

THE MINISTRY OF HEALTH OF UKRAINE  
THE HIGHER STATE EDUCATIONAL INSTITUTION OF UKRAINE  
"UKRAINIAN MEDICAL STOMATOLOGICAL ACADEMY"

Approved  
at the meeting of orthodontics department  
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**METHODICAL RECOMMENDATION**  
**for independent work of students during the preparation**  
**to practical lessons and the lessons**

Academic discipline	Orthodontics
Module №2	Anomalies and deformation of dento-jaw region
The theme of the lesson №14	Transversal malloclusion. Cross bite. Etiology, pathogenesis, prophylaxis, clinical presentation and diagnostics. Treatment of cross bite.
Course	IV
Faculty	Preparation of foreign students

Poltava 2017

### 1. The relevance of the topic.

Cross bite is referred to transversal anomalies. Cross bite frequency, according to literature, varies in different age groups and makes from 0.39 to 1.9 % in children and teenagers, and around 4 % in adults. Different terms are used to denote cross bite: oblique, lateral, buccal bite; vestibular, buccal, and lingual occlusion; articular cross bite; lateral forced bite; lateral dyskinesia; lateral position; exo- and endoocclusion.

### 2. Specific objectives:

To explain the causes and mechanism of cross bite development.

To classify forms of cross bite.

To explain basic principles of diagnosis and prevention of cross bite.

To determine degree of complication of morphological and functional violations at treatment of forms of cross bite.

To explain appliances which are used for treatment of different forms of cross bite.

To explain features of treatment of different forms of cross bite in a temporal, mixed and permanent bite.

To determine prognosis of treatment of cross bite forms.

### 3. Basic knowledge's, abilities, skills necessary for studying the topic (interdisciplinary integration)

Name of previous disciplines	Skills
1. Anatomy	To characterize the structure of the maxillofacial region.
2. Physiology	To be able to determine synchronicity of the contraction of the muscles.
3. Neuroscience	Identify the innervation (facial nerve paresis).
4. Prosthodontics	To determine the deviation in the developed bite
5. Oral surgery	To determine the indications for surgical intervention
6. Pediatric dentistry	To determine the biological, dental age of the patient, deviation in development.
7. Orthodontics	To determine the form of the anomaly, the nature of the aesthetic, morphological and functional disorders. To choose the necessary elements for the preparation of the design of the

	appliance.
8. Physical therapy	Select and appoint the necessary method.

#### 4. Tasks for independent work during preparation to the lesson and the lesson

4.1. A list of the main terms, parameters, characteristics that need to learn by the student during the preparation to the lesson:

Terms	Definition
1. Cross bite	Malocclusion in transversal plane that characterize by abnormal overlapping in lateral area.
2. Buccal cross bite	Type of cross bite when lower lateral teeth cover the upper.
3. Lingual cross bite	Type of cross bite when upper lateral teeth cover the lower more than the width of buccal cusp.
4. Midline shift	Displacement of lines that form the midline of the face (upper and lower lip frenulum's lines, inter-incisor lines, midline of the face).
5. Joint form of cross	Type of cross bite with displacement of the lower jaw in transversal plane.
6. Illina-Markosian tests	Clinical test for determination of cross bite type.

4.2. Theoretical questions to the lesson:

1. How to describe occlusion in transversal plane?
2. What facial signs do patients with cross bite have?
3. What are the intraoral signs of cross bite?
4. What functional disorders take place at cross bite?
5. What methods of diagnosing of cross bite do you know?
6. What types of cross bite according to the classification by Uzhumetskene?
7. What are the features of treatment of cross bite in the milky bite?
8. What are the features of treatment of cross bite in a mixed bite?
9. What are the features of treatment of cross bite in a permanent bite?
10. Description of constructions of appliances which apply for treatment of different forms of deep bite.

4.3. Practical works (task) which are executed at the lesson:

1. To know the characteristics of physiological occlusion in transversal plane.
2. To determine the form of cross bite according to the classification by Uzhumetskene.

3. To diagnose the different forms of cross bite.
4. To make the functional, clinical test by L. V. Ilyina-Markosian.
5. To know the methods of prevention of malocclusion in the transversal plane, and methods of treatment forms of cross bite in different age periods.
6. To make the plan of treatment of different forms of deep bite.
7. To choose rational construction of appliances for treatment of different forms of deep bite.
8. To make the impressions.
9. To determine and fix the constructional bite in patients with deep bite.
10. To choose rational construction of appliances.
11. To determine the prognosis of treatment of deep bite forms.
12. To fill the current document of doctor.
13. To correct and activate the appliance for deep bite treatment.

### The content of the topic:

Transversal plane is characterized by

- Midline matching ( face line, lip frenulum, interincisor lines);
- Upper dental arch wider than lower

on the size of buccal cusps.

According to Betelman's occlusion classification, cross bite is a pathological occlusion, belonging to transversal anomalies, which may be uni- and bilateral. Cross bite may be also viewed as labial (buccal) and lingual occlusion (according to Angle's classification of individual teeth position).

The WHO views cross bite as dental arches correlation anomaly:

- lateral teeth cross bite;
- lingual occlusion of the lower lateral teeth.

Kalvelis included cross bite to transversal anomalies, in particular – to the inadequacy of the lower and upper dental arches width:

- violation of lateral teeth correlation on both sides (bilateral cross bite);
- violation of lateral teeth correlation on one side (unilateral cross bite).

Y.I. Havrylov and **I.I. Uzhumetskene**, taking into account the diversity of clinical presentations, differentiate three forms of cross bite:

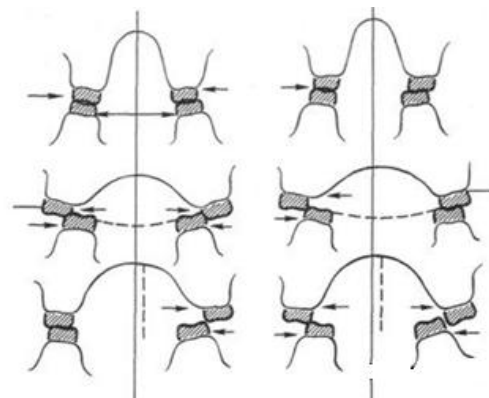
#### ***The 1<sup>st</sup> form – buccal cross bite.***

1. Without lateral lower jaw displacement:

a) unilateral, conditioned by unilateral narrowing of the upper dental arch or jaw, dilation of the lower dental arch or jaw, these signs combination;

b) bilateral, conditioned by bilateral symmetric or asymmetric narrowing of the upper dental arch or jaw, dilation of the lower dental arch or jaw, these signs combination.

2. With lateral jaw displacement:



- a) parallel to the median-sagittal plane;
- b) diagonally.
- 3. Combined buccal cross bite – combination of the 1<sup>st</sup> and 2<sup>nd</sup> varieties signs.

***The 2<sup>nd</sup> form – lingual cross bite.***

- 1. Unilateral, conditioned by the unilaterally wide upper dental arch, the unilaterally narrowed lower jaw, or combination of these disorders.
- 2. Bilateral, conditioned by the wide upper dental arch or jaw, narrowed lower jaw, or these signs combination.

***The 3<sup>rd</sup> form – combined (buccal-lingual) cross bite.***

- 1. Dento-alveolar — dilation or narrowing of the dento-alveolar arch of a jaw; combination of signs on both jaws.
- 2. Gnathic – dilation or narrowing of the jaw basis (underdevelopment, overgrowth).
- 3. Articular – lateral displacement of the lower jaw (parallel to the median-sagittal plane or diagonally).

L.V. Ilyina-Markosian singles out two forms of cross bite:

- without lower jaw displacement;
- with lateral lower jaw displacement.

Grigorieva L.P. differentiate two forms of cross bite:

- laterognathic (the upper dental arch covers the lower one);
- laterogenic (the lower dental arch covers the upper one).

On the basis of cephalometric methods of investigation Schwarz, Khoroshilkina, and Shcherbakov distinguish next forms of cross bite:

- 1. *Dento-alveolar cross bite* (dento-alveolar dilation or narrowing of the dental arch) – unilateral or bilateral.
- 2. *Gnathic cross bite* (narrowing or dilation of the jaws basis).
- 3. *Articular cross bite* – lower jaw displacement:
  - parallel to the median-sagittal plane;
  - diagonally.

A.A. El-Nofeli was the first to use the terms "buccal" and "lingual" to denote cross bite. According to the scholar, 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 lower 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 may be conditioned by numerous **etiological agents**, the most important of which are:

- 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 1<sup>st</sup> branchial arch);
- atypical position of teeth germs;
- adentia;
- violation of eruption process on one side (retention, violation of eruption sequence);
- underdevelopment or overgrowth of one of the jaws;
- functional insufficiency of mastication muscles on one side;
- infancy diseases (osteomyelitis, staphylococcosis, etc.), leading to bone deformations;
- calcium dysbolism;
- nonunion (most often unilateral), residual defect of the chin after uranostaphyloplasty;
- neoplasms;
- TMJ disease (ankylosis);
- unilateral facial hemiatrophy (facial nerve paresis), neuralgias;
- irregular position during sleep (on one side, putting a hand or a fist under the cheek);
- pernicious habits: supporting a cheek with a hand, sucking fingers, biting different objects on one side;
- irregular wearing out of the milk teeth tubercles;
- bruxism;
- caries, premature teeth extraction;
- irrational prosthetics.

Cross bite may develop in different periods of occlusion – milk, permanent, transitional dentition. It may also complicate vertical and sagittal occlusion anomalies, may be complicated by dental arches and individual teeth pathologies.

### **Cross Bite Clinical Presentation and Diagnostics**

At cross bite intraoral and extra-oral signs depend on the form and degree of pathology manifestation.

At cross bite face configuration is violated, lower jaw transversal movements are hampered, 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.

TMJ function is not infrequently violated, especially at occlusion anomaly with lateral lower jaw displacement.

The clinical presentation of each cross bite variety has its peculiarities.

1. *At the buccal cross bite without lower jaw displacement* face asymmetry is possible without dislocation of the chin midpoint, which is detected by the relation to the median plane.

Intraoral signs. The median line between the upper and lower central incisors usually coincide. But at dense position of the frontal teeth, their displacement, dental arches asymmetry it may be dislocated. In such cases the location of the basis of the lips and tongue frenula is found. The degree of dental

arches correlation violation may be different. The upper lateral teeth buccal tubercles may be located in the longitudinal sulci on the mastication surface of the lower teeth or not touch them.

2. *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.

*Intraoral signs.* The median line between the upper and lower central incisors does not usually coincide because of lower jaw displacement, the change of the dental arches (and not infrequently jaws) form and size. The lower jaw may displace parallel and diagonally to the median-sagittal plane. Position of the articular heads of the lower jaw in the joint changes at its lateral displacement, which shows on the mesio-distal correlation of lateral teeth in occlusion. Distal correlation of the dental arches appears in the place of displacement, in the opposite place – neutral or mesial correlation. Palpation of the TMJ region during opening and closing of the mouth on the side of lower jaw displacement shows normal or feebly marked movement of the articular head, on the opposite side – marked stronger. At mouth opening the lower jaw in lateral position may shift to the central one, at closing – return to the initial position. In some patients there was noted the increase of mastication muscle proper tone and volume, which increases face asymmetry.

To characterize lateral lower jaw displacement **Ilyina-Markosian's** and **clinical tests are used:**

*the 1st test* – examination of the face in physiological rest (disjoint in 2 mm).

*the 2nd test* – examination of the face in habitual occlusion.

*the 3<sup>rd</sup> test* – a patient is offered to open the mouth wide, facial signs of the pathology are studied. Face asymmetry increases, decreases or disappears depending on its reason (if face asymmetry increases and diagonal lower jaw displacement takes place, the pathology is of articular form);

*the 4<sup>th</sup> test* – the lower jaw is set in usual occlusion, then facial harmony is evaluated from the esthetic point of view, there are detected the degree of lower jaw displacement, the size of inter-occlusal space in the region of lateral teeth, dental arches narrowing (or dilation) degree, facial skeleton bones asymmetry, etc.

The studying of an antero-posterior head radiograph or cephalometrics not infrequently shows asymmetric development of the facial bones of left and right side, their irregular location in the vertical and transversal directions, diagonal lateral lower jaw displacement. The shortening of the lower jaw body or branch in the place of displacement or the thickening of this jaw body and of the chin on the opposite side are noted.

3. *At the lingual cross bite on the basis of face examination* en face and in profile lower jaw displacement and chin flattening are not infrequently detected.

*Intraoral signs.* Sometimes mastication muscles hypotonia, mastication function disorder, lower jaw blocking, its lateral movements violation are detected.

Occlusion and the form of dental arches change. At the excessively wide upper dental arch or the sharply narrowed lower one, the upper lateral teeth partially or completely slip by the lower ones on one or both sides.

4. *At the combined buccal-lingual cross bite* facial, dental, articular, muscle and other signs are characteristic of both buccal and lingual cross bite.

The final diagnosis based on the clinical and laboratory research (anthropometric, biometric (Pont method), X-ray).

### **Cross Bite Treatment**

Cross bite treatment depends on the pathology variety, reasons for its development, the degree of manifestation, the patient's age.

In the periods of temporary and early transitional dentition periods the treatment consists in the elimination of etiological agents, which have caused the anomaly:

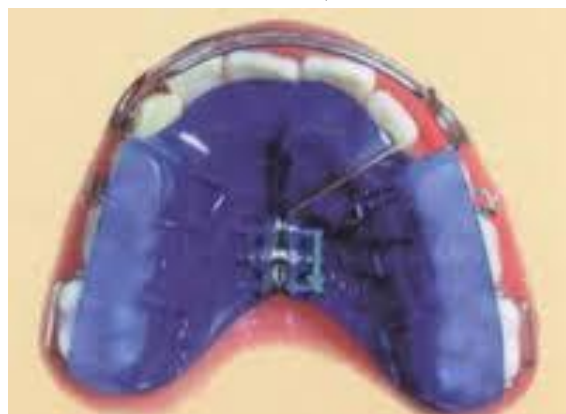
- fight against pernicious habits and oral breathing;
- extraction of retained milk teeth;
- regrinding of the tubercles of milk molars and canine teeth, which have not worn out and hamper lower jaw transversal movements;
- children are recommended to chew hard food on both sides of jaws;
- myogymnastics is administered in cases of considerable lateral lower jaw displacement;
- oral cavity sanitation for regular mastication of food on both sides;
- after premature loss of milk molars removable dentures are made to replace dental arches defects (artificial teeth should not have evident tubercles).
- normalization of dental arches form.

Principles of cross bite treatment without displacement:

- disjoin the occlusion (bite plane);
- normalization of dental arches form (screws, springs, wires).

Removable dentures for the upper jaw are made with a biting platform in the anterior part. Occlusion is elevated on artificial teeth, which allows disjoining teeth on the anomaly developed side. This facilitates correcting their position with the help of springs, screws, an inclined plane, and other appliances.

Except for prophylactic measures, orthodontic devices are used. By indications occlusion is elevated with the help of crowns or gum shields, fixed on temporary molars, which allows creating conditions for the normalization of dental arches and jaws growth and development, and also eliminating lower jaw displacement. At lateral lower jaw displacement crowns or gum shields are designed taking into consideration its correct position. A chin cup is recommended for the normalization of lower jaw position, which is achieved with the help of a stronger pull on the side opposite to



Upper jaw appliance for asymmetric expansion with occlusion bite planes and screw



the displacement. To set the lower jaw in correct position plates or gum shields for the upper or lower jaw with an inclined plane in the lateral part are used.

To make appliances for the treatment of cross bite constructive occlusion is found: the dental arches are disjoined on the side of deformation to facilitate their dilation or narrowing, the lower jaw is set in correct position at its lateral displacement.

To treat the cross bite combined with lower jaw lateral displacement there is designed an inclined plane or a device: for the upper jaw – palatine, for the lower jaw – vestibular, on the side opposite to displacement. The *inclined plane* may also be made on the side of lower jaw displacement: on the upper plate – form the vestibular side. In most known devices orthodontic screws are used.

At bilateral cross bite there is used an expansion appliance with occlusive bite planes on the lateral teeth without imprints of the opposing teeth, which facilitates dental arch expansion. At considerable narrowing of the upper dental arch, unilateral or bilateral, dilating devices with a screw or springs are recommended, and also devices with biting platforms in the lateral parts.

The treatment aims at:

- setting the lower jaw in correct position;
- disjoining lateral teeth, which facilitates upper dental arch dilation;
- correcting occlusion;
- rearrangement of myotatic reflex, changing mastication muscles tone;
- normalizing lower jaw articular heads position in TMJ.

At the most evident occlusion anomaly, including the one combined with sagittal and vertical anomalies at the age of 5.5-6 years, functionally directing or functionally acting orthodontic devices are used.

The most often used functionally directing device is activator. At the unilateral inadequacy of lateral teeth position (upper dental arch narrowing, lower dental arch dilation) Andresen-Haupl's activator is added with devices for lateral teeth transfer (springs, screws, levers, etc.).

Occlusive side plates are preserved on the side of correctly formed occlusion. Occlusion normalizes as a result of teeth position correction, articular process and lower jaw branch growth, jaw dislocation replacement. An activator with a unilateral (on the side of correct dental arches closure) or bilateral sublingual bandage may be used. In the latter case it should not be adjacent to the teeth, which are to be inclined lingually with the help of a vestibular arch.

The most often used functionally acting device is Frankel's function regulator. Treatment with this device is the most effective in the final period of temporary occlusion and in the initial period of transitional dentition. At buccal cross bite the regulator is set in such a way that lateral shields are adjacent to the crowns and alveolar process of the lower jaw and do not touch them in the region of the upper jaw on one side at unilateral cross bite or on both sides at bilateral one; at lingual cross bite lateral shields and dento-alveolar parts correlation must be reverse.

In the final period of transitional dentition and initial period of permanent occlusion prophylactic and treatment measures are the same as in the previous period. Different methods of orthodontic treatment stimulation (vibration, vacuum therapy, MRT) significantly improve the results and shorten the period of treatment.

In the period of permanent occlusion individual teeth position, dental arches form, and lower jaw displacement may be corrected. Mechanically acting devices are more often used, in combination with inter-maxillary pull, individual teeth extraction, methods of orthodontic treatment stimulation, and also different types of surgical procedures. To transfer upper and lower teeth in opposite



Cross elastics

directions after occlusion disjoining with the help of a removable device rings on lower and upper teeth with inter-maxillary pull are used. At the treatment of **buccal cross bite rubber elastics** are fastened by the hooks, soldered from the oral side of the rings, and by the hooks, located from the vestibular side of the rings fixed on the lower lateral teeth. The dental arches are subject to disjoining in these parts.

If the patient cannot set the lower jaw in correct position without assistance, the doctor does this during finding the constructive occlusion.

Sometimes Angle's devices are used. The distance between the vestibular surfaces of transferred teeth may also be regulated with elastic. To treat the cross bite with lateral lower jaw displacement or combine with sagittal or vertical occlusion anomalies Angle's devices with inter-maxillary recoil are used. Modern treatment methods – bracket system with inter-maxillary recoil – are resorted to as well.

In cases of the most evident cross bite, combined with face deformation, surgical treatment is used, whose method is chosen taking into account cross bite varieties, the degree of jaw parts sizes disorder and etiology.



Nord appliance for palatal suture fracture

Surgical treatment is combined with preliminary or subsequent orthodontic treatment by indications. The obtained results are not infrequently fixed by means of tooth replacement, which in some cases may be the way of obtaining numerous contacts between the dental arches. During prosthetics attention must be paid to the position of the lower jaw relative to the median-sagittal plane of face. Lower jaw irregular position fixation increases face asymmetry, provokes uneasiness, symptoms of arthropathy (crunch, clicking, pain in TMJ).

During cross bite treatment the following errors are made most often:

- the dental arch is dilated or narrowed on the side of cross bite without sufficient teeth transfer;
- lower jaw displacement is not eliminated at dento-alveolar cross bite.

Orthodontic treatment duration depends on the possibility of eliminating the etiological agents, which cause anomaly development.

In the period of temporary occlusion there are eliminated the obstacles conditioning lower jaw displacement; not infrequently it is enough to set it in the correct position (regrind the tubercles of individual teeth or high filling, replace absent teeth by means of prosthetics).

### **Treatment Prognosis**

At a most evident occlusion anomaly the orthodontic treatment, begun in the initial period of transitional dentition, not infrequently finishes in the period of permanent occlusion after obtaining numerous contacts between the dental arches, setting the lower jaw in the correct position, and normalizing dento-gnathic apparatus functioning.

Dento-alveolar forms of cross bite in adults may be eliminated by means of orthodontic treatment and subsequent teeth replacement.

At most evident gnathic forms surgical treatment is resorted to.

Treatment prognosis is favorable after early elimination of the dento-alveolar forms of cross bite, including the ones combined with lower jaw displacement. This anomaly may be eliminated in adults and teenagers, but face asymmetry is preserved more often than in children, and it might increase after teeth loss. At the gnathic form of cross bite prognosis is more favorable at early orthodontic treatment. At older age at the most evident occlusion and face symmetry violation the anomaly may be eliminated only by means of surgical intervention.

Retention period duration depends on the cross bite variety and the period of dento-gnathic apparatus formation. After eliminating the dento-alveolar form of cross bite, obtaining numerous contacts between the dental arches and correct position of the lower jaw in the quiescence the retention period is required.

If there are disorders in the TMJ, the retention period is prolonged. After correcting the gnathic form of cross bite in the retention period the treatment is not infrequently finished with teeth replacement.

### **Materials for self-control:**

A. Tasks for self-control (tables, diagrams, drawings, graphs):

1. To draw in albums dento-alveolar forms of cross bite.
2. To draw in albums appliances for treatment of cross bite without displacement of the jaw.
3. To draw in albums appliances for treatment of cross bite with displacement of the jaw.

B. Tasks for self-control:

1. A child of 7 years. During the examination revealed that the right lateral lower teeth cover the upper teeth. Name the appliance for treatment of this anomaly?

- a) appliance on the upper jaw with a screw and sectorial stich
- b) appliance on the upper jaw with a screw and median stich
- c) Dass appliance
- d) the appliance on the lower jaw with the inclined plane on left side
- e) the appliance on the upper jaw with the inclined plane on left side

2. What are the orthodontic appliance use for treatment of unilateral cross bite without displacement of the mandible?

- a) Angle
- b) Katz
- c) Bruckle
- d) Gulyayeva
- e) Ainsworth

3. What are the possible cause of formation of unilateral cross-bite without lower jaw displacement?

- a) atypical location of the teeth germs and their retention
- b) thumb sucking
- c) infantile type of swallowing
- d) dyslaly
- e) sucking of objects

4. The 11 years old child. Complaints on asymmetry of the face. Chin and the line between central incisors shifted to the left on 3 mm. Lower lateral teeth cover the upper on left side. What are the orthodontic appliance for the treatment of this anomaly?

- a) appliance on the upper jaw with the inclined plane on the right lateral teeth
- b) appliance on the upper jaw with a screw and a median stich
- c) appliance on the upper jaw with a screw and segmental stich
- d) angle appliance on upper dentition
- e) angle appliance on the lower dentition

5. A 7 years old child. Complaints on asymmetry of the face, displacement of the chin to the right. The line between the central incisors does not match, the displacement of the mandible to the right on 4 mm. Lower lateral teeth cover the upper on right side. Which of the following methods of examination is necessary in this case?

- a) clinical test by Ilyina-Markosyan
- b) Genci test
- c) test with fibers of cotton wool and a sip of water
- d) Eshler-Bitner test
- e) method of Hawley-Herberger-Herbst

6.Diagnostic feature of mandibular displacement in the transversal plane is?

- a) not matched the grounds of frenulum of upper and lower lip
- b) not matched the median lines between the central incisors of the upper and lower jaws
- c) violation of the ratio of lateral group of teeth in the transversal plane on the one side
- d) violation of the ratio of lateral group of teeth in the transversal plane both sides
- e) bilateral expansion of the upper dentition

7.Specify orthodontic appliance, which is not used for the treatment of cross bite?

- a) Brucle appliance
- b) appliance on the upper jaw with a screw and median stich
- c) appliance on the upper jaw with a screw and segmental stich.
- d) appliance with the frontal inclined plane on the upper jaw
- e) appliance with the frontal inclined plane on the lower jaw .

8.To specify the muscle that moves the lower jaw to the side?

- a) lateral pterygoid
- b) temporal
- c) hypoglossal
- d) digastric
- e) circular

9.To determine of the following factors that is most likely in the development of cross bite?

- a) unabraded milky molars
- b) lower lip biting
- c) tongue biting
- d) mouth breathing
- e) infantile type of swallowing

10.Determine following factors that is most likely in the development of cross bite?

- a) unilateral chewing
- b) biting the upper lip
- c) mouth breathing
- d) infantile type of swallowing
- e) pacifier sucking.

11.For the treatment of cross bite with a shift of the mandible in the construction of the appliance you would enter?

- a) inclined plane in the lateral area
- b) frontal biting plane site

- c) screw
- d) rudolf loops
- e) occlusal biting plane

12. Cross bite is a malocclusion in the following plane?

- a) transversal
- b) sagittal
- c) Vertical
- d) cranial
- e) frankfurt

13. A patient is 10 years old boy. Objectively: face symmetrical, proportional. There is mouth breathing. In the mouth: the shape of dental arches is like saddle, high palate. What pathology has a boy?

- a) narrowing of the upper dental arch
- b) anomalies of individual teeth
- c) anomalies of the size
- d) short lower dental arch
- e) anomalies of occlusion

14. A patient is 11 years old. During the examination it was diagnosed symmetrically narrowed upper dental arch. What removable appliance is indicated in this case?

- a) removable appliance on the upper dental arch with a screw
- b) Frankel's function regulator
- c) removable appliance on the upper dental arch with inclined plane
- d) appliance with functionally directing action
- e) removable appliance on the upper dental arch with biting platform

15. In permanent dentition the form of upper arch is?

- a) semyellipse
- b) semycircles
- c) parabolic
- d) oval
- e) saddle

16. Which anomalies of form dental arches in transversal plane do you know?

- a) dental alveolar lengthening and shortening of dental arch
- b) narrow dental arch and dilatation dental arch
- c) narrow dental arch and elongation dental arch
- d) elongation of dentition
- e) short dental arch

17. Cross bite is subdivided into?

- a) buccal, lingual
- b) covering, buccal
- c) covering, blocking, rachitic
- d) blocking, lingual
- e) rachitic

18. What facial signs are characteristic of unilateral cross bite with displacement?

- a) face asymmetry
- b) Middle part of face shortened
- c) lower part of face shortened, supramental sulcus deepening
- d) lower part of face enlargement, chin protrusion
- e) there are no facial signs

19. What diagnostic methods are required to put the final diagnosis of cross bite?

- a) frontal cephalometrics
- b) diagnostic models examination
- c) panoramics
- d) lateral cephalometrics
- e) axial roentgenography

20. Which method used to determine the width of the dentition in the period of permanent dentition?

- a) Pont
- b) Korkhaus
- c) Tonn
- d) Gerlach
- e) Howes

21. A 12 year-old girl turned to a doctor. No complains. Dental formula according the age. In the frontal region there is no deviations. In the lateral area in transversal plane revealed reverse overlap. What is the preliminary diagnosis?

- a) bilateral cross bite
- b) mesial bite
- c) open bite
- d) deep bite
- e) distal occlusion

22. A 6 year-old child complains of harmful habit sleeping with fist under cheek. What kind of anomalies may cause this harmful habit?

- a) cross bite
- b) distal bite
- c) open bite
- d) mesial bite
- e) deep bite

23. Treatment of cross bite in the deciduous teeth period is achieved by?

- a) preparation of not abraded tubercles of temporary teeth
- b) Katz appliance
- c) Muleman propulsor
- d) Andresen-Gouple appliance
- e) Frenkel regulator of functions

24. For treatment of laterogenic bilateral cross-bite in the period of permanent teeth is used?

- a) appliance on the upper jaw with a screw and occlusal bite plane
- b) regulator functions Frenkel
- c) Klamt activator
- d) Balters Bionator
- e) Schwarz kappa

25. Laterognathic form of cross-bite due to?

- a) bilateral narrowing of the lower or expansion of the upper dentition
- b) unilateral narrowing of the upper dentition
- c) unilateral expansion of the lower dentition
- d) expansion of the lower dentition
- e) extension of the lower dentition or a narrowing of the upper dentition

26. Diagnostic feature of mandibular displacement in the transversal plane is?

- a) the discrepancy between the grounds of upper and lower lip frenulum
- b) the discrepancy between the median lines between the central incisors of the upper and lower jaws
- c) violation of the ratio of lateral group of teeth in the transversal plane on the one side
- d) violation of the ratio of lateral group of teeth in the transversal plane both sides
- e) bilateral expansion of the upper dentition

27. The most informative in the diagnosis oblique bite is the following method?

- a) clinical
- b) ciometric
- c) graphical
- d) functional
- e) X-Ray

28. In what classifications of malocclusion there is no pathology in the transversal plane?

- a) E. Angle
- b) A.I. Betel'man
- c) D. A. Kalveli



- d) L. V. Ilyina-Markosian
- e) WHO

29. The use of any of the orthodontic appliances is a contraindication at and cross bite?

- a) preorthodontic trainer
- b) extending appliance
- c) Frenkel regulator functions
- d) Andresen-Goupl activator
- e) appliance on upper jaw with a screw and occlusal overlays.

30. What minimum number of teeth which are in reverse overlap to put diagnose cross bite?

- a) 3
- b) 2
- c) 1
- d) 4
- e) 5

31. For treatment of bilateral buccal crossbite is used?

- a) expanding appliance with occlusal flat biting planes on the lateral teeth
- b) propulsor of Mulleman
- c) appliance with screw and sectorial cut
- d) Pozdnyakova appliance
- e) appliance with screw and median cut

32. What appliance is used for the treatment of buccal cross-bite?

- a) Frenkel regulator of functions
- b) Pozdnyakova appliance
- c) Brucle appliance
- d) Katz appliance
- e) propulsor of Muleman

33. The degree of displacement of the mandible estimate relative to size of?

- a) central lower incisor
- b) lateral upper incisor
- c) central upper incisor
- d) lateral lower incisor
- e) premolars

34. For treatment of cross bite with displacement of lower jaw is used?

- a) appliance on upper jaw with inclined biting plane in lateral areas
- b) propulsor of Muleman
- c) appliance with screw and sectorial cut

- d) pozdnyakova appliance
- e) appliance with screw and median cut

35. What clinical forms of cross bite do you know?

- a) dentoalveolar, skeletal, combined, articular
- b) lateral , dento-alveolar
- c) central
- d) dento-alveolar
- e) gnathic.

## **Literature**

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