

## Dedicated to the Great Edward Angle and the Classification of Dental Anomalies

LS Persin<sup>1\*</sup>, DB Kaplan<sup>2</sup> and VS Karpova<sup>3</sup>

<sup>1</sup>Professor, Head of the Department of Orthodontics, Moscow State University of Medicine and Dentistry, Moscow, Russia

<sup>2</sup>Orthodontist of the Department of Orthodontics, Moscow State University of Medicine and Dentistry, Moscow, Russia

<sup>3</sup>Assistant of the Department of Orthodontics, Moscow State University of Medicine and Dentistry, Moscow, Russia

**\*Corresponding Author:** LS Persin, Professor, Head of the Department of Orthodontics, Moscow State University of Medicine and Dentistry, Moscow, Russia.

**Received:** September 22, 2022; **Published:** October 26, 2022

### Abstract

The article is devoted to the E. Angle's classification of first molar malocclusion.

Classifications of dentoalveolar anomalies based on different principles are given. Classification of dentoalveolar anomalies that includes anomalies of teeth, dentition, jaws and occlusion is suggested.

**Keywords:** Bite; Occlusion; Disocclusion; Anomalies; Teeth; Jaws; Dentition

### Introduction

According to their principles, classifications could be: etiopathogenetic, functional, morphological.

#### Etiopathogenetic classification

By A. Kantorovich (1932) [1] is based on etiological signs, and it is proposed to distinguish two groups of anomalies:

1. Endogenous anomalies caused mainly by hereditary causes (progeny, deep bite and diastema).
2. Exogenous anomalies caused mainly by external conditions (compression or curvature of the alveolar process, curvature of the jaw body, stunting of the jaws due to loss of teeth, etc.); distal occlusion resulting from the distal position of the lower jaw.

According to V.Y. Kurlyandsky (1957) [2], the division of anomalies according to the etiological principle did not find recognition since the etiology cannot be often established. In addition, the same anomaly may be the result of several causes, both endogenous and exogenous, or endogenous-exogenous, and the elimination of the cause of the anomaly (if it has already arisen) does not lead to the normalization of the development of the dentofacial system and, conversely, treatment can be successful in cases where the etiology of the anomaly is not established.

#### Functional classification by A.Y. Katz (1950) [3]

This classification is based on the idea of the formation of dentoalveolar anomalies depending on the functional state of the muscles of the maxillofacial region. Three classes are suggested:

1. The first class is characterized by a change in the structure of the dentition in front of the first molars as a result of the prevalence of vertical (crushing) movements of the lower jaw.
2. The second class according to the morphological structure is the Angle Class II, functionally it is characterized by weakly functioning muscles that moves forward the lower jaw.
3. The third class morphologically is the Angle Class III, that according to A.Y. Katz, is associated with the prevalence of the function of the muscles that moves forward the lower jaw.

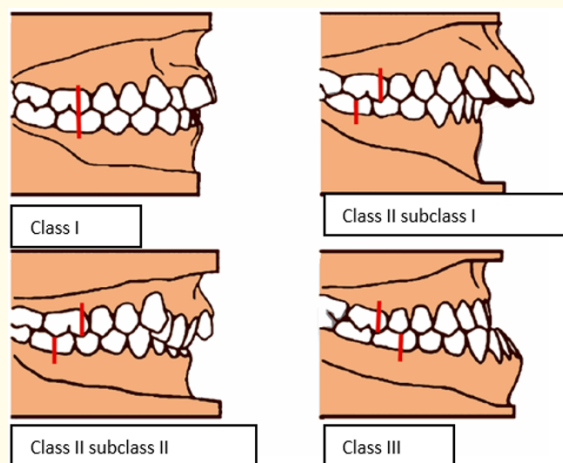
### Morphological classifications

Morphological classifications characterize changes in the structure of teeth, dentitions, jaws and systematize the types of malocclusion disorders and types of occlusions (articulation). These are the classifications of E. Angle (1898-1919).

### Angle's classification [4]

One of the first classifications based on the principle of closing teeth-antagonists was the classification of E. Angle (1898-1919). It is based on the type of closure of the first molars. This classification is based on the fact that the first upper molar occupies a permanent place after the second premolar.

In addition, the upper jaw is inseparably related with other bones of the skull, and the closure of the first upper and lower molars was called by him the key of occlusion. According to Angle, all changes can occur due to the mobile lower jaw. The author identified three classes of closure of molars (Figure 1).



**Figure 1:** Angle's classification of malocclusion.

Angle class I is characterized by normal closure of the molars in the sagittal plane. The mesiobuccal cusp of the maxillary first permanent molar occludes with the mesiobuccal groove of the mandibular first permanent molar. In this case all changes occur in front of the molars. Crowded position of the incisors, a violation of their closure is possible.

Angle class II is characterized by first molars occlusion disturbance where the mesiobuccal groove of the mandible first molar is located behind the mesiobuccal cusp of the maxillary first molar. This class is divided into two subclasses: the first subclass - the upper incisors are inclined in the labial direction (protrusion); the second subclass - the upper incisors are inclined palatally (retrusion).

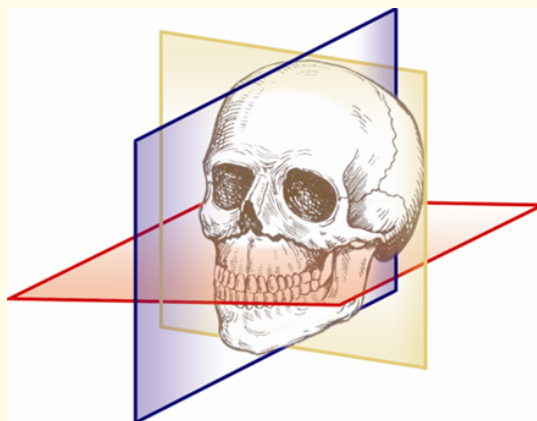
Angle class III is characterized by first molars occlusion disturbance where the mesiobuccal groove of the mandible first molar is located in front of the mesiobuccal cusp of the maxillary first molar.

Angle's classification is used by specialists at the present time, however it can only be used for orientation at the first stages of diagnosis that is associated with the disadvantages underlying it:

- The maxilla first molar does not always occupy a permanent place; when premolars are extracted or if we have adentia of premolars, molars can move mesially.
- The maxilla can occupy an anterior position in the skull, and then the first molar changes its position.
- Angle's classification provides an idea of the occlusion of the antagonistic teeth in the sagittal plane and only at the level of first molar occlusion; it cannot be used to determine the dentition occlusion in the transversal and vertical planes.
- The classification cannot be used for caries of the first molar, during the occlusion of deciduous teeth.

### Simon's classification

Simon (1919-1951) based his classification on the principle of determination of deviations in the development of the dento-facial system in relation to three mutually perpendicular planes of the skull: sagittal, frankfurter (horizontal) and frontal (vertical) (Figure 2).



**Figure 2:** Diagnostics of dentoalveolar anomalies in sagittal, vertical and transversal planes.

Dental position anomalies, dentition and jaw structure anomalies are identified.

This classification lists all deviations from a particular plane of teeth, alveolar processes and maxillary and mandibular bodies separately, for example: maxillary protrusion (anteversion), mandibular retrusion (retroversion) when abstracting the frontal teeth of both jaws.

### Classification by V.Y. Kurlyandsky (1957) [2]

Classification by V.Y. Kurlyandsky presents dentoalveolar anomalies in sufficient detail, that are further divided into anomalies of dental form and position, dentition anomalies, dentition relation anomalies. Anomalies in the development of one or both dentitions create a certain type of relationship between the maxillary and mandibular dentitions. The classification by Kurlyandsky V.Yu. lists certain types of maxillary and mandibular malformations. However, all three groups of this classification lack clear consistency between the group name and the anomalies included in it. For example, the third group of anomalies is named “dentition relation anomalies”, yet it focuses on maxillary and mandibular growth malformations and identifies only two types of malocclusion: “open” and “deep” even though these terms have nothing to do with articulation.

### Classification by D.A. Kalvelis (1957) [5]

According to the morphological classification, there are anomalies of individual teeth, dentitions and malocclusion.

In this classification, the author used the terms “prognathia” and “progenia”, which cannot characterize malocclusion, since they characterize the jaw position.

### Classification by K.A. Kalamkarov (1976) [6]

In accordance with the classification by K.A. Kalamkarov (1976) [5], dentoalveolar anomalies are divided into anomalies of the teeth, jaw bones and combined anomalies. For the first time, the author spoke about the position and size of the jaws.

### International classification

Based on the International Classification of Diseases (ICD-10), the World Health Organization published the International Classification of Dental Diseases in Geneva in 1977, introducing a section on orthodontic diseases.

It identified:

- Anomalies of jaw-cranial base relationship (K07.1)
- Anomalies of dental arch relationship (K07.2)
- Anomalies of tooth position (K07.3)
- Malocclusion, unspecified (K07.4)
- Dentofacial functional abnormalities
- Temporomandibular joint disorders (K.07.6).

According to Y.M. Malygin (2005) [7], “The Orthodontic Program in the International Classification of Dental Diseases” is a weak attempt to classify dentoalveolar and maxillofacial anomalies. It is incomplete from a morphological point of view and lacks consistency.

The sequence of the described abnormalities is presented inappropriately, and the etiopathogenetic approach to the structure of the classification is primitive. From a theoretical point of view, it reflects the level of development of the specialty and the specialists who created this classification at the end of the XX century””.

L.S. Persin (1989) [8] defined the concept of occlusion. Occlusion is the articulation of the dentitions in the habitual static position of the mandibular teeth. In normal occlusion, the habitual position of the lower jaw coincides with its central position (central occlusion). In cases of malocclusion, the central position of the lower jaw and its habitual position do not coincide, as the lower jaw can be positioned anteriorly or posteriorly (mandibular prognathia, mandibular retrognathia). Abnormalities of occlusion often result in a lack of occlusion of the antagonistic teeth and dentition disocclusion. The concept of physiological occlusion of the dental arches is introduced. This is normal dentition occlusion that creates the conditions for the normal functioning of the dentoalveolar system. This is normal dentition occlusion that creates the conditions for the normal functioning of the dentoalveolar system.

Based on the above conclusions, the classification of dentition malocclusions [8], which may be caused by anomalies at the level of dentition, the apical bases of the jaws, the jaw bones, are developed.

In the presence of all signs characteristic of physiological occlusion, one should distinguish between physiological occlusion of deciduous teeth and physiological occlusion of permanent teeth (Figure 3).



Figure 3: Physiological occlusion of permanent teeth.

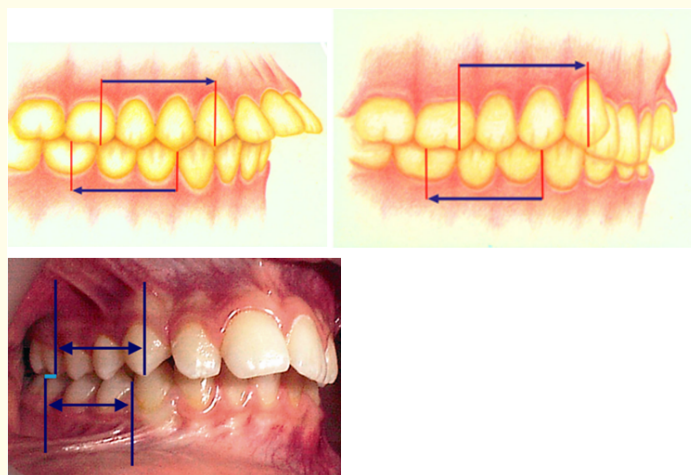
Malocclusions are considered in the sagittal, transversal and vertical planes. The type of occlusion in the anterior and lateral dentition sections should be considered. If one side of the dentition is cuspidal and a distal occlusion is formed, and the other side has normal occlusion, the occlusion of the lateral group of teeth can be considered as unilateral distal occlusion.

The relationship between the lateral segments of the maxillary and mandibular dentitions should be considered. The lateral segment of the maxillary dentition starts from the cusp of the cuspidate to the mesio buccal cusp of the first molar. The lateral segment of the mandibular dentition starts from the proximal contact point of the cuspidate and first premolar to the intercuspid fissure of the first molar. Normally, the lateral segment of the maxillary dentition corresponds to that of the mandibular dentition (Figure 4).

Distal or mesial occlusion is diagnosed only in the event of a distal or mesial occlusion in the lateral areas of the dentitions (left and right) with the formation of a distal or mesial step and a distal or mesial dentition occlusion occurs.

### Sagittal malocclusions

Distal occlusion of the dentitions is diagnosed when the lateral occlusion is abnormal, that is, the maxillary dentition is moved forward in relation to the mandibular dentition or the mandibular dentition is moved backward in relation to the maxillary dentition. With this anomaly, the lateral segment of the maxillary dentition is in front of the segment of the mandibular dentition (Figure 4).



**Figure 4:** Relation of the dentition segments in patients with distal occlusion.

Distal occlusion of the dentitions is diagnosed when the lateral occlusion is abnormal, that is, the maxillary dentition is moved backward in relation to the mandibular dentition or the mandibular dentition is moved forward in relation to the maxillary dentition. With this anomaly, the lateral segment of the maxillary dentition is behind the segment of the mandibular dentition (Figure 5). In the anterior segment, a reverse incisal occlusion or disocclusion is observed as a result of maxillary teeth moving-palatal retroversion of incisors or mandibular incisors moving vestibularly - protrusion of incisors.



**Figure 5:** Relation of the dentition segments in patients with mesial occlusion.

When the maxillary incisors are moved forward or the lower jaw is moved backward, disocclusion of the frontal group of teeth occurs. For example: disocclusion due to protrusion of the maxillary incisors or retroversion of the mandibular incisors.

**Vertical malocclusions**

Vertical incisal disocclusion involves the absence of occlusion of the anterior group of teeth (Figure 6). There are two types of malocclusion: deep incisal disocclusion and deep incisal occlusion (Figure 7).



*Figure 6: Disocclusion.*



*Figure 7: Deep incisal occlusion.*

Deep incisal disocclusion means that the maxillary incisors overlap the mandibular teeth without occlusion.

With deep incisal occlusion, the maxillary incisors overlap the mandibular teeth by more than 1/3 of the cap height. The occlusion of the incisors is preserved.

### Transversal malocclusions

Cross occlusion of the anterior teeth and cross occlusion of the lateral teeth should be considered.

Cross occlusion of the anterior teeth is considered if the midline between the central incisors is not aligned (Figure 8).



**Figure 8:** Cross disocclusion of the anterior teeth.

If the anterior teeth are occluded, cross occlusion of the anterior teeth is considered (Figure 9).



**Figure 9:** Cross (Transversal) occlusion of the anterior teeth.

If the anterior teeth are not occluded, cross disocclusion of the anterior teeth is considered (Figure 10).

Cross Occlusion of the Lateral Teeth. Depending on the causality, an anomaly in the shape or size of the dentition should be considered:

- Vestibuloocclusion - displacement of the mandibular or maxillary dentition toward the cheek (Figure 11).
- Palatoocclusion - displacement of the maxillary dentition palatally (Figure 12).
- Linguoocclusion - narrowing of the mandibular dentition lingually (Figure 13).





**Figure 10:** Cross (Transversal) disocclusion of the anterior teeth.



**Figure 11:** Vestibulocclusion caused by overdevelopment of the maxillary dentition.



**Figure 12:** Palatocclusion caused by overdevelopment of the maxillary dentition.



*Figure 13: Left-sided linguoocclusion.*

### **Classification of anomalies of teeth, jaws, and dentition occlusion (1990)**

#### **1. Dental anomalies**

1.1. Dental form anomalies

1.2. Dental hard tissue structure anomalies

1.3. Dental color anomalies

1.4 Dental size anomalies (height, width, thickness)

1.4.1. Macrodontia

1.4.2. Microdontia

1.5 Dental number anomalies

1.5.1. Hyperodontia (in the presence of supernumerary teeth)

1.5.2. Hypodontia (total or partial adentia of the teeth)

1.6. Dental eruption anomalies

1.6.1. Early eruption

1.6.2. Delayed eruption (retention)

1.7 Dental position anomalies (in 1, 2, 3 directions)

1.7.1. Vestibular

1.7.2. Oral

1.7.3. Mesial

1.7.4. Distal

1.7.5. Supraposition

1.7.6. Infraposition

1.7.7. Tortoanomaly

1.7.8. Transposition

## **2. Dentition anomalies**

2.1. Form defects

2.2. Size defects

2.2.1. In transversal direction (contraction, expansion)

2.2.2. In sagittal direction (lengthening, contraction)

2.3. Dental alignment abnormalities

2.4. Abnormalities in the symmetrical dental position

2.5. Abnormal contact between adjacent teeth (crowded or sparse position)

## **3. Anomalies of the jaws and their individual anatomical parts**

3.1. Form defects

3.2. Size defects

3.2.1. In sagittal direction (lengthening, contraction)

3.2.2. In transversal direction (contraction, expansion)

3.2.3. In vertical direction (increased, decreased height)

3.2.4. Combined in 2 and 3 directions

3.3. Jaw part luxation

3.4. Maxillary bone malposition

## **4. Dentition occlusion anomalies**

4.1. Abnormal dentition occlusion in the sagittal direction

**Lateral segment**

4.1.1. Distal

4.1.2. Mesial

**Anterior segment**

4.1.3. Sagittal incisal disocclusion

4.1.4. Reverse incisal occlusion

4.1.5. Reverse incisal disocclusion

4.2. Abnormal dentition occlusion in the vertical direction

**Lateral segment**

4.2.1. Disocclusion

**Anterior segment**

4.2.2. Vertical incisal disocclusion

4.2.3. Deep incisal occlusion

4.2.4. Deep incisal disocclusion

4.2.5 Direct incisal occlusion

4.3. Abnormal dentition occlusion in the transversal direction

**Lateral segment**

4.3.1. Vestibulocclusion

4.3.2. Palatocclusion

4.3.3. Linguoocclusion

**Anterior segment**

4.3.4. Transversal incisal occlusion

4.3.5. Transversal incisal disocclusion

**5. Occlusal anomalies of pairs of antagonistic teeth**

5.1. Sagittally

5.2. Vertically

5.3. Transversally.

This classification follows the same principle: malocclusion of the dentitions in the sagittal, vertical, and transversal planes is characterized according to the type of occlusion.

**Signs of transversal malocclusions**

Signs of malocclusion can be identified in the anterior and lateral sections of the dentition in the sagittal, vertical and transversal directions.

In the sagittal direction: There may be sagittal incisal disocclusion in the anterior section due to protrusion of the maxillary incisors and retroversion of the mandibular incisors. The magnitude of the sagittal over-jet is an indication of the severity of the maxillary anomalies (Figure 14).



**Figure 14:** Sagittal incisal disocclusion.

In the anterior region, there may be direct incisal occlusion as well as reverse incisal occlusion and disocclusion (Figure 15).

Distal dentition occlusion occurs where the lateral segment of the maxillary dentition (from cuspidate to first molar) is in front of the mandibular segment and forms a distal step (Figure 16).

Mesial occlusion can be determined sagittally, with the lateral segment of the mandibular row in front of the same segment of the maxillary segment (Figure 17).



**Figure 15:** Reverse incisal occlusion.



**Figure 16:** Distal dentition occlusion.



**Figure 17:** Mesial occlusion.

In the vertical direction, the upper front teeth do not come into contact with the lower front teeth and a vertical over-jet is formed in the anterior segment (Figure 18). The magnitude of the vertical over-jet is an indication of the severity of the anomalies.



**Figure 18:** Vertical incisal disocclusion.

Deep incisal occlusion may form where the maxillary anterior teeth overlap the mandibular anterior teeth by more than 1/3. In one case, there may be a preserved incisor-cuspal interference (deep incisal occlusion) (Figure 19).



**Figure 19:** Deep incisal occlusion.

In the other case, the depth of the incisal occlusion can be increased without preserving the incisal-cuspal interference (deep incisal disocclusion) (Figure 20).



**Figure 20:** Deep incisal disocclusion.

Disocclusion can also form in the lateral areas of the dentitions (Figure 21).



Figure 21: Lateral teeth group disocclusion.

In the transversal direction.

In the anterior section, a misalignment of the middle interincisal line (transversal incisal occlusion, disocclusion) can be diagnosed (Figure 22).



Figure 22: Transversal incisal occlusion, disocclusion.



The magnitude of the misalignment is an indication of the severity.

Vestibuloocclusion, palatoocclusion and linguoocclusion can be identified in the lateral parts of the dentition (Figure 23).



Figure 23: Cross dentition occlusion.

This classification follows the same principle: malocclusion of the dentitions in the sagittal, vertical, and transversal planes is characterized according to the type of occlusion.

The World Health Organization recommends using the International Classification of Dental Diseases based on ICD-10. It has many ambiguities, but nevertheless, it is important to compare the types of dentoalveolar anomalies given in ICD-10 and the classification proposed by the Department of Orthodontics of the Moscow State University of Medicine and Dentistry, approved at the 10<sup>th</sup> congress of Russian Orthodontists.

| 1. International Classification of Dental Diseases based on ICD-10. 3 <sup>rd</sup> edition.<br>Diseases of the digestive system.<br>Diseases of oral cavity, salivary glands and jaws | 2. ICD-10 name                            | 3. CODE | 4. Classification of the Department of Orthodontics of the Moscow State University of Medicine and Dentistry.<br>Approved at the 10 <sup>th</sup> Congress of Orthodontists of Russia. |
|--|---|---------|--|
| K00  | Developmental and dentition abnormalities | 1.0     | Dental anomalies   |
| K00.0  | Adentia                                   | 1.5     | Dental number anomalies  |

|        |   |       |                                   |
|--------|---|-------|-----------------------------------|
| K00.00 | Partial adentia                         | 1.5.2 | <b>Hypodontia (full, partial)</b> |
| K00.01 | Anodontia                               | 1.5.2 | <b>Hypodontia (full, partial)</b> |
| K00.1  | Supernumerary teeth                     | 1.5.1 | Hyperdontia                       |
| K00.2  | Abnormalities of size and form of teeth | 1.1   | Dental form anomalies             |
|        |   | 1.4   | Dental size anomalies             |
| K00.20 | Macrodontia                             | 1.4.1 | Macrodontia                       |
| K00.21 | Microdontia                             | 1.4.2 | Microdontia                       |
| K00.3  | Mottled teeth                           | 1.2   | <b>Dental structure anomalies</b> |
| K00.4  | Disturbances in tooth formation         | 1.2   | <b>Dental structure anomalies</b> |
| K00.6  | Disturbances in tooth eruption          | 1.6   | Dental eruption anomalies         |
| K00.62 | Early eruption                          | 1.6.1 | Early eruption                    |
| K00.64 | Delayed eruption                        | 1.6.2 | Delayed eruption                  |
| K00.80 | Dental color anomalies                  | 1.3   | Dental color anomalies            |
| K07.3  | Dental position anomalies               | 1.7   | <b>Dental position anomalies</b>  |
| K07.31 | Displacement                            | 1.7.1 | <b>Vestibular</b>                 |
|        |   | 1.7.2 | <b>Oral</b>                       |
|        |   | 1.7.3 | <b>Mesial</b>                     |
|        |   | 1.7.4 | <b>Distal</b>                     |
|        |   | 1.7.5 | <b>Supraposition</b>              |
|        |   | 1.7.6 | <b>Infraposition</b>              |
| K07.32 | Twist                                   | 1.7.7 | Tortoanomaly                      |
| K07.33 | Diastema                                |       |                                   |
| K07.34 | Transposition                           | 1.7.8 | Transposition                     |

| 1      | 2                           | 3     | 4   |
|--------|-----------------------------|-------|---|
|        |                             | 2.    | <b>Dentition anomalies</b>                                  |
|        |                             | 2.1   | <b>Form defects</b>   |
|        |                             | 2.2   | <b>Size defects</b>   |
|        |                             | 2.2.1 | <b>In transversal direction (contraction, expansion)</b>    |
|        |                             | 2.2.2 | <b>In sagittal direction (lengthening, contraction)</b>     |
|        |                             | 2.3   | <b>Dental alignment abnormalities</b>                       |
|        |                             | 2.4   | <b>Abnormalities in the symmetrical dental position</b>     |
|        |                             | 2.5   | <b>Disturbance of contact between adjacent teeth</b>        |
| K07.30 | Overcrowding                | 2.5.1 | Overcrowded position  |
|        |                             | 2.5.2 | <b>Rare position</b>  |
| K07.0  | Major anomalies of jaw size | 3.0   | Anomalies of the jaws and their individual anatomical parts |
|        |                             | 3.1   | <b>Form defects</b>   |
|        |                             | 3.2   | <b>Size defects</b>   |
| 1      | 2                           | 3     | 4   |
| K07.00 | Maxillary macrognathia      | 3.2.1 | Upper macrognathia  |
| K07.01 | Mandibular macrognathia     | 3.2.2 | Lower macrognathia  |

|          |  |                |  |
|----------|--|----------------|--|
| K07.02   | Mandibular and maxillary macrognathia      | 3.2.3          | Mandibular and maxillary macrognathia                    |
| K07.03   | Maxillary micrognathia                     | 3.2.4          | Upper micrognathia                                       |
| K07.04   | Mandibular micrognathia                    | 3.2.5          | Lower micrognathia                                       |
| K07.05   | Mandibular and maxillary micrognathia      | 3.2.6          | Mandibular and maxillary micrognathia                    |
| K07.1    | Anomalies of jaw-cranial base relationship | <b>3.4</b>     | <b>Maxillary bone malposition</b>                        |
| K07.11   | Mandibular prognathia                      | 3.4.1          | Lower prognathia   |
| K07.12   | Maxillary prognathia                       | 3.4.2          | Upper prognathia   |
| K07.13   | Mandibular retrognathia                    | 3.4.3          | Lower retrognathia                                       |
| K07.14   | Maxillary retrognathia                     | 3.4.4          | Upper retrognathia                                       |
| K07.2    | Anomalies of dental arch relationship      | <b>4</b>       | <b>Dentition occlusion anomalies</b>                     |
|          |  | <b>4.1</b>     | <b>In the lateral section</b>                            |
|          |  | <b>4.1.1</b>   | <b>Sagittally</b>  |
| K07.20   | Distocclusion                              | <b>4.1.1.1</b> | <b>Distal occlusion</b>                                  |
| K07.21   | Mesiocclusion                              | <b>4.1.1.2</b> | <b>Mesial occlusion</b>                                  |
| K07.24   | Open occlusion                             | <b>4.1.2</b>   | <b>Vertically: disocclusion</b>                          |
| <b>1</b> | <b>2</b>                                   | <b>3</b>       | <b>4</b>   |
| K07.25   | Cross occlusion                            | <b>4.1.3</b>   | Transversally: cross occlusion                           |
|          |  | <b>4.1.3.1</b> | <b>Vestibuloocclusion</b>                                |
|          |  | <b>4.1.3.2</b> | <b>Palatocclusion</b>                                    |
|          |  | <b>4.1.3.3</b> | <b>Linguoocclusion</b>                                   |
|          |  | <b>4.2</b>     | <b>In the frontal area</b>                               |
| K07.22   | Horizontal occlusion                       | <b>4.2.1</b>   | <b>Sagittally: sagittal incisal disocclusion</b>         |
| K07.27   | Back occlusion                             | <b>4.2.2</b>   | <b>Reverse incisal occlusion</b>                         |
|          |  | <b>4.3</b>     | <b>Vertically</b>  |
|          |  | <b>4.3.1</b>   | <b>Vertical incisal disocclusion</b>                     |
|          |  | <b>4.3.2</b>   | <b>Direct incisal occlusion</b>                          |
| K07.23   | Excessively deep vertical occlusion        | <b>4.3.3</b>   | <b>Deep incisal occlusion</b>                            |
|          |  | <b>4.3.4.</b>  | <b>Deep incisal disocclusion</b>                         |
|          |  | <b>4.4</b>     | <b>Transversally</b>                                     |
| K07.26   | Dental arch displacement                   | <b>4.4.1</b>   | <b>Transversal incisal occlusion</b>                     |
| K07.26   | Dental arch displacement                   | <b>4.4.2</b>   | <b>Transversal incisal disocclusion</b>                  |
|          |  | <b>5.0</b>     | <b>Occlusal anomalies of pairs of antagonistic teeth</b> |
|          |  | <b>5.1</b>     | <b>Sagittally</b>  |
|          |  | <b>5.2</b>     | <b>Vertically</b>  |
|          |  | <b>5.3</b>     | <b>Transversally</b>                                     |

**Table 1:** Classifications of dentoalveolar anomalies of ICD-10 and the Department of Orthodontics at Moscow State University of Medicine and Dentistry.

Note: Bold font indicates inconsistency with ICD-10.

## Conclusion

The authors gave a report based on the E.Angle [4] classification of malocclusion that allows to evaluate only the closure of the first molars in sagittal direction. The author (L.S.Persin) [8] proposed a full-fledged classification of dentoalveolar anomalies that has subdivisions according to anomalies of teeth, dentition, jaw bones and occlusion in vertical, sagittal and transversal direction. A segmental formula that allows to assess occlusion in anterior and posterior areas has been proposed.

## Bibliography

1. Kantorovich A. Occlusion Anomalies (Kantorovich classification) (1932).
2. Kurlyandsky VY. "Dentoalveolar Anomalies in Children and Methods of Treatment". Orthodontics. M.: Medicine (1957).
3. Katz AY. "Successes of Orthodontic Dentistry in 30 years". *Dentistry* 2 (1950): 6-9.
4. Angle EH. "Orthodontia". *Dent Cosmos* 11 (1920).
5. Kalvelis DA. "Development of Orthodontics in the USSR". *Stomatology* 3 (1967): 6-10.
6. Kalamkarov KA. "Dentoalveolar Anomalies in Children" (1976).
7. Malygin YM. "Orthodontic Program in the International Classification of Dental Diseases" (2005).
8. LS Persin. "Angle's Classification of Dentoalveolar Anomalies". *Dentistry* (1989).

**Volume 21 Issue 11 November 2022**

**© All rights reserved by LS Persin., et al.**