

MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN  
FEDERATION

Federal State Autonomous Institution

higher professional education

"Kazan (Volga) Federal University"

Institute of Fundamental Medicine and Biology

Department of Dentistry and Implantology

METHODICAL DEVELOPMENT

practical training for students of the 5th course of the 10th semester in  
dentistry.

**Topic:** Diagnosis and treatment of distal occlusion. Classification, etiology,  
treatment principles.



**The purpose of the lesson.** Train students in distal occlusion based on clinical examination and the use of additional research methods. To familiarize with the methods of treatment of these occlusion anomalies, with the devices used to treat them.

**Lesson plan:**

1. The teacher determines the initial level of knowledge of students through a survey, group discussion, testing -30 min;
2. The teacher corrects the initial level of knowledge, reveals lagging students -15 min;
3. The teacher checks the readiness of jobs, distributes students to jobs-10 min;
4. Work with literary sources. Compilation of a compendium-60 min;
5. Oral analysis of the material -120 min;
6. Testing -35 min.

**Class equipment:**

1. A multimedia audience with a capacity of 20 people;
2. Educational literature;
3. Visual aids: phantoms, demonstration models of the jaws, tables, diagrams, film and video films, computer presentations.
4. Dental education tools: booklets, brochures, memos, stands, exhibitions, posters, etc.
5. Control models of children of different ages with various forms of distal occlusion before and after treatment, OPTG, TRG.

**The list of literature to prepare for the lesson.**

1. Yakhina Z.Kh. Teaching aid on orthodontics for students: 2017
2. Khoroshilkina F.Ya., Persin L.S., Okushko-Kalashnikova V.P. Orthodontics. (Moscow, 2005, 453 pp .; ill. Bibliography p. 408-447 (542), Subject index p. 488-453 2000 copies (Code number 616.34-089.23).
3. W. Profit Modern Orthodontics 2016

4. Persin L.S. Orthodontics. Diagnosis and treatment of dentoalveolar anomalies: a Guide for doctors.-M.: Publishing House "Medicine", 2007-360s .; Il.-ISBN 5-225-04819-6.

## LESSON CONTENT

### Distal occlusion

The main sign of a violation of the ratio of the dentition is a change in their closure (occlusion). L.S. Persin proposed the term "distal occlusion of the dentition", which reflects the essence of the violation of the closure of the dentition, characteristic of both prognathic and distal occlusion.

### ETIOLOGY:

1. Heredity;
2. Early and improper artificial feeding;
3. Bad habits;
4. Disturbed nasal breathing;
5. Improper position during sleep (head thrown back);
6. Anomalies in the development of the jaw bones;
7. Functional insufficiency of the circular muscle of the mouth, etc.
8. Macrodonia of the teeth of the upper jaw, microdonia of the teeth of the lower jaw, displacement of the teeth of the upper jaw mesial, adonia of the teeth on the lower jaw or supernumerary teeth on the upper jaw.

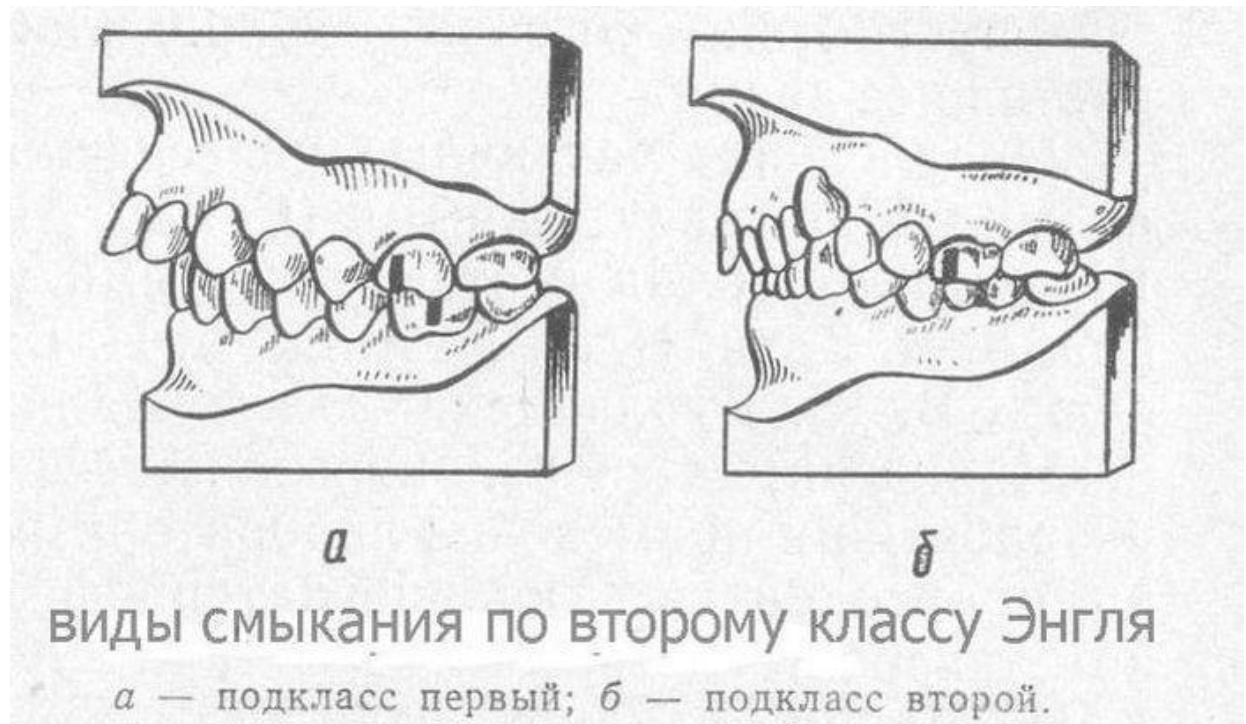
### CLINIC

The clinical manifestations of distal occlusion are diverse. The teeth of the lateral segments (fangs, premolars and molars) are located in the tuberos contacts or are located in front of the crowns of the same lower teeth. Engle, in his proposed classification of dentoalveolar anomalies, attributed such violations to class 2 and, depending on the location of the upper front teeth, distinguished two subclasses.

The first subclass is characterized by a vestibular deviation of the upper anterior teeth with or without trans and with the presence of a sagittal gap between the incisors. When closing the dentition there is a deep incisal overlap.

Characteristic facial signs of anomalies: the face is convex, its lower part is often shortened, the upper incisors are located on the lower lip, under which there is a deep supramental groove, the lips do not close.

The second subclass, which is called a blocking bite, is characterized by retrusion of incisors, often the upper central ones. Moreover, the upper lateral incisors are often deflected vestibularly and rotated along the axis. Retrusion of the upper incisors leads to retrusion of the lower incisors. Characteristic facial signs of the anomaly: the lower part of the face is shortened, the lips are closed, the lower lip is thickened, twisted, there is a deep supramental groove under it, the corners of the lower jaw are close to straight. This form of distal occlusion is often observed as a family feature.



With dystocclusion, functional disorders are observed. The lack of contact between the incisors is the cause of difficulty biting off food. A decrease in the area of functioning chewing surfaces of the teeth leads to a deterioration in chewing. Parents note that such children chew food for a long time and slowly. When narrowing the dentition, the lower incisors often come into contact with the mucous membrane of the palate and injure it. Mouth breathing contributes to the violation of the function and shape of the lips, non-closure of the lips leads to a

change in the position of the tongue, since the pressure of the muscles of the lips and cheeks is not balanced by the pressure of the tongue.

## DIAGNOSTICS

Anomalies of occlusion of the dentition are considered in the lateral sections (left and right), as well as in the frontal section. Thus, the diagnosis of “distal occlusion of the dentition” is made when the medial buccal tubercle of the upper first molar is located in front of the inter-tubercle fissure of the lower first molar (Engle's 2nd class). Moreover, such a closure should be on the right and left. In addition, the lateral teeth have one antagonist, and not two, as should be normal. The distal step is also formed between the vertical line drawn along the axis of the upper canine and the line drawn along the interdental space between the canine and the first premolar of the lower jaw.

With distal occlusion, there is a sagittal incisive disocclusion of the anterior teeth, i.e. there is no closure of the anterior teeth, which is expressed by the presence of a sagittal incisor gap, which indicates the severity of distal occlusion and incisal disocclusion. Incisive disocclusion can occur due to protrusion of the upper anterior teeth and retrusion of the lower anterior teeth.

Distal occlusion can be combined with deep incisal occlusion (Grade 2, 2nd subclass of Engle), resulting from palatine tilt of the upper and lower incisors and changes in the depth of overlap. An early clinical symptom of the development of distal occlusion in children 4-5 years old is the position of the distal surfaces of the second milk molars in one vertical plane

In clinical practice, the Ashler-Bittner test is used to differential diagnosis of disorders of the upper jaw and lower jaw. The patient is offered to extend the lower jaw to a neutral ratio of the first molars and evaluate the facial expression. If it improves, then the prognathic ratio is due to the underdevelopment of the lower jaw, if it worsens - a violation of the upper jaw.

If distal occlusion is due to anomalies in the development of the jaw bones, then they are diagnosed by TRG of the patient's head in a lateral projection. On TRG, the front position of the upper jaw can be determined by the SNA angle, which is more than normal.

## FORMS OF DISTAL OCCLUSION.

-dentoalveolar

- functional
- skeletal / true /
- maxillary macrognathia
- mandibular micrognathia

## DENTAL FORM OF DISTAL OCCLUSION

It is caused by a violation of the shape and size of the dentition, their position on the apical basis, the mismatch of the size of the crowns of the upper and lower milk molars and incomplete eruption of the lower first permanent molars.

## FUNCTIONAL FORM OF DISTAL OCCLUSION

There are two varieties:

- It is caused by the distal position of the lower jaw with a normally developed and located upper jaw; it is a fixed retrogeneration.
- Due to the forced displacement of the lower jaw distally due to the early loss of the first permanent molars or other posterior teeth, uncleaned tubercles of milk teeth or pronounced permanent tubercles.

A distinctive feature of this anomaly is the ability to move the lower jaw forward and the appearance of multiple occlusal contacts.

## SKELETON FORM OF DISTAL OCCLUSION

Due to the anterior position of the upper jaw relative to the base of the skull. Facial sign of abnormality is pronounced. Dental signs - of two varieties: according to the first and second subclasses of Grade 2 according to Engle. In both cases, there is an excessive overlap of the front teeth, most pronounced in the second variety.

## MAXILLAR MACROGNATHIA

This form of distal occlusion is due to the excessive development of the upper jaw. An increase in the body of the upper jaw leads to the appearance between the teeth of a diastema and three. On diagnostic models, an increase in the apical base is determined.

Mandibular micrognathia

Due to the underdevelopment of the lower jaw. Unlike other forms of distal occlusion, it is less often combined with excessive incisive overlapping of the front teeth. The shape of the dental arches is often not changed. There is a decrease in the length of the lower dentition, crowding of the teeth of the lower jaw, anomalies in the position of individual teeth.

## TREATMENT

During the occlusion of milk teeth, factors that interfere with the normal growth and development of the jaw bones are eliminated, therapeutic exercises of the masticatory and facial muscles are prescribed in order to achieve closing of the lips without tension and training the muscles that extend the lower jaw.

Therapeutic gymnastics can be an independent method of treatment, as well as precede orthodontic treatment and be combined with it. Sanitation of the oral cavity and nasopharynx is carried out, the child is weaned from bad habits. To normalize breathing and other functions of the dentition, vestibular plates are used. The vestibular plate is designed to correct the vestibular deviation of the incisors and stimulate the growth of the lower jaw. When the jaw moves, the pressure of the lower lip on the plate increases, and through it on the upper incisors.

Unpleasant sensations force the child to push the lower jaw, which contributes to its growth and increase in the oral cavity. Orthodontic treatment is more effective when combined with gymnastics. Gymnastic exercises consist in the fact that the child inserts the vestibular plate into the mouth and pulls it forward, placing one finger on the wire ring. In this case, the lips are compressed to hold the plate in the mouth. Repeatedly repeating the exercise improves the closing of the lips.

The final period of the milk bite and the initial shift period are the most favorable for the use of functionally functioning devices, in particular, type 1 and type 2 Frenkel function regulators.

Type 1 - FR - 1 - is used to treat dystocclusion, combined with narrowing of the dentition and protrusion of the upper front teeth (Grade 2, 1st Angle subclass)

Type 2 - FR-2- for the treatment of dystocclusion, combined with retrusion of the upper front teeth (Grade 2, 2nd subclass according to Engle)

FR-2 differs from FR-1 in that the palatine arch is added to it to protect the upper front teeth and change the shape of the loops into fangs.

Apply RF for the treatment of dentofacial anomalies during the period of active growth of the jaws (5-12 years).

Also, from the age of 6 to 10 years, trainers can be used to treat the dentoalveolar form of dystocclusion with mild malocclusion. Various types of trainers have



been developed: preorthodontic, myofunctional. The preorthodontic trainer is designed to correct the position of the front teeth, namely the retrusion of the maxillary incisors in the process of eruption, as well as to correct the tight position of the incisors on the lower jaw and their protrusion.

The trainer helps to eliminate bad habits: sucking fingers, mouth breathing, biting the lower lip. With its help, the normalization of the position of the lower jaw and its growth is achieved. It is contraindicated in case of difficulty in nasal breathing caused by diseases of the nasopharynx. Use the trainer during sleep during the day 1-1.5 hours. The blue transparent trainer is designed to eliminate myofunctional disorders. The average duration of use is 6 months. For the final alignment of the teeth use a pink trainer, harder. The duration of treatment with a pink trainer is from 6 to 12 months. Trainers are standard devices used in the process of orthodontic treatment.

In the late shift and permanent bite of removable orthodontic appliances for the treatment of distal occlusion, the most commonly used devices are O.M.

Basharova:

Most often, during the period of occlusion of permanent teeth, treatment is carried out with fixed equipment - bracket systems.

The duration of orthodontic treatment depends on many factors: the severity of the pathology and the difficulty of eliminating it, the dentoalveolar or skeletal form of distal occlusion, the age of the patient, the quality of the orthodontic apparatus, and the patient's contact with the doctor. The prognosis of treating skeletal forms of distal occlusion is less favorable than dentoalveolar. The results of treatment are stable after eliminating dysfunctions in the dentoalveolar region and achieving multiple tubercular-fissure contacts between the dentition.

test questions

1. Decipher the term "distal occlusion."
2. What are the etiological factors leading to distal occlusion?
3. What are the facial signs of distal occlusion.
4. List the intraoral disturbances in distal occlusion.
5. What are the functional disorders with distal occlusion?
6. What forms of distal occlusion do you know?
7. What is the cause of the tooth-alveolar form of distal occlusion and what devices are used to treat it?

8. Describe the functional form of distal occlusion and the principles of its treatment.
9. What devices are used to treat skeletal distal occlusion? The principles of their action.
10. What is the Ashler-Bittner test and what is it used for?
11. What types of regulators of Frenkel function are used to treat distal occlusion and at what age?
12. Describe the design of Basharova's apparatus, which are used to treat distal occlusion, indicate age indications.