

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

Approved
at the meeting of orthodontics department
«____»_____20____y.
protocol №____ by _____
Head of department_____ L.V. Smaglyuk

METHODICAL RECOMMENDATION
for independent work of students during the preparation
to practical lessons and on the lessons

Academic discipline	Orthodontics
Module № 1	Orthodontia. Diagnostic of dento-gnathic anomalies and deformations.
The theme of the lesson № 3	Mixed bite, its morphological and functional characteristics. Bite increasing and jaw growth periods. Morpho-functional characteristics of permanent occlusion. Mechanism of dento-jaw region growth and development in this period of development.
Course	III
Faculty	Preparation of foreign students

Poltava 2016

1. The relevance of the topic. Background due to the need to know the morphological and functional features of the structure replacement and permanent dentition.

2. Specific objectives:

To know the structural features of the face, upper and lower jaws, bite and TMJ in 2 periods of mixed bite;

To know the periods of mixed bite;

To know structural features of the face, jaw and bite in and the 1 period of mixed bite;

To know structural features of the face, jaw and bite in and the 2 period of mixed bite;

To know the stages of physiological increasing of the bite height;

To know the stages of the sagittal and transversal occlusal curves forming;

To know the terms of permanent teeth eruption;

To know the differences between the temporary and permanent teeth;

To know the factors of jaws growth during mixed bite;

To know the features of the upper and lower jaw structure, TMJ and structural features of the oral cavity at a permanent bite;

To know the morphological features of 3 periods of a permanent bite.

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

Name of previous disciplines	Skills
1. Anatomy	Features of the structure of the facial bones. The structure of the TMJ in different age periods. Anatomical features of different groups of temporary and permanent teeth. Able to identify the group of the temporary teeth.
2. Prevention of dental diseases	Timing, order and sequence of eruption of temporary teeth. Number of teeth in the temporary occlusion.
3. Propaedeutic of therapeutic stomatology	The differences between the temporary and permanent teeth. Features of permanent teeth structure.

4. Tasks for independent work during preparation to the lesson and on 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. Mixed occlusion	The period of dentition, when in the mouth there are temporary and permanent teeth simultaneously.
2. Rules of teeth	Pairing, timing, sequence and order.

eruption	
3. Permanent occlusion	The period of dentition, when in the mouth there are only permanent teeth.

4.2. Theoretical questions to the lesson:

1. The terms of permanent teeth eruption.
2. The periods of the permanent occlusion.
3. The periods of physiological height bite increasing.
4. The structural features of the face, jaw and bite in and the 1 period of mixed bite.
5. The structural features of the face, jaw and bite in and the 2 period of mixed bite.
6. The features of the sagittal and transversal occlusal curves forming.
7. The factors of jaws growth during the mixed bite.
8. The differences between the temporary and permanent teeth.
9. The features of the upper and lower jaw structure, TMJ and structural features of the oral cavity at a permanent bite.
10. The morphological features of permanent bite 3 periods.

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

1. To determine the child's age because of an anamnesis. To determine the period of the malocclusion formation by Zubkova and Horoshylkina.
2. Pay attention to the difference between temporary and permanent teeth (color, size, crowns, cusps' abrasion).
3. To determine the period of the mixed bite development.
4. To determine the period of the child development according to the age of patient and intra-oral signs of different periods of temporary bite.
5. To determine the age of the patient with using of formula $4n - 20$, when n – is a patient' age.
6. Pay attention to the age of patient, and on relation of the canines.
7. To make a temporal bite' formula (clinical, by WHO, anatomical).
8. Pay attention to the age of patient and the affiliation of teeth to the temporary bite.
9. To determine the period of the permanent bite development.

The content of the topic:

A mixed dentition is the high degree of development and differentiation of the denta-jaw system. He is characterized by a presence temporary and permanent teeth simultaneously. Duration of period of teeth change hesitates from 6 to 12-14 years.

A mixed dentition is divided into 2 periods: I early – from 6 to 9 years and II periods – from 10 to 12-14 years.

I – is characterized by the presence of first permanent molars and incisors.

II – eruption of bicuspid and second molars, change of canines.

Resorption of roots of temporal teeth lasts in mixed dentition, due to what they become mobile. Eruption of first permanent molars provides the II physiological increasing of the bite height, is formed sagittal and transversal occlusal curves. The terms of permanent teeth eruption depend from the common state of organism, development and terms of life of child, to the state of temporal teeth and their periodont, time of their premature loss, etc.

In mixed dentition select two periods of the most intensive growth of jaws: I - is which precedes and accompanies eruption of first permanent molar; II - answers eruption of bicuspid and second molars and change of canines.

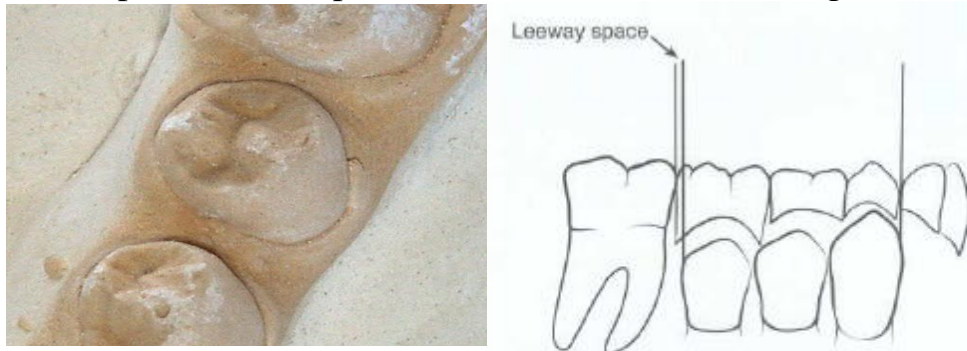


Figure 5-3 Leeway space is the difference in space between the combined mesial-distal crown dimensions of the unerupted permanent canine, first and second premolars, and the primary canine and the primary first and second molars.

During the change of teeth the substantial declining can concern in development persons which are conditioned by either innate or acquired factors. More frequent in all it concerns as a result of loss of plenty of temporal teeth, because there are violations of becoming height of bite.

A III physiological increasing of the bite height takes place due to growth of alveolar process in vertical direction during eruption and correct mutual setting of second permanent molars.

Eruption of the permanent teeth is characterized by an order, evenness and sequence. Sequence of teeth eruption is:

SEQUENCE OF ERUPTION There is wide variability in the sequence of arrival of teeth in the mouth.

Maxilla 6-1-2-4-3-5-7 or 6-1-2-4-5-3-7 (most common)

Mandible 6-1-2-4-5-3-7 or 6-1-2-3-4-5-7 (most common)

Dental age 6: First stage of eruption • Eruption of mandibular central incisor and permanent first molar.

• Mandibular molar eruption precedes maxillary molar.

Dental age 7 • Eruption of maxillary central and mandibular lateral incisor. • Root formation of maxillary lateral incisor well advanced. • Crown completion of canines and premolars.

Dental age 8 • Eruption of maxillary lateral incisor. • Delay of 2-3 years before any further teeth erupt.

Dental age 9 • One-third root formation of mandibular canine and first premolar is complete. • Root development of mandibular second premolar begins.

Dental age 10 • One-half root formation of mandibular canine and first premolar is complete. • Significant root development of maxillary and mandibular second premolar as well as maxillary canine. • Root completion of mandibular incisors and near completion of maxillary laterals. • According to Movers, mandibular canine erupts between 9 and 10 years.

Dental age 11

• Eruption of mandibular canine (according to Proffit), mandibular first premolar and maxillary first premolar. • Maxillary first premolar erupts ahead of canine and second premolar.

Dental age 12 • Remaining succedaneous teeth erupt. • Second permanent molars nearing eruption • Early beginnings of third molar

Dental age 13, 14, 15 • Completion of roots of permanent teeth • Third molars apparent on the radiograph Change in eruption sequence is a reliable sign of disturbance in normal development of the dentition. Certain normal variations with important clinical significance: • Eruption of second molars ahead of premolars in the mandibular arch. This decreases the space for second premolars, which get partially blocked out. • Eruption of maxillary canines ahead of premolars will cause the canines to be forced out labially. • Asymmetries in eruption between the right and left sides occurs when there is lack of space to accommodate erupting teeth due to different pattern of mechanical obstruction, decreased space on one side compared to the other.

Middle terms of the permanent teeth eruption such.

Preparation of place for eruption of second permanent molars begins after eruption of first permanent molars. Space for them on a lower jaw appears both due to the mesial moving of first permanent molars and due to resorb of bone of frontal side of branch of lower jaw and new formation on-the-spot back. On a maxilla an alveolar process grows in length. Growth of alveolar sprouts in a width and frontal area of maxilla in length takes place due to formation of bone fabric on-the-spot external alveolar processes and resorbtion of bone on-the-spot internal its. Formation of bone goes as a result of action of osteoblasts, and resorbtion - osteoclasts. These two opposite processes determine forming and growth of jaws bones.

The structure and interrelation of dental arcs change due to the changes of form and function of TMJ. If in a temporal bite an occlusal surface (masticatory) is horizontal, in mixed dentition compensative occlusal curves are formed is sagittal and transversal. Their expressed depends on the size of articular tubercle. A sagittal occlusal curve provides the contact of dental arcs during the forward movements of lower jaw minimum in 3th points which are located as a triangle with bases on molars and apex on frontal teeth. These three contact points name the three points contact by Bonvil. A sagittal occlusal curve is formed to 10-12 years.

On a tooth which was cut through, have influence: growth of jaws, pressure of lips muscles, cheeks and tongue; teeth-antagonists position. In this period look after the considerable increase of bone tissues in the area of back edges of lower

jaw branches, and also in a frontal area and on-the-spot external body of lower jaw. Lengthening of dental arc due to the increase of bone tissues necessity for distributing and establishment of permanent incisors in a dental row, as only very rarely enough growth of jaw in a width. Determine this sagittal growth in two different areas of jaw and in different time - due to eruption of first permanent molars and then permanent incisors and canines. Correct sagittal correlation of teeth is possible, if under act of growth of lower jaw its dental row mesial moves, not losing touch with an overhead dental row. That is why incomplete eruption of first permanent molars results in violations of bite not only in vertical but also in sagittal direction.

The location of first permanent molars influences on the form of occlusal Spee curve, as they are focus to which all second teeth move during eruption as though. Thus, sagittal growth of jaw regulates the height of bite. If growth of jaw answers age, correlation of teeth in vertical direction remains the same, as well as in a temporal bite. If the maxilla of relatively lower appears at the front, in the period of mixed bite determine the decline of height of bite. There is the increase of bite at normal sagittal growth of lower jaw; if she is located behind, a bite rises also. This favorable sign and is estimated as a II physiology increase of height of bite. After it growth of alveolar processes of jaws is halted to 10,5 years.

During eruption of the second teeth there is development of the denta-jaw system not only in horizontal but also in vertical direction. Thus apexes of roots of teeth, which cut through, rise in relation to basis of jaw. Especially it is observed in the area of canines, when they are moved to 10 mm (Frankel, 1971). As a result, a apical base, part of alveolar process, which covers apexes of roots, moves in occlusal direction.

More frequent place to the permanent canines is created during the third impulse of growth of jaws in sagittal one and transversal directions.

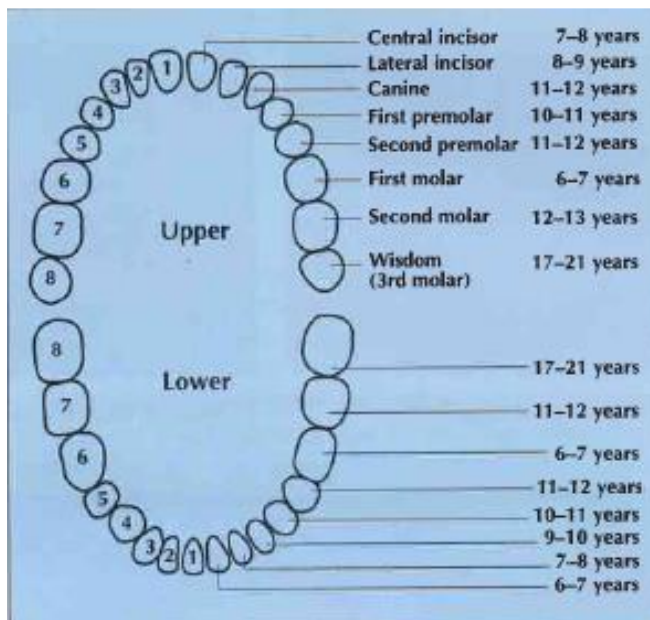
Thus, a III physiology increase of bite is related to eruption of permanent canines not second permanent molars (by Horoshilkina).

Speed of eruption different for every group of teeth. Second bicuspid cuts through quick in all (8 mm for 6 months). For a year quick other teeth central incisors (12 mm) cut through, and for 2 years are canines (13 mm). From the beginning of forming of root distance between him and by the lower surface of lower jaw diminishes on 2-4 mm in connection with his growth deep into bones. Growth of root is accompanied by rapid eruption of crown of the tooth. She passes considerably anymore distance, than apex of root. It is explained by that eruption of crown of the tooth takes place quick, than forming of root, which is sharply slowed after appearance of contacts with the oppositely located teeth. After establishment of teeth in a bite distance from the apex of root to the surface of lower jaw diminishes, that testifies to ending of forming of root. During eruption of the permanent teeth determine the reliable increase of dental and alveolar arc in sagittal one and transversal directions, which results in the increase of distance between permanent canines. After it in the permanent bite of substantial changes of sizes of dental and alveolar arc does not determine. Growth of jaws during the

change of teeth is conditioned by three factors. I – factor is biological tendency to growth; II factor – is eruption of the teeth; III factor – is the normal function of masticatory musculature which becomes valuable in a permanent bite.

The permanent teeth differ from temporal by such features:

1. The height of crowns of the permanent teeth is greater.
2. The permanent teeth have a rather yellow tint unlike blue-white one in temporal.



3. The permanent teeth are located in a dental arc under a corner, and temporal – without it. Upper teeth have the inclination of crown part (vestibular), and root-back (oral); lower teeth-by crowns inclined oral, and roots-vestibular.

4. Unlike temporal in the permanent teeth well the expressed equator.

5. In the under crown area of the permanent teeth absent enamel roller.

6. In the permanent teeth of children and teenagers absent signs of elimination at a physiology bite.

7. In a permanent bite distinguish 4

groups of teeth, in temporal - 3 (absent bicuspid).

8. Amount of teeth of permanent bite - 28-32, and temporal - 20.

The formation of a permanent occlusion begins per 6 years, when begin to erupt first permanent molars. As conditional border between a mixed and permanent occlusion consider such condition of teeth-jaw system, when remained of any temporary tooth.

A permanent occlusion has 3 stages (Khoroshilkina, 1999):

The I stage - with 12 till 18 years. At this stage, when occurs of eruption of last permanent molars, it is possible to see active body height of alveolar processes of jaws. The body height of jaws in particular active per the first 1,5 years (12-13,5 years), became slower in the following 1,5 years (13,5-15 years), remits till 16,5 years and practically absent in the age of 16,5-18 years. The body height essentially depends from eruption of second permanent molars, formation of roots of canines, second premolars and molars.

The II stage - "preformational" (Maligin) with 18 till 24 years. At this stage of a jaw reach maximal length in time of eruption of third permanent molars. The absence of "wisdom" teeth per 21 years testifies to insufficient body height of jaws in length. Active eruption of teeth last near to them mesial moving, which occurs in a direction of forces of chewing pressure.

The III stage - generated permanent occlusion. With an establishment in an occlusion permanent teeth processes formation and the reorganizations of bones became slower, but do not stop. Mesial moving of teeth lasts during life of the man depending on deleting their contacting surfaces. The space decreases which is

borrowed a tooth in a tooth arch (local length of tooth arches), whereas their general length is enlarged for the bill eruption two last molars (7, 8).

Body height and eruption of teeth essentially influence changes of height the face, which is enlarged with eruption temporary teeth by 17 %, first permanent molars and following (next) teeth - on 14 %, second permanent molars - on 24 %. It in the sum is equal 55 %. The proportions of the face and its external form, as bones of a facial skeleton displaces rather one change. The constancy of the form and conservation of an individual kind is provided with remodulating body height, that is generically controlled process of body height in all zones (articulate, sutural, appositional) in various time, with unequal intensity and in different directions.

Summary

The mixed dentition period is characterized by significant changes in the dentition as a result of the loss of 20 primary teeth and the eruption of their succedaneous permanent teeth. In the early stages of the mixed dentition period there may be a temporary open bite, usually either a result of the still incomplete eruption of the incisors or because of mechanical interference from a persistent finger habit. During normal development this open bite is often transitory in nature; the open bite is present until the incisors complete their eruption process, unless the abnormal habit persists. As each tooth erupts the clinician should expect that its antimere (the same tooth on the opposite side [e.g., the right and left central incisors]) would erupt within 6 months of each other.

Spacing. A diastema is a space between any two neighboring teeth. During the mixed dentition stage the presence of a midline diastema between the maxillary central incisors is a normal occurrence. In most cases the size of the diastema may vary between 1.0 and 3.0 mm. These diastemas usually close by the time the maxillary canines fully erupt and do not require any orthodontic intervention. If the diastema persists in the permanent dentition stage and if the patient is concerned, the clinician may consider closing it orthodontically or with composite buildups to the teeth.

Molar Relationship. As stated previously, the terminal planes of the second primary molars influence the path of eruption of the permanent first molars. For example, when the terminal plane relationship in the primary dentition stage is flush, the permanent molars erupt in a "cusp-to-cusp" or "end-to-end" first permanent molar relationship in the mixed dentition stage. Before we elaborate further on the molar relationship, a number of definitions are in order.

Causes of Change in the Molar Relationship. A number of factors are involved in the changes of the molar relationship from the flush terminal plane relationship, which is considered "normal" in the early mixed dentition stage, to a Class I molar relationship, which is "normal" in the permanent dentition stage.

The Leeway Spaces. In general, the sum of the mesio-distal width of the primary canine and the primary first and second molars is larger than the sum of their succedaneous teeth, namely, the permanent canine and first and second premolars. This difference is called the leeway space and is present in both the maxillary and mandibular arches. The most favorable dental arch pattern is when

leeway space is excessive (i.e., the combined size of unerupted canine and premolars is smaller than the available arch space). The leeway space is larger in the mandibular arch than in the maxillary arch. On the average, the unerupted canine and premolars are 1.8 mm smaller, per side, in the lower arch. In the upper arch, the leeway space averages only 0.9 mm per side.' Sometimes the combined sizes of the unerupted teeth are larger than the space available. This condition is called a leeway space deficiency, and dental arch crowding often results. It is important to note that, for most individuals, the growth changes in other dental arch dimensions will not typically be great enough to compensate for leeway deficiencies. The leeway space differential between the two arches allows the first permanent molars to move mesially relatively more in the mandibular arch than in the maxillary arch.

Mandibular Growth In general, both the maxilla and mandible grow downward and forward, but during this developmental stage the mandible grows relatively more forward than the maxilla. It was thought that these relative growth changes may contribute to the transition from an end-to-end to a Class I molar relationship. The findings from the Iowa study indicated that a weak correlation was present between the changes in the molar relationship and the changes in the antero-posterior jaw relationship.' Furthermore, there were no significant correlations between these two variables and the difference in the leeway space between the maxillary and mandibular arches. The Iowa results further indicated that changes in other variables such as inter-canine widths, arch lengths, and maxillary and mandibular relationships were associated with, and indirectly contributed to, the changes in the molar relationship. In other words the factors involved in the changes in the molar relationship are more complex than previously thought and are not solely dependent on one or two variables such as leeway spaces or mandibular growth.

Characteristics of a "Normal" Dental Arch Pattern in the Mixed Dentition Stage. The status of the dental arch at mid-adolescence is contingent upon clinical features that can be easily recognized during the mixed dentition stage. The simplest method of evaluating the status of the dental arches for either the presence or predisposition to a malocclusion, is to conceptually compare the patient's arches in the mixed dentition stage to what is considered to be an ideal dental arch pattern.

The ideal dental arch pattern in the mixed dentition stage after the eruption of the central and lateral incisors has the following characteristics:

- Class I molar and canine relationship
- Positive leeway space (i.e., no TSALD)
- Minor or no rotations or incisor crowding
- Normal bucco-lingual axial inclinations
- Normal mesio-distal axial inclinations
- Tight proximal contacts
- Even marginal ridges vertically
- Flat occlusal plane or a mild curve of Spee

Environmental Factors That May Influence the Dental Arch Pattern

The primary determinant of a malocclusion is the genetic predisposition. On the other hand, there are secondary environmental factors that can dramatically influence the disposition of the dental arches including early loss of primary teeth, interproximal caries, a pathologic condition, ankylosis of primary teeth, oral habits, and trauma. The environmental factors most commonly affecting dental arch status are probably caries and premature loss of the primary teeth. According to Northway, Wainright, and Demirjian, early caries as well as early loss of the primary first or second molars result in a decrease in dental arch length. For example, the loss of the primary second molars had the most deleterious effect on dental arch length and resulted in 2 to 4 mm of space closure per quadrant in both arches. In addition, the loss of the upper primary first molar typically resulted in blocked out canines, whereas upper primary second molar loss usually resulted in an impacted second premolar. The greatest space loss was the result of the mesial movement of the permanent molars. In general, more space was lost in the first year after the premature tooth loss of a primary tooth than in successive years. It needs to be emphasized that no reattainment of space was demonstrated during growth in either the upper or lower arches without treatment.

Permanent Dentition Stage

The permanent dentition stage of dental development starts after the shedding of the last primary tooth and the eruption of all the permanent teeth excluding third molars. **Some of the characteristics of the "normal" occlusion in the permanent dentition stage include the following:**

- **Overlap:** In a normally occluding dentition, the maxillary teeth are labial/buccal to the mandibular teeth.
- **Angulations:** In the primary dentition stage the teeth are, in general, vertically positioned in the alveolar bone. On the other hand, in the permanent dentition stage the teeth have bucco-lingual and mesio-distal angulations.
- **Occlusion:** With the exception of the mandibular central incisors and the maxillary second molars, each permanent tooth occludes with two teeth from the opposite arch.
- **Arch curvatures:** The antero-posterior curvature in the mandibular arch is called the curve of Spee. The corresponding curve in the maxillary arch is called the compensating curve. The bucco-lingual curvature from the one side to the other is called the Monson curve or the Wilson curve.
- **Overbite and overjet:** The overbite often ranges between 10% and 50%, and the overjet ranges between 1.0 and 3.0 mm.
- **Posterior relationships:** The maxillary and mandibular molars are in a Class I occlusion (i.e., the mesio-buccal cusp of the maxillary first molar is in the buccal groove of the mandibular first molar). In addition, the whole posterior segment needs to be well inter-digitated. More specifically, the maxillary canines should also be occluding in the embrasure between the mandibular canines and first premolars.

Late Changes in the Permanent Dentition Stage Because of the increasing number of adults seeking orthodontic care, an understanding of the changes that normally take place in the adult craniofacial structures becomes critical. In general, after the eruption of the permanent teeth, the dentition is relatively stable when compared with the cascade of changes observed in the mixed dentition stage. But change is the rule when it comes to the dento-facial complex. The changes in the various craniofacial skeletal profile and dental arch parameters between 25 and 45 years of age were investigated. The average time span between young and mid-adulthood observations for female subjects was 20.0 ± 0.8 years and for male subjects was 20.3 ± 1.2 years. The findings suggested that age-related changes in the craniofacial complex do not cease with the onset of adulthood but continue, albeit at a significantly slower rate, throughout adult life. With a few important exceptions, these changes tend to be of small magnitude so that their clinical relevance is somewhat limited and generally would not significantly influence orthodontic treatment planning. Two findings are considered to be of clinical importance and need elaboration. In both male and female subjects the lips became more retruded relative to the nose and chin between 25 and 45 years of age. The implication is that orthodontic treatment at earlier ages should not result in an overly straight soft tissue profile and overly retrusive lips because the expected changes in the relative positions of the nose, lips, and chin may exaggerate these characteristics. In both male and female subjects, interincisor and intercanine arch widths decreased. Also total arch lengths decreased and, as a result, anterior crowding increased.

Materials for self-control:

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

1. Write down the periods of mixed occlusion.
2. To draw in albums the sequence scheme of teeth eruption.
3. Write down the periods of physiological increasing of the bite.
4. To draw in albums the 4 variants of eruption and correct position in the bite of the first permanent molars.
5. Write down the factors, that influence on the grows and eruption of permanent teeth.
6. Write down the features of the permanent teeth structure, difference between permanent and temporary.
7. Write down the morphological features of permanent bite 3 periods.

B. Tasks for self-control:

1. Mixed bite characterized by:
the presence of temporary and permanent teeth
the presence of temporary teeth
the presence of permanent teeth
absence of all teeth
no premolars

2. Mixed bite divided into such number of periods:

2

4

3

5

1

3. In the first period of the mixed bite occurs:

the eruption of the first permanent molars and incisors

the eruption of the first permanent molars and canines

the eruption of the first permanent molars and premolars

the eruption of the first and second permanent molars

the eruption of premolars

4. In the second period of the mixed bite occurs:

the eruption of canines, premolars and second permanent molars

the eruption of incisors, canines, premolars

the eruption of incisors and first permanent molars

the eruption of premolars and canines

the eruption of canines and second permanent molars

5. To define physiological sequence of the upper permanent teeth eruption:

6, 1, 2, 4, 3, 5, 7

6, 1, 2, 3, 4, 5, 7

1, 2, 3, 4, 5, 6, 7

1, 2, 6, 3, 4, 5, 7

6, 1, 4, 3, 2, 5, 7

6. To define physiological sequence of the lower permanent teeth eruption:

6, 1, 2, 3, 4, 5, 7

6, 1, 2, 4, 3, 5, 7

1, 2, 3, 4, 5, 6, 7

1, 2, 6, 3, 4, 5, 7

6, 1, 4, 3, 2, 5, 7

7. The occlusion curve in the mixed dentition is modified in such planes:

sagittal and transversal

sagittal and vertical

vertical and transversal

orbital and vertical

orbital and transversal

8. The space for eruption of permanent molars in the upper jaw is formed by:

alveolar bone growth in length and resorption in the maxillary hill region
medial displacement of the mandible
the presence of diastema and thremas
eruption of premolars
the difference between the mesio-distal sizes of temporary and permanent teeth

9. "Optimal individual norm" by Y. M. Malygin is based on the feature:

3 signs of norm
4 signs of norm
5 signs of norm
2 signs of norm
6 signs of norm

10. Morphological characteristics of malocclusion are described in such planes:

in the sagittal, vertical and transversal planes
in the sagittal and vertical planes
in the sagittal and vertical planes
in the sagittal, orbital and nasal planes
in the sagittal, transversal and orbital planes

11. Orthognatic bite from orthogenic bite by relation in next plane differs:

vertical
sagittal
transversal
Frankfurt
nasal

12. Orthognatic bite from orthogenic bite by relation of such teeth group differs

incisors
canines
premolars
the first permanent molars
lateral teeth

13. Sagital occlusal curve formed by:

different height of teeth crowns (1 to 8)
the presence of gaps between teeth
different heights of posterior teeth cusps
the teeth inclination
the posterior teeth cusps abrasion

14. Transversal occlusal curve formed by:

different side of the teeth inclination
different widths of buccal and oral cusps of posterior teeth

different heights of the posterior teeth crowns
the posterior teeth cusps abrasion
the presence of spaces between teeth

15. One antagonist has the following teeth:
the lower central incisor and upper last molars
the upper central incisor and lower last molar
the lower lateral incisor and the lower “wisdom” tooth
the upper lateral incisor and the upper “wisdom” tooth
the upper canine and lower “wisdom” tooth

16. To determine the age of the child when there are teeth: 16, 55, 54, 53, 52, 11, 21, 62, 63, 64, 65, 26, 36, 75, 74, 73, 72, 31, 41, 82, 83, 84, 85, 46.
7 years
8 years
11 years
9 years
13 year

17. To determine the age of the child when there are teeth: 16, 55, 14, 13, 12, 11, 21, 22, 23, 24, 65, 26, 36, 75, 34, 33, 32, 31, 41, 42, 43, 44, 85, 46.
10 years
8 years
11 years
9 years
13 years

18. In normal permanent dentition incisors covering is:
1/3 of the height of the crown
to 2/3 the height of crown
on the whole height of the crowns
more than the whole height of the crowns
1/4 the height of the crowns

19. The anterior buccal cusp of upper first permanent molar in normal occlusion located is:
between the medial and distal buccal cusps of the same lower
over buccal cusp the same lower
between the cusps of the first lower molar and the second premolar.
between the cusps of the first and second lower molars.
over buccal cusp the lower second molar

20. The upper dental arch at the permanent orthognathic occlusion is:
semi-oval form

semi-circle form
parabola form
trapezoid form
triangular form

21. The lower dental arch at the permanent orthognathic occlusion is:

parabola form
semi-circle form
semi-oval form
trapezoid form
triangular form

22. Physiological types of occlusion in orthodontics believe:

orthognathic and ontogenic
orthognathic and prognatic
orthognathic and progenic
orthognathic and open
orthognathic and deep

23. Bite is:

The teeth relation in central occlusion
The teeth relation in the anterior occlusion
The teeth relation in lateral occlusion
The teeth relation in a constructive occlusion
The teeth relation in normal occlusion

24. Physiological permanent occlusion includes the following number of teeth:

28-32
24
20
30
16

25. The fourth stage of physiological height bite increasing occurs when erupted:

third permanent molars
the first permanent molars
second permanent molars
permanent canines
permanent incisors

26. In what periods of child development the grows jaws of frontal area mostly?

6-12 months 6-9 years
12-20 months and 9-10 years
in 2-2,5 years and 10-14 years

10-16 months and 8-10 years
1-2 years and 4-6 years

27. To determine the age of the child in the following dental formula: 16, 55, 14, 53, 12, 11, 21, 22, 63, 24, 65, 26, 46, 85, 44, 83, 42, 41, 31, 32, 73, 34, 75, 36.

9 years
6 years
7 years
8 years
11 years

28. To determine the age of the child when there are teeth: 16, 55, 14, 13, 12, 11, 21, 22, 23, 24, 65, 26, 36, 35, 34, 33, 32, 31, 41, 42, 43, 44, 85, 46.

11 years
7 years
8 years
9 years
13 years

29. The second period of physiological height bite increasing is?

permanent first molars eruption
temporary first molars eruption
temporary second molars eruption
permanent second molars eruption
permanent canines eruption

30. The third period of physiological height bite increasing is?

permanent second molars, canines and premolars eruption
temporary first molars eruption
temporary second molars eruption
permanent first molars eruption
permanent canines eruption

31. To determine the age of the child when there are teeth: 16, 55, 54, 53, 12, 11, 21, 22, 63, 64, 65, 26, 36, 75, 74, 73, 32, 31, 41, 42, 83, 84, 85, 46.

8 years
7 years
11 years
9 years
13 years

32. The first period of permanent bite lasts:

from 12 to 18 years
from 18 to 24 years

from 10 years to 16 years
from 14 to 17 years
from 12 to 18 years

33. The second period of permanent bite lasts:

From 18 to 24 years
From 12 to 18 years
From 10 years to 16 years
From 14 to 17 years
From 12 to 18 years

34. The third period of permanent bite begins after:

24 years
25 years
26 years
27 years
28 years

35. The morphological signs of bite are described in the followings planes:

sagittal, vertical and transversal
sagittal and vertical
sagittal and transversal
sagittal, orbital and nasal
sagittal, transversal and orbital

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