of the dental arches and their abnormal relationship (shift in the sagittal, vertical and transversal direction).

1. prognathic (distal)
2. prognathic ECK s (medial)
3. open suspended ;
4. deep;
5. cross;
6. neutral bite with abnormal position of individual teeth.

Tsilinsky's symptom

The value of Tsilinsky's symptom is quite large in the formation of a permanent bite. This is a preventive symptom that prevents the development of sagittal malocclusion. It should be determined at the end of the third bite period to ensure correct eruption of the first permanent molars in a neutral ratio.

In the third period of temporary occlusion, due to uneven growth of the lower jaw, physiological abrasion of the tubercles of the teeth, the medial-buccal tubercle of the upper second temporary molar moves from the first to the second groove and the distal surfaces of the second molars form a sagittal site.

In the clinic, the Tsilinsky symptom is determined using a mirror and a probe. The cheek is pulled back with a mirror, the probe is inserted behind the distal surface of the upper second temporary molar and gradually moves to the second temporary lower molar. If the probe moves forward when moving, this indicates the presence of a medial ostip and, in the future, correct eruption of the first permanent molars. If the probe smoothly transitions from the upper second molar to the lower one or moves distally, this indicates distal eruption of the first permanent molar and the formation of a distal occlusion. **Boome and Schwartz**

final planes

Boom (1959) came to the conclusion that even with a pronounced abrasion of the deciduous teeth, the medial displacement of the lower jaw does not occur. He distinguishes two forms of temporary bite with respect to the final plane:

1. shape - when the line is straight, that is, the distal surfaces of 2 temporary molars are on the same plane;
2. shape - a broken line, when the upper molars hang over the lower ones, forming a mesial place.

According to the author, this is due to the different sizes of the 2 upper temporary molars. If the dimensions of the latter are less than 8.8 mm, the final line will be straight. In addition, the author speaks about the stability of the sagittal position of the jaws, thereby emphasizing that the treble between the teeth and the mesial step is nothing more than a physiological variant of the norm.

Most experts support his opinion and identify 2 variants of orthognathic occlusion in the time period: 1st - 3 intervals and 2nd - without intervals. A.M. Schwartz identifies options in the ratio of the distal surfaces of the second molars in the temporary bite:

1. if the upper molar is smaller than the lower one - straight the line is that the crowns of the second temporary molars are the same size - there will be a medial step
- 2 . if the crown of the lower molar is larger, there will be a distal step.

5. Topics of reports/abstracts:

1. How many developmental periods does a milk bite have?
2. What physiological signs characterize milk bite at 5-6 years of age?
3. What are the periods of establishing the height of the bite.

4. What is the morpho-functional characteristic of the early mixed bite?
5. Morpho-functional characteristics of late mixed bite?

6. Summarizing the information received at the lesson.

7. List of recommended literature:

Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician
1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України
<http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України
<http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №2

Topic: Clinical methods of inspection of children and adults with malocclusion and dentofacial deformity

Goal: must master the clinical methods of examining children with PAA. The student should clearly understand the importance of studying anamnestic data when examining children with PAH. The student must be able to collect the patient's complaints, anamnestic data, fill out the medical history of the orthodontic patient.

Basic concepts: In the process of mastering the material, the student must apply his knowledge about the peculiarities of the anatomy and physiology of the child's MFO, the stages and timing of the development of temporary and permanent teeth, the morpho-functional characteristics of the temporary, removable and permanent bite, physiological and pathological types of bite.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. What is the mechanism of occurrence of pathology of the dentoalveolar system in case of improper artificial feeding?
2. How is the TMJ state diagnosed?
3. What factors can cause the diagnosis of anomalies and deformities of the maxillofacial region during prenatal development?

4. Discussion of theoretical issues:

Clinical examination of patients with dentoalveolar anomalies and malocclusion is the main one in determining the orthodontic diagnosis and includes subjective and objective research.

Subjective research is finding out the patient's passport data, complaints, life history and disease. It is carried out by interviewing the patient or his parents.

The passport part reflects the last name, first name and patronymic of the patient, his gender, age, information about the place of education or training, address. You must register the child's parent or guardian information. The gender of the patient is important in planning orthodontic treatment, since girls are ahead of boys in biological development.

Distinguish between passport, biological, dental and bone age.

Passport (chronological, or calendar) age is the period from the moment of birth to a certain moment in life.

Biological, or anatomical and physiological age is determined by the totality of metabolic, structural, functional, regulatory features and adaptive capabilities of the body and is an obligatory function of time, but in contrast to the passport, it is characterized by less distinct time intervals during which irreversible age-related biological changes occur in the body. The biological age can correspond to the chronological age or be ahead of or lagging behind it.

Assessment of the level of age-related development for "dental age" (Table 1) is carried out during the change of teeth according to the formula:

$4n-20$ where n is the patient's age in years, 20 is the number of temporary teeth.

If the number of permanent teeth erupted is age appropriate, then development is considered normal. If the number of permanent teeth is less than necessary, the development is delayed; with a larger number of permanent teeth, the development of the child is considered accelerated. Bone age is the age of a person, which is determined by the state of the skeletal system. X-rays of the hands are often used to determine bone age.

Table 1.

Assessment of the level of age development according to "dental age "

age	flo	Number of permanent teeth		
		Delay ed development	Norm al devel	Accelerate d developme
	or		opment	nt

5.5 years	M D	0 0	0-3 0-4	more than 3 more than 4
6 years	M D	0 0	1-5 1-6	more than 5 more than 6
6.5 years	M D	0-2 0-2	3-8 3-9	more than 8 more than 9
7 years	M D	less than 5 less than 6	5-10 6-11	more than 10 more than 11
7.5 years	M D	less than 8 less than 8	8-12 8-13	more than 12 more than 13

The address or place of residence enables the orthodontist to determine the medico-geographical features of the area in which the patient lives, and their influence on the development of the child's body in general and on the development of the dentition of the maxillofacial region in particular.

The methodology for collecting complaints varies. You can ask questions, but it is better to give the patient or the parents an opportunity to talk about what is bothering them at the moment.

Complaints of orthodontic patients are most often associated with aesthetic imperfections of the face and dentition, less often - with impaired functions: speech, chewing, swallowing, breathing, lips closing; pain and crunching in the ears during opening of the mouth with disorders in the temporomandibular joints.

When determining the history of a child's life, pay attention to the following:

- determining the age of the parents at the time of the child's birth;

- from which pregnancy the child was born, if the pregnancy is not the first, then what was the course and end of the previous one; the course of pregnancy (toxicosis, their nature, during pregnancy they were observed; hormonal disorders, metabolic disorders, attempts to terminate pregnancy; the nature of the diet and regime of an avagitnoi woman; the presence of occupational hazards; pharmacological, radiation and other factors during pregnancy that could lead to congenital malformations development and deformities;

- deviations in the position of the fetus;

- the course of labor (term of birth, obstetrics: forceps, cesarean section)

- the nature of the child's feeding (breastfeeding, artificial, mixed);

- use of the nipple (shape and size of the nipple, hole size, space of use);

- timing of eruption of temporary and permanent teeth; • diseases of the teeth and oral cavity; premature tooth loss (at what age)

- past illnesses (infectious, rickets, hyperthermic states, etc.), At what age were observed, how many times were repeated;

- trauma (character, at what age)

- bad habits;

- position of the child during sleep;

- the nature of breathing during the day and during sleep (the child breathes through his nose or through his mouth; sleeps with his mouth closed or open)

- diseases of the upper respiratory tract; operative interventions (adeno- and tonsilotomy or -ectomy, dental operations), how they affected the development of the dento-maxillofacial region;

- violations of the musculoskeletal system (violation of the physique, posture • fractures of the jaw and facial bones), at what age; ongoing treatment;
 - general diseases (cardiovascular, pulmonary, endocrine, nervous, diseases of the gastrointestinal tract, kidneys, etc.);
 - state of health during examination;
 - hygienic care of the oral cavity;
 - hereditary burden;
 - allergic status;
 - environmental conditions in the place of residence.
- Anamnesis of the disease allows you to determine the onset of the disease (the formation of a dentoalveolar anomaly or deformity of the bite), which preceded it, the duration and dynamics of the disease; applied methods of treatment and

their effectiveness; the possibility of inherited transmission of certain signs of the structure of the face, jaws, bite, teeth. Due to the fact that individual changes in the oral cavity arise as a result of past or concomitant diseases, and also at one time affect the course of somatic diseases, it is necessary to determine how the patient feels at the moment.

Objective research.

Review - assumes general overview, determination of physique and features of the structure of the face, examination of the oral cavity.

During the general review, the somatic and mental development of the patient is determined, their compliance with age. Pay attention to height and body weight, fatness, constitution. The patient is examined in front, in profile, from the back and the position of the head, shoulders, shoulder blades, legs (curvature of the legs, feet), the shape of the chest, abdomen, back (curvature of the spine) is determined. Particular attention is paid to the physical development and physique of the patient. Depending on the severity of the curvature of the spine, the following types of posture are distinguished: normal, or straightened; stooped; lordic, kyphotic and scoliotic.

This information, in addition to the general characteristics of the growth and formation of the skeleton, makes it possible to determine the pathogenetic relationship with the weakening of the musculoskeletal system and constitutional disorders.

When examining the head, it is necessary to determine its proportionality to the size of the body; the proportionality of the facial and brain regions; face shape.

The shape of the face can be similar to the shape of a circle, square, rhombus, truncated cone; have the form of a triangle, hexagon. The face can be narrow, wide, medium length, elongated. The shape of the profile can be convex, straight, flattened, concave. Features of the shape and structure of the face are important in determining the aesthetic prognosis of orthodontic treatment. Individual congenital features of the structure and shape of the face show us disorders caused by the presence of a dentoalveolar anomaly.

In addition to the general characteristics of the shape of the face and head, their components are described.

The proportionality of the face. Usually the face is subdivided into three relatively proportional parts: upper, middle and lower.

Facial symmetry. There is a relative symmetry of the right and left halves of the face. Distinguish between physiological and pathological asymmetry of the face. Physiological asymmetry is considered a difference of up to 2 mm. Determine the shape of the forehead, eyes, their expression, direction of vision (straight line, sullenly). This is important for determining racial characteristics, psychological development, etiological factors. So, with rickets transferred in early childhood, the forehead can be high and tower-like or square with well-defined frontal tubercles.

Examine the nasal dorsum, characterizing the mobility of the nasal wings (in the presence of adenoid vegetations, the nasal dorsum can be wide, the fixed nasal wings in combination with a half-open mouth and a dry red border of the lips indicate a violation of nasal breathing, this can lead to a growth retardation of the middle part of the face - microrhinodysplasia, to the formation of an adenoid type of face). A deviation in the structure of the auricles (atresia, protruding ears and "satyr" ears) may be a secondary sign of disorders in the growth of the temporal bone, which affects the location of the TMJ elements and the lower jaw.

Characterizes the severity of nasolabial folds (smoothed, deep or medium depth), which can be a manifestation of sagittal malocclusion.

Pay attention to the nature of lips closing (free, with tension, half-open mouth). The thickness and length of the upper and lower lips are determined. These factors influence the aesthetic prognosis of the treatment. Symptom may occur due to tight closing of lips and infantile type of swallowing.

"Thimble" or "lemon peel" (pinpoint indentations on the skin of the chin). Undesirable medial movement of the lower jaw or expansion of the jaws along the short upper lip, therefore, an increase in the volume of the bite will lead to tense closing of the lips and a change in facial expression (formed

“Surprised face”), a “gummy smile” may form.

The depth of the labio-chin sulcus is assessed (deep, medium depth, smoothed). The depth of the labio-mental sulcus depends on the presence of vertical or sagittal malocclusion. The shape of the chin can be of great importance in the aesthetic prognosis of treatment. The chin can be straight, sloping back, or protruding. These manifestations can be a sign of an individual face structure or a symptom of sagittal malocclusion. A straight square chin gives the face a masculine look. A double chin can be a manifestation of an incorrect tongue position.

Determine the size of the mandibular angles, the size of the branch and the body of the lower jaw.

Diagnostics of the temporomandibular joint condition

With various types of TMJ dysfunction, the following symptoms may occur: flapping, clicking, crunching, crepitus, limited opening of the mouth, displacement of the lower jaw to the side when opening the mouth, S-shaped movements when lowering the lower jaw, signs of tooth wear.

Palpation of the joints: the index fingers are placed in front of the ear tragus on both sides and ask the patient to open his mouth wide. With an excessive excursion of the condyles (dislocation, subluxation), the fingers fall into the empty articular cavities behind the maximum open mouth. On palpation, you can determine the crunch, flapping, and sometimes palpate the deformed process.

Further, the attachment points of the masseter and temporal muscles are palpated. Muscle pain indicates hypertonicity.

Attention is drawn to the nature of the movements of the lower jaw when opening and closing the mouth. Movement should be smooth, can be tilt, zigzag, circular.

At the time of closing the mouth, attention is drawn to the presence and degree of displacement of the lower jaw, the cause of the displacement (arthrogenic or myogenic) is determined. Arthrogenic displacement is characteristic of habitual unilateral dislocations, subluxations, deforming arthrosis, etc. Myogenic - develops as a result of a sharp unilateral hypertonicity of the masticatory muscles (especially the lateral pterygoid).

The distance between the cutting edges of the central incisors is measured (in adults, according to D.E. Kalantorovim, it averages 44 mm).

After examining the head and face, they begin to examine the oral cavity, first the mucous membrane of the lips and corners of the mouth. At the same time, the relief of the lips, the size and nature of the moisture content of the red border, the presence of pathological elements are determined. Then the symmetry of the corners of the mouth is determined, their direction (raised up or lowered down), the presence of postoperative scars, the prevalence of lips. Normally, the upper lip should prevail over the lower lip. A protruding lower lip along a smoothed labiochin sulcus can be a sign of a medial or open bite.

When examining the vestibule of the oral cavity, its depth is determined. Depth of the vestibule - the distance in millimeters from the middle of the gingival margin to the actual bottom of the vestibule of the oral cavity).

According to Yu.L. Obraztsov (1992), the depth of the vestibule can be:

- very small - up to 3 mm,
- small - up to 5 mm,
- medium depth - from 5 to 10 mm,
- deep - more than 10 mm.

A shallow vestibule can be an etiological factor in the underdevelopment of the frontal area of the lower jaw (crowding of the lower frontal teeth) or the development of periodontal diseases .

- Then they move on to examining the frenulum of the lips and cheek cords in order to determine the anomalies of their location (high attachment, low, normal), shape and size.

- The normal frenulum is a thin triangular fold of the mucous membrane, has a wide base on the lip and ends in the midline of the alveolar ridge at about 5 mm from the gingival margin. Anomalies of the frenum are characterized by attachment site, shape, and size.

- G.Yu. Pakalns (1969) distinguishes: strong bridles with an attachment point at the apex of the interdental papilla, when stretching the lip along such a bridle the interdental papilla is also fed;

- • middle - attached at a distance of 1 to 5 mm from the top of the interdental papilla;

- • weak, which are attached in the area of the transition fold.

- Deviations from the normal location of the lip frenulum are more common in the upper lip area and turn out to be changes in the level of attachment, a decrease in their length and tension.

- Depending on this, there are three types of abnormal upper lip bridles.

- The frenum and the species are characterized by the fact that they have a normal length, but are located close to the gingival margin (at a distance of 1-2 mm) or are woven into it.

- Type II bridles are characterized by a normal level of attachment to the alveolar process, however, in the lip area, they are attached more closely to its free edge. The mobility of the lip in such cases is limited; when it is removed, the bridle stretches and acquires a triangular shape with a base at the red border of the lip.

-

- Type III includes bridles, which begin with a wide base at the free edge of the lip,

- are attached along the entire length to the alveolar process and end in the form of a mucosal duplication between the central incisors. The middle part of the lip is more often shortened, nasal closure of the lips.

- Anomalies in the location, shape, size and strength of the frenulum can be the cause of diastema, the development of periodontal disease.

- An examination of the tongue is important, since its size, shape, location and mobility directly affect the development of the bite and the formation of dentoalveolar anomalies. So, the presence of dental prints on the lateral surfaces of the tongue or in the frontal area indicates insufficient space for the tongue or an increase in its size. The shortened frenum of the tongue, attached close to its tip, can cause disturbances in the dentition. Restriction of the mobility of the tongue makes it difficult for a newborn baby to suck, can lead to swallowing disorders, incorrect pronunciation of certain sounds.

- F.Ya. Khoroshilkina (1972) identifies 5 types of frenum of the tongue, restricting its movement.

- The first type includes thin, almost transparent bridles, normally attached, but limiting its movement due to its small length.

- The second type also includes thin, translucent bridles, attached close to the tip of the tongue and are of short length. During the raising of the tongue, a groove forms at its tip in the center. The third type is the frenulum, which is a tight, short cord attached close to the tip of the tongue. During the extension of the tongue, the tip is tucked, and the back explodes as a result of tension. Licking the upper lip is difficult and sometimes impossible. On palpation of such a frenum, it is determined that the limitation of the mobility of the tongue is due to the fixation of its tip with a connective tissue cord. In the cord, which looks like a cord, there is a thin duplication of the mucous membrane.

- The fourth type includes bridles, the cord of which, although it stands out, is fused with the muscles of the tongue.

- Such bridles are often found in children with congenital clefts of the lip, alveolar ridge, and palate.

- Frenulum of the fifth type is characterized by the fact that the cord is hardly noticeable, its fibers are located in the thickness of the tongue, woven from its muscles and limit movement .

- The next step in the examination of the oral cavity is to determine the state of the periodontal tissues. Since periodontal disease is often accompanied by dental anomalies, it is important for the orthodontist to determine the condition of the gingival mucosa. In this

case, the color, size, volume and shape of the gingival papillae are assessed; the nature of the gingival margin; determine the level of location of the gingival margin relative to the necks of the teeth (growth, recession).

- Changes in the color of the gums indicate the presence of a pathological process. Normally, ash-trees of a pale pink color are pale - with anemia; bright red

- - in acute inflammation, cyanosis is inherent in chronic inflammation, leukemia and diabetes. Changes in the color of the gums can be determined in the area of individual and groups of teeth or have a generalized character; manifest only in the gingival papillae or spread to the mucous membrane of the alveolar process.

- Using palpation, the consistency of the gums is determined. Normally, of course, elastic, if pathological changes appear, then they are loose pasty or dense. Changes in the consistency of the gums are accompanied by changes in its contours.

- Normally, the interdental gingival papillae are sharp; in chronic inflammatory processes, of course, roller-like thickened; the gingival margin becomes scalloped . When determining the location of the gingival margin relative to the necks of the teeth, the recession of the gingival margin can be determined; the edge of the gum is located below the enamel-dentin border.

- Examining the palate, pay attention to the mobility of the soft palate; palatine arches; palatine tonsils (their volume, color, location relative to the palatine arches) pharynx; the mucous membrane of the posterior pharyngeal wall, determining its condition (atrophic, normal, hypertrophic).

- Examination of the teeth and writing down the dental formula allows you to determine whether the teeth belong to a temporary or permanent bite; the condition of the hard tissues of the teeth (lesion and acceleration, hypoplasia, fluorosis, etc.). Zoubi postiynogo bite for Zigmondy (1861) poznachayut Arabic numerals, i preformed postiynogo dentition bite Got Taqiy viglyad:

87654321: 12345678

87654321: 12345678

The teeth of a temporary bite are determined by Roman numerals and the dental formula of the formed temporary bite is as follows:

$$\begin{array}{c} \underline{\text{V IV III II I: I II III IV}} \\ \underline{\text{V V IV III II I: I II III IV}} \\ \text{V} \end{array}$$

1

To unify the recording of the dental formula, the International Organization of Dentists FDI-ISO (1970) proposed an ambiguous system for naming teeth, which consists in the digital designation of their location on the corresponding side of the upper or lower jaw. The dental formula of the formed permanent bite with this method of designation is as follows: **18 17 16 15 14 13 12 11: 21 22 23 24 25 26 27 28**

48 47 46 45 44 43 42 41: 31 32 33 34 35 36 37 38

In the bite of deciduous teeth, the right upper jaw is conventionally designated by the number 5, the left - 6, the left part of the lower jaw - 7, the right - 8. The dental formula of the temporary bite with this designation method is as follows:

$$\begin{array}{c} \underline{\text{55 54 53 52 51: 61 62 63 64 65}} \\ \text{85 84 83 82 81: 71 72 73 74 75} \end{array}$$

A review of individual teeth allows you to determine anomalies in their number, eruption, location, size, color, structure of hard tissues.

Anomalies in the location of individual or groups of teeth are reflected in the shape and size of the dental arches and alveolar processes. For their characteristics, such clinical symptoms as: crowded positions of the teeth; the presence of diastemas and three;

narrowing and expanding; shortening and lengthening of dental arches; dentoalveolar lengthening or shortening in certain areas of the dental arches. Such violations can lead to changes in the location of the dental arches relative to each other, that is, to various forms of dentoalveolar anomalies.

According to D.A. Kalvelis (1961), distinguish between a narrowed dentition, saddle-shaped compressed, V-shaped, quadrangular (trapezoidal) and asymmetric.

F.Ya. Khoroshilkina, G.H. Granchuk, I.I. Postolaks distinguish the following forms of the dentition of the upper jaw: normal, narrowed, elongated, shortened, stepped, symmetrical and asymmetrical. On the lower jaw: normal, narrowed, elongated, widened. Describing the bite, describe it in three planes: mid-sagittal, vertical and horizontal.

Closure of the dentition is an important clinical symptom that determines the indications for orthodontic treatment.

5. Topics of reports/abstracts:

Instrumental method

Biological method

Surgical method

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
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Information resources

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2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України
<http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №3

Topic: Diagnosis methods of malocclusion.

Goal: To learn the position of clinical methods of examination of children with dental maxillo facial abnormalities develop the skills determine the configuration of the face, a clinical survey of the soft tissues of the oral mucosa, determine the status of teeth, occlusal relationships between the study of the dentition, filling medical history and establishment according to the preliminary diagnosis by clinical examination.

Basic concepts: in the process learning the student must apply their knowledge of the features of the anatomy and physiology of maxillo facial area child, stages and timing of temporary and permanent teeth, morphological and functional characteristics temporary, alternating and permanent occlusion, physiological and pathological types of bite . Clinical methods of examination of children with dentalmaxillo-facial abnormalities and deformities. During the survey is to find out the patient's passport information, namely: surname, name and patronymic; sex; age; information about the place of education or training, address; information about the parent or guardian of the child (name and surname, place of work, means of communication with parents and child - and so on. f.); information about the child's pediatrician or dentist and other professionals who have been patient.

Equipment: cephalometric analys, plaster models, typodonts, panoramic x-rays.

Plan

- 1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
- 2. Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
- 3. Questions (test tasks) to check basic knowledge on the topic of the seminar:**

What measures do I need to have in order to construct the diagram of Haulay Gerber Herbst?

- Sum of the sizes of the crowns of the upper iliac, central and lateral cavity
- Dimensions of lateral segments of dental series
- Length of dental arc
- The sum of the width of the crowns of the four cuttings
- Width of dental arc

A 9-year-old boy turned to an orthodontist doctor in connection with not having 12 teeth. Objectively: the face is symmetrical. Narrowing of dental rows. A place for 12 - 4 mm. What additional method of research is necessary to conduct?

- Panoramic X-ray
- Mastication
- Helerentgenography
- Myotometry
- Diagnostic study of models

To the orthodontic clinic, the girl turned 14 years old with complaints about the absence of one tooth and an aesthetic defect. During clinical examination it was revealed: the ratio of the jaws is neutral, the absence of 23 tooth with a site deficiency. Previous diagnosis: a retention of 23 tooth with a placebo defect in the tooth row. Which of the additional research methods should be used to establish the final diagnosis? A. Ortopantomografiya

- Myotometry

- C. Telerentgenography
- D. Roentgenography of adnexal nasal cavities
- E. Measurement of diagnostic models

The parents of the child appealed to the clinic at the age of 8 years with complaints about the wrong posture of the front teeth. Objectively: vestibular position of 12 and 22 teeth, insufficient space for them in the dentine. The first permanent molars are merged into Class I Englia. What additional testing methods should I use?

- A. Definition of the Pona index
- B. Mastication
- C. Clinical functional tests
- D. Telerentgenography
- E. Photometric research

With which X-ray method can you determine the bone age?

- A. Tomogramma
- B. Sighting X-ray
- C. Telerentgenography
- D. Ortopantogram
- E. Roentgenography of the hand

Measuring gypsum jaw models using the Pona method involves:

- A. Determination of length length of dental rows
- B. Studying segments of dentitions
- C. Determination of sagittal sizes of dentitions
- D. Diagnosis of semetricity of dental rows and displacement of angular teeth
- E. Determination of transversal dimensions of dentitions

Telerentgenographic head scan is used to study:

- A. Tooth, alveolar and basal arches of the upper or lower jaw
- B. Structures of temporomandibular joints
- C. Determination of the condition of hard tissues of teeth, their periodontal disease, alveolar processes and jaw bones
- D. Posture of teeth, dental alveolar height, asymmetry of the right and left half of the face

- E. Structures of the facial skeleton, its growth and prognosis of orthodontic treatment Which additional method of examination should be used when narrowing the tooth row?
- A. Electrometry
 - B. Korkhauz Method
 - C. Method Gerlach
 - D. Method Pon
 - E. Telerentgenography

Where are the Pont points on the upper jaw molars?

- A. Top of the mesial-thymus bug of the first molar
- B. Rear deepening of intergranular fissure
- C. Anterior deepening of the intergranular fissure of the first molar
- D. Contact points between the first and second molars
- E. Top of the distal-bilgeous bulge of the first molar

A child has 8 years defined: the upper dental arch V - like shape, the bottom - trapezoidal (quadrangular). What diagnostic method allows you to determine the correct shape of the dental arc A.

- A. Linder-Hart
- B. Hawley-Herber-Herbst
- C. Rope
- D. Tonn-Gerlach
- E. Hoves

A girl of 14 years defined the overcrowding of the upper and lower frontal teeth II degree. Which method allows us to determine the proportionality of the size of the incisors of the upper and lower jaw at the normal depth of the cutter overlap:

- A. Howes
- B. Tonne
- C. Gerlach
- D. Pont
- E. Hawley

To study the size of teeth in the period of milk bite method is used:

- A. Dolgopolova
- B. Corghause
- C. Snowboard
- D. Haulay-Herbst

E. Pona

Why is the Pona index equivalent for premolars and molars

- A. Premolar index 80, molar 64
- B. 74 and 68
- C. 82-68
- D. 78-32
- E. 86 and 72

What measurements do I need to have in order to construct a Chaule-Gerber-Herbst chart?

- A. The width of the tooth arch
- B. Sum of the size of the crowns of the upper canine, central and lateral incisor
- C. Length of dental arc
- D. Dimensions of lateral segments of dentition
- E. The sum of the width of the crowns of the four incisors

4. Discussion of theoretical issues:

Anthropometry allows you to study the size and shape of the face and its individual parts, the relationship between the size and shape of the facial region of the skull and tooth-mirk arches.

Biometric method for the study of diagnostic models of the jaws
Diagnostic models are those jaw models that are used by an orthodontist to conduct biometric studies and compare the results obtained during orthodontic treatment . For the production of diagnostic models of the jaws, it is necessary to completely and clearly remove the dentition, alveolar processes, the transitional fold of the mucous membrane with the display of the frenulum of the lips and tongue and cords, palate, hyoid region and maxillary tubercles.

Better to work with diagnostic models cast from super plaster. The bases of the models are made out with the help of special devices - rubber molds - or the corners of the base are cut in accordance with the canine line. The bases of the models of the upper and lower jaws

should be parallel to the chewing surfaces of the posterior teeth. Models are marked with the patient's last name, first name, age and date of prints.

To determine the size of the teeth, dentition, apical bases of the jaws, a modified caliper or special meters are used, as well as various devices such as an orthochrest, simethroscope, and optometer.

The study of diagnostic models of the jaws is carried out in three mutually perpendicular planes: mid-sagittal, vertical and horizontal (transversal) and in three directions corresponding to them: sagittal, vertical and horizontal. Determining the size and shape of teeth

In orthodontic practice, three sizes of teeth are usually measured: width, height and thickness.

The width is measured in all teeth at the level of the most convex part of the tooth crown (equator), in the lower incisors - at the level of the incisal edge.

Comparison of the measured width of the crowns of temporary and permanent teeth with their average value, shown in the tables, allows you to determine the changes in their size (macro- and microdentia). By the vestibular or oral arrangement of the central incisors, the location for these teeth is determined by measuring the distance between the contact points of adjacent teeth. Comparison of the width of the crowns of abnormally located teeth and the presence of space, which is for them in the dentition, makes it possible to determine the presence or lack of space. The lack of space by 1/2 or more of the width of the crown of an abnormally located tooth for choosing a treatment method is an absolute indication for the extraction of individual teeth.

The height of the coronal part of the frontal teeth is measured from the cutting edge of the tooth to its cervical border in the middle of the vestibular surface, and in the lateral teeth - from the middle of the buccal tubercle to the cervical border.

Crown thickness is measured for anterior and posterior teeth as their vestibulo-oral dimension.

Determination of proportionality of the sizes of the incisors of the upper and lower jaws

Tonn determined a directly proportional relationship between the sum of the crown widths of the upper and lower incisors with a constant orthognathic bite. The Tonn index is 1.33.

Z.I. Dolgopolova determined, according to the technique developed by Tonn, the ratio of the sum of the width of the crowns of the temporary upper and lower incisors and confirmed their relationship with the temporary orthognathic occlusion. The Dolgopolovaya index is 1.30. **Gerlah** found that the ratio of the sizes of the upper and lower incisors depends on the depth of the incisor overlap. With a straight permanent (orthogenic) bite, the Gerlah index is 1.23.

Yu.M. Malygin determined the ratio of the sizes of the upper and lower incisors with a constant deep bite. Index Yu.M. Malygin is 1.42.

Determination of the longitudinal length of the dentition

Determination of the length of the dentition is carried out according to the Nase method. For this, the ligature wire is placed from the distal surface of the first permanent molar of one of the sides of the dentition through the middle of the chewing surfaces of the lateral teeth and the cutting edges of the opposite side frontal to the distal surface of the first permanent molar, providing the wires of the dentition shape. The length of the dentition should be equal to the sum of the mesio-distal dimensions of 12 permanent or 10 deciduous teeth.

Determination of transversal dimensions of dentition (width)

In children during the period of temporary occlusion **Z.I. Dolgopolova** (1973) proposed to determine the transversal dimensions (width) of the dentition on the upper and lower jaws between the central and lateral incisors, canines, first and second temporary molars.

The measuring points in the central and lateral incisors and canines are located at the tops of the dental cusps (on the oral side), in the first and second molars - on the chewing surfaces in the anterior recess at the intersection of the longitudinal and transverse grooves.

During the period of permanent occlusion, the Pont technique (1907) is used to determine the transversal dimensions of the dentition, which is based on a directly proportional relationship between the sum of the mesio-distal dimensions of the 4 upper incisors and the width

between the first premolars and the first molars on the upper and lower jaws.

For this, Pont proposed measuring points on the upper and lower jaws, which coincide during the closing of the dentition of a permanent orthognathic bite, and, accordingly, the width of the dentition at these points is the same. On the first premolars, the width of the upper jaw is measured between points located in the center of the intertubercular fissure, and on the lower jaw, the distal point of the first premolar, which is tangent to the second premolar (contact point between premolars).

On the first molars, the width of the upper jaw is measured between points in the anterior depressions of the longitudinal fissure, and on the lower jaw, between the distal buccal cusps of the first molars.

Pont has defined indices by which it is possible to determine the indices of the width of the dentition in the area of premolars and molars, depending on the sum of the mesio-distal dimensions of the 4 upper incisors.

$$\text{Premolar s first index} = \frac{\text{The sum of the transverse dimensions of 4 incisors} \times 100\%}{\text{Distance between premolars}} = 80$$

$$\text{Molar index} = \frac{\text{The sum of the transverse dimensions of 4 incisors} \times 100\%}{\text{Distance between molars}} = 64$$

According to Korkhaus, in a changeable bite, instead of measuring points on the premolars, the distal dimples of the first temporary molars on the upper jaw or their distal buccal tubercles on the lower jaw are taken.

Linder, Hart (1939) amended the index numbers. According to these authors, the premolar index is 85, and the molar index is 65. In practical work, it is recommended to use the table they proposed.

40 -

In addition to studying the width of the dentition in the premolar region, it is important to measure the width between the canines, which is determined between the tops of their tearing tubercles.

A.B. Slabkovskaya (1995) proposed to determine the width between the canines depending on the sum of the mesio-distal sizes of the 4 lower incisors, since their sizes are less variable.

Determination of the sagittal dimensions of the dentition

The sagittal dimensions of the dentition of children during the period of temporary occlusion are measured by the method of **Z.I. Dolgoplov oh**. In this case, the length of the anterior segment and the total sagittal length of the dentition are determined. The length of the anterior segment of the dentition is measured from the middle of the distance between the mesial angles of the central incisors from the vestibular side in the sagittal direction to the point of intersection with the line connecting the distal surfaces of the crowns of the temporary canines. The total sagittal length is from the middle of the distance between the mesial angles of the central incisors from their vestibular side to the point of intersection with the line connecting the distal surfaces of the second temporary molars.

Korkhaus established a definite relationship between the sum of the mesiodistal dimensions of the 4 upper incisors and the length of the

anterior segment of the dental arch. he compiled a table of measurements. Table indicators are reduced by 2-3 mm

(Thickness of the upper incisors) can be used to determine the length of the anterior segment of the lower dental arch. The indicators of the length of the anterior segment of the upper and lower dental arch can be the same with a straight (orthogenic) bite. The ratio of the sizes of the segments of the dental arches (frontal and lateral)

Gerlach (1966) proposed to divide the dental arches into three segments: frontal and two lateral. The dimensions of the frontal segment are determined by the sum of the mesio-distal dimensions of the 4 incisors, and the lateral ones are measured from the mesial surface of the canine to the distal contact points of the first permanent molars. The author has proved that there is a symmetry of the lateral areas of the dental arches and a certain ratio of the sizes of the anterior and lateral areas. The ideal ratio for an incisal depth of 3 mm is determined when the size of the anterior segment corresponds to that of the lateral segment. With a straight bite, a shortened frontal part of the dental arch, since there was an adaptation to a certain ratio of teeth

Determination of the parameters of the apical basis

H.G. Snagina confirmed the method of **A. Howes** (1957), determined the directly proportional relationship between the sizes of

dental arches and their apical basis. In the transversal direction, the width of the apical base is measured on the upper jaw between the deepest points of the canine fossa on the lower jaw - stepping back 8 mm from the intersection of the horizontal line connecting the necks of the lower canines and the first premolars, and the vertical line passing through the crown of their interdental papilla ... Normally, the width of the apical base of the upper jaw is 44%, and in the lower - 43% of the sum of the mesio-distal

dimensions of the 12 permanent teeth of each jaw.

The narrowing of the dentition is usually accompanied by a narrowing of the apical base. According to H.G. Snagina, it can be 2 steps:

1. 1st step - width apical basis is 42-39% in the maxilla and 41-38% - in the lower jaw.

Grade 2 - the width of the apical base is 39-32% in the upper and 38-34% in the lower jaw.

Narrowing of the I degree there is a hope that after the expansion of the dentition there will be no recurrence of the anomaly. Narrowing of the II degree is indications for a decrease in the size of the dental arch due to the removal of individual teeth to eliminate the discrepancy between the dimensions of the dental arch and the apical base. Snagina minutes, measuring the length of the apical basis in the maxilla is performed from a point between the central incisors in the necks of the teeth on the palatal surface, the lower - from the front surface of the cutting edges of cutters to a line connecting the distal surface of the first permanent molars.

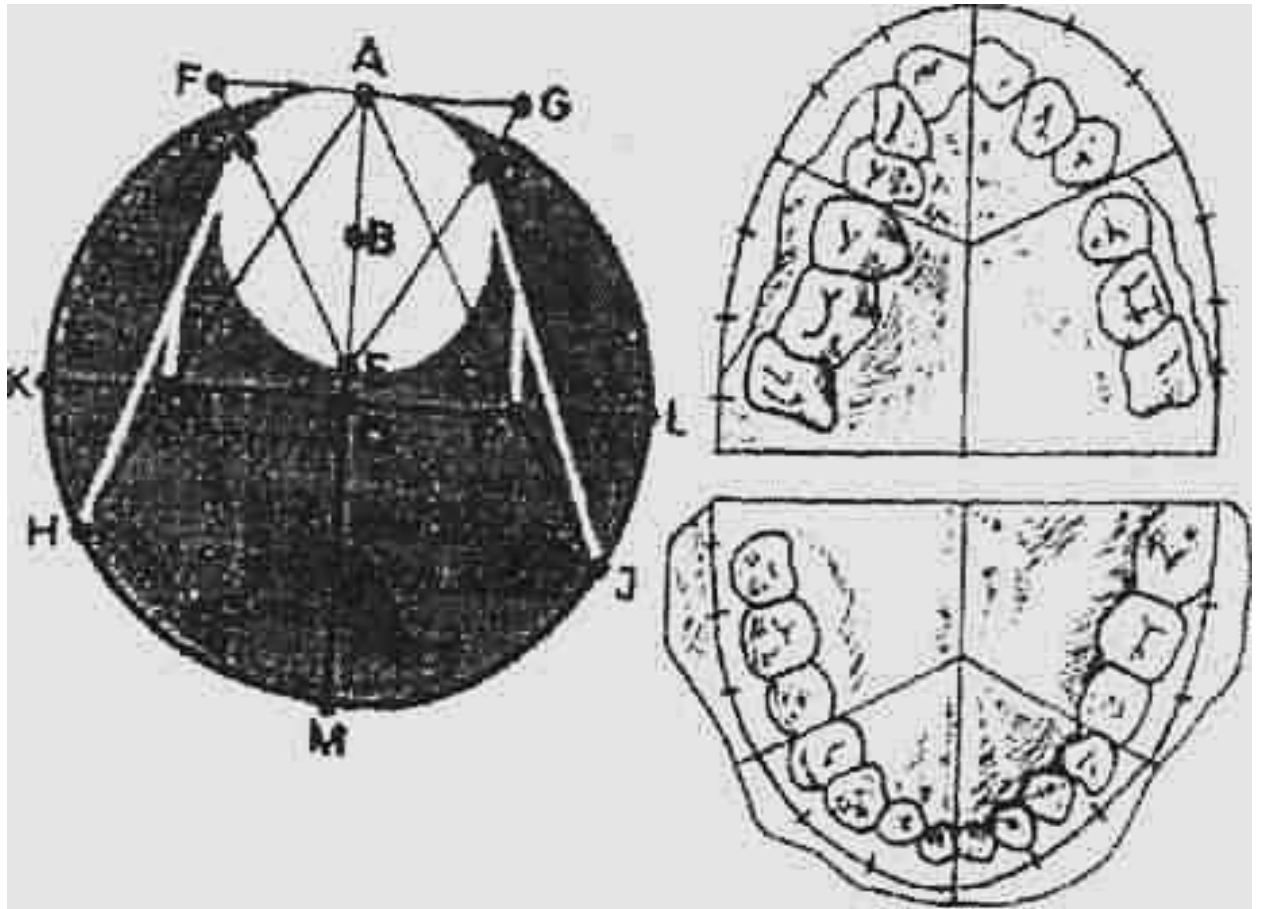
In children with temporary occlusion, the width of the apical base is 55.7% in the upper and 50.0% in the lower jaws of the sum of

the mesio-distal dimensions of 10 deciduous teeth. In the period of temporary occlusion, the width of the apical basis is determined between the apex of the canine roots and the first temporary molars. The measuring points are located in the recesses corresponding to the projection of the apex of the interdental papilla between the above teeth.

Graphic method for studying the shape and size of the dental arch

The Hawley-Herber-Herbst diagram plays an important role in determining the normal shape of the dental arch.

Figure 1. Plotting a Hawley-Herber-Herbst diagram.



To plot the diagram, the mesio-distal dimensions of the 3 frontal teeth (central and lateral incisors and canine) are measured and they are laid out. This is the magnitude of the radius AB. From point B, describe a circle with radius AB. With a radius AB from point A, segments AC and AD are laid on both sides. The CA arch is the curve of the 6 anterior teeth. To determine the location of the lateral teeth, another circle is described. From point E, straight lines are drawn through points C and D and a triangle EFG is obtained. With a radius equal to the size of the side of the triangle EFG, from point A, point O is marked on the extension of the diameter AE, from which a circle with radius FE is described. From point M to an additional circle is plotted according to the value of AO points J and H. By connecting point H with point C and point J with point D, the HCADJ curve is obtained, which reflects the curve of the location of the posterior teeth with Hawley. On the HC and DJ segments

the posterior teeth should be located. Herbst combined the Herber (ellipse) and Hawley principle, replacing the lateral straight lines with CN and DP arcs. The centers for these arcs are points L and K, which are located on a diameter perpendicular to the diameter AM. The arc CN is described with the radius LC, and the arc DP with the radius KD. Thus, the NCADP arch has rounded lateral areas and is a curve corresponding to the ellipsoidal shape of the normal upper dentition.

Depending on the width of the 3 anterior teeth on a transparent celluloid film, several different diagrams are determined, which make it possible to choose the one necessary for comparison with the diagnostic model. In order to determine the shape of the dentition, the diagnostic model is imposed on the diagram so that the midline that runs along the palate of the suture coincides with the diameter of the AM, and the sides of the PEC triangle pass between the canines and premolars. Then the contour of the dentition of the diagnostic model is drawn with a pencil and compared with the plotted curve on the diagram.

The study of the ratio of segments of the dentition according to Gerlach allows

- to determine the individual differences of the segments of the dentition, selected taking into account their functional unity;
- to establish the proportionality of the ratio of the segments of the dentition, which is characteristic of a properly formed bite;

Differentiation of crowding of teeth caused by the discrepancy between their size, from crowding, which developed as a result of narrowing or shortening of the dentition.

5. Topics of reports/abstracts:

1. How to estimate the proportion and symmetry face?
2. Classification of types of bridles for FY Horoshylkinoyi?

3. How many types of oral vestibule depth defined Yu.L.Obraztsova?
4. What are the features characterizing cerebral type faces by B. Bauer?
5. What are the signs of study when examining the state of the temporomandibular joint?
6. What kind of functional disorders symptom indicates "thimble"?

6. Summarizing the information received at the lesson.

7. List of recommended literature:

Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. "Orthodontics: The art and science". Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. "Patient Interaction in Planning". In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. "The Orthodontic Patient: Examination and Diagnosis". EC DentalScience 18.5 (2019): 975-988

8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician

1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України
<http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України
<http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №4

Topic: Modern treatments of teeth anomalies.

Goal: student of the Faculty of Dentistry must clearly master the basic methods used in the treatment of dental-maxillofacial anomalies and deformities, know the biological, functional method. To be able to carry out preventive measures to prevent the occurrence of orthodontic pathology and draw up a plan for orthodontic treatment.

Basic concepts: in the process of mastering the material, the student must apply his knowledge on the periods of development of the ABA histological structure of hard tissues of temporary and permanent teeth, anatomical signs of different groups of temporary and permanent teeth.

To be able to determine the group belonging of temporary and permanent teeth.

Equipment: cephalometric analys, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test,**

frontal survey on basic terminology, etc.)

3. Questions (test tasks) to check basic knowledge on the topic of the seminar:

1. A teenager applied to an orthodontist complaining about tooth malposition.

Objectively: the face is without peculiarities. Occlusion of permanent teeth is present. There are no abnormalities of jaw correlation in three planes. The 23 tooth is vestibularly over the occlusal plane; the space in the dental arch is less than $\frac{1}{3}$ of crown size. How is it possible to make room for the malpositioned 23 tooth?

- A. To remove the 24 tooth
- B. To enlarge sagittal jaw dimensions
- C. To enlarge vertical dimensions
- D. To remove the 23 tooth
- E. To enlarge transversal jaw dimensions

2. A 12-years-old male patient consulted an orthodontist about disposition of canine. Objectively: the face is symmetric and proportional. In the oral cavity: permanent occlusion, occlusal relationship is orthognathic in the lateral parts, the 13 tooth is located off dentition on the palate, biometric measurements show that the width of the 13 tooth is 11,4 mm, the distance between the 12 and 14 teeth is 4,6 mm, the width of the 14 tooth is 7,6 mm. Suggest the treatment plan:

- A. Extract the 14 tooth and move the 13 tooth into its place
- B. Extraction of the 14 tooth
- C. Move the 13 tooth into its place without bite opening
- D. Open the bite and move the 13 tooth into its place
- E. No treatment is required

3. Examination of a 13-years-old patient allowed to make a final diagnosis: vestibular position of the 13 and 23 teeth with the total space deficit, narrowing of maxillary dental arch, tortoposition of the 12 and 22 teeth. To eliminate this pathology it was suggested to widen the dental arch and to extract some teeth. What teeth have orthodontic indication for their extraction?

- A. First premolars
- B. Second premolars
- C. First molars
- D. Canines

E. Second incisors

4. A 12-years-old patient presents with abnormal position of canine on the upper jaw. The 13 tooth is in the vestibular position, above the occlusal plane. Space between the 14 and the 12 tooth is 6,5 mm. Choose a rational treatment method:

- A. Surgical and instrumental
- B. Instrumental
- C. Surgical and physiotherapeutic
- D. Surgical and myogymnastics
- E. Instrumental and myogymnastic

5. A 17-years-old patient consulted an orthodontist about improper position of an upper canine. Objectively: permanent occlusion, class I Angles relationship of the first molars, the 13 tooth has vestibular position above the occlusal line, there is a 6,5 mm gap between the 14 and 12 teeth. What period of orthodontic treatment will reduce the time of lidasephonophoresis therapy?

- A. Active period
- B. Preparatory period
- C. Retention period
- D. Passive period E. -

6. Parents of a 12-years-old child consulted an orthodontist about improper position of the child's upper teeth. Objectively: the face is narrow, elongated; the developing occlusion is present (temporary second molars). The 13 and 23 teeth are located beyond the dental arch, they deviate to the lips above the occlusal plane, there is a 2,5 mm gap between the 12 and 14 teeth, and a 1,5 mm gap between the 22 and 24 ones, 45 degree rotation the 33 and 43 teeth is present. Choose the most rational method of treatment:

- A. Extraction of the premolars and relocation of the canines
- B. Extraction of temporary premolars and expansion of dental arches
- C. Expansion of dental arches in the region of canine apices
- D. Compact osteotomy and expansion of dental arches
- E. All the answers are wrong

7. A child is 7 years old. He has early transitional dentition. There is overcrowding of the lower front teeth: the 42 and 32 teeth erupted orally with a complete lack of space. Make a plan of treatment:

- A. Serial consecutive extraction by Hotz's method
- B. Extraction of the 41 and 31 teeth
- C. Extraction of the 84 and 74 teeth
- D. Extraction of the 83 and 73 teeth
- E. Extraction of the 42 and 32 teeth

8. Parents with a child 12- years -old complains about the absence of tooth on the upper jaw. In anamnesis: temporary tooth was removed at the age of 4 as a result of injury. Objectively: bite of permanent teeth, the 21 tooth is absent. The gap between 11 and 22 is 4 mm. On the X-ray: 21 is located at an angle of 45 degrees to 11.

Choose a rational method of treatment:

- A. Combination treatment method [surgical and apparatus]
- B. Surgical
- C. Physiotherapy
- D. Orthopedic
- E. Hardware

9. A 4-years-old child got a face trauma 2 hours ago. A dentist on duty made a diagnosis: intrusive luxation of the 61 tooth. What is the tactics of choice? A. Extraction of the 61 tooth

- B. Observation
- C. Reposition of the 61 tooth
- D. Splinting of the 61 tooth
- E. Removal of pulp of the 61 tooth

10. Parents of 4-years-old child complains about the defect of the language, the wrong pronunciation of the sound "R". Objectively: the tongue is limited to movements, when pushed forward pushes downward, the lower edge of the tongue bristle is attached to the front of the streaks of the submandibular salivary glands. The nipple is thin, clear. Specify the terms of surgery:

- A. After the diagnosis is established
- B. After the end of growth of maxillo-facial hips
- C. -
- D. After the formation of a permanent bite
- E. After eruption of permanent molars

4. Discussion of theoretical issues:

Methods for the treatment of dentoalveolar anomalies are divided into:

- Preventive
- Hardware
- Combined (physiotherapy and surgical methods of intensification)
- Surgical
- Prosthetic

In order to correct malocclusion or anomalies in the position of individual teeth, orthodontists mainly use the apparatus method of treatment. The main method is instrumental, all the rest are auxiliary. Orthodontic appliances are a source of force, applied to the tooth to be moved, and cause a certain tension in the periodontal tissues. There is a corresponding restructuring in all components of the periodontium - tissue of the alveoli, periodontal tissue, tooth cement and gums. Treatment is carried out with the help of special standard devices or devices made by a dental technician, called ortho-dontic devices.

Preventive treatments:

- Basic principles of prevention of dentoalveolar anomalies and deformities in children
 - - ensuring the optimal course of pregnancy;
 - - ensuring the correct technique of breastfeeding the child, timely introduction of bait, correct artificial feeding using an elastic nipple with a small opening, the transition to feeding from a spoon, cup, as well as the consumption of solid food from 10-11 months; - prevention of childhood and infectious diseases;
- elimination of bad habits by conducting sanitary educational work among parents, educators and children;

- normalization of the functions of sucking, swallowing, chewing, breathing; sanitation of the oral cavity, prevention of caries and its complications;
- elimination of anomalies of the frenulum of the lips and tongue, deepening of the bottom of the oral cavity;
- prevention of inflammatory processes in the maxillofacial region;
- timely removal of milk teeth;
- identification and clinical examination of children with early signs of dentoalveolar anomalies and deformities.

Preventive measures should be taken at all times during the growth and development of the child.

apparatus first method of treatment

The apparatus method of treatment consists in continuous, fragmentary or alternating pressure on the teeth, alveolar processes and jaws with the help of special mechanical devices called orthodontic appliances . The devices are activated by sliding screws, a spring wire, rubber rings, ligatures or efforts of the chewing or facial muscles, as well as changes in the movements of the lower jaw using occlusal or biting pads, inclined planes, labial pads, cheek shields.

Continuous acting force - pressure on the tooth without a resting phase, as a result of which hyalinization occurs. The forces must be weak. An alternating force is characteristic of the regular onset of the resting phase, due to the fact that the equipment is not worn for a certain time during the day, but bone resorption is currently continuing. Osteoblast activity does not stop after the end of the pressure phase.

The choice of orthodontic treatment is carried out taking into account the patient's age and the severity of the anomaly. During the period of milk and early bite, removable equipment is shown. In case of late changeable and permanent occlusion, it is also possible to use non-removable mechanical devices.

Orthodontic treatment stimulation methods

Stimulation of osteoreparation processes is a set of measures aimed at resorption of bone tissue of the alveolar process and the formation of new layers of bone in places that are not subject to pressure.

The mechanisms of stimulation of the processes of osteoreparation include: drug therapy, physiotherapy (massage, vacuum, use of various types of currents, magnetic and ultrasonic fields), surgical interventions in the area of the teeth being moved.

Surgical treatments

can be used both independently and in combination with the instrumental method for the treatment of tooth-jaw pathology. The main factor accelerating the remodeling of bone tissue is the intensity of enzymatic processes that develop after bone damage.

Surgical methods can be divided into the following groups:

- a) on soft tissues:

- - plastic bridle

- - move the city of attachment of the bridle

- - plastic in the area of the mucous membrane

- - deepening of the vestibule of the oral cavity

- - alignment of the supramental skin fold b) on the teeth and dentition:

- - exposure of the crown of a ratinated tooth

- The separation of I the teeth in,

- removal of supernumerary and individual complete teeth; c) on the alveolar bone

- compactosteotomy d) on the jaws:

- osteotomy

- osteoctomy

2) a prosthetic treatment method.

If it is impossible to correct dentoalveolar pathology by orthodontic methods, prosthetics are sometimes used according to specific indications in accordance with age and pathology .

Clinical examination in orthodontics

Clinical examination - the system of work of medical institutions in our country ensures the prevention of diseases, their early detection and treatment with systematic observation of patients. It is carried out by district children's dental clinics and in particular by an orthodontist, who

is allocated a preventive day a week. Held in organized childcare facilities.

The first stage is registration of all children. Age, gender and general health are taken into account.

The second stage is a specialized examination of each child.

The third stage is their distribution among dispensary groups.

The fourth stage is monitoring patients, sanitizing the oral cavity, conducting hygiene lessons and other mass preventive measures.

The fifth stage is the study of the effectiveness of orthodontic medical examination. The complex of therapeutic and prophylactic measures planned during the examination of the child is registered in the medical examination card, after which the children are assigned to dispensary groups. Osadchy identified 4 dispensary groups:

The 1st group includes children with correct closure of the lips, normal functioning of the dentoalveolar apparatus and correct bite. These are practically healthy children, they are examined once a year.

The 2nd group includes children with risk factors, that is, with functional disorders of breathing, swallowing, speech, chewing, facial expressions, bad habits, having shortened frenulum of the lips, and a shallow vestibule of the mouth. In such children, it is necessary to eliminate the causes of deviations and create favorable conditions for the normal growth of the jaws and the formation of the bite . Sanitation of the oral cavity is carried out, methods of combating bad habits, therapeutic myogymnastics, consultation of specialists are recommended: ENT, orthopedist, pediatrician, etc. such children should be supervised by parents and educators,

medical personnel of the children's institution. An orthodontist's review is half a year. The 3rd group includes children with mild morphological changes and anomalies in the position of teeth or their groups, changes in the shape of dental arches, malocclusion caused by functional changes. To assist such children, measures are taken to eliminate the cause of the development of violations, including the use of orthodontic appliances. After treatment, observation is carried out once a year. Up to 4 dispensary groups include children with pronounced changes in the dentition. Impaired breathing, swallowing, speech, biting and chewing food. Such children need specialized help in complex therapeutic measures, leading to the normal function of the dentition and the whole organism. The choice of orthodontic apparatus for the treatment of various dentoalveolar anomalies is carried out taking into account the patient's age and the severity of the anomaly. During the period of milk and early bite, mainly removable equipment is shown. With a late changeable and permanent bite, you can also use non-removable mechanical devices, especially with pronounced anomalies.

5. Topics of reports/abstracts:

1. What dispensary groups do you know?
2. What is the prevention of HSPA & D?
3. What groups can be divided into orthodontic treatment methods?

6. Summarizing the information received at the lesson.

7. List of recommended literature:

Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.

4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician
1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України
<http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України
<http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №5

Topic: Etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of tooth abnormalities (color, hard tissue structure, shape, size),

number of dental anomalies (adentia, supernumerary teeth). Features orthopedic treatment of multiple adentia. Prospects for implantation in adentia.

Goal: to study etiology, pathogenesis, clinics, diagnostics, treatment and prevention of teeth position anomalies. Features of treatment of dystopia of canines and torotoanomalies.

Basic concepts: Etiology, pathogenesis, clinics, diagnostics, treatment and prevention of teeth position anomalies. Features of treatment of dystopia of canines and torotoanomalies.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. . Parents of Olga M. (7 years old) noticed that the her central incisors are erupting orally and primary teeth are already fell out. What reason could lead to the location of the teeth? A - Rachitis.

B - Speech pathology.

C -supernumerary tooth.

Ans. C.

D -Primary central incisors.

E -Adentia.

2. Which teeth abnormalities can cause the early removal of milky canine, if the permanent canine germ is present?

A – Makrodentia of the canine.

B – Adentia.

C – Dystopia of the canine

Ans. C.

D –

Prognathism.

E – Progenia.

3. What anomaly of teeth can occur because of the syphilis of a newborn? A – The anomaly of the crown shape.

B – Dental retention.

C – Diastem.

Ans. A.

D –

Prognathism.

E – Progenia.

4. During the routine inspection of a 4.5 years old child revealed premature absence of upper molars. The lower incisors are in the contact with the mucous membrane of the palate. Determine the tactics of the doctor?

A – To make a removable laminar dental prosthesis.

B – To observe 1 time per year till the eruption of permanent teeth.

C – To observe every 6 months till the eruption of permanent teeth.

D – To provide a miogymnastics.

E – Medical intervention is not required.

Ans. A

5. A girl of 8 years old does not have the 12 and the 22 teeth. There is no place for them in the dental arch. There are no germs of these teeth on the X-Ray. The girl's father does not have the 12 tooth, and his 22 tooth is spicular. What is the etiology of this pathology?.

A. Caries.

B. Teeth extraction.

C. Heredity.

Ans. C

D. Trauma.

E. Bad habits.

6. Parents with a child of 3 years addressed to the orthodontist. In anamnesis: severe toxicosis during pregnancy of the mother, the baby was born premature. Objectively: the child is astenic, stooping, with the elongated face, the mouth is half opened. The upper incisors protrude from under the lip. Enamel hypoplasia of incisors is observed. Identify the leading causative factor of the anomaly.

A. Rachitis.

B. Bad habits.

C. The pathology of pregnancy.

D. Incorrect posture.

E. The mouth breathing.

Ans. C

7. A girl of 8 years old has dark yellowish permanent first molars and incisors. There are all teeth and germs on the X-Ray. A girl's father does not have the 12 tooth. Tell the possible etiological factor of the pathology.

A – Receiving of antibiotics. Y.- Teeth extraction.

C.- Heredity.

D.- Trauma.

E.- Rickets

Ans.A

8. A 9 years old boy's mother appealed a doctor with complaints on fast erosion of his frontal teeth crowns. Objectively: the crowns of the frontal teeth are eroded on $\frac{3}{4}$ of their length, the enamel is dirty-gray. Choose the most possible diagnosis..

A. The Steinton-Capdepon's syndrome .

B. The pathological teeth erosion.

C. The acid teeth dissolution.

D. The amelogenesis imperfecta.

E. The dentinogenesis imperfecta.

Ans. A

9. The parents of the 5 years old girl appealed to the orthodontist with complaints on slow food mastication. Anamnesis: primary molars on the lower jaw were extracted because of caries complications at the age of 3. Objectively: the lower one third of the face is short, a deep supra-mental sulcus is observed, 85, 84, 74, 75 teeth are absent. The distal occlusion complicated with the deep one is forming. Which method of treatment is the most important on the first stage?

A. Prosthetic.

B. Instrumental.

C. Surgical.

D. Surgical-instrumental.

E. Biological.

Ans. A

10. The parents of the 9 years old boy applied with complaints on defects of the frontal teeth crowns. Objectively: there are fosses, strips and brown spots on the enamel of the frontal teeth. Choose the most possible diagnosis.

A. Fluorosis.

B. The pathological teeth erosion.

C. The acid teeth dissolution. D. The amelogenesis imperfecta. E. The dentinogenesis imperfecta.

Ans. A

11. The parents of the 19 years old boy applied with complains on the aesthetic shortage: overcrowding of teeth on the upper and lower jaws. Objectively: the sum of mesio-distal sizes of the 4 upper incisors is 40mm. Choose the most possible diagnosis. A. The enamel hyperplasia of the upper incisors.

B. The enamel hypoplasia of the upper incisors.

C. Fluorosis

D. Macrodontia.

E. Microdontia.

Ans. D.

4. Discussion of theoretical issues:

Protrusion of frontal teeth –or teeth inclination, often on the upper jaw to the middle of dental arch.

Etiology. This anomaly arises from the delay of change of milk incisors, presence of supernumerary teeth, lack of space in the dental row for permanent teeth and so on.

The clinical picture. Protrudent teeth lead to a lengthening of the anterior segment of the dental arch, the appearance of diastems between the teeth or their close location without closing the lips, functional and aesthetic violations.

Treatment. To treat some protrusion of the front teeth removable and non-removable orthodontic appliances can be used. Removable - plate with vestibular arc and different designs for teeth retrusion, with hooks on the first premolars and pulling on rubber rings.

Vestibular position of canines is often an isolated form of an independent anomalies of teeth, which can occur in different types of bite. This anomaly can be indicated with different terms: high standing of upper canines (G.A. Anderson), vestibular position of canines (L.E. Olikier) and oth. The clinical picture. Vestibular position of canines, especially on the upper jaw, causes aesthetic disorders, conversation and smile disorders, complicates closing of lips:

Treatment. The main methods of treatment of vestibular position of canines: lateral movement of distal teeth, mesial movement of the incisors, the expansion of the dental arches, removing of some teeth, often first premolars, and movement of canines in the distal direction to the vacant place. For the treatment removable and non-removable mechanically active orthodontic appliances can be used, with removable devices - plate with springs, including springs "double traction" levers vestibular arcs (different designs), with fixed - apparatus Engle rubber or other

ligature thrust. Mesio-position of teeth, or inclination of teeth to the front of the dental arch. Both frontal and lateral teeth may be displaced.

The clinical picture. As a result of mesial shift of lateral teeth the tooth row can be shortened, place in the dental arch for the permanent incisors, canines and premolars decreases (sometimes is absent), which causes the eruption of some teeth outside the dental arch and their retention. Treatment. Treatment of such anomalies produces by performance: 1) removing of some teeth (first premolars as often); 2) expansion of the dental arches; 3) the lateral movement of incisors and distal movement of the lateral teeth. For distal movement of molars and premolars removable and nonremovable orthodontic devices operating mechanically are used. Anomalies of the teeth in the vertical direction.

Supra- and infraposition of teeth, or their irregular location in the vertical direction is determined in relation to the occlusal plane.

Supraposition of teeth on the upper jaw, infraposition of teeth on the lower jaw. The upper jaw teeth in supraposition when teeth don't reach the occlusal plane, usually the incisors and canines, including their vestibular location.

Etiology. Incomplete tooth eruption may be caused by lack of space for the tooth in the dental row, bad habits, mechanical obstacle of eruption (odontoma, supernumerary teeth, and others.). Violation of the formation of a tooth root or alveolar process and other reasons.

The clinical picture. Dentoalveolar shortening in the region of one, two teeth, abuse nibble of food, irregular location of the frontal teeth. Fuzzy audio pronunciation of certain phonemes, abuse aesthetics of face and smile.

Treatment. Most designs of orthodontic appliances designed for pulling of semiretained teeth, usually the incisors and canines. After creating a number of places in the tooth arch for the tooth to be moving, strengthen the ring with a hook, clip or the other pole. If the dentoalveolar shortening is combined with sagittal and transversal malocclusions, to the construction of apparatus add devices for dentoalveolar protrusion of some teeth.

Infraposition of teeth on the upper jaw, lower jaw teeth are in supraposition, when teeth of the upper and lower jaws crossing the occlusal plane. This anomaly can be observed both in front and in the lateral areas of the dentition

Etiology. The anomaly may develop after the early loss of the opposite teeth, partial adentia and retention of some teeth.

The clinical picture. Dentoalveolar extension in the closing violates individual teeth of dentition, often causes functional overload of separate teeth during the lower jaw movements and periodontal disease.

Treatment. For the dentoalveolar shortening devices that increase pressure in the vertical direction on the wrong tooth can be used, or a plate of springs, buttons, hooks, with a biting platform that separates the remaining teeth.

Tortoposition of teeth that rotate on their longitudinal axis. Most of all incisors and canines turns. Etiology. The rotation of teeth may be caused by the insufficiency of space in the alveolar ridge and teeth row as a result of narrowing of the dental arches, makrodonia (absolute or individual), mesial shift of teeth, presence of supernumerary teeth that prevent the correct installation of individual teeth, bad habits, etc..

The clinical picture. Teeth, rotated on an axis, may be located in the dental arch or beyond it. The extent of their rotation could be different; more frequent is the rotation of 45 °.

Treatment. After creating of space in the dental arch returned to the axis of the tooth set it to the correct position using removable or non-removable orthodontic appliances using two opposing forces. If there is contact with the teeth transported antagonists should be divide by the bite using platform, occlusal overlays.

5.

Topics of reports/abstracts:

1. What is dystopy?
2. What is tortoposition?
3. What is transposition?
4. What is the plan of tortoposition and transposition treatment?
4. What is the plan of canines dystopy treatment?
5. What is the etiology of teeth position anomalies?

6. **Summarizing the information received at the lesson.**

7. **List of recommended literature:** Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України <http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №6

Topic: Etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention eruption of tooth. Clinical forms impacted teeth. Types of tooth impacted, characteristics and prognosis of orthodontic treatment.

Goal: to study etiology, pathogenesis, clinics, diagnostics, treatment and prevention of teeth position anomalies. Features of treatment of dystopia of canines and torotoanomalies.

Basic concepts: Etiology, pathogenesis, clinics, diagnostics, treatment and prevention of teeth position anomalies. Features of treatment of dystopia of canines and torotoanomalies.

Equipment: cephalometric analis, plaster models, typodonts, panoramic x-rays.

Plan

4. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
5. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
6. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. . Parents of Olga M. (7 years old) noticed that the her central incisors are erupting orally and primary teeth are already fell out. What reason could lead to the location of the teeth? A - Rachitis.

F - Speech pathology.

G -supernumerary tooth.

Ans. C.

H -Primary central incisors.

I -Adentia.

2. Which teeth abnormalities can cause the early removal of milky canine, if the permanent canine germ is present?

A – Makrodentia of the canine.

B – Adentia.

C – Dystopia of the canine

Ans. C.

D –
Prognathism.
E – Progenia.

3. What anomaly of teeth can occur because of the syphilis of a newborn? A – The anomaly of the crown shape.

B – Dental retention.

C – Diastem.

Ans. A.

D –

Prognathism.

E – Progenia.

4. During the routine inspection of a 4.5 years old child revealed premature absence of upper molars. The lower incisors are in the contact with the mucous membrane of the palate. Determine the tactics of the doctor?

A – To make a removable laminar dental prosthesis.

B – To observe 1 time per year till the eruption of permanent teeth.

C – To observe every 6 months till the eruption of permanent teeth.

D – To provide a miogymnastics.

E – Medical intervention is not required.

Ans. A

5. A girl of 8 years old does not have the 12 and the 22 teeth. There is no place for them in the dental arch. There are no germs of these teeth on the X-Ray. The girl's father does not have the 12 tooth, and his 22 tooth is spicular. What is the etiology of this pathology?.

A. Caries.

B. Teeth extraction.

C. Heredity.

Ans. C

D. Trauma.

E. Bad habits.

12. Parents with a child of 3 years addressed to the orthodontist. In anamnesis: severe toxicosis during pregnancy of the mother, the baby was born premature. Objectively: the child is astenic, stooping, with the elongated face, the mouth is half opened. The upper incisors protrude from under the lip. Enamel hypoplasia of incisors is observed. Identify the leading causative factor of the anomaly.

A. Rachitis.

B. Bad habits.

C. The pathology of pregnancy.

D. Incorrect posture.

E. The mouth breathing.

Ans. C

13. A girl of 8 years old has dark yellowish permanent first molars and incisors. There are all teeth and germs on the X-Ray. A girl's father does not have the 12 tooth. Tell the possible etiological factor of the pathology.

A – Receiving of antibiotics. Y.- Teeth extraction.

C.- Heredity.

D.- Trauma.

E.- Rickets

Ans.A

14. A 9 years old boy's mother appealed a doctor with complains on fast erosion of his frontal teeth crowns. Objectively: the crowns of the frontal teeth are eroded on $\frac{3}{4}$ of their length, the enamel is dirty-gray. Choose the most possible diagnosis..

A. The Steinton-Capdepon's syndrome .

B. The pathological teeth erosion.

C. The acid teeth dissolution.

D. The amelogenesis imperfecta.

E. The dentinogenesis imperfecta.

Ans. A

15. The parents of the 5 years old girl appealed to the orthodontist with complains on slow food mastication. Anamnesis: primary molars on the low jaw were extracted because of caries complications at the age of 3. Objectively: the lower one third of the face is short, a deep supra-mental sulcus is observed, 85, 84, 74, 75 teeth are absent. The distal occlusion complicated with the deep one is forming. Which method of treatment is the most important on the first stage?

A. Prosthetic.

B. Instrumental.

C. Surgical.

D. Surgical-instrumental.

E. Biological.

Ans. A

16. The parents of the 9 years old boy applied with complains on defects of the frontal teeth crowns. Objectively: there are fosses, strips and brown spots on the enamel of the frontal teeth. Choose the most possible diagnosis.

A. Fluorosis.

B. The pathological teeth erosion.

C. The acid teeth dissolution. D. The amelogenesis imperfecta. E. The dentinogenesis imperfecta.

Ans. A

17. The parents of the 19 years old boy applied with complains on the aesthetic shortage: overcrowding of teeth on the upper and lower jaws. Objectively: the sum of mesio-distal sizes of the 4 upper incisors is 40mm. Choose the most possible diagnosis. A. The enamel hyperplasia of the upper incisors.

B. The enamel hypoplasia of the upper incisors.

C. Fluorosis

D. Macrodontia.

E. Microdontia.

Ans. D.

4. Discussion of theoretical issues:

Protrusion of frontal teeth –or teeth inclination, often on the upper jaw to the middle of dental arch.

Etiology. This anomaly arises from the delay of change of milk incisors, presence of supernumerary teeth, lack of space in the dental row for permanent teeth and so on.

The clinical picture. Protrudent teeth lead to a lengthening of the anterior segment of the dental arch, the appearance of diastems between the teeth or their close location without closing the lips, functional and aesthetic violations.

Treatment. To treat some protrusion of the front teeth removable and non-removable orthodontic appliances can be used. Removable - plate with vestibular arc and different designs for teeth retrusion, with hooks on the first premolars and pulling on rubber rings.

Vestibular position of canines is often an isolated form of an independent anomalies of teeth, which can occur in different types of bite. This anomaly can be indicated with different terms: high standing of upper canines (G.A. Anderson), vestibular position of canines (L.E. Olikier) and oth. The clinical picture. Vestibular position of canines, especially on the upper jaw, causes aesthetic disorders, conversation and smile disorders, complicates closing of lips:

Treatment. The main methods of treatment of vestibular position of canines: lateral movement of distal teeth, mesial movement of the incisors, the expansion of the dental arches, removing of some teeth, often first premolars, and movement of canines in the distal direction to the vacant place. For the treatment removable and non-removable mechanically active orthodontic appliances can be used, with removable devices - plate with springs, including springs "double traction" levers vestibular arcs (different designs), with fixed - apparatus Engle rubber or other

ligature thrust. Mesio-position of teeth, or inclination of teeth to the front of the dental arch. Both frontal and lateral teeth may be displaced.

The clinical picture. As a result of mesial shift of lateral teeth the tooth row can be shortened, place in the dental arch for the permanent incisors, canines and premolars decreases (sometimes is absent), which causes the eruption of some teeth outside the dental arch and their retention. Treatment. Treatment of such anomalies produces by performance: 1) removing of some teeth (first premolars as often); 2) expansion of the dental arches; 3) the lateral movement of incisors and distal movement of the lateral teeth. For distal movement of molars and premolars removable and nonremovable orthodontic devices operating mechanically are used. Anomalies of the teeth in the vertical direction.

Supra- and infraposition of teeth, or their irregular location in the vertical direction is determined in relation to the occlusal plane.

Supraposition of teeth on the upper jaw, infraposition of teeth on the lower jaw. The upper jaw teeth in supraposition when teeth don't reach the occlusal plane, usually the incisors and canines, including their vestibular location.

Etiology. Incomplete tooth eruption may be caused by lack of space for the tooth in the dental row, bad habits, mechanical obstacle of eruption (odontoma, supernumerary teeth, and others.). Violation of the formation of a tooth root or alveolar process and other reasons.

The clinical picture. Dentoalveolar shortening in the region of one, two teeth, abuse nibble of food, irregular location of the frontal teeth. Fuzzy audio pronunciation of certain phonemes, abuse aesthetics of face and smile.

Treatment. Most designs of orthodontic appliances designed for pulling of semiretained teeth, usually the incisors and canines. After creating a number of places in the tooth arch for the tooth to be moving, strengthen the ring with a hook, clip or the other pole. If the dentoalveolar shortening is combined with sagittal and transversal malocclusions, to the construction of apparatus add devices for dentoalveolar protrusion of some teeth.

Infraposition of teeth on the upper jaw, lower jaw teeth are in supraposition, when teeth of the upper and lower jaws crossing the occlusal plane. This anomaly can be observed both in front and in the lateral areas of the dentition

Etiology. The anomaly may develop after the early loss of the opposite teeth, partial adentia and retention of some teeth.

The clinical picture. Dentoalveolar extension in the closing violates individual teeth of dentition, often causes functional overload of separate teeth during the lower jaw movements and periodontal disease.

Treatment. For the dentoalveolar shortening devices that increase pressure in the vertical direction on the wrong tooth can be used, or a plate of springs, buttons, hooks, with a biting platform that separates the remaining teeth.

Tortoposition of teeth that rotate on their longitudinal axis. Most of all incisors and canines turns. Etiology. The rotation of teeth may be caused by the insufficiency of space in the alveolar ridge and teeth row as a result of narrowing of the dental arches, makrodonia (absolute or individual), mesial shift of teeth, presence of supernumerary teeth that prevent the correct installation of individual teeth, bad habits, etc..

The clinical picture. Teeth, rotated on an axis, may be located in the dental arch or beyond it. The extent of their rotation could be different; more frequent is the rotation of 45 °.

Treatment. After creating of space in the dental arch returned to the axis of the tooth set it to the correct position using removable or non-removable orthodontic appliances using two opposing forces. If there is contact with the teeth transported antagonists should be divide by the bite using platform, occlusal overlays.

5.

Topics of reports/abstracts:

5. What is dystopy?
6. What is tortoposition?
7. What is transposition?
8. What is the plan of tortoposition and transposition treatment?
6. What is the plan of canines dystopy treatment?
7. What is the etiology of teeth position anomalies?

8. Summarizing the information received at the lesson.

9. List of recommended literature: Main:

5. Lectures on the relevant topic.
6. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
7. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
8. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

5. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
6. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
7. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
8. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
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8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
5. Національна наукова медична бібліотека України <http://library.gov.ua/>
6. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №7

Topic: Etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of tooth position anomalies. Features of treatment of dystopia of canines and toroto-anomalities.

Goal: to study etiology, pathogenesis, clinics, diagnostics, treatment and prevention of teeth position anomalies. Features of treatment of dystopia of canines and torotoanomalies.

Basic concepts: Etiology, pathogenesis, clinics, diagnostics, treatment and prevention of teeth position anomalies. Features of treatment of dystopia of canines and torotoanomalies.

Equipment: cephalometric analis, plaster models, typodonts, panoramic x-rays.

Plan

7. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
8. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
9. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. . Parents of Olga M. (7 years old) noticed that the her central incisors are erupting orally and primary teeth are already fell out. What reason could lead to the location of the teeth? A - Rachitis.

J - Speech pathology.

K -supernumerary tooth.

Ans. C.

L -Primary central incisors.

M-Adentia.

2. Which teeth abnormalities can cause the early removal of milky canine, if the permanent canine germ is present?

A – Makrodentia of the canine.

B – Adentia.

C – Dystopia of the canine

Ans. C.

D –
Prognathism.
E – Progenia.

3. What anomaly of teeth can occur because of the syphilis of a newborn? A – The anomaly of the crown shape.

B – Dental retention.

C – Diastem.

Ans. A.

D –

Prognathism.

E – Progenia.

4. During the routine inspection of a 4.5 years old child revealed premature absence of upper molars. The lower incisors are in the contact with the mucous membrane of the palate. Determine the tactics of the doctor?

A – To make a removable laminar dental prosthesis.

B – To observe 1 time per year till the eruption of permanent teeth.

C – To observe every 6 months till the eruption of permanent teeth.

D – To provide a miogymnastics.

E – Medical intervention is not required.

Ans. A

5. A girl of 8 years old does not have the 12 and the 22 teeth. There is no place for them in the dental arch. There are no germs of these teeth on the X-Ray. The girl's father does not have the 12 tooth, and his 22 tooth is spicular. What is the etiology of this pathology?.

A. Caries.

B. Teeth extraction.

C. Heredity.

Ans. C

D. Trauma.

E. Bad habits.

18. Parents with a child of 3 years addressed to the orthodontist. In anamnesis: severe toxicosis during pregnancy of the mother, the baby was born premature. Objectively: the child is astenic, stooping, with the elongated face, the mouth is half opened. The upper incisors protrude from under the lip. Enamel hypoplasia of incisors is observed. Identify the leading causative factor of the anomaly.

A. Rachitis.

B. Bad habits.

C. The pathology of pregnancy.

D. Incorrect posture.

E. The mouth breathing.

Ans. C

19. A girl of 8 years old has dark yellowish permanent first molars and incisors. There are all teeth and germs on the X-Ray. A girl's father does not have the 12 tooth. Tell the possible etiological factor of the pathology.

A – Receiving of antibiotics. Y.- Teeth extraction.

C.- Heredity.

D.- Trauma.

E.- Rickets

Ans.A

20. A 9 years old boy's mother appealed a doctor with complains on fast erosion of his frontal teeth crowns. Objectively: the crowns of the frontal teeth are eroded on $\frac{3}{4}$ of their length, the enamel is dirty-gray. Choose the most possible diagnosis..

A. The Steinton-Capdepon's syndrome .

B. The pathological teeth erosion.

C. The acid teeth dissolution.

D. The amelogenesis imperfecta.

E. The dentinogenesis imperfecta.

Ans. A

21. The parents of the 5 years old girl appealed to the orthodontist with complains on slow food mastication. Anamnesis: primary molars on the lower jaw were extracted because of caries complications at the age of 3. Objectively: the lower one third of the face is short, a deep supraorbital sulcus is observed, 85, 84, 74, 75 teeth are absent. The distal occlusion complicated with the deep one is forming. Which method of treatment is the most important on the first stage?

A. Prosthetic.

B. Instrumental.

C. Surgical.

D. Surgical-instrumental.

E. Biological.

Ans. A

22. The parents of the 9 years old boy applied with complains on defects of the frontal teeth crowns. Objectively: there are fosses, strips and brown spots on the enamel of the frontal teeth. Choose the most possible diagnosis.

A. Fluorosis.

B. The pathological teeth erosion.

C. The acid teeth dissolution. D. The amelogenesis imperfecta. E. The dentinogenesis imperfecta.

Ans. A

23. The parents of the 19 years old boy applied with complains on the aesthetic shortage: overcrowding of teeth on the upper and lower jaws. Objectively: the sum of mesio-distal sizes of the 4 upper incisors is 40mm. Choose the most possible diagnosis. A. The enamel hyperplasia of the upper incisors.

B. The enamel hypoplasia of the upper incisors.

C. Fluorosis

D. Macrodonia.

E. Microdonia.

Ans. D.

4. Discussion of theoretical issues:

Protrusion of frontal teeth –or teeth inclination, often on the upper jaw to the middle of dental arch.

Etiology. This anomaly arises from the delay of change of milk incisors, presence of supernumerary teeth, lack of space in the dental row for permanent teeth and so on.

The clinical picture. Protrudent teeth lead to a lengthening of the anterior segment of the dental arch, the appearance of diastems between the teeth or their close location without closing the lips, functional and aesthetic violations.

Treatment. To treat some protrusion of the front teeth removable and non-removable orthodontic appliances can be used. Removable - plate with vestibular arc and different designs for teeth retrusion, with hooks on the first premolars and pulling on rubber rings.

Vestibular position of canines is often an isolated form of an independent anomalies of teeth, which can occur in different types of bite. This anomaly can be indicated with different terms: high standing of upper canines (G.A. Anderson), vestibular position of canines (L.E. Olikier) and oth. The clinical picture. Vestibular position of canines, especially on the upper jaw, causes aesthetic disorders, conversation and smile disorders, complicates closing of lips:

Treatment. The main methods of treatment of vestibular position of canines: lateral movement of distal teeth, mesial movement of the incisors, the expansion of the dental arches, removing of some teeth, often first premolars, and movement of canines in the distal direction to the vacant place. For the treatment removable and non-removable mechanically active orthodontic appliances can be used, with removable devices - plate with springs, including springs "double traction" levers vestibular arcs (different designs), with fixed - apparatus Engle rubber or other

ligature thrust. Mesio-position of teeth, or inclination of teeth to the front of the dental arch. Both frontal and lateral teeth may be displaced.

The clinical picture. As a result of mesial shift of lateral teeth the tooth row can be shortened, place in the dental arch for the permanent incisors, canines and premolars decreases (sometimes is absent), which causes the eruption of some teeth outside the dental arch and their retention. Treatment. Treatment of such anomalies produces by performance: 1) removing of some teeth (first premolars as often); 2) expansion of the dental arches; 3) the lateral movement of incisors and distal movement of the lateral teeth. For distal movement of molars and premolars removable and nonremovable orthodontic devices operating mechanically are used. Anomalies of the teeth in the vertical direction.

Supra- and infraposition of teeth, or their irregular location in the vertical direction is determined in relation to the occlusal plane.

Supraposition of teeth on the upper jaw, infraposition of teeth on the lower jaw. The upper jaw teeth in supraposition when teeth don't reach the occlusal plane, usually the incisors and canines, including their vestibular location.

Etiology. Incomplete tooth eruption may be caused by lack of space for the tooth in the dental row, bad habits, mechanical obstacle of eruption (odontoma, supernumerary teeth, and others.). Violation of the formation of a tooth root or alveolar process and other reasons.

The clinical picture. Dentoalveolar shortening in the region of one, two teeth, abuse nibble of food, irregular location of the frontal teeth. Fuzzy audio pronunciation of certain phonemes, abuse aesthetics of face and smile.

Treatment. Most designs of orthodontic appliances designed for pulling of semiretained teeth, usually the incisors and canines. After creating a number of places in the tooth arch for the tooth to be moving, strengthen the ring with a hook, clip or the other pole. If the dentoalveolar shortening is combined with sagittal and transversal malocclusions, to the construction of apparatus add devices for dentoalveolar protrusion of some teeth.

Infraposition of teeth on the upper jaw, lower jaw teeth are in supraposition, when teeth of the upper and lower jaws crossing the occlusal plane. This anomaly can be observed both in front and in the lateral areas of the dentition

Etiology. The anomaly may develop after the early loss of the opposite teeth, partial adentia and retention of some teeth.

The clinical picture. Dentoalveolar extension in the closing violates individual teeth of dentition, often causes functional overload of separate teeth during the lower jaw movements and periodontal disease.

Treatment. For the dentoalveolar shortening devices that increase pressure in the vertical direction on the wrong tooth can be used, or a plate of springs, buttons, hooks, with a biting platform that separates the remaining teeth.

Tortoposition of teeth that rotate on their longitudinal axis. Most of all incisors and canines turns. Etiology. The rotation of teeth may be caused by the insufficiency of space in the alveolar ridge and teeth row as a result of narrowing of the dental arches, makrodonia (absolute or individual), mesial shift of teeth, presence of supernumerary teeth that prevent the correct installation of individual teeth, bad habits, etc..

The clinical picture. Teeth, rotated on an axis, may be located in the dental arch or beyond it. The extent of their rotation could be different; more frequent is the rotation of 45 °.

Treatment. After creating of space in the dental arch returned to the axis of the tooth set it to the correct position using removable or non-removable orthodontic appliances using two opposing forces. If there is contact with the teeth transported antagonists should be divide by the bite using platform, occlusal overlays.

5.

Topics of reports/abstracts:

9. What is dystopy?
10. What is tortoposition?
11. What is transposition?
12. What is the plan of tortoposition and transposition treatment?
8. What is the plan of canines dystopy treatment?
9. What is the etiology of teeth position anomalies?

10. Summarizing the information received at the lesson.

11. List of recommended literature: Main:

9. Lectures on the relevant topic.
10. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
11. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
12. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

9. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
10. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
11. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
12. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
7. Національна наукова медична бібліотека України <http://library.gov.ua/>
8. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №8

Topic: Etiology, pathogenesis, clinics, diagnostics, treatment and prevention of dentition pathology.

Goal: to know the learning material about this pathology, must know the etiology, pathogenesis, clinics, diagnostics, treatment and prevention of teeth position anomalies, the treatment of canines disposition and teeth torsions.

Basic concepts: Etiology, pathogenesis, clinics, diagnostics, treatment and prevention of dentition pathology.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. Patient D.13 years old. Diagnosis: distopia of 13.
There is not enough place in the dental arch for the 13 tooth. Measuring of diagnostic models by Pon and Korkhaus showed decreasing of premolars and molars indexes on 2 and 3mm. The length of the frontal part of the dental arch is normal.

Name the possible reason for the pathology. Tell the stages of treatment and recommended apparatus.

2. The parents of a 9 years old child appealed to the orthodontist complaining at lack of the 11 tooth, and rotation around a vertical axis of the 21 tooth. From the anamnesis revealed that at the age of six she fell and hit her face. The 21 tooth erupted in time. There is enough place for the 11

tooth in the dental arch.

Complete the examination of the patient. Put the preliminary diagnosis.
Outline a treatment plan

3. The parents of a 10 years old child approached the orthodontist with complaints at overcrowding of teeth on the upper jaw. The 11 and the 21 are turned around the vertical axis with the presence of diastema, lateral incisors are situated vestibularly. From the anamnesis it is revealed that in the period of aging of the milk occlusion there were no diastema and diastema in the frontal area of the upper and lower jaws.

Complete the examination of the patient. Put the preliminary diagnosis. Outline a treatment plan

4. The parents of a 7 years old child appealed to the orthodontist with complaints of disturbed pronunciation of certain sounds. An examination of the patient revealed: the lack of 12,11,21,22 teeth. In conversation with the child estimated that he paves the tip of the tongue between the upper and the lower alveolar ridge.

Complete the examination of the patient. Put the preliminary diagnosis. Outline a treatment plan

5. The mother with the girl of '12 addressed to the orthodontist with complains at plainness of the two frontal teeth. During the examination of the oral cavity revealed that 11 and 12 teeth are colored in the intense yellow color that is not normal, and have the defect of their enamel.

What reason could lead to such anomalies?

What is the tactics of the orthodontist in the case?

4. Discussion of theoretical issues:

Relatively to the three perpendicular axes the following dental arch anomalies are known. In the transversal direction: 1) narrowing of teeth archs; 2) widening of teeth archs. In the sagittal direction: 1) lengthening of dental archs; 2) shortening of dental archs. In the vertical direction: 1) dento-alveolar shortening in separate segments of dental archs; 2) dento-alveolar widening in separate segments of dental archs.

Dental arch anomalies in the transversal direction.

The narrowing of dental archs is defined by the change of their shape (decreasing of the distance between the middle and lateral teeth. The upper tooth arch shape

anomaly is determined according to the median palatine suture, of the lower one – by the midline.

Etiology. Basic factors of the narrowing of teeth archs and their apical basis are: the complicated nose or mouth breathing, violations of functions of the tongue, swallowing, mimic and masticatory muscles. The idle chewing of food on one side does not stimulate the growth of jaws.

Clinics. The narrowing of teeth archs can be observed at neutral, distal or mesial occlusion of lateral teeth.

Treatment. After the measuring of the width of the dental arc in the region of premolars and molars the received number compare with the individual norm. It helps to find out the treatment method. A doctor takes into account the following factors: 1) the lateral teeth occlusion (neutral, distal, mesial); 2) the dental arc narrowing; 3) the lateral teeth position; 4) if the active jaw growth completed; 5) if it is possible to improve the situation by orthodontics methods, or it will be necessary to use additional treatment methods.

The treatment is orthodontic, or orthodontic in combination with surgical one.

The wideness of dental arcs. The etiology of the anomaly is: bad habits, wrong dental germs position, late primary teeth change; macrognathia, macroglossia, displacement of the lower jaw aside. Clinics. A more rear anomaly, it can be one-sided, double-sided, symmetric, asymmetric, on one or both jaws, with or without dental rows occlusion.

The treatment is orthodontic, or orthodontic in combination with surgical one.

Elongation of dental arcs can be determined by their total length and the frontal dental arc part length.

Etiology. The pathology is a result of nose breathing, mouth breathing, bad habits, macrodontia, supernumerary teeth in the dental arc, wrong articulation of the tongue and frontal teeth.

Clinics. The frontal teeth project under the upper lip, with spaces between them, closely situated teeth are possible. The anomaly often combines with sagittal, transversal and vertical anomalies of occlusion.

The treatment is orthodontic, or orthodontic in combination with surgical one.

The dental arc shortening can be reached by the mesial moving of lateral teeth after extraction of some premolars.

The dental arc shortening can be defined by their total length and the frontal dental arc part length. Etiology. The dental arc shortening can be the result of the teeth shape anomaly, size and number anomaly, position teeth anomaly, jaw hypoplasia, bad habits.

Clinics. Often teeth congestion is observed, pushing of some teeth from the dental arc, some teeth retention. The pathology can be one-sided or double-sided.

The treatment is orthodontic, or orthodontic in combination with surgical one.

The vertical dental arcs anomalies.

Dentoalveolar shortening and lengthening can be observed both on the upper lower jaws in different dental arcs parts. Its determined according to the occlusal surface.

Etiology. The reason of the dentoalveolar shortening or lengthening can be the disbalance of dental rows occlusion because of bad habits of sucking. Early loss of primary or permanent lateral teeth, irregular jaws development leads to the lowering of the dentition.

Clinics. There are different types of disorders in different segments of the dental row.

The treatment is orthodontic, or orthodontic in combination with the surgical one or with the orthopedic one.

5. Topics of reports/abstracts:

1. What is the dental arc narrowing?
2. What dental deformations do you know?
3. What diagnostic methods can be used for the dental row anomaly determination?
4. What is the dental row anomaly etiology?
4. What is the treatment plan for the dental row anomaly in different age periods?
5. What is the dentoalveolar shortening of the dental row? What is the treatment of this pathology?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
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8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

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1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України <http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №9

Topic: Prevention and treatment of complex anomalies of dentition in temporary, removable and permanent occlusion.

Goal: to get knowledge of the exact pathology. For the learning of the topic a student must use his knowledge and skills of methods of clinical examination of the patient.

Basic concepts: Prevention and complex treatment of dentition in temporary, mixed and permanent dentitions.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**

2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**

3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

4. 1. Parents of Olga M. (7 years old) noticed that the her central incisors are erupting orally and primary teeth are already fell out. What reason could lead to the location of the teeth? A - Rachitis.

B - Speech pathology.

C -supernumerary tooth.

Ans. C.

D -Primary central incisors.

E -Adentia.

5. Which teeth abnormalities can cause the early removal of milky canine, if the permanent canine germ is present?

A – Makrodentia of the canine.

B – Adentia.

C – Dystopia of the canine

Ans. C.

D –

Prognathism.

E – Progenia.

6. What anomaly of teeth can occur because of the syphilis of a newborn? A – The anomaly of the crown shape.

B – Dental retention.

C – Diastem.

Ans. A.

D –

Prognathism.

E – Progenia.

7. During the routine inspection of a 4.5 years old child revealed premature absence of upper molars. The lower incisors are in the contact with the mucous membrane of the palate. Determine the tactics of the doctor?

A – To make a removable laminar dental prosthesis.

B – To observe 1 time per year till the eruption of permanent teeth.

C – To observe every 6 months till the eruption of permanent teeth.

D – To provide a miogymnastics.

E – Medical intervention is not required.

Ans. A

8. A girl of 8 years old does not have the 12 and the 22 teeth. There is no place for them in the dental arch. There are no germs of these teeth on the X-Ray. The girl's father does not have the 12 tooth, and his 22 tooth is spicular. What is the etiology of this pathology?.

A. Caries.

B. Teeth extraction.

C. Heredity.

Ans. C

D. Trauma.

E. Bad habits.

9. Parents with a child of 3 years addressed to the orthodontist. In anamnesis: severe toxicosis during pregnancy of the mother, the baby was born premature. Objectively: the child is astenic, stooping, with the elongated face, the mouth is half opened. The upper incisors protrude from under the lip. Enamel hypoplasia of incisors is observed. Identify the leading causative factor of the anomaly.

A. Rachitis.

B. Bad habits.

C. The pathology of pregnancy.

D. Incorrect posture.

E. The mouth breathing.

Ans. C

10. A girl of 8 years old has dark yellowish permanent first molars and incisors. There are all teeth and germs on the X-Ray. A girl's father does not have the 12 tooth. Tell the possible etiological factor of the pathology.

A – Receiving of antibiotics. Y.- Teeth extraction.

C.- Heredity.

D.- Trauma.

E.- Rickets

Ans.A

11. A 9 years old boy's mother appealed a doctor with complaints on fast erosion of his frontal teeth crowns. Objectively: the crowns of the frontal teeth are eroded on $\frac{3}{4}$ of their length, the enamel is dirty-gray. Choose the most possible diagnosis..

A. The Steinton-Capdepon's syndrome.

B. The pathological teeth erosion.

C. The acid teeth dissolution.

D. The amelogenesis imperfecta.

E. The dentinogenesis imperfecta.

Ans. A

12. The parents of the 5 years old girl appealed to the orthodontist with complaints on slow food mastication. Anamnesis: primary molars on the lower jaw were extracted because of caries complications at the age of 3. Objectively: the lower one third of the face is short, a deep supra-mental sulcus is observed, 85, 84, 74, 75 teeth are absent. The distal occlusion complicated with the deep one is forming. Which method of treatment is the most important on the first stage?

A. Prosthetic.

B. Instrumental.

C. Surgical.

D. Surgical-instrumental.

E. Biological.

Ans. A

13. The parents of the 9 years old boy applied with complaints on defects of the frontal teeth crowns. Objectively: there are fosses, strips and brown spots on the enamel of the frontal teeth. Choose the most possible diagnosis.

A. Fluorosis.

B. The pathological teeth erosion.

C. The acid teeth dissolution.

- D. The amelogenesis imperfecta.
- E. The dentinogenesis imperfecta.

Ans. A

14. The parents of the 19 years old boy applied with complains on the aesthetic shortage: overcrowding of teeth on the upper and lower jaws. Objectively: the sum of mesio-distal sizes of the 4 upper incisors is 40mm. Choose the most possible diagnosis.

- A. The enamel hyperplasia of the upper incisors.
- B. The enamel hypoplasia of the upper incisors.
- C. Fluorosis
- D. Macrodontia.
- E. Microdontia.

Ans. D.

4. Discussion of theoretical issues:

The prevention of dental arch anomalies of children contains measures of detection and factors of its development. This work must be performed on different stages of the dentognathic system development in the antenatal and postnatal periods of a child growth. The health of the child parents is important, that is why the dental arch anomalies prevention is:

- continuous and permanent complex of the preventional work with population, that contains:
 - sanitation of the environment;
- sanitary- educational work with the population;
- health lessons in kindergartens, schools;
- the educational work with pregnant women;
- popularization of the healthy life style and correct nutrition;
- the health state control of children and the control of the dentognathic system development; - the systematic sanitation of oral cavity and the orthodontist control.

This work must be provided by different doctors.

Educational work consists of lectures, agitation, advertisement programs by the radio and TV. This work popularize the healthy life style and correct nutrition,

hygiene and prevention substances for the oral cavity care. Bad habits as smoking, alcoholism and narcomania must be disprised. The prevention of dental arch anomalies of children is the continuous and permanent complex of the preventional work against the dental arch anomalies development.

Dispensary prophylactic system in orthodontics.

There are 4 dispensary prophylactic system groups of children.

The 1st group includes children with the correct lips closing, normal functions of the dentoalveolar system and normal dentition. It is necessary to cultivate a habit of the teeth and oral cavity care in this group of children. They must see a doctor once a year.

The 2nd group includes children without any morphological deviations but with abnormality of breathing, swallowing, speaking, chewing, mimicry, bad habits that lead to dentoalveolar anomalies. In this group active observation continuous 6 months. After removing of the reason of the deformation, the next visit to a doctor must be in a year.

The 3rd group includes children without severe anomalies of separate teeth or groups of teeth position, with dental arch shapes changes, functional deviations. For the normalization of functions and removing of the pathology reasons simple orthodontic apparatus can be used. After the dentition normalization-visiting a doctor once a year.

The 4th group includes children with evident changes in the dentoalveolar system, changes of the face shape, of the functions of breathing, swallowing, speaking, chewing. These children inquire special orthodontic treatment and rehabilitation, with usage of orthodontic apparatus, normalization of the dentoalveolar system function and influence on the hole organism.

5. Topics of reports/abstracts:

1. What dispensary prophylactic system groups of children do you know?
2. What is the 1st dispensary prophylactic system groups of children?
3. What is the 2nd dispensary prophylactic system groups of children?
4. What is the 3rd dispensary prophylactic system groups of children?
5. What is the 4th dispensary prophylactic system groups of children?
6. How often the 1st group of health children must see a doctor?

7. Summarizing the information received at the lesson.

8. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
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<http://www.nbuv.gov.ua/>

Practical Lesson №10

Topic: Etiology, pathogenesis and prevention of distal occlusion. Clinic diagnosis of distal occlusion.

Goal: to know the learning material about exact orthodontic pathology. He must know etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of the exact pathology.

Basic concepts: Etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of distal occlusion

Equipment: cephalometric analys, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**
 1. A 10-years-old girl complains of an aesthetic defect. She has a history of sucking her right thumb till the age of 7. Objectively: the height of the lower third of face is shortened. There is a 9 mm gap in sagittal direction between the upper and lower incisors, Engle's class 2. As a

result of Eschler-Bittner's test the girl's face appears at first better, then worse. What clinical form of occlusal anomaly is most likely?

- A. Maxillary macrognathia and mandibular micrognathia
- B. Maxillary prognathism with lateral compression
- C. Mandibular retrognathia
- D. Maxillary macrognathia
- E. Mandibular micrognathia

2. Child 9-years-old diagnosis is established: distal bite, II class Angle, underdeveloped mandible. When conducting the Eshler-Bittner's test, the aesthetics of the face image an increase. Select the device for correction:

- A. Frenkel I function control
- B. Catz's cavity plate
- C. Propulsar Muleman
- D. Clamped Activator Closed
- E. The angular arc of the upper and lower dental arches with intracranial traction.

3. The guy 21- years-old came to the orthodontic with complains about the significant severity of the fattened fold. Objectively: the lower third of the face is reduced, the subcutaneous fold is significantly pronounced. During an intraoperative review: the absence of the contacts of the frontal teeth of both jaws with their displacements, a 4 mm sagittal gap, the mesial buccle cusp of the first upper molar is connected with the same cusp of the first lower molar. What kind of anomalous bite is it characterised?

- A. Distal
- B. Mesial
- C. Cross
- D. Open E. Deep

4. A 13-years-old girl complains about the wrong position of the teeth. Objectively: the upper jaw and upper lip appear forward. The teeth of the upper jaw protrude from the upper lip and overlap the lower one. Upper jaw increased in sagittal direction; 12, 11, 21, 22 are located in the opposite direction, there are diastemas, the distal cusps of 16, 26 teeth are connected with the mesial-buccle cusps of 36, 46 teeth. Determine the rational plan for treatment:

- A. Movement of the lower jaw is mesialy
- B. Reduction of sagital dimensions of the upper jaw

- C. Increased transverse dimensions of the mandibular cavity
- D. Reduction of the transverse dimensions of the upper jaw
- E. Increase of sagittal dimensions of the mandible

5. The clinical examination of 10 –years- old boy came to orthodontic. Intraorally : the sagittal gap is 11 mm, the contact between 1-st molars is the 2 class by Angle's classification . Which additional diagnosis method will help to establish a final diagnosis?

- A. Profile cephalometric
- B. Orthopantomography
- C. Anthropometric measurement of jaw models
- D. Definition of the front index for Irsra
- E. Conducting Clinical Functional Testes

6. A 14-years-old patient has a skeletal anomaly of grade II (angle ANB 70 degree), facially the II class. Which device is helpful in the initial stages of patient treatment?

- A. Apparatus Twin- block
- B. Andresen-Goiplia's apparatus
- C. The device of Bruckle
- D. Activator of the function of Frenkel
- E. Klamp's apparatus

7. The parents of 8 – years – old girl complains of mouth breathing of the child. Objectively: the circular muscle of the mouth is tense, the naso-labial folds are smoothed, the lower lip is twisted. The upper jaw is compressed in the lateral areas, the front teeth are protruded. The lower frontal teeth are contacted with the mucous membrane of the palate, in the lateral areas the contact of the same tooth is determined. Which is the most likely diagnosis? A. Distal bite, complicated deep

B. Mesial bite

C. Deep bite

D. Open bite

E. –

8. The parents of the 9-years-old girl came to the orthodontic with complains on the wrong position of the upper teeth. The orthodontist performed clinical diagnostic Ashler-Bitner's tests. When this test is used?

A. Distal bite

B. Deep bite

C. Mesial bite

D. Cross bite

E. Open bite

9. Which devices are used to treat distal occlusion during the primary bite? A. Functional devices

B. Combined devices

C. -

D. Adguise-technique

E. Mechanical action devices

10. When can we use an inclined plane in the frontal area of the upper jaw? A. Distal bite

B. Cross bite

C. Open bite

D. Deep bite

E. Mesial bite

11. The 10- years – old boy complaints on the chin position. Artificial feeding in the childhood. Objectively: II Angle's class. Sagittal gap is 7 mm. The Eshler-Beatner's test is positive. What is the most likely diagnosis?

A. Prognathia, distal displacement of the lower jaw

B. Retroposition of the mandible

C. Prognathia, macrognathia of the upper jaw

D. Progenia, macrognathia of the mandible

E. Protrusion of the frontal area of the upper jaw

12. Clinical examination of 9-years-old patient, diagnosed with distal bite. What clinical test should be used for differential diagnosis of distal bite?

- A. Ashler-Bitner's test
- B. Ilyin-Markosyan's test
- C. -
- D. Frenkel's test
- E. Functional swallowing test

4. Discussion of theoretical issues:

The distal occlusion is characterized by the violation of teeth connection in the sagittal direction at the response of distal position of lower teeth relatively the upper dental row (2nd class by Angle), that is followed by changes in the transversal and vertical direction.

Etiology. The distal occlusion can be developed under the influence of functional and morphological changes in the dentoalveolar region, and in the result of genetically determined disparity of jaws sizes and teeth and jaws position.

Distal adequacy of jaws of neaborns – is physiological regularity. The delay of the low jaw growth is observed as a result of incorrect artificial feeding of children, shortening of the tongue bridle, bad habits of the finger sucking, wrong swallowing, difficult nose and mouth breathing, weakening of a child organism by infectious and other diseases. Carious of proximal surfaces of teeth crowns, early loss of primary teeth and other reasons can cause the distal occlusion.

The clinical picture. There are 2 subclasses by Angle. The 1st subclass: vestibular inclination of upper teeth with or without tremas, the presence of sagital fissure, deep incisal overlap. The face is convex, its lower part is often shortened, the upper incisors are on the lower lip, there is a deep supramental sulcus under the lower lip. The 2nd subclass by Angle, or the blocking dentition, is characterized by the retrusion of incisors.

The same time the upper lateral incisors are often inclined vestibularly and turned around their axis. The face signs: the lower part of the face is shortened, lips are closed, the lower lip is thick, there is a deep supramental sulcus under it.

In clinical practice there are other types of deep occlusion except its classical forms, that were described by Angle. Malygin Y.M. described 9 types of distal occlusion, that express the intensification of deviations, and can ease the signification of the morphological and physiological deviations.

In case of severe dental deviation the process of biting and chewing is harden. The chronical trauma of the palatinal mucose membrane, wrong swallowing is observed. The esthetic of the face changes.

The diagnose can be made after the clinical investigation, the diagnostic jaws models studying, the X-Ray examination of teeth and jaws, teleroentgenography. Additional methods of the investigation can be used, such as: measuring of dental arcs and their apical basis, measuring of the palate, studying of the face pictures and others. A doctor finds out the reason of the pathology: the deviation can be

found in the dentoalveolar region (the dentoalveolar form), in the jaws region (gnatic form) or in the region of the face or cerebral skeleton (skeleton form). The skeleton form can be determined according to the studying of side teleroenography of a head. The treatment is planning according to the patient age, the direction of the lower jaw growth, the pathology degree, general organism disorders.

5.

Topics of reports/abstracts:

1. What is prognatia?
2. What types of distal occlusion do you know?
3. What is the diagnostics of the prognatia?
4. What is the etiology of the prognatia?
5. What are classes 2.1 and 2.2?

6. **Summarizing the information received at the lesson.**

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
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5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication

(2015)

6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.

7. Ramy Ishaq. “The Orthodontic Patient: Examination and Diagnosis”. EC Dental Science 18.5 (2019): 975-988

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<http://www.dec.gov.ua/index.php/ua/> 2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.

3. Національна наукова медична бібліотека України <http://library.gov.ua/>

4. Національна бібліотека України імені В.І. Вернадського
<http://www.nbuv.gov.ua/>

Practical Lesson №11

Topic: Complex treatment of distal bite in children in the temporary, removable and permanent occlusion and in adults.

Goal: A student must know the learning material about exact orthodontic pathology. He must know etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of the exact pathology.

Basic concepts: During the studying a student must use his knowledge of the exact pathology. For the learning of the topic a student must use his knowledge and skills of methods of clinical examination of the patient.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

A 10-years-old girl complains of an aesthetic defect. She has a history of sucking her right thumb till the age of 7. Objectively: the height of the lower third of face is shortened. There is a 9 mm gap in sagittal direction between the upper and lower incisors, Engle's class 2. As a result of Eschler-Bittner's test the girl's face appears at first better, then worse. What clinical form of occlusal anomaly is most likely?

- A. **Maxillary macrognathia and mandibular micrognathia**
- B. **Maxillary prognathism with lateral compression**
- C. **Mandibular retrognathia**

- D. Maxillary macrognathia
- E. Mandibular micrognathia

2. Child 9-years-old diagnosis is established: distal bite, II class Angle, underdeveloped mandible. When conducting the Eshler-Bittner's test, the aesthetics of the face image an increase. Select the device for correction:

- A. Frenkel I function control
- B. Catz's cavity plate
- C. Propulsar Muleman
- D. Clamped Activator Closed
- E. The angular arc of the upper and lower dentinal arches with intracranial traction.

3. The guy 21- years-old came to the orthodontic with complains about the significant severity of the fattened fold. Objectively: the lower third of the face is reduced, the subcutaneous fold is significantly pronounced. During an intraoperative review: the absence of the contacts of the frontal teeth of both jaws with their displacements, a 4 mm sagittal gap, the mesial buccle cusp of the first upper molar is connected with the same cusp of the first lower molar. What kind of anomalous bite is it characterised?

- A. Distal
- B. Mesial
- C. Cross
- D. Open E. Deep

4. A 13-years-old girl complains about the wrong position of the teeth. Objectively: the upper jaw and upper lip appear forward. The teeth of the upper jaw protrude from the upper lip and overlap the lower one. Upper jaw increased in sagittal direction; 12, 11, 21, 22 are located in the opposite direction, there are diastemas, the distal cusps of 16, 26 teeth are connected with the mesial-bucle cusps of 36, 46 teeth. Determine the rational plan for treatment:

- A. Movement of the lower jaw is mesialy
- B. Reduction of sagittal dimensions of the upper jaw
- C. Increased transverse dimensions of the mandibular cavity
- D. Reduction of the transverse dimensions of the upper jaw E. Increase of sagittal dimensions of the mandible

5. The clinical examination of 10 –years- old boy came to orthodontic. Intraorally : the sagittal gap is 11 mm, the contact between 1-st molares is the 2 class by Angle's classification . Which additional diagnosis method will help to establish a final diagnosis?

- A. Profile cephalometric**
- B. Orthopantomography**
- C. Anthropometric measurement of jaw models**
- D. Definition of the front index for Irsra**
- E. Conducting Clinical Functional Testes**

6. A 14-years-old patient has a skeletal anomaly of grade II (angle ANB 70 degree), facially the II class. Which device is helpful in the initial stages of patient treatment?

- A. Apparatus Twin- block**
- B. Andresen-Goiplia's apparatus**
- C. The device of Bruckle**
- D. Activator of the function of Frenkel**
- E. Klamp's apparatus**

7. The parents of 8 – years – old girl complains of mouth breathing of the child. Objectively: the circular muscle of the mouth is tense, the naso-labial folds are smoothed, the lower lip is twisted. The upper jaw is compressed in the lateral areas, the front teeth are protruded. The lower frontal teeth are contacted with the mucous membrane of the palate, in the lateral areas the contact of the same tooth is determined. Which is the most likely diagnosis?

A. Distal bite, complicated deep

B. Mesial bite

C. Deep bite

D. Open bite

E. –

8. The parents of the 9-years-old girl came to the orthodontic with complains on the wrong position of the upper teeth. The orthodontist performed clinical diagnostic Ashler-Bitner's tests. When this test is used?

A. Distal bite

B. Deep bite

C . Mesial bite

D. Cross bite

E. Open bite

9. Which devices are used to treat distal occlusion during the primary bite? A. Functional devices

B. Combined devices

C. -

D. Adguise-technique

E. Mechanical action devices

10. When can we use an inclined plane in the frontal area of the upper jaw? A. Distal bite

B. Cross bite

C. Open bite

D. Deep bite

E. Mesial bite

11. The 10- years – old boy complaints on the chin position. Artificial feeding in the childhood.

Objectively: II Angle's class. Sagittal gap is 7 mm. The Eshler-Beatner's test is positive. What is the most likely diagnosis?

A. Prognatia, distal displacement of the lower jaw

B. Retroposition of the mandible

C. Prognatia, macrognathia of the upper jaw

D. Progenia, macrognathia of the mandible

E. Protrusion of the frontal area of the upper jaw

12. Clinical examination of 9-years-old patient, diagnosed with distal bite. What clinical test should be used for differential diagnosis of distal bite?

A. Ashler-Bitner's test

B. Ilyin-Markosyan's test

C. -

D. Frenkel's test

E. Functional swallowing test

4. Discussion of theoretical issues:

Treatment. General methods for the distal occlusion treatment are: the nasopharynx and oral cavity treatment, bad habits elimination, curative gymnastics, normalization of the dentognathic system functions, the teeth crowns restoration, plasty of the frenulum of tongue, a speech therapist treatment.

The 2nd class, 1st subclass anomaly (by Angle) treatment.

The primary dentition. Vestibular plates are used. Before the lower first molars eruption a doctor can use a plate for the upper jaw with clasps, vestibular arcs, biting plate or the inclined plate.

The mixed dentition. If the upper dental row is narrowed, the treatment can be started with its widening with the upper jaw screw plate with a clasp fixation, vestibular retractive arc and a biting plate for lower teeth in case of deep dentition.

The permanent dentition. In the early period of permanent dentition a doctor can use the same methods as in the mixed dentition. The apparatus with the extraoral traction for the jaw growth delay can be effective in case of the correct estimation of age indications for the orthodontic treatment, ability of the jaw to grow.

The 2nd class, 2nd subclass anomaly (by Angle) treatment.

In the temporal dentition the plate for the upper jaw with clasps, a biting plate for lower frontal teeth, with a screw and a sectoral sawcut for the vestibular incisors moving. The apparatus is effective in the age of 4-5 years, after this age it must be changed on a similar retentional plate without a screw.

A mixed dentition. Besides the named before apparatus, a plate with a screw, a sectoral sawcut for the vestibular incisors inclination or protractive springs for the upper jaw can be used, an opened activator of Klammt; the function regulator of Frenkl(type 2). Among the nonremovable apparatus, the Angle's apparatus are preferable. The Angle's apparatus can be united with the intermaxillary draught. A permanent dentition. The same apparatus as in the time of mixed dentition can be used. During a distal occlusion with the protrusion of the upper frontal teeth or with their retrusion but with close teeth contact, the extraction of some teeth is indicated.

The orthodontic treatment length depends on many factors: the intensity of the pathology, if its form is dentoalveolar or gnathic, the patient's age, the quality of orthodontic apparatus, the contact of a patient with a doctor.

The prognosis of the gnathic form treatment is lessfavourable. The retentional period length is individual.

The results can be stable after the removing of functional breaches in the dentoalveolar region and the multiple teeth contact achievement.

5. Topics of reports/abstracts:

1. What instrumental and non-instrumental prognatia treatment methods?
2. What orthodontic apparatus for the prognatia treatment in primary dentition do you know?
3. What orthodontic apparatus for the prognatia treatment in mixed dentition do you know?
4. What orthodontic apparatus for the prognatia treatment in permanent dentition do you know?
5. What retentional apparatus for the prognatia treatment do you know

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
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Practical Lesson №12

Topic: Etiology, pathogenesis and prevention of the mesial bite. Clinic diagnosis of the mesial bite.

Goal: To know main principles of the pathology treatment considering patient's age.

To know the structural features of the orthodontic appliances used for the pathology treatment. To be able to plan the treatment of patient with given orthodontic pathology.

Basic concepts: While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**

3. Questions (test tasks) to check basic knowledge on the topic of the seminar:

1. An 18-year-old patient complains about an aesthetic defect. Objectively: the lower teeth are located forward and overlap the upper antagonists. This symptom is typical for the following bite abnormality:

- A. Mesial bite
- B. Cross bite
- C. Deep bite
- D. Distal bite
- E. Open bite

2. Examination of a 9-year-old child revealed protruded chin, the lower lip overlapping the upper lip. There are diastemas and spaces between the lower incisors, the lower incisors overlap the upper ones by $\frac{2}{3}$ of crown height. Sagittal fissure is 3 mm. Specify the treatment tactics:

- 1. Brueckls appliance
- 2. Schwartz guard
- 3. Myogymnastics complex
- 4. Angles sliding appliance
- 5. Bynins guard

3. Parents of a 6-years-old girl consulted an orthodontist about protrusion of the lower jaw. The child looks like his father. Objectively: the child has primary bite, there are diastemas and treads on both jaws, reverse incisal overlap of front teeth, the sagittal gap is up to 3 mm, the lateral parts are characterized by mesio-occlusion. Ilyina-Markosyan's test for the distal displacement of mandible is negative. What principle of treatment will be most effective?

1. To delay the growth of mandible in sagittal direction
2. The treatment is not required
3. To stimulate the growth of maxilla in sagittal direction
4. No to start treatment until the end of transitional dentition
5. To start orthodontic treatment after the second dentition is completed

4. A 7-years-old child has protruding chin, the lower lip overlaps the upper one. There are diastemas and treads between the lower incisors, the lower incisors overlap the upper ones by $\frac{2}{3}$ of crown height. First permanent molars demonstrate Angles class III relation. Sagittal gap is 5 mm. The correct doctor's tactics will be to:

1. Use Bruckl's appliance
2. Use Bynin's appliance
3. Use Schwartz's appliance
4. Recommend a complex of myogymnastic exercises
5. Use Angle's apparatus

5. A girl of 9 years appeared to an orthodontist doctor with complains on the protruding chin. Objectively: an increase in the lower part of the face. Naso-labial folds are deep. In the frontal area of the teeth closure is reversed sagittal gap 4 mm. I class by Angle. Make a diagnosis: A. Fuels progeny

B. Distal bite

C. True progeny

D. Retroposition of the upper incisors

E. -

6. 10-years-old girl came to orthodontic with complains about a cosmetic defects. Objectively: an increase in the lower third of the face. Naso-labial folds are deep. In the front of the closure of the teeth is reverse sagittal gap 6 mm. The III class by Angle. Choose a device for effective treatment of this patient:

A. The device of Bruckle

B. Apparatus of Hurghina

C. The generational Angle's arch

D. Lower muscular apparatus with vestibular arcuate and occlusive lining

E. Frenkel's apparatus

7. Parents with 12- years-old child came with complains of aesthetic defects. During the examination: the face is elongated by increasing the height of the lower third of the face. The upper lip is flattened, the bottom is cleared, the labial-mental is folded, the enlarged angle of the lower jaw. Bite of permanent teeth. The lower incisors cover the upper by 1/2 of the crown. The 46, 36 teeth are in contact with 15, 25 and the mesial cusps of 16, 26 teeth. What Angle's class is described?

A. III

B. IV

C. I

D. II (2 subclass) E. II (1 subclass)

8. When we use myogymnastics for muscles, that move the lower jaw distally at the primary dentition? A. Mesial bite

B. Cross bite

C. Deep bite

D. Open bite

E. Distal bite

9. The patient is recommended for Frenkel's III type appliance. What diagnosis was established for the patient? A. Mesial bite

B. Retention of 21-st tooth

C. Cross bite

D. Open bite

E. Vestibular position of the upper frontal teeth

10. 6 –years-old boy diagnosed with chin protruding when mouth closing. The mesial - buccal cusps of 16 and 26 are in contact with the distal cusps of 46 and 36 teeth. Which orthodontic device should be used for treatment?

A. Frenkel's functional III type regulator

B. Frenkel's Type I Regulator

C. Palatine plate with buccal plane in the frontal area

D. Palatal plate with inclined plane in the frontal area

E. Frenkel's II type regulator

11. The patient has a mesio-occlusion contact between molars, and the lower front teeth overlap the upper one. Sagittal gap is 7 mm. It's named:

A. Progenia

B. Open bite

C. -

D. Prognathia

E. Deep bite

12. Which kind of appliance is used for the mesial- deep bite in the period of mixed dentition?

A. Briukla's appliance

B. Schwartz's appliance

C. Poznyakova's appliance

D. Katz's appliance

E. Binina's appliance

13. The parents came to the clinic with a nine-years-old child. At clinical examination, it was revealed: the lower frontal teeth overlapping the upper one, the upper frontal teeth are retruded. The position and the size of lower jaw is normal. Which device should be used for treatment?

A. Binina's appliance

- B. Frenkel's II type appliance
- C. Babaskina's appliance
- D. Andresen-Goiplia's appliance
- E. Appliance on the upper jaw with Rudolph's loops

4. Discussion of theoretical issues:

Different terms are used to characterize the pathology: progenia, mandibular prognathism, false progenia, the progenia with the lower jaw disposition, the joint progenia, the forced bite, the true progenia, the anterior occlusion.

The etiology: the inborn features of the facial bones structure, especially the inherited shape of the lower jaw; mother's diseases during the pregnancy; the birth trauma; partial adentia; numerous teeth retention, their loss; childhood diseases (rachitis); a short tongue frenulum; macroglossia; bad habits of the upper lip; the tongue and fingers suction; sleeping with the inclined on the chest head; the usual lower jaw putting forward; unerased molar cusps, the torsion of some lower incisors, that leads to a lower jaw protrusion; the change of the physiological chewing muscles balance, that surround dental rows; the mouth breathing; wrong swallowing; wrong tongue articulation during the speaking and in rest; the scar deformity of the upper jaw after the surgery; acromegalia.

The clinics. In the temporary dentition period the deciduous canines crowns relationship and the mesial stage (between distal surfaces of the upper and lower second deciduous molars crowns) severity should be taken into account. In the period of the mixed and permanent dentition a doctor should characterize the mesial position of the lower first permanent molars and canines position in relation to the upper ones crowns on 1/2 of the cusp width, on 1 cusp and more. In the frontal area the lower incisors usually overlap the upper ones (the inverse incisal overlapping), but the straight teeth position or the open bite can be observed. In the case of the severe pathology, there is a sagittal gap between the incisors. It can be physiological and pathological mesial occlusions. The physiological one is characterized by numerous teeth contacts in frontal and lateral regions, so it is an anatomic form and it does not require the treatment. In case of the pathological occlusion the teeth contacts are changed, morphological, functional, esthetic disorders are present, and must be treated.

The following basic mesial occlusion types can be determined: dentoalveolar, gnathic and mixed, all of them can be combined with the lower jaw protrusion forward and aside.

The dentoalveolar type is often combined with the upper incisors retrusion, inverse incisal overlapping. The lower incisors can sometimes incline vestibularly, trends

can appear between them, they can push the upper incisors and increase their palatal inclination. In the lateral parts of dental arcs, the lateral cross occlusion can be observed. If the patient can move the lower jaw back up to the marginal incisal contact and the interlocking of the first permanent molars becomes typical for the neutral dentition, the dentoalveolar form is diagnosed.

The gnathic form of the mesial occlusion can be caused by the back position of the upper jaw, the upper jaw hypoplasia, excessive lower jaw development, anterior position of the lower jaw in the facial skeleton. The combination of the named symptoms with the lower jaw disposition, abnormal position of teeth, disorders of the occlusion in vertical and transversal directions might be observed. The close position of the frontal teeth often combines with the dental deposits, 5th class caries cavities, gingivitis, the periodontium overload. The diagnosis can be put on the basis of the clinical examination, the results of the used functional probes, diagnostic models investigation, face pictures and other methods.

5. Topics of reports/abstracts:

1. What is the mesial bite?
2. What is the false frontal teeth protrusion?
3. What are the methods of mesial bite diagnostics?
4. What is etiology of the progenic bite?
4. What is the etiology of the false progenic bite?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.

2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. Ramy Ishaq. “The Orthodontic Patient: Examination and Diagnosis”. EC Dental Science 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України <http://library.gov.ua/>
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Practical Lesson №13

Topic: Combined treatment of the mesial bite in children in the temporary, mixed and permanent dentition and in adults.

Goal: to study the progenesis treatment methods with and without using orthodontic appliances; to study the features of the progenesis treatment in the primary dentition; to study the features of the progenesis treatment in the mixed dentition; to study the features of the progenesis treatment in the permanent dentition.

Basic concepts: While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. An 18-years-old patient complains about an aesthetic defect. Objectively: the lower teeth are located forward and overlap the upper antagonists. This symptom is typical for the following bite abnormality:

- A. Mesial bite
- B. Cross bite
- C. Deep bite
- D. Distal bite
- E. Open bite

2. Examination of a 9-years-old child revealed protruded chin, the lower lip overlapping the upper lip. There are diastemas and spaces between the lower incisors, the lower incisors overlap the upper ones by $\frac{2}{3}$ of crown height. Sagittal fissure is 3 mm. Specify the treatment tactics:

1. Brueckls appliance
2. Schwartz guard
3. Myogymnastics complex
4. Angles sliding appliance
5. Bynins guard

3. Parents of a 6-years-old girl consulted an orthodontist about protrusion of the lower jaw. The child looks like his father. Objectively: the child has primary bite, there are diastemas and spaces on both jaws, reverse incisal overlap of front teeth, the sagittal gap is up to 3 mm, the lateral parts are characterized by mesio-occlusion. Ilyina-Markosyan's test for the distal displacement of mandible is negative. What principle of treatment will be most effective?

1. To delay the growth of mandible in sagittal direction
2. The treatment is not required

3. To stimulate the growth of maxilla in sagittal direction
4. No to start treatment until the end of transitional dentition
5. To start orthodontic treatment after the second dentition is completed

4. A 7-years-old child has protruding chin, the lower lip overlaps the upper one. There are diastemas and gaps between the lower incisors, the lower incisors overlap the upper ones by $\frac{2}{3}$ of crown height. First permanent molars demonstrate Angles class III relation. Sagittal gap is 5 mm. The correct doctor's tactics will be to:

1. Use Bruckl's appliance
2. Use Bynin's appliance
3. Use Schwartz's appliance
4. Recommend a complex of myogymnastic exercises
5. Use Angle's apparatus

5. A girl of 9 years appeared to an orthodontist doctor with complains on the protruding chin. Objectively: an increase in the lower part of the face. Naso-labial folds are deep. In the frontal area of the teeth closure is reversed sagittal gap 4 mm. I class by Angle. Make a diagnosis: A. Fuels progeny

B. Distal bite

C. True progeny

D. Retroposition of the upper incisors E. -

6. 10-years-old girl came to orthodontic with complains about a cosmetic defects. Objectively: an increase in the lower third of the face. Naso-labial folds are deep. In the front of the closure of the teeth is reverse sagittal gap 6 mm. The III class by Angle. Choose a device for effective treatment of this patient:

A. The device of Bruckle

B. Apparatus of Hurghina

C. The generational Angle's arch

D. Lower muscular apparatus with vestibular arcuate and occlusive lining

E. Frenkel's apparatus

7. Parents with 12- years-old child came with complains of aesthetic defects.

During the examination: the face is elongated by increasing the height of the lower third of the face. The upper lip is flattened, the bottom is cleared, the labial-mental is folded, the enlarged angle of the lower jaw. Bite of permanent teeth. The lower incisors cover the upper by $\frac{1}{2}$ of the crown. The 46, 36 teeth are in contact with 15, 25 and the mesial cusps of 16, 26 teeth. What Angle's class is described?

A. III

B. IV

C. I

D. II (2 subclass) E. II (1 subclass)

8. When we use myogymnastics for muscles, that move the lower jaw distally at the primary dentition? A. Mesial bite

B. Cross bite

C. Deep bite

D. Open bite

E. Distal bite

9. The patient is recommended for Frenkel's III type appliance. What diagnosis was established for the patient? A. Mesial bite

B. Retention of 21-st tooth

C. Cross bite

D. Open bite

E. Vestibular position of the upper frontal teeth

10. 6 –years-old boy diagnosed with chin protruding when mouth closing. The mesial - buccal cusps of 16 and 26 are in contact with the distal cusps of 46 and 36 teeth. Which orthodontic device should be used for treatment?

A. Frenkel's functional III type regulator

B. Frenkel's Type I Regulator

C. Palatine plate with buccal plane in the frontal area

D. Palatal plate with inclined plane in the frontal area

E. Frenkel's II type regulator

11. The patient has a mesio-occlusion contact between molars, and the lower front teeth overlap the upper one. Sagittal gap is 7 mm. It's named:

A. Progenia

B. Open bite

C. -

D. Prognathia

E. Deep bite

12. Which kind of appliance is used for the mesial- deep bite in the period of mixed dentition?

A. Briukla's appliance

B. Schwartz's appliance

C. Poznyakova's appliance

D. Katz's appliance

E. Binina's appliance

13. The parents came to the clinic with a nine-years-old child. At clinical examination, it was revealed: the lower frontal teeth overlapping the upper one, the upper frontal teeth are retruded. The position and the size of lower jaw is normal. Which device should be used for treatment?

A. Binina's appliance

B. Frenkel's II type appliance

C. Babaskina's appliance

D. Andresen-Goiplia's appliance

E. Appliance on the upper jaw with Rudolph's loops

4. Discussion of theoretical issues:

The progenia treatment in primary dentition.

The elimination of the cause. The myogymnastics for muscles that move the lower jaw back.

Lapping of the deciduous teeth cusps.

From the age of 3 the medio-prophylactic appliances can be used, the Frenkel function regulator (type III), Andresen's apparatus, trainer and Dass's apparatus can be used also.

In the early mixed dentition the treatment is similar to the treatment in the primary dentition. In the late mixed dentition the apparatus of the functional and functional-directed action can be used, the Frenkel function regulator (type III), the Bynin's cap, bionators, Shwarz's apparatus, Bulters's bionator, are also used. The extensional plates are widely used.

In the permanent dentition period the Frenkel function regulators (type III)B and bionators, removable extensional plates , facial masks can be used. The orthodontic treatment can be combined with the surgical methods: teeth extraction on the lower jaw, the lower jaw body shortening, different gnathological surgery.

5.

Topics of reports/abstracts:

1. What is progenia?

2. What is the etiology of progenia?
3. What is the false progenia?
4. What is the class 3?
5. What basic treatment methods are used for the progenia treatment?
6. What differences in orthodontic treatment of progenia in different age periods can you name?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
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6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
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<http://www.nbuv.gov.ua/>

Practical Lesson №14

Topic: Etiology, pathogenesis, clinical and diagnosis deep bite.

Goal: to study the etiology of deep occlusion; to study the pathogenesis of deep occlusion; to study the diagnostics of the deep occlusion; to study the treatment and prevention of deep occlusion

Basic concepts: While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analys, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. A 10-years-old boy complains on pain in the palate during eating. Objectively: the lower third of his face is shortened, mouth opening is not limited. By joining the teeth the cutting edge of lower incisors contacts with the mucous membrane of

palate. Mucous membrane in the contact point is hyperemic, slightly edematous. Lateral teeth relationship Angle's I class. What is the most appropriate plan of treatment of the lower jaw?

- A. To impact frontal part
- B. To protract lateral parts
- C. To widen the lower jaw
- D. To impact lateral parts
- E. To protract frontal part

2. External examination of a 9-years-old boy revealed strongly expressed nasolabial and labiomental folds, a shortening of the lower third of face. Examination of the oral cavity revealed mixed dentition, the upper front teeth completely overbite the lower teeth, the palate exhibits imprints of the lower incisors. What is the most likely diagnosis?

- 1. Dentoalveolar mandibular lengthening
- 2. Mesial occlusion
- 3. Dentoalveolar maxillary lengthening
- 4. Distal occlusion
- 5. Supraocclusion

3. During the examination oral cavity of the child 11-years-old is established that the upper frontal teeth completely cover the lower ones. The teeth in the sagittal and transversal planes without malocclusions. Diagnosis: deep bite. The violation of which functions is accompanied by this anomaly?

- A. Chewing, scouring food
- B. Breathing, swallowing
- C. Swallowing, snoring food
- D. Scourge of food, breathing
- E. Unreliability of pronunciation, insufficient chewing

4. During the examination oral cavity of the child 11-years-old is established that the upper frontal teeth completely cover the lower ones. The teeth in the sagittal and transversal planes without malocclusions. Diagnosis: deep bite. Choose an orthodontic device for the treatment of this pathology:

- A. Appliance with bite plane in the frontal area on the upper jaw
- B. Appliance with bite plane in the lateral area on the upper jaw
- C. Bryukl's appliance
- D. Appliance with bite plane in the lateral area on the lower jaw

E. Andresen's appliance

4. Discussion of theoretical issues:

The deep occlusion – is the pathology in the vertical plane, it's characterized by the increasing of the depth of the frontal teeth overlapping and their contact loss:

- the deep blocking occlusion – the increasing of the overlapping of the lower teeth by the upper ones more than on 1/3 of the crown with the upper incisors oral position;
- the roof-shaped deep occlusion – is characterized by the presence of the contact between the lower frontal teeth with the palate.

Among the etiological factors the most important are:

- heredity;
- different prenatal diseases (the toxicosis, traumas, infections during the pregnancy, avitaminosis and others) ;
- the early children's age diseases;
- incorrect artificial feeding;
- long time period between the terms of eruption of the upper and lower incisors;
- excessive intrajaw bone development;
- caries and non-caries lesions of lateral teeth hard tissues;
- early loss of the temporal molars, first permanent molars and other lateral teeth;
- bad habits of biting and sucking of fingers, different objects cause the inclination of frontal teeth, the proximal contacts breach and contacts of antagonist teeth, that leads to the dentition height decreasing, wrong occlusal position of the first permanent molars and the alveolar process hypoplasia in the lateral regions;
- the frontal teeth position changes, their support loss, it leads to the dentoalveolar elongation; • the same results can be obtained because of the increasing of one of the dental rows, with the supernumerary teeth, diastemas, temporal molars, individual macrodontia, or in case of decreasing of one of the teeth row, or some teeth retention or adentia, changes of permanent teeth eruption terms.

The breach of the alveolar process growth in the vertical plain causes also other pathology, as mesial and crossing dentitions, that can complicate the deep dentition and leads to the integrated pathology. A. I. Betelman divided the deep occlusion on the:

- overlapping one;

- blocking one;
- roof-shaped one.

F. Y. Horoshilkina divides the deep occlusion on the three stages of the incisors overlapping:

- - less than 5 mm;
- - from 5 till 9 mm;
- - more than 9 mm.

5.

Topics of reports/abstracts:

1. What is the deep occlusion?
2. What methods of diagnostics for the deep occlusion diagnostics can be used?
3. What is the etiology of the deep occlusion?
4. What clinical forms of the deep occlusion do you know?
5. What features of the deep occlusion differential diagnostics do you know?

6. **Summarizing the information received at the lesson.**

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.

5. Bhalajhi SI., et al. "Orthodontics: The art and science". Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. "Patient Interaction in Planning". In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. "The Orthodontic Patient: Examination and Diagnosis". EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. Laura Mitchell, «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України <http://library.gov.ua/>
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Practical Lesson №15

Topic: Prevention and complex treatment of deep bite in children in a temporary, removable and permanent occlusion and an adults.

Goal: to study the instrumental and non-instrumental deep occlusion treatment methods; To study the features of the deep occlusion treatment in the primary dentition; To study the features of the deep occlusion treatment in the mixed dentition; To study the features of the deep occlusion treatment in the permanent dentition.

Basic concepts: While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. A 10-years-old boy complains on pain in the palate during eating. Objectively: the lower third of his face is shortened, mouth opening is not limited. By joining the teeth the cutting edge of lower incisors contacts with the mucous membrane of palate. Mucous membrane in the contact point is hyperemic, slightly edematous. Lateral teeth relationship Angle's I class. What is the most appropriate plan of treatment of the lower jaw?

- A. To impact frontal part
- B. To protract lateral parts
- C. To widen the lower jaw
- D. To impact lateral parts
- E. To protract frontal part

2. External examination of a 9-years-old boy revealed strongly expressed nasolabial and labiomental folds, a shortening of the lower third of face. Examination of the oral cavity revealed mixed dentition, the upper front teeth completely overbite the lower teeth, the palate exhibits imprints of the lower incisors. What is the most likely diagnosis?

1. Dentoalveolar mandibular lengthening
2. Mesial occlusion
3. Dentoalveolar maxillary lengthening
4. Distal occlusion
5. Supraocclusion

3. During the examination oral cavity of the child 11-years-old is established that the upper frontal teeth completely cover the lower ones. The teeth in the sagittal and transversal planes without malocclusions. Diagnosis: deep bite. The violation of which functions is accompanied by this anomaly?

- A. Chewing, scouring food
- B. Breathing, swallowing
- C. Swallowing, snoring food
- D. Scouring of food, breathing

E. Unreliability of pronunciation, insufficient chewing

4. During the examination oral cavity of the child 11- years -old is established that the upper frontal teeth completely cover the lower ones. The teeth in the sagittal and transversal planes without malocclusions. Diagnosis: deep bite. Choose an orthodontic device for the treatment of this pathology:

- A. Appliance with bite plane in the frontal area on the upper jaw
- B. Appliance with bite plane in the lateral area on the upper jaw
- C. Bryukl's appliance
- D. Appliance with bite plane in the lateral area on the lower jaw
- E. Andresen's appliance

4. Discussion of theoretical issues:

The treatment of the deep occlusion.

- Elimination of the cause;
- Functions normalization – mastication, swallowing, breathing, speech;
- Psychotherapeutic preparation;
- The oral cavity sanitation;
- The dental prosthetics in case of permanent teeth extraction and early primary teeth extraction;
- The creation of conditions for the normalization of lateral alveolar process parts development in the vertical plane;
- The vertical growth of the frontal jaw part stimulation

The treatment and prevention in the temporal dentition period:

- Bad habits elimination;
- The oral cavity sanitation;
- The dental prosthetics in case of early primary teeth extraction;
- The functional orthodontic appliances with a biting plate;
- The trainer usage;
- The surgery treatment methods according to indications – the lip and tongue frenulum plastic surgery, the oral cavity vestibulum deepening and others.

The treatment and prevention in the mixed dentition period:

- Bad habits elimination;

- The oral cavity sanitation;
- The dental prosthetics in case of early primary teeth extraction;
- The trainer usage;
- The surgery treatment methods according to indications – the lip and tongue frenulum plastic surgery, the oral cavity vestibulum deepening and others.
- The usage of removable and fixed appliances with biting plate in the frontal teeth region – the biting plate in the frontal area, Frenckle's functional regulators.

The treatment and prevention in the permanent dentition period (period of growth):

- Bad habits elimination;
- The oral cavity sanitation;
- The dental prosthetics in case of permanent teeth extraction;
- The usage of removable appliances with biting plates in the frontal teeth region;
- The usage of fixed appliances;
- Physiotherapy – the vacuum therapy, the ultrasonic therapy, electrophoresis;
- The surgery treatment methods according to indications – the lip and tongue frenulum plastic surgery, the oral cavity vestibulum deepening and others.

The treatment and prevention in the permanent dentition period (after the period of active growth):

- The usage of fixed appliances;
- Prosthetic methods – increasing of teeth height in lateral parts of dental rows by restoration or prosthetics;
- The surgery treatment – reconstructive surgery of the upper or lower jaw.

5.

Topics of reports/abstracts:

1. What is the deep occlusion?
2. What is the etiology of the deep occlusion?
3. What is the traumatic deep bite?
4. What class by Angle is the deep bite?
5. What basic deep occlusion treatment methods do you know?
6. What is the difference of the deep bite treatment in different periods of the dentition formation?

6. Summarizing the information received at the lesson.

7. List of recommended literature:

Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
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6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
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<http://www.nbuv.gov.ua/>

Practical Lesson №16

Topic: Etiology, pathogenesis, clinical and diagnosis open bite.

Goal: A student of the dental faculty should know the learning material regarding given orthodontic pathology. He must know etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of the exact pathology.

Basic concepts: While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

- 1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
- 2. Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
- 3. Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. Parents of a 9-years-old boy complain about permanently open mouth of the child. External examination revealed elongation of the lower face part, non-closure of lips. Examination of the oral cavity revealed early mixed dentition. Relationship of the first permanent molars is neutral, vertical space is 5 mm. What's the most likely diagnosis?

1. Openbite
2. Distalocclusion
3. Deepoverbite
4. Crossbite
5. Mesialocclusion

2. A 12-years-old female patient was diagnosed with open bite and dento-alveolar elongation of lateral part of mandible. What construction of apparatus is required?

1. Upper jaw appliance with occlusal rest seats
2. Upper jaw appliance with occlusal rest seats
3. Herbst appliance
4. Upper jaw appliance with a face bow
5. Extraoral face bow
6. Angles sliding face bow

3. Analysis of a 10-years-old boys jaw models revealed that occlusal plane of the frontal maxillary teeth was of concave form, its lateral parts were convex. Form of the alveolar process also represents deformation of dental arches. The upper jaw is of saddle-like form with abrupt narrowing in the region of premolar teeth. What type of bite is it?

1. Open
2. Distal
3. Mesial
4. Cross
5. Deep

4. A 6,5-years-old child has a gap 2,5-3 mm large between frontal teeth from canine to canine.

Relationship of the first permanent molars complies with Angle's class I. Specify the severity degree of bite deformation:

1. I degree
2. II degree
3. IV degree
4. V degree
5. III degree

5. Parents of a 6,5-years-old boy consulted an orthodontist about no contact between the front teeth. The child has a bad habit of sucking his tongue.

Objectively: there is a symptom of multiple pits in his chin when the lips are closed, speech disturbance, between the front teeth there is a vertical gap up to 8 mm. Specify the occlusion anomaly : a. Open bite

- b. Overbite
- c. Distal occlusion
- d. Cross-bite
- e. Mesial bite

4. Discussion of theoretical issues:

Open bite is referred to vertical anomalies, that is characterized by the absence of teeth contact in the exact part of the jaw.

It can be in two clinical forms: the dentognathic (the frontal open bite and lateral open bite) and gnathic. Open bite might arise due to various etiological agents and be the consequence of many functional and morphological violations of the dentognathic apparatus. Of great importance are:

- heredity;
- mother's diseases during pregnancy (gestational toxicosis, injuries, infectious diseases, avitaminosis, rachitis, etc.);
- infancy diseases (rachitis, endocrinopathy and other pathologies, leading to bones deformations including jaw bones);
- irregularartificial feeding (nipple size in adequacy);
- considerable gap in the terms of upper and lower incisors coming out (partial dental retention);
- intermaxillary bone underdevelopment;
- megaloglossia;
- affection of the process zone of the upper or lower jaw in the frontal part because of injuries, surgical procedures, infectious diseases;
- hypoplasia, caries, irregular wearing out of enamel;
- premature loss of milk frontal teeth and untimely (or absent) prosthetic;
- bad habits of sucking, biting fingers, tongue, lips, different objects;
- breathing dysfunction;
- mouth breathing habit;
- palatopharyngeal tonsils enlargement promotes forward tongue displacement, its irregular location;
- swallowing dysfunction;
- speech disturbance;
- irregular position during sleep;
- individual teeth adentia, macrodontia on one of the jaw;
- shortened tongue frenulum.

Open bite clinical presentation and diagnostics.

Clinical signs:

Esthetic disorders:

- the lower part of the face increasing;
- the lower jaw angle increasing; - the «symptom of long face»;

- lips don't contact each other or contact with tense. Morphological disorders:
- dento alveolar lengthening in lateral parts of dental rows; -
dentoalveolar shortening in frontal parts of dental rows; - vertical gap between teeth.

Classification of open bite by the size of the vertical gap:

- the 1st stage – less than 5 mm;
- the 2ndstage – less than 9 mm;
- the 3rdstage – more than 9 mm.

Functional disorders:

- bad habits of sucking, biting fingers, tongue, lips, different objects;
- mouth breathing habit;
- irregular swallowing;
- speech disturbance with putting off the tongue between teeth; -
mastication disorders.

Additional examination methods:

- study of diagnostic jaws models; - photometric face investigation; -
roentgenograms.

5.

Topics of reports/abstracts:

1. What is open bite?
2. What is the etiology of open bite?
3. What is the pathogenesis of open bite?
4. **What is the class of the open bite pathology?**
5. What basic open bite prevention methods do you know?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
3. Національна наукова медична бібліотека України <http://library.gov.ua/>

Practical Lesson №17

Topic: Prevention and complex treatment of the open bite in children primary, mixed, and permanent occlusion and an adults.

Goal: to study the open occlusion treatment methods with and without using orthodontic appliances; to study the features of the open bite treatment in the primary dentition; to study the features of the open bite treatment in the mixed dentition; to study the features of the open bite treatment in the permanent dentition;

Basic concepts: While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analis, plaster models, typodonts, panoramic x-rays.

Plan

- 1. Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
- 2. Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
- 3. Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. Parents of a 9-years-old boy complain about permanently open mouth of the child. External examination revealed elongation of the lower face part, non-closure of lips. Examination of the oral cavity revealed early mixed dentition. Relationship of the first permanent molars is neutral, vertical space is 5 mm. What's the most likely diagnosis?

6. Openbite
7. Distalocclusion
8. Deepoverbite
9. Crossbite

10. Mesialocclusion

2. A 12-years-old female patient was diagnosed with open bite and dento-alveolar elongation of lateral part of mandible. What construction of apparatus is required?

7. Upper jaw appliance with occlusal rest seats
8. Upper jaw appliance with occlusal rest seats
9. Herbst appliance
10. Upper jaw appliance with a face bow
11. Extraoral face bow
12. Angles sliding face bow

3. Analysis of a 10-years-old boy's jaw models revealed that occlusal plane of the frontal maxillary teeth was of concave form, its lateral parts were convex. Form of the alveolar process also represents deformation of dental arches. The upper jaw is of saddle-like form with abrupt narrowing in the region of premolar teeth. What type of bite is it?

6. Open
7. Distal
8. Mesial
9. Cross
10. Deep

4. A 6,5-years-old child has a gap 2,5-3 mm large between frontal teeth from canine to canine. Relationship of the first permanent molars complies with Angle's class I. Specify the severity degree of bite deformation:

6. I degree
7. II degree
8. IV degree
9. V degree
10. III degree

5. Parents of a 6,5-years-old boy consulted an orthodontist about no contact between the front teeth.

The child has a bad habit of sucking his tongue. Objectively: there is a symptom of multiple pits in his chin when the lips are closed, speech disturbance, between the front teeth there is a vertical gap up to 8 mm. Specify the occlusion anomaly : f.

Open bite

- g. Overbite
- h. Distal occlusion

- i. Cross-bite
- j. Mesial bite

4. Discussion of theoretical issues:

Treatment:

- Elimination of the cause;
- Functions normalization – mastication, swallowing, breathing, speech;
- Psychotherapeutic preparation;
- The oral cavity sanitation;
- The dental prosthetics in case of permanent teeth extraction and early primary teeth extraction;
- The creation of conditions for the normalization of the frontal part growth stimulation; - Stopping of the vertical growth of the lateral jaw parts.

The treatment and prevention in the temporal dentition period:

- Bad habit elimination;
- Nose breathing correction;
- Myogymnastics;
- The oral cavity sanitation;
- The dental prosthetics in case of early primary teeth extraction;
- The surgery treatment methods according to indications – the lip and tongue frenulum plastic surgery;
- Orthodontic functional appliances, trainers.

The treatment and prevention in the mixed dentition period:

- Bad habit elimination;
- Nose breathing correction;
- Myogymnastics;
- The oral cavity sanitation;
- The dental prosthetics in case of early primary teeth extraction;
- The surgery treatment methods according to indications – the lip and tongue frenulum plastic surgery.
- Psychotherapeutic preparation;
- Usage of orthodontic appliances of functional action – the Frenche's function regulator, trainers;

- The usage of removable and fixed appliances of mechanical action.

The treatment and prevention in the permanent dentition period(period of growth):

- The usage of removable and fixed appliances of mechanical action;
- The usage of modern fixed orthodontic systems;
- Physiotherapy – the vacuum therapy, the ultrasonic therapy, electrophoresis;
- The surgery treatment methods according to indications – the lip and tongue frenulum plastic surgery, the oral cavity vestibulum deepening and others.

The treatment and prevention in the permanent dentition period(after the period of active growth):

- The usage of removable and fixed appliances of mechanical action;
- The usage of modern fixed orthodontic systems;
- The surgery treatment – reconstructive surgery of the upper or lower jaw.

5.

Topics of reports/abstracts:

1. What is open bite?
2. What is the open bite treatment in the primary dentition?
3. What is the open bite treatment in the mixed dentition?
4. What is the open bite treatment in the early permanent dentition?
5. What is the open bite treatment in the late permanent dentition?
6. What removable and fixed appliances can be used for the open bite treatment?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
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3. Національна наукова медична бібліотека України <http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського <http://www.nbuv.gov.ua/>

Practical Lesson №18

Topic: Etiology, pathogenesis and prevention, clinic diagnosis of cross-bite.

Goal: To study the etiology of the cross occlusion; To study the pathogenesis and clinics of the cross occlusion; To study the diagnostics of the pathology; To study the anomaly prevention;

Basic concepts: While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

1. A 5-years-old girl with crossbite was referred to an orthodontist. Objectively: between frontal teeth there are diastems and transverse, canine cusp have no signs of physiological wear out. Central line between incisors doesn't match. What is the doctor's tactics?

- A. To remove unworn tubercles of canines
- B. To disconnect occlusion
- C. To make a screw plate for the upper jaw
- D. To administer jaw massage
- E. To wait for autoregulation

2. A 9-year-old boy presents with face asymmetry due to the chin displacement to the left. When the third Ilina-Marcosian diagnostic test is performed, face asymmetry disappears. What is the most likely clinical form of this occlusal abnormality?

1. Bilateral narrowing of the maxillary dental arch
2. Unilateral narrowing of the maxillary dental arch
3. Ankylosis of the temporomandibular joint
4. Unilateral hypoplasia of mandible
5. *Habitual displacement of mandible

3. During the prophylactic examination of the child's 9.5 year oral cavity, a bilateral bite was diagnosed without displacement of the mandible. What method of biometric studies of dental model models should be used in this case?

- A. Method Pona

4. B. The method of Gerlach
5. C. Schwartz method
6. D. Method of Korkhaus
7. E. Method of Ton

4. When reviewing the child, the following morphological features are established: a violation of the abutment overlap in the lateral areas, the displacement of the central line, narrowing of the mandible. What does this testify to?

- A. Squat (cross) bite
- B. Deep bite
- C. Mezial bite
- D. Distal bite
- E. Transversal bite

5. To the clinic of orthodontics a school dentist sends a boy 12 years old. No complaints. The tooth formula corresponds to the age. In the frontal region, on all planes the deviations are not determined. Sharpening of the teeth in the lateral sections on the transversal, the reverse of the teeth of the lateral segment. Which is the most timely diagnose?

- A. Two-point oblique bite
- B. Deep bite
- C. Open bite
- D. Distal bite
- E. Mezial bite

4. Discussion of theoretical issues:

Cross bite referred to transversal anomalies. It can be uni- and bilateral. Cross bite may also viewed as labial and lingual occlusion. The buccal cross bite is such a dental arch correlation, at which the upper lateral teeth vestibular tubercles go into the longitudinal tubercles of the low teeth. At the lingual cross bite upper the lateral teeth completely or partially slip by the lateral ones on one or both sides.

Cross bite maybe conditioned by numerous etiological agents, the most important tofwhichare:

- heredity;
- prenatal pathologies;
- malposition;
- amniotic fluid excess pressure;
- gestational toxicosis, injuries, infectious diseases, avitaminosis, etc.;
- birth injuries (torticollis);
- fibrous dysplasia (McCune-Albright's syndrome;
- shortening or lengthening of the lower jaw branch (Franceschetti-Tsvalen's syndrome of the 1st branchial arch);
- atypical position of teeth germs;
- adentia;
- violation of eruption process on one side;
- underdevelopment or overgrowth of one of the jaws;
- functional insufficiency of mastication muscles on one side;
- infancy diseases, leading to bone deformations;
- calcium dysbolism;
- neoplasms;
- TMJdisease (ankylosis);
- Irregular position during sleep (on one side, putting a hand or a fist under the cheek;
- Badhabitsetc.

At cross bite facec on figuration is violated, lower jaw transversal movement sarehampered, which may lead to irregular distribution of mastication pressure, traumatic occlusion and periodontal tissues disease. Some patients complain of buccal mucosa biting, irregular speech sounds pronunciation.

At the buccal cross bite without lover jaw displacement face asymmetry is possible without dislocation of the chin midpoint, which is detected by the relation to the median plane.

At the buccal cross bite with lower jaw displacement face asymmetry is observed, conditioned by the lateral displacement of the chin relative to the median-sagittal plane.

The left and right profiles of such patients are differentiated by the form, which progresses with age. At the lingual cross bite on the basis of face examination en face and in profile lower jaw displacement and chin flattering are not infrequently detected.

At the combined buccal-lingual cross bite facial, dental, articular, muscle and othe signs are characteristic of both buccal and lingual cross bite.

5.

Topics of reports/abstracts:

1. What is cross bite?
2. What is the etiology of cross bite?
3. What is the pathogenesis of cross bite?
4. **What types of the cross bite pathology do you know?**
5. What basic cross bite prevention methods do you know?

6. **Summarizing the information received at the lesson.**

7. **List of recommended literature:** Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

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2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
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6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988

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2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.
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4. Національна бібліотека України імені В.І. Вернадського
<http://www.nbuv.gov.ua/>

Practical Lesson №19

Topic: Combined treatment of cross-bite in children in the temporary, mixed and permanent occlusion and an adults.

Goal: to study the cross occlusion treatment methods with or without using orthodontic appliances; to study the features of the cross bite treatment in the primary dentition; to study the features of the cross bite treatment in the mixed dentition;

To study the features of the cross bite treatment in the permanent dentition; to study the cross bite treatment prognosis.

Basic concepts: During the studying a student must use his knowledge of the exact pathology. For the learning of the topic a student must use his knowledge and skills of methods of clinical examination of the patient. While studying the topic, a student must use his knowledge of the given pathology. To learn the topic a student must use his knowledge and practical skills of methods of clinical examination of the patient.

Equipment: cephalometric analysis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**

3. Questions (test tasks) to check basic knowledge on the topic of the seminar:

1. A 5-year-old girl with crossbite was referred to an orthodontist. Objectively: between frontal teeth there are diastemas and transverse spaces, canine cusp has no signs of physiological wear out. Central line between incisors doesn't match. What is the doctor's tactics?

- F. To remove unworn tubercles of canines
- G. To disconnect occlusion
- H. To make a screw plate for the upper jaw
- I. To administer jaw massage
- J. To wait for autoregulation

2. A 9-year-old boy presents with face asymmetry due to the chin displacement to the left. When the third Ilina-Marcosian diagnostic test is performed, face asymmetry disappears. What is the most likely clinical form of this occlusal abnormality?

- 6. Bilateral narrowing of the maxillary dental arch
- 7. Unilateral narrowing of the maxillary dental arch
- 8. Ankylosis of the temporomandibular joint
- 9. Unilateral hypoplasia of mandible
- 10. *Habitual displacement of mandible

3. During the prophylactic examination of the child's 9.5 year oral cavity, a bilateral bite was diagnosed without displacement of the mandible. What method of biometric studies of dental model models should be used in this case?

- A. Method Pona
- 8. B. The method of Gerlach
- 9. C. Schwartz method
- 10. D. Method of Korkhaus
- 11. E. Method of Ton

4. When reviewing the child, the following morphological features are established: a violation of the abutment overlap in the lateral areas, the displacement of the central line, narrowing of the mandible. What does this testify to?

- A. Squat (cross) bite
- B. Deep bite
- C. Mesial bite
- D. Distal bite
- E. Transversal bite

5. To the clinic of orthodontics a school dentist sends a boy 12 years old. No complaints. The tooth formula corresponds to the age. In the frontal region, on all planes the deviations are not determined. Sharpening of the teeth in the lateral sections on the transversal, the reverse of the teeth of the lateral segment. Which is the most timely diagnose?

- A. Two-point oblique bite
- B. Deep bite
- C. Open bite
- D. Distal bite
- E. Mezial bite

4. Discussion of theoretical issues:

Treatment:

- Elimination of the reason;
- Functions normalization – mastication, swallowing, breathing, speech;
- Psychotherapeutic preparation;
- The oral cavity sanitation;
- The dental rows size and shape normalization;
- The dental rows correlation normalization; - Results retention.

The treatment and prevention in the temporal dentition period:

- psychotherapeutic preparation;
- the oral cavity sanitation;
- bad habits elimination;
- speech correction;
- the dental prosthetics in case of early primary teeth extraction;
- myogymnastics;
- the primary teeth cusps cutting;
- regrinding of the milk molars and canine cusps;
- apparatus method – the delay of jaw growth or stimulation of one jaw growth;
- the dental rows size and shape normalization;
- the dental rows correlation normalization;
- dentition separation;

- the surgery treatment methods according to indications; - results retention.

The treatment and prevention in the mixed dentition period (dentoalveolar form):

- psychotherapeutic preparation;
- the oral cavity sanitation;
- bad habits elimination;
- speech correction;
- the dental prosthetics in case of early primary teeth extraction;
- myogymnastics;
- the primary teeth cusps cutting;
- regrinding of the milk molars and canine cusps;
- apparatus method – the delay of jaw growth or stimulation of one jaw growth;
- the dental rows size and shape normalization;
- the dental rows correlation normalization;
- dentition separation;
- the surgery treatment methods according to indications; - results retention.

The treatment and prevention in the mixed dentition period (gnathic form):

- psychotherapeutic preparation;
- the oral cavity sanitation;
- bad habits elimination;
- speech correction;
- the dental prosthetics in case of early primary teeth extraction;
- myogymnastics;
- the primary teeth cusps cutting;
- regrinding of the milk molars and canine cusps;
- apparatus method – the delay of jaw growth or stimulation of one jaw growth;
- the dental rows size and shape normalization;
- the dental rows correlation normalization;
- dentition separation;
- the surgery treatment methods according to indications; - results retention.

The treatment and prevention in the mixed dentition period (joint form):

- the upper dental row shape and size normalization with mechanically acting removable and fixed, with following correction of the low jaw position (inclined plane); - the functional occlusion control;
- retention.

The treatment and prevention in the permanent dentition period

(dentoalveolar form): - psychotherapeutic preparation;

- the oral cavity sanitation;
- the surgery treatment methods according to indications ;
- the apparatus treatment method – correction of a shape sizes and correlation of dental rows on the transversal plane with removable and fixed apparatus of mechanical and mixed action, intraoral and extraoral traction;
- the reached results retention.

The treatment and prevention in the permanent dentition period (gnathic form):

- psychotherapeutic preparation;
- the oral cavity sanitation;
- the surgery treatment methods according to indications ;
- the apparatus treatment method – correction of a shape sizes and correlation of dental rows on the transversal plane with removable and fixed apparatus of mechanical and mixed action, intraoral and extraoral traction;
- the reached results retention.

5. Topics of reports/abstracts:

1. What is cross bite?
2. What is the cross bite treatment in the primary dentition?
3. What is the cross bite treatment in the mixed dentition?
4. What is the cross bite treatment in the early permanent dentition?
5. What is the cross bite treatment in the late permanent dentition?
6. What removable and fixed appliances can be used for the cross bite treatment?

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher medical educational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

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Practical Lesson №20

Topic: Orthodontic treatment plan.

Goal: To master planning provision of orthodontic care children and adults, methods of examination of children and adults with tooth-jaw abnormalities and deformities, identify factors vestments in the treatment of tooth-jaw abnormalities and deformities

Basic concepts: in the process learning the student must apply their knowledge of anatomy and physiology features maxillofacial child, stages and timing of temporary and permanent tooth. For mastering topics the student must use their skills and knowledge of methods of clinical and instrumental investigation of special patients.

Equipment: cephalometric analis, plaster models, typodonts, panoramic x-rays.

Plan

1. **Organizational measures (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).**
2. **Control of the reference level of knowledge (written work, written test, frontal survey on basic terminology, etc.)**
3. **Questions (test tasks) to check basic knowledge on the topic of the seminar:**

A 14 –year-old patient consulted an orthodontist. The objective examination revealed that on the site of the second incisor a canine tooth had cut out, and on the site of the canine the second incisor appeared. The same pathology had also the patient’s father. Make a diagnosis:

- A. Transposition of the lateral incisor and the canine
- B. Palatine position of the lateral incisor

- C. Distal position of the lateral incisor
- D. Mesial position
- E. Superocclusion of the incisor and infraocclusion of the canine

2. Preventive examination of a 6-year-old child revealed the temporary teeth bite. The upper and the lower dental arches are trapeziformed. The upper incisors overlap the lower incisors more than by

$\frac{2}{3}$. The incisors and the second molars are in the same relation. There is no space between the

frontal teeth. The upper dental arch is bigger than the lower dental arch by the buckle cusp size. Bite abnormality is observed in the following planes:

- A. Sagittal and vertical
- B. Sagittal and nasal
- C. Sagittal and frankfurt
- D. Sagittal and lateral
- E. Sagittal and occlusal

3. A 12-year-old patient complains about an aesthetic defect. Objectively: the lower third of the face is shortened, the upper frontal teeth overbite the lower teeth by $\frac{3}{3}$ of height, an oral inclination is observed, the lateral parts all along exhibit cusp-to-cusp relationship between the antagonists; Engle's class II malocclusion is also present. Malocclusion is observed in the following planes: A.

In sagittal and vertical

- B. In sagittal
- C. In transversal and vertical
- D. In transversal
- E. In vertical

4. An 11-year-old girl has adentia of the 35 tooth; it was proved by an X-ray examination. Between the 34 and 33 teeth as well as between the 34 and 36 teeth there are tremas, the 34 tooth is turned by 30 degree relative to its glosso-buccal direction. What abnormal position does the 34 tooth have?

- A. Torsoocclusion (rotation of teeth) and distal
- B. Oral
- C. Mesial
- D. Distal
- E. Vestibular

5. A boy of 10 years- old comes to see the doctor. His face is symmetric and proportional, mouth breathing is observed. The examination of the oral cavity reveals a saddle-like form of the dental arches and deep palate. The upper first molar relationship (Engle's key to occlusion) remains intact. What is the most likely diagnosis?

- A. Narrowing of dental arches
- B. Elongation of dental arches
- C. Mesial occlusion
- D. Distal occlusion
- E. Widening of dental arches

6. An 8-year-old boy complains of improper arrangement of the teeth. The examination at an orthodontic clinic reveals a broad, tight, low-attached upper lip frenulum.

The broad frenulum and its low attachment may cause:

- A. Diastema
- B. Protrusion of the upper front teeth
- C. Elongation of the upper dentition
- D. Shortening of the upper dentition
- E. Narrowing of the upper dentition

7. Preventive examination of a 5-year-old child revealed a half-open mouth, the difficult closing of the lips, primary occlusion, a 4 mm sagittal gap, the homonymous contact between the canines and the second molars. The upper dental arch is V-shaped, the lower one is trapezoid. Both dental arches in primary occlusion should have the following shape:

- A. Semicircle
- B. Parabola
- C. Semiellipse
- D. Quadrangle
- E. Triangle

8. Preventive examination of a 5-year-old child reveals the infant swallowing. The bad habit of thrusting the tongue between the teeth may cause the following complication:

- A. Incomplete eruption of the front teeth
- B. Broadening of the upper dental arch
- C. Narrowing of the lower dental arch

- D. Narrowing of the upper dental arch
- E. Broadening of the lower dental arch

4. Discussion of theoretical issues:

Without doubt, treatment planning is the most difficult, but also the most important, element of orthodontics. A knowledge of dental development, facial growth, psychology, and appliance mechanics are all prerequisites for success. Treatment planning is an interactive process. No longer can the doctor decide, in a paternalistic way, what is best for a patient. Both ethically and practically, patients must be involved in the decision-making process. Ethically, patients have the right to control what happens to them in treatment. It is something done for them, not to them.

It can also be the case that the patient has no concern regarding their dentition, and it is the parent or dentist who has requested the consultation. In this case, acceptance of orthodontic treatment more difficult to obtain. Four factors are considered important for the success or failure of orthodontic treatment:

- (1) Motivation: The patient must be interested to correct the malocclusion and aware of the problem related to their appearance.
- (2) Mobility: Teeth may have progressive mobility and continuous migrations.
- (3) Limitations: Health of the oral tissues must be good and at least three quarters of the teeth's roots should be surrounded by alveolar bone, and no evident root resorption.
- (4) Cooperation: The patient should follow the guidelines for appliance care and oral hygiene with removable and fixed appliances.

It is important to consider the type of complaint of the patient and whether its correction falls within the scope of orthodontic treatment. For example, a patient with a gummy smile might seek orthodontic care to enhance aesthetics. It must here be noted that the correction of the problem might require the interaction of orthodontic treatment with other disciplines that include orthognathic surgery.

Treatment aims

The following list is not comprehensive and has to be tailored to the individual case. Some of the problems that may need to be addressed during treatment are:

- Improved dental health

- Relieve crowding
- Correct the buccal occlusion
- Reduce the overbite
- Reduce the overjet
- Align the teeth

As emphasised previously, it is essential that the oral health is of a high standard before treatment starts. Carious teeth should be restored and the periodontal condition and oral hygiene should be excellent before treatment starts.

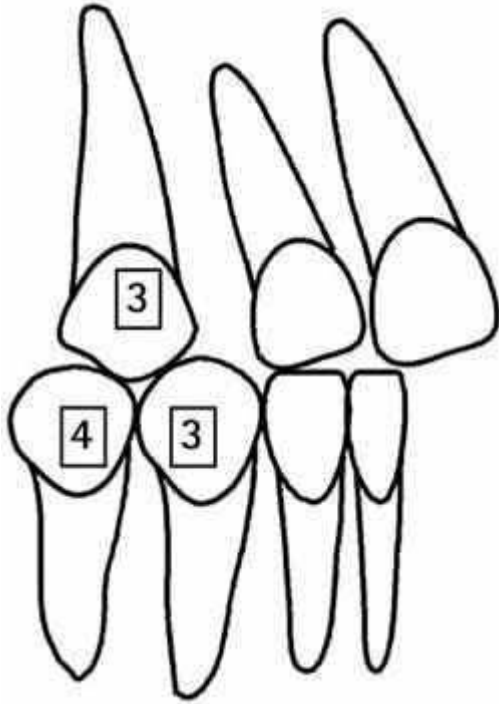
Relieve crowding

The decision to extract teeth needs to be carefully considered and depends on the degree of crowding, the difficulty of the case and the degree of overbite correction.

Correct the buccal occlusion

The key to upper arch alignment is to get the canines into a Class I relationship ([Fig. 1](#)). Providing the lower incisors are well aligned, achieving this will generally produce sufficient space to align the upper incisors.

Figure 1



It is important to achieve a Class I canine position in order to fully correct the overjet and the buccal segment relations

[Full size image](#)

In order to get the canines Class I there are, in general two choices for the molar relationship at the end of treatment; either Class I or a full unit Class II. This will be covered in more detail later in the section on treatment plan.

Overbite and overjet reduction

The overbite should always be reduced before overjet reduction is attempted. A deep overbite will physically prevent the overjet from being reduced because of contact between the upper and lower incisors.

Retention

Once the overjet has been reduced and or upper incisors have been aligned a retainer should be fitted. These are designed to reduce the risk of relapse post treatment by allowing remodelling and consolidation of the alveolar bone around the teeth and reorganisation and maturation of the periodontal fibres. There are many different types of retainers but they are generally removable or fixed. There are no hard and fast rules regarding the length of time retention should continue. The authors recommend for removable appliance treatment that retention should continue for 3 months full time and 3 months at night-time only. For fixed

appliance cases this should be 3 months full time and a minimum of 9 months at night-time only. At the end of this minimum year's worth of retention, discretionary wear should be advised. This means that the patient is given the option of discarding the retainer if they are fed up with wearing it, or continuing on a part-time regime to give the teeth the best possible chance of staying straight. If they decide to stop wearing the retainer they should be warned there is no guarantee that the teeth will remain straight throughout life and the only way to improve this prospect is by indefinite (ie life-long) wearing of the retainer.

Some cases, especially those that were spaced or where rotations were present prior to treatment, should be retained indefinitely, usually with bonded retainers.

Treatment plan

The treatment plan should be considered as follows:

- Oralhealth
- Lowerarch
- Upperarch
- Buccalocclusion
- Choosetheappliance

Oralhealth

Tooth brushing and diet advice must be given and written in the notes. Daily fluoride rinses are also recommended. Caries must be treated and periodontal problems appropriately addressed.

Lower arch

Plan the lower arch first. The size and form of the lower arch should generally be accepted.

Excessive expansion in the buccal regions or proclination of the lower incisors is contra-indicated in most cases because the soft tissues will generally return the teeth to their original position.

The need for extractions depends on the degree of crowding. In some cases, slight proclination of the lower incisors and expansion in the lower premolar region is acceptable, although this should be kept to a minimum in carefully planned cases. Generally this type of treatment is confined to the correction of mild crowding (less than 5 mm), cases where incisors have been retroclined by a digit habit or trapped in the vault of the palate, or during development of Class II Division 2 malocclusions especially where there is a deep bite. Any case where the overbite is excessive must be very carefully assessed before extraction decisions are made. As the degree of crowding increases from 5–10 mm the need for extractions increases and with more than 10 mm of crowding extractions are nearly always required. If spontaneous alignment or removable appliances are to be used, first premolars are usually the extraction of choice because they are near to the site of crowding, allow the canines to upright and produce the best contact point relationship. If other teeth are to be extracted then generally fixed appliances will be required. Crowding tends to worsen with age and is thought to be related to facial growth which continues at least until the fifth decade.

Upper arch

Plan the upper arch around the lower. If extractions are undertaken in the lower arch these should generally be matched by extractions in the upper. If no extractions are carried out in the lower arch the space for upper arch alignment may come from either distal movement of the upper buccal segments or extraction of upper premolars. The choice depends on the space requirements and the buccal occlusion. As the degree of crowding and overjet increase, then the space requirements will also increase and it is more likely that extractions as opposed to distal movement will be indicated.

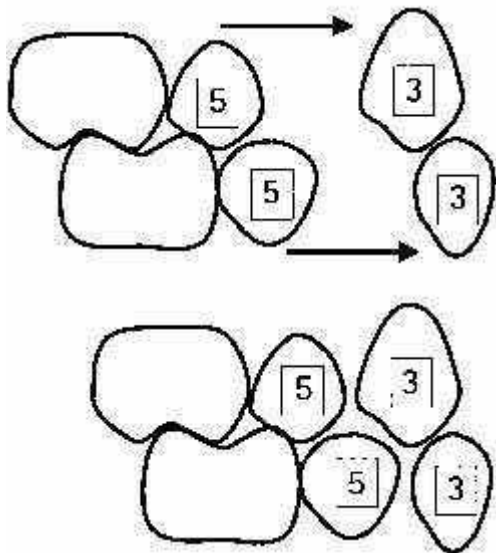
Determine whether the teeth are favourably positioned for spontaneous alignment. If appliances are needed can removable or fixed appliances accomplish the tooth movements?

Plan the buccal occlusion

Consider whether this needs to be corrected and if so how. If headgear is to be used, should it be used in conjunction with a removable or a fixed appliance? If the

lower arch is crowded, space may be created by the removal of two lower premolars. This is then matched by upper premolar extractions and the molar relationship must be Class I at the end of treatment to allow the arches to fit together ([Fig. 2](#)).

Figure 2: The importance of keeping extraction patterns symmetrical is demonstrated.

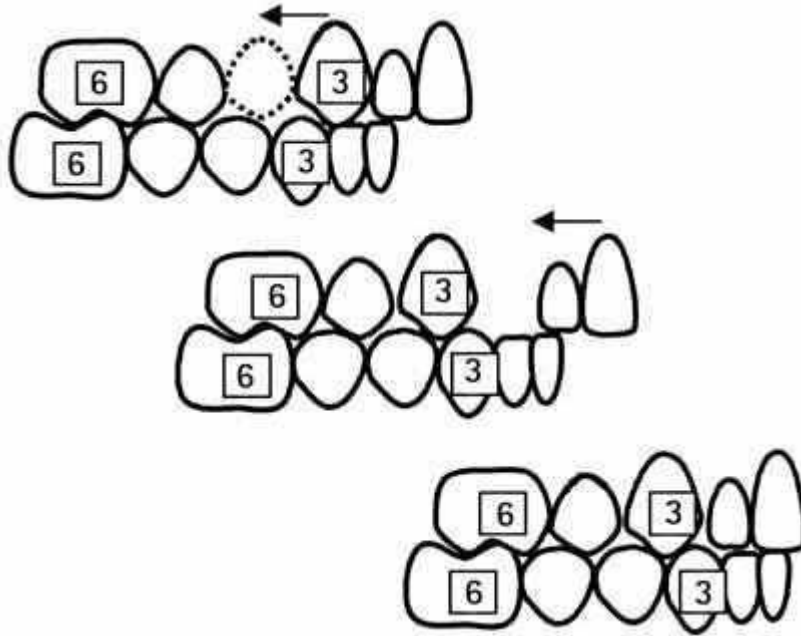


The lower arch crowding has been dealt with by removal of two lower premolars. The loss of the corresponding upper premolars means the molar relationship at the end of treatment should be Class I

[Full size image](#)

However if the lower arch is well aligned, space to align the upper arch can be created by either upper premolar extractions or by distal movement of the upper buccal segments. The choice depends on how much space is required and what the molar relationship is at the start of treatment. Generally the more Class II the molars are the more likely one will opt for premolar extraction rather than distal movement. Moving molars more than 3–4 mm distally is possible but becomes increasingly demanding on patient co-operation. In circumstances where the space requirements are large, upper premolar extraction reduces the treatment time and increases patient compliance. [Figure 3](#) shows the sequence of events when upper premolar extraction alone is undertaken as an aid to overjet reduction.

Figure 3

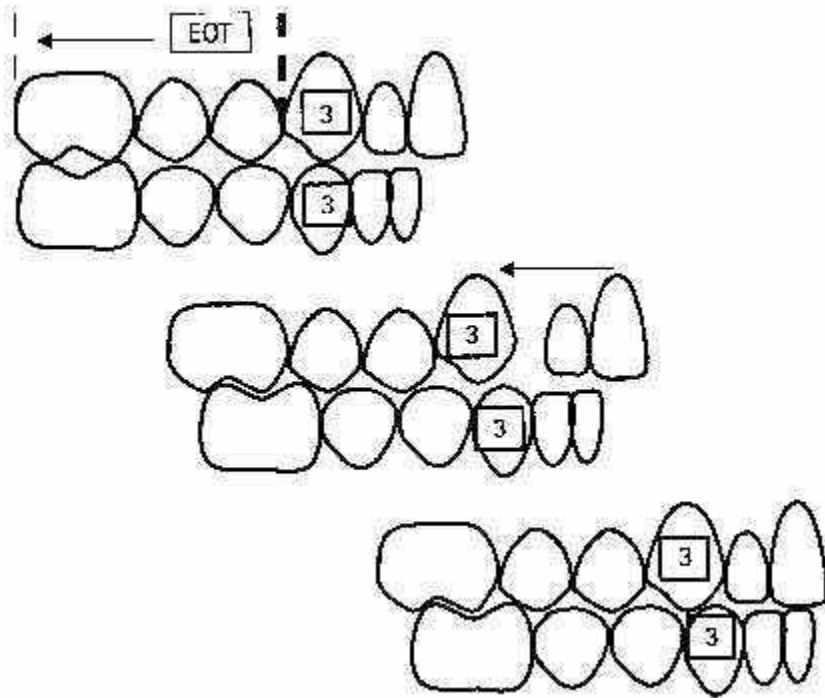


Where upper premolars alone are extracted (assuming no crowding in the lower arch), reduction of the overjet and space closure means the molar relationship must be a full unit Class II

[Full size image](#)

The nearer to Class I the initial buccal occlusion is, the more likely it will be that distal movement is appropriate. Therefore, space requirements that involve less than half a unit Class II correction can be accomplished by distal movement of the molars in a relatively short time with more chance of good patient co-operation (Fig. 4). Extracting upper premolars in these cases produces an excess of space and may increase the treatment time.

Figure 4: Where a relatively small Class II correction is required – this can be achieved through distal movement of the molars.



The loss of upper premolars in this case would produce an excess of space

Choose the appliance

Once the need for extractions has been considered the appropriate appliance should be selected. This can involve allowing some spontaneous alignment to occur, using removable, fixed or functional appliances with the addition of extra-oral traction or anchorage. Appliance choices are covered in the next section.

5.

Topics of reports/abstracts:

1. Organization of orthodontic care for adults and children
2. Clinical examination methods of orthodontic patients
3. Establishing a preliminary diagnosis
4. Anthropometric survey methods of orthodontic patients
5. Biometric methods of measuring diagnostic models
6. Photometric examination methods of orthodontic patients
7. Functional examination methods of orthodontic patients
8. Panoramic x-rays analysis of orthodontic patients
9. Analysis of cephalometrics orthodontic patients

6. Summarizing the information received at the lesson.

7. List of recommended literature: Main:

1. Lectures on the relevant topic.
2. Flis P.S. et al., Orthodontics: a textbook for students of stomatological faculties of higher mediceeducational institutions of IV level of accreditation - Kyiv, 2019, 305p.
3. Golovko N.V.-Orthodontics.-Poltava.-2015. - with. 128-132.
4. L. V. Smagliuk Basic course in orthodontics / L. V. Smagliuk, A. E. Karasyunok, A. M. Bilous. – Poltava: Blitz Style, 2019. – P.173-184.

Additional:

1. Маланчук В.О., Борисенко А.В., Фліс П.С. та ін. Основи стоматології. - Київ: «Медицина», 2009 р.
2. Ravindra Nanda, Flavio Andres Uribe - Atlas of Complex Orthodontics.- Elsevier Health Sciences, 2016, 424 p.
3. Charles J. Burstone, Kwangchul Choy. - The Biomechanical Foundation of Clinical Orthodontics. – e-book - 2020 г.
4. KALEY ANN.- Evidence-Based Orthodontics.- American Medical Publishers.- 2022, 225p.
5. Bhalajhi SI., et al. “Orthodontics: The art and science”. Sixth edition. Arya (Medi) Publication (2015)
6. William R Proffit., et al. “Patient Interaction in Planning”. In: Contemporary Orthodontics Elsevier Ltd (2019): 138.
7. RamyIshaq. “The Orthodontic Patient: Examination and Diagnosis”. EC DentalScience 18.5 (2019): 975-988
8. 3D Diagnosis and Treatment Planning in Orthodontics: An Atlas for the Clinician 1st Edition ed. by Jean-Marc Retrouvey (Editor), Mohamed-Nur Abdallah (Editor) 2021.

Information resources

1. Державний Експертний Центр МОЗ України <http://www.dec.gov.ua/index.php/ua/>
2. [Laura Mitchell](#), «An introduction to orthodontics», 2013 – 336 p.

3. Національна наукова медична бібліотека України <http://library.gov.ua/>
4. Національна бібліотека України імені В.І. Вернадського
<http://www.nbuv.gov.ua/>