

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

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protocol № 1
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METHODICAL RECOMMENDATION
for independent work of students during the preparation
to practical lessons and the lessons

Academic discipline	Orthodontics
Module №3	Children's dental prosthetics
The theme of the lesson № 11	Morphological and functional features of the age and formation maxilla-dental system of the child and their clinical evaluation.
Course	V
Faculty	Preparation of foreign students

Poltava 2017

1. The relevance of the topic.

In modern conditions, people pay more and more attention on facial aesthetics, harmony of its structure. Violations of the dento-alveolar region can be prevented by using preventive measures, using the knowledge of morphological and functional age-related peculiarities of formation and development of dento-alveolar region. Rational orthodontic treatment is possible only after performing a comprehensive differential diagnosis, it is therefore important that the doctor possessed the necessary knowledge for the effective clinical assessment of orthodontic status of the patient.

2. Specific objectives:

To know the definition of "normal", "optimal individual norm" in orthodontics.

To analyze the periods of child development and bite.

To classify the types of physiological pathology that bites.

To explain the extra-oral and intraoral signs of physiological occlusion.

Interpreted the anatomical and physiological features of the oral cavity and the temporomandibular joint of the newborn.

To explain the morphological features of the formation of temporary, removable, permanent occlusion.

To explain the function of the formation of a temporary, removable, permanent occlusion.

To analyze the clinical manifestations of the major periods of becoming of height of bite.

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

Name of previous disciplines	Skills
1. Anatomy	Describe the structure of the cerebral and facial departments of skull, jaws, attachment of the facial and masticatory muscles. To assess the development and the proportionality of the size of the face, jaws.
2. Normal physiology	Describe the physiological act of a mastication, swallowing, speaking, breathing.
3. Radiology	To know radiology diagnostic, cephalometrics. To determine the form of malocclusion according to the lateral cephalometric.
4. Pediatric dentistry	To know the growth and development of the facial skeleton and of muscles in the age aspect, the timing of teething. To master principles of rehabilitation of the oral cavity in the prevention of a vertical malocclusions.

5. Prophylaxis of stomatological diseases	To write down the tooth formula (clinical, anatomic, by WHO), determine bite period and dental age.
6. Propedeutics of a therapeutic odontology	To define teeth according to the bite: temporary or constant occlusion.
7. Orthodontics (intra-subject)	To know construction of orthodontic appliance, principles of their design To choose a rational orthodontic appliances for the treatment of deep bite.

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. Optimal norm in orthodontics.	The state guaranteed in time morphological, functional and aesthetic balance in dento-facial system and facial skeleton in general, has to be pursued in the process of orthodontic treatment.
2. Dento-facial anomaly	It is a disease that is characterized by not only morphological changes in the structure of the bite, but functional and esthetic disorders of varying severity, which force the patient to seek help from a specialist.
3. The state compensation.	Mobilization of protective forces to maintain a dynamic equilibrium with the environment; the state of decompensation – defenses are exhausted, but the adaptation is preserved.
4. Key of occlusion according to Angle.	Cusp-to-groove contact between the first permanent molars of the upper and lower jaws at the correct inclination of the longitudinal axes of these teeth to the occlusal plane.
5. Pathological bite.	Bite, that characterized by the malposition of individual teeth, deformity of the dental arches and their abnormal ratio (a shift in the sagittal, vertical, or transversal directions).

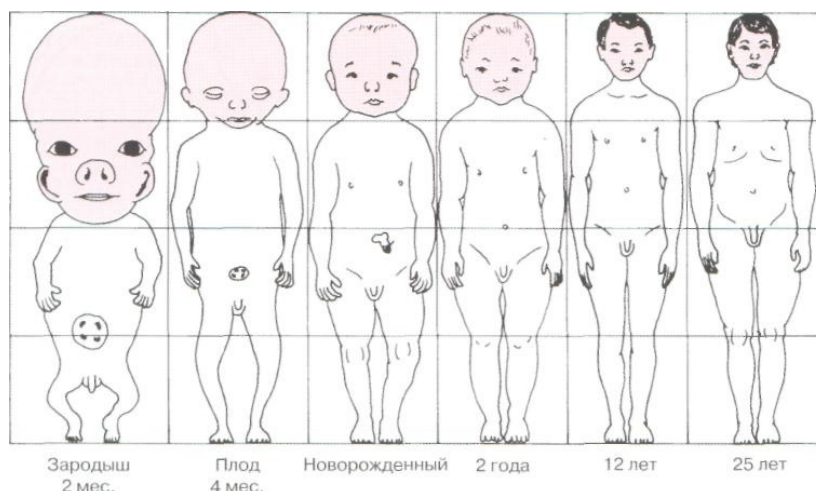
4.2. Theoretical questions to the lesson:

1. List and expand the anatomic-physiological features of the oral cavity and the temporomandibular joint in the newborn.
2. List the functional features of the formation of temporary, removable, permanent occlusion.
3. List the morphological features of the formation of temporary, removable, permanent occlusion.
4. What are the basic principles of clinical assessment of orthodontic status in different age periods?

4.3. Practical work (tasks) that run in class:

1. To determine the period of the formation of occlusion.
2. Describe the methodology of conducting clinical functional tests in patients during periods of temporary, mixed, permanent occlusion.
3. To inspect the face, vestibule of the oral cavity, the oral cavity of patients during the period of temporary, mixed, permanent occlusion.
4. Describe the dentition in three planes for patients in periods of temporary, mixed, permanent occlusion.
5. To be able to take impressions of patients during periods of temporary, mixed, permanent occlusion.

The content of the topic:



PERIODS OF DEVELOPMENT OF A CHILD.

The features of growth and development of a child depend to great extent on properties and features that a child receives from his or her parents. But there are some common laws of growth and development for most children.

Among numerous classifications of ontogenetic development the modified classification of Gundobin M. is the most widespread.

A. Embryonal phase:

- a) phase of embryo development (II-III months);
- b) phase of placenta development (from III month to birth)

B. Post-embryonic phase:

- 1- period of a new-born (to 3-4 weeks);
- 2- period of infancy (from 3-4 weeks to 12 months);
- 3- nursery period (from 1 year to 3th);
- 4- preschool period (from 3 to 6 years);
- 5- junior school period (from 7 to 11 years);
- 6- senior school period (from 12 to 17-18 years).

Classification of World Organization of Health Protection (WOHP):

- | | |
|---------------------|--------------------------------------|
| 1. New-born | 1-10 days |
| 2. Pectoral age | 10 days - 1 year |
| 3. Babyhood | 1-3 years |
| 4. First childhood | 4-7 years |
| 5. Second childhood | 8-12 years (boys) 8-11 years (girls) |
| 6. Teens | 13-16 (boys), 12-15 (girls) |
| 7. Youth age | 17-21 (young man), 16-20 (girls) |
| 8. Mature age | |
| I period | 22-35 (for men), 21-35 (for women) |
| II period | 36-60 (for men), 36-55 (for women) |
| 9. Aged | 61-74 (for men), 56-74 (for women) |
| 10. Old age | 75-90 |
| 11. Long-livers | 90 years and senior. |

In post-embryonic development of a persons there are the following periods according to the psychological development:

- | | |
|------------------|-----------------------------|
| 1. Infantile | from to 1 year birth. |
| 2. Pre-preschool | from 1 to 3 years. |
| 3. Preschool | from 3 to 6-7 years. |
| 4. Junior school | from 6-7 years to 10 years. |
| 5. Middle school | from 10 to 15 years. |
| 6. Senior school | from 15 to 18 years. |
| 7. Adult | from 18 years and anymore. |

From the moment of birth and to 14-18 years there are considerable changes which are caused by the process of growing.

FEATURES OF MOUTH CAVITY STRUCTURE OF A NEW-BORN

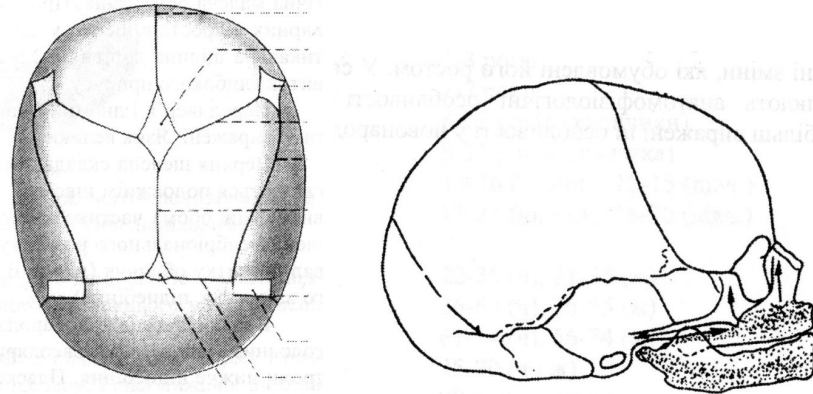
The proportions of the facial department of a child and an adult are different. The difference is mainly defined by the correlation of the facial department size and a cerebral department size. The head of a new-born is big and makes 1/4 of the whole body length.

The skull of a new-born is marked by the small size of the facial department in comparison to the cerebral one. As a result of it the facial department does not almost come forward.

Another peculiarity of a new-born baby skull is the presence of fontanels (fonticulis).

They are situated on the skull stitches' crossing where the rest of the connective tissue can be found.

Their presence has a very important role because they allow the skull bones be mobile at the time of the birth. All fonticulis are grown over at the age of 2-3 months but the frontal fonticulis. The frontal fonticulis grows over at the age of two.



As a result of weak development of musculature which hasn't started functioning so far, different muscular skull bone humps, ridges and lines are defined poorly.

There is a disproportion of the middle and lower facial department, which is caused by the lack of milk teeth.

The nose of a new-born is relatively small, nasal passages are narrow.

The adipose subcutis is situated evenly and gives to the face of a child its characteristic roundness and fullness.

In the middle layer of cheeks there are adipose (fatty) pillows that are called lumps of Bish. The fatty layer of cheeks is a self-many lobed body which is contained in its own capsule. These lumps of Bish are helpful for suction.

The lower lip prevails over the upper lip and creates the step of a lip. The lips of a new born are soft and swollen. Cross lip rollers are well defined. They are called Pfaundler-Lushke. Due to them a child seizes tightly the breast nipple.

Every jaw has 18 follicles, 10 temporal and the 8 permanent follicles of permanent teeth (6 3 2 1 / 1 2 3 6). The rudiments of temporal teeth on both jaws are located on the lip side, rudiments of permanent - lie deeper than temporal. They lie on the tongue side of the lower jaw and from palatal side.

A gingival membrane is the double fold of mucus membrane that has a ridge like form in the frontal area of the jaw. It is called the fold of Robena-Majito. It can be observed at the time after suction.

Every meal of a baby favours the training of the lower jaw, masseteric and mimic muscles, tongue muscles. That's why the wrong process of feeding can lead to bite anomalies.

During swallowing a child swallows and breathes. It is determined by the features of larynx structure.

High location of larynx entrance and its connection with the mouth cavity allows a child to breathe swallow and to suck simultaneously.

Features of structure of TMJ are:

- articular head has a round form;
- glenoid fossa is flat. It doesn't have an articular tubercle of temporal bone at the front and articular cone which limits motions of lower jaw toward a middle ear;
- a mandibular fossula functions fully;
- depth of mandibular fossula is a little bit more than 2 mm;
- a fibroplate of a new-born child is a soft layer which consists of collagen fibres;
- absent fibers of shell of articular capsule.

Type of swallowing is "infantile". During swallowing the tongue of a child pushes off from closed lips. It strains mimic muscles around mouth cavity that is called the symptom of "lemon crust or thimble".

"*The Optimum individual norm*" in orthodontic is defined as a condition enough guaranteed during long time morphological, functional and aesthetic balance in teeth-jaw system and in a facial skeleton as a whole, which is necessary for reaching in process of orthodontic treatment (Y.M. Maligin, 1979).

The neuroocclusion is characterized by facial attributes; an attribute inherent in a physiological condition of an occlusion and of temporal-mandibular joints, and also myodynamik balance of muscles of a jaw-facial system.

The description of features the face has the large meaning for definition of the aesthetic forecast of treatment. Therefore it is necessary to know the descriptive characteristics of the face behind a neuroocclusion. The face under the form part on wide, average and narrow. Besides they can be round, square, oval, triangular, with the form of the truncated cone or hexahedron. Studying a structure, distinguish the average, convex or concave faces.

Is conditional the faces part on three parts: upper, middle and lower, which are formed owing to realization of horizontal lines:

- upper - passes through the superciliary point;
- middle - passes through the subnasal point;
- lower- through the bottom part of a chin.

The upper part begins from border of a pilar part of forehead to middle of a line of superciliary arches; middle - from a median line of superciliary arches to subnasal point, lower – from subnasal points to the lower part of a chin. Only middle part has the rather stable vertical sizes.

Behind a neuroocclusion an middle and lower part of the face almost level. Bridge of nose of the usual form, mobile wings of a nose. The upper labium prevails above lower, forming "step of lips". Lips connect without a strain, average depth of a labium-mental sulcus. Size of an angle of a mandible in borders 120 °- 130°. The physiological asymmetry of the face (up to 2 mm) is defined.

The neuroocclusion is characterized by morphological attributes, one of which concern all tooth arch, others - only parity frontal teeth, third - parity lateral teeth.

The attributes, which concern all tooth arch:

1. The upper tooth arch has ellipsoid form, lower – form of a parabola.
2. On the upper jaw a tooth arch large, than alveolar, alveolar large, than basal. On a mandible other parity: a tooth arch smaller, than alveolar, and last smaller than

basal. Thus, upper tooth arch smaller than lower. It explains that fact, which for orthognatic bite the upper dentition is blocked lower, and at complete absence of teeth, even at an insignificant degree of athrophia of alveolar processes, the upper jaw smaller, than lower.

3. Each tooth, as a rule, connects with two antagonists, from which is called as one main, and second - collateral, except for top teeth of "wisdom" and lower central incisors. It is explained in greater width of the top central incisors in comparison with lower. For this reason the lower teeth is displaced mesially rather teeth of the upper jaw. The upper tooth of "wisdom" narrower, than lower, therefore mesial shortening of the bottom dentition become level in a site teeth of "wisdom" and their distal surface lay in one plane. Each upper tooth connects with same and behind of itself by posed lower teeth, and each lower tooth connects with same and posed ahead by top teeth.

4. The teeth of each dentition adjoins one up to one, concerning contact items (point, linear, flat), posed on a proximal surfaces at the expense of equators.

5. Height of crowns teeth gradually decreases, beginning from the central incisors and finishing molar tooth (except for a canine).

6. The upper teeth is posed with an inclination of crowns from the outside and roots deep into; and lower, on the contrary, inclined by crowns is oral, and roots from the outside.

The attributes, which concern to frontal teeth:

1. The average lines, which pass between central incisors upper and lower jaws, lay in one sagital plane and is continuation one.

2. The upper incisors block lower on 1/3 heights of a crown.

3. The lower incisors by the cutting edges contact with tooth cusp on palatal surface of the upper incisors.

Attribute of closing chewing teeth in buccal-palatal direction:

1. Buccal cusp of upper premolars and molars are posed outside from same cusp lower, and buccal cusp lower - inside from same cusp upper, therefore upper palatal cusp get in axial fissure lower teeth, and lower buccal - in axial fissure of upper teeth.

2. Lingual cusp of lower teeth posed deep into from the same cusp upper teeth.

3. External (buccal) and internal t cusp of chewing teeth on both parties upper and lower of jaws posed on various levels. The cross section chewing teeth, with which goes on the right to left or in the opposite direction, makes by itself transversal curve, convex below and concave above.

4. The upper tooth arch wider from lower on size buccal cusp, due to what the scope of lateral movements of a mandible is enlarged and extends occlusal field.

Attribute of closing of chewing teeth in medial-distal direction:

1. Frontal buccal cusp of the first upper molar tooth is posed on the buccal party of the first lower molar tooth in transversal fissure between buccal cusps, and back buccal cusp - between distal-buccal cusp of the first lower molar tooth and medial-buccal cusp of the second molar tooth.

2. The chewing surfaces lower teeth, beginning from premolars and finishing last

molar tooth, form concave sagittal curve surface. The chewing surfaces upper chewing teeth also form sagittal curve, but not concave, but convex, that repeats the form of the lower concave curve.

By the second variant of a neutroclusion is by a straight line or orthogenic. He differs from orthognatic by that the cutting edges of the upper incisors do not block lower, and are established in direct contact (contact by cutting surfaces). That is the difference is a parity frontal teeth in a vertical plane. In a site lateral teeth same interrelations, as well as for orthognatic of an occlusion.

In clinic of an orthopedic odontology allocate other versions of a neutroclusion. It, in particular, physiological prognatia and physiological opistognatia, biprognatia.

These versions of an occlusion have such parities in lateral sites, as well as at a neutroclusion. And differ from last only of directions of alveolar crests and inclination frontal teeth. For opistognatic of an occlusion frontal teeth and alveolar processes with frontal teeth on both jaws directed back; for prognatic an alveolar process and frontal teeth directed forward; for biprognatia – frontal directed alveolar processes and frontal teeth both of jaws; for physiological progenia tracking a return parity frontal teeth – the lower incisors block upper. As infringements of a parity in a site lateral teeth is not defined, such occlusions valuable and in the functional attitude, as the authors consider, which have offered these forms.

Filling a clinical case history (out-patient card of the patient), an occlusion describe in three planes: sagittal, transversal and vertical.

Sagittal plane passes between central incisors through a seam of a palate, the middle of a nose and is parted by the face on two parts. In this plane characterize locating of a mandible concerning upper in medial-distal direction (neutral, distal, mesial).

Orienteers of the description of an occlusion serve:

- a) presence of dense contact of incisors on sagittal;
- b) correct sagittal contact of incisors, or return overlapping (blocking);
- c) presence of sagittal split (space between incisors both of jaws);
- d) canines relation;
- e) first permanent molars or second temporary molars relation.

At a neutroclusion the incisors have dense contact on sagittal or sagittal space does not exceed 2 mm; cusp of the upper canine is projected between the lower canine and first premolar tooth (permanent occlusion) or between a canine and first temporary molar tooth (temporary and mixed occlusion); frontal-buccal cusp of the upper permanent molar tooth is posed in inter-cusp fissure between frontal and back cusps of the lower first constant molar tooth.

The vertical plane passes in parallel planes of forehead from above downwards and characterizes presence of incisor contact, depth of its overlapping (blocking) (normal, deep) or absence of incisor contact. Normal the overlapping(blocking) up to 1/2 heights of a crown of the lower incisor is considered.

Transversal plane (horizontal, lateral), perpendicular to sagittal plane, contact to chewing cusp first permanent molars and premolars (medial-buccal - in first constant molars and medial - in premolars). In this plane define lateral position of a mandible. Orienteers of the description of an occlusion there is a parity buccal cusp upper and lower chewing teeth. At a neutroclusion the upper tooth arch large, than lower on size buccal tuberculum. Shift of a mandible judge for discrepancy of bases of bridles of lips. A degree of shift define on the attitude to a crown of the lower central incisor.

Milky bite

After 6-8 months, during which the jaws of babies reform and become able to teething (eruption) of teeth. Temporal teeth, the rudiments of which are contained in the alveolar sprouts of jaws, pass certain stages of development, they teeth gradually, forming the bite of temporal teeth.

Formation of a temporal bite is divided into three periods:

- 1 period of formation (from 6 months to 2-2,5 years);
- 2 is period of stable temporal bite (from 2,5 to 4 years);
- 3 is period of aging

Due to the growth and development of a child there are the changes in the dento-jaw system, new functions appear or the existing system is reformed.

Before teething (eruption) of temporal teeth rudiments move in growing jaws. Thus, there appears resorbtion of bone fabric before a tooth rudiment.

New bone fabric accumulates from an oral side. The bone wall of alveolus is considerably multiplied from the distal side of every lateral tooth.

From the cheek and occlusal sides of rudiments the increase of new bone fabric does not occur. This fact testifies that teeth move towards to an occlusal surface and the level of occlusion rises slowly. Teething (eruption) of temporal teeth, which continues approximately for two years, begins at the age of six month, and continues up to the age of two and a half.

For the accelerated type of child development this period continues for 2 years, for the slow type - 3 years.

Teething (Eruption) of temporal teeth are characterized by the following patterns.

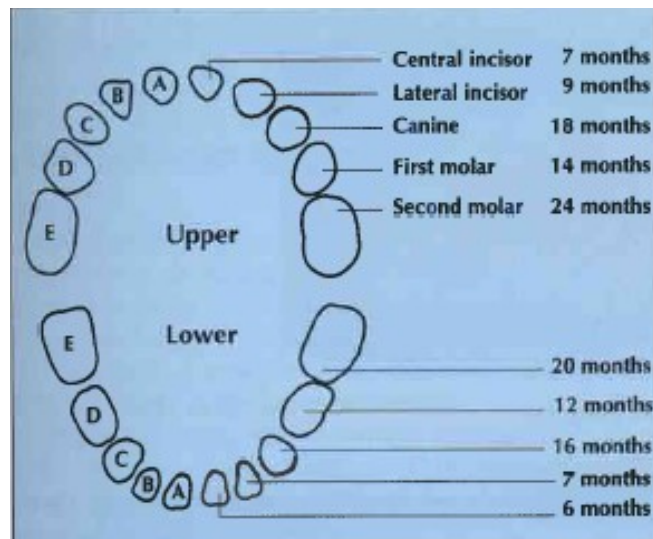
- terms;
- order of teething (eruption);
- twoness of teething (eruption);
- sequence of eruption.

Order and sequence of teething (eruption) of temporal teeth:

Upper jaw - I, II, IU, III, U

Lower jaw - I, II, IU, III, U





The timing of eruption is highly variable, so these values are only approximate: 1. At 6 months: primary mandibular incisor 2. Between 6 and 13 months: the other primary incisors 3. Between 12 and 18 months: primary first molars 4. Between 18 and 24 months: primary canines 5. Between 24 and 36 months: primary second molars. After the emergence of the 20 primary teeth, the primary dentition remains relatively stable for about 4 years. First teeth erupt on the lower jaw, except for lateral chisels and first temporal molar, which erupt on the maxilla.

Without regard to the fact that first temporal molars erupt first, canines in a temporal bite occupy correct position in the dental arc, because they have a possibility to move the first molar back, as second temporal molar hasn't erupted yet.

The first physiological height bite increasing begins with due to the fact that teething (eruption) of first temporal molars. They have the same role in a temporal bite, as permanent teeth in variable bite - they support a bite on a certain height.

Twoness of teething (eruption) is expressed by the following. The teeth of the same name erupt simultaneously.

The violation of twoness of teething of the teeth of the same name on the different sides of jaws is the sign of growing lag and in some cases there can be observed the anomalies of development of dental arcs and jaws.

With teething (eruption) of teeth and development of function of mastication the alveolar sprouts of jaws grow actively; basal part of lower jaw thickens; the branches of lower jaw grow; relief and structure of jaws become more complex.

The dynamics of teething (eruption) plays a very important role for the development of the facial skeleton, as an alveolar process is formed parallel to growth and teething of teeth. During teething (eruption) of temporal teeth intensive development of alveolar sprouts of jaws place in horizontal and vertical directions. The dental arcs of temporal bite appear after the completion of temporal teeth eruption.

At the age of 2 and a half the period of temporal bite finishes – the formation period. Due to the first physiological bite increasing the volume of oral cavity increases.

II period of temporal bite is named a “stable temporal bite”. It continues to the age of 4.

III period of temporal bite, which is named the period of “ageing” is characterized by the teeth abrasion.

4-year-old child has 20 temporal teeth and 28 rudiments of permanent teeth, which are located in the area of eye sockets, nasal cavity on the maxilla and lower jaw and are covered by thin layer of bone of 2-4 mm. Up to the age of 4 after teething (eruption) and the end of formation of temporal teeth roots the growth of alveolar sprouts stops and begins again at the age of 5,5-6 years.

Absence of spaces is unfavorable condition for correct establishment of permanent frontal teeth in the dental row.

During the III period of temporal bite the lower jaw due to uneven growth and tendency to the mesial moving, to physiology elimination of knolls of teeth the mesio-buccal cusp of upper second temporal molar's moves from the first in the second furrow (between middle and distal cheek cusps) and distal surfaces of second molars form a sagittal step. It is named the Tsilinsky' symptom. By the correlation of distal surfaces of second temporal molars at the age of 6 development of bite in sagittal direction can be forecast. During a clinical check up it is very important to define the correlation of distal surfaces of second temporal molars and difference of size of their crowns. In such cases it is recommended to estimate correlation of stomach-teeth, which remains unchanged during all temporal bite and does not change after teething (eruptions) of first permanent molars. Even insignificant wrong correlation of temporal canines is unfavorable for development of normal bite.

The deciduous dentition stage starts from the eruption of the first deciduous tooth, usually the deciduous mandibular central incisors and ends with the eruption of the first permanent molar, i.e. from 6 months to 6 years of postnatal life. By 2 years of age, deciduous dentition is usually complete and in full function. Root formation of all deciduous teeth is complete by 3 years of age. Because primary dentition is transitory and operates on evolving basal bone, the occlusion of the primary teeth can be classified into three categories (Tollaro 1990): the normal primary dentition; the at-risk primary dentition; and the pathologic primary dentition.

Overbite is the amount of vertical overlap between the maxillary and mandibular central incisors. This relationship can be described either in millimeters or more often as a percentage of how much the upper central incisors overlap the crowns of the lower incisors. The overbite in the primary dentition normally varies between 10% and 40%. When the incisal edges of the incisors are at the same level, the condition is described as "edge to edge or zero overbite." When there is a lack of overlap, the condition is described as open bite and quantified in millimeters. Foster² in a study of 100 British children between 2 and 3 years of age

described the overbite relationship as ideal (19%), reduced (37%), open bite (24%), and excessive overbite (20%). The fact that more than 60% of the children in this population have a reduced overbite or an open bite is attributed to the effects of the various oral habits (finger or pacifier sucking) that are common in this age group.

Overjet is the horizontal relationship or the distance between the most protruded maxillary central incisor and the opposing mandibular central incisor. This relationship is expressed in millimeters. If the maxillary incisors are lingual to the mandibular incisors, the relationship is described as an underjet. The normal range of overjet in the primary dentition varies between 0 and 4.0 mm. In the same study by Foster, the overjet was ideal in 28% of the cases and excessive in 72% of the children. Again, the presence of excessive overjet was attributed to the effects of the oral habits.

d. Virtually perpendicular relationship between most teeth and basal bone, with interincisal angles of 150 degrees.

e. Ovoid arch form and transverse harmony of the dental arches. Alignment of the maxillary and mandibular frenum.

f. Flat occlusal plane

g. Articulation of the maxillary canine with the mandibular canine and the primary mandibular first molar. Molar Relationship - Class I molar relationship: flush terminal plane or terminal plane with a mesial step.

Straight/flush terminal plane relation: the molar relationship in the primary dentition can be classified into 3 types.

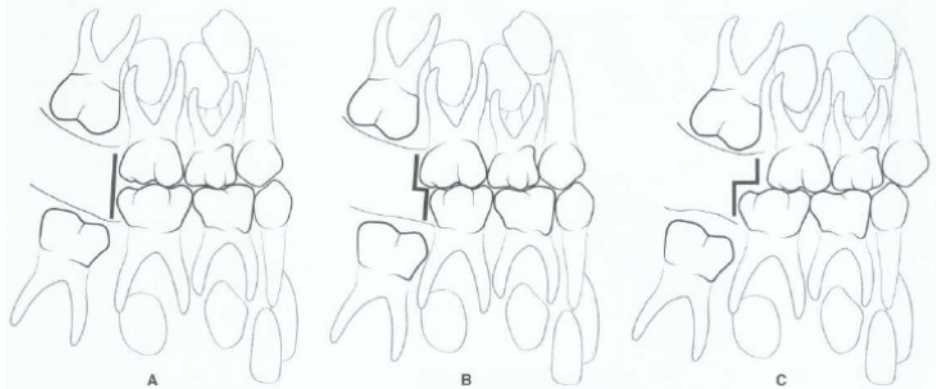
- Flush terminal plane when the distal surfaces of maxillary and mandibular deciduous second molars are in the same vertical plane; this is the normal molar relationship in the primary dentition because the mesiodistal width of the mandibular molar is greater than the mesiodistal width of the maxillary molar

- Mesial step - distal surface of mandibular deciduous second molar is mesial to the distal surface of maxillary deciduous second molar.

- Distal step - distal surface of mandibular deciduous second molar is more distal than the distal surface of maxillary deciduous second molar, i.e. the upper second molar occludes with two opposite teeth. Between 5 and 6 years, just before shedding of the deciduous incisors, there are more teeth in the jaws than at any other time.

The word relative needs to be emphasized; the description of a mesial or distal step does not identify which of the two arches is ahead or behind the other. In a study on 121 Iowa children at age 5 years, the distribution of the terminal plane relationships of the primary second molars were found to be as follows': Distal step 10% Flush terminal plane 29% Mesial step of 1.0 mm 42% Mesial step >1.0 mm 19% Therefore almost 90% of the cases had a terminal plane relationship, which was either flush or with a 1.0-mm or greater mesial step. Determining the terminal plane relationships in the primary dentition stage is of great importance to the clinician because the erupting first permanent molars are guided by the distal surfaces of the second primary molars as they erupt into occlusion.

The permanent first molars emerge along the distal surfaces of the maxillary and mandibular primary second molars, which have been described as the terminal plane. The terminal planes predetermine the position the permanent first molars will occupy in the dental. However, other factors, such as maxillary and mandibular growth rates, the leeway space, the size and the shape of the teeth, and environmental factors such as caries and premature loss of primary teeth, can play a role. In addition, so-called noxious habits and the functional matrix can exert considerable influence.



Although the primary dentition may be normal, this is no guarantee that the permanent dentition will be free of malocclusion. In general, indications of malocclusion can make their first appearance as the permanent teeth erupt, but their primary etiologic factors and especially the influence of the functional matrix manifest themselves during periods of more rapid growth.

Characteristics of at-risk and pathologic primary dentitions.

When any of these conditions is present, a primary dentition can be considered to be at risk of developing a malocclusion:

1. Absence of diastema
2. Crowding
3. Terminal planes that have:
 - A mesial step and where there are large diastema distal to the mandibular canines and the incisors are in end-to-end occlusion, suggesting a developing Class III malocclusion
 - A distal step or are flush and where there are excessively large maxillary canines, suggesting a developing Class II malocclusion
 - A mesial step and where the maxillary and mandibular incisors are inclined lingually and/or the incisors are in supraocclusion, suggesting a developing Class II division 2 malocclusion or a Class III malocclusion
4. Insufficient space for eruption of permanent teeth following extraction of, or untreated interproximal dental caries in, the corresponding primary teeth
5. Functional disturbances arising from:
 - Unilateral mastication that stems from a child's avoidance of painful occlusal contact on one side or from a premature contact, usually of canine teeth, or other occlusal interferences
 - So-called noxious habits, such as excessive sucking of a finger or a pacifier, mouth breathing, or atypical swallowing

6. Sequelae of trauma:

- Loss of space from the accidental loss of a tooth
- Traumatic impact on a permanent tooth germ
- Pulpal necrosis accompanied by an untoward modification in the physiologic root resorption of the primary tooth
- Temporomandibular joint problems, such as luxation of the discs, that could provoke midline deviations as condyles readjust and establish a difference between the Angle classifications of the right and the left sides

All the types of malocclusion that can occur in the mixed and permanent dentitions may appear in the primary dentition.

Functions of the primary dentition.

One of the chief functions of the primary dentition is to provide a mechanism for chewing. Occlusion in the primary dentition is rudimentary, and the dental morphology is rather flattened. The morphology is not as complex as that of the permanent dentition, which will function at a time when more sophisticated mastication will be required. The primary dentition also participates in the development of facial height. As the mandible and maxilla grow downward and forward, corresponding points in the two jaws move away from each other, following divergent lines. To compensate for these emerging gaps, maxillary structures, especially the alveolar process, grow vertically, and the child passes from the edentulous state of the newborn into the successive stages of the primary, mixed, and permanent dentitions. In addition, the primary dentition sets the stage for the emergence of the permanent teeth by guiding them as they erupt and by establishing and preserving the space needed for the permanent dentition.

Skeletal and neuromuscular characteristics of the primary dentition. In newborn babies, the glenoid fossae of the temporomandibular joint are flat; in the absence of teeth and the masticatory movements that would accompany them, the mandible moves only horizontally, back and forth, sucking on the mother's breast or on the bottle. When the primary teeth begin to erupt, the articular discs organize for more sophisticated action, the glenoid fossae deepen, and the condylar slope augments progressively. As teeth continue to erupt, the muscles of mastication learn to accomplish all the movements required for functional activity.

During the primary dentition stage the overbite, overjet, and anteroposterior relationship of the dentition do not undergo significant changes unless they are influenced by environmental factors such as trauma, habits, or caries. At the late primary dentition stage of development, the maxilla and mandible are housing the greatest number of teeth ever, including 20 erupted primary teeth and at least 28 unerupted but partially forming permanent teeth.

Mixed bite

A mixed dentition is the high degree of development and differentiation of the dento-jaw system. It 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.

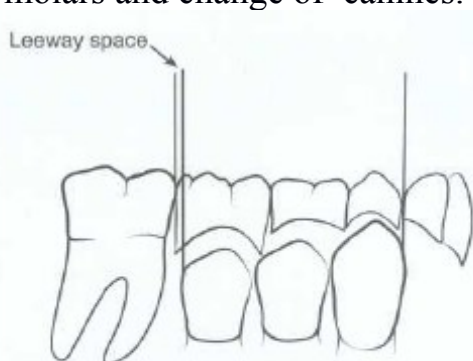


Figure 5-3 Leeway space is the difference in space between the combined mesial-distal crown dimensions of the unerupted permanent canine, first and second premolars, and the primary canine and the primary first and second molars.

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:

maxilla: 6, 1, 2, 4, 3, 5, 7, 8

mandible: 6, 1, 2, 3, 4, 5, 7, 8

Middle terms of 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 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 resorption of bone on-the-spot internal its.

Formation of bone goes as a result of action of osteoblasts, and resorption – 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.

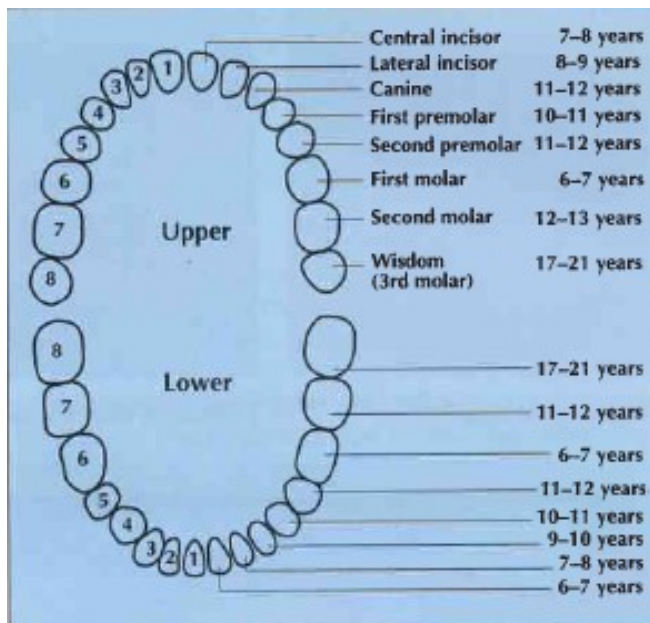
More frequent place to the permanent canines is created during the third impulse of growth of jaws in sagittal one and transversal directions.

Thus, a III physiology increase of bite is related to eruption of permanent canines not second permanent molars (by F. 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 erupting 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 (Horoshilkina, 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 teeth 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 1

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 mesiodistal 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 anteroposterior 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 intercanine 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 buccolingual axial inclinations
- Normal mesiodistal axial inclinations
- Tight proximal contacts
- Even marginal ridges vertically
- Flat occlusal plane or a mild curve of Spee

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 buccolingual and mesiodistal 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 anteroposterior curvature in the mandibular arch is called the curve of Spee. The corresponding curve in the maxillary arch is called the compensating curve. The buccolingual 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 mesiobuccal 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 interdigitated. 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.

THE PERMANENT DENTITION

The permanent dentition forms within the jaws soon after birth. Calcification begins at birth with the calcification of the cusps of the first permanent molar and extends as late as the 25th year of life. Complete calcification of incisor crowns takes place by 4 to 5 years and of the other permanent teeth by 6 to 8 years except for the third molars. Therefore the total calcification period is about 10 years. The permanent incisors develop lingual to the deciduous incisors and move labially as they erupt. The premolars develop below the diverging roots of the deciduous molars. Nolla (1960) gave stages of tooth development to make a meaningful assessment of eruption from panoramic/posteroanterior radiographs. At approximately 13 years of age all permanent teeth except third molars are fully erupted. Before the deciduous incisors are shed, there are 48 teeth / parts of teeth present in the jaws.

Features of the permanent dentition:

- Coinciding midline.
- Class 1 molar relationship of the permanent first molar.
- Vertical overbite of about one-third the clinical crown height of the mandibular central incisors.

Eruption is the developmental process that moves a tooth from its crypt position through the alveolar process into the oral cavity and to occlusion with its antagonist. During eruption of succedaneous teeth:

- Primary tooth resorbs
- Roots of the permanent teeth lengthen
- Increase in the alveolar process height
- Permanent teeth move through the bone. Teeth do not begin to move occlusally until crown formation is complete. It takes 2-5 years for posterior teeth to reach the

alveolar crest following crown completion and 12-20 months to reach occlusion after reaching alveolar margin.

DIMENSIONAL CHANGES IN THE DENTAL ARCHES

The usual arch dimensions measured are: 1. Widths of the canines, primary molars (premolars) and first permanent molars: a. Dimensional increase in width involves alveolar process growth almost totally, since there is little skeletal width increase at this time. b. Clinically significant differences exist in the manner and magnitude of width changes in the maxilla and mandible. Width increase correlates highly with vertical alveolar process growth. Maxillary alveolar processes diverge while mandibular alveolar processes are more parallel. Thus, maxillary width increases more and can be easily altered in treatment. c. The only significant increase in mandibular inter-canine width occurs during eruption of incisors when primary cuspids are moved distally into primate spaces and does not increase significantly thereafter; d. Maxillary arch width increase is timed with periods of active eruption of teeth. Eruption of maxillary permanent canines is an important factor in widening of the arch. e. Maxillary premolar width increase is coincidental with vertical growth whereas mandibular premolar width increase occurs because of further buccal placement of premolar crowns. 2. Length or depth: Arch length or depth is measured at the midline from a point midway between central incisors to a tangent touching distal surfaces of second primary molars or premolars. Any changes in arch length are coarse reflections of changes in perimeter. 3. Arch circumference or perimeter: Measured from distal surface of second primary molar or mesial surface of first permanent molar around the arch over contact points and incisal edges in a smoothed curve to the distal of second primary molar or mesial surface of first permanent molar of the opposite side. The reduction in mandibular arch circumference during transitional and early adolescent dentition is a result of: a. Late mesial shift of first permanent molar as "Leeway space" is pre-empted. b. Mesial drifting tendency of posterior teeth throughout life. c. Slight interproximal wear of teeth. d. Lingual positioning of incisors. e. Original tipped position of incisors and molars.

Development of dentition in humans is complex and depends on many variables. Development of dentition deviates markedly from that of other parts and structures of the body. Crowns of teeth are formed directly to adult size and housed within the jaws years before they emerge. To determine an abnormal course of development, it is the responsibility of an orthodontist to have adequate knowledge on the subject to differentiate abnormal from normal before initiating therapy.

Establishment of the mixed dentition All 20 of the primary teeth will be replaced by permanent teeth. Even though the permanent premolars usually have smaller mesio-distal diameters than the primary molars that they replace, the permanent incisors and canines are always larger than their primary predecessors. That is why the presence of diastema in the primary dentition is essential for the proper eruption of the permanent teeth. The permanent first molars emerge into the dental arches when children are about 6 years old, erupting along the distal surfaces of the primary second molars following the terminal plane. In these final

moments of the primary dentition, it is difficult to predict the exact nature and the Angle classification of the future permanent dentition. A series of possible variations may ensue, depending not only on the dental situation but also on the child's skeletal growth pattern. From a preventive and interceptive viewpoint, when a child's dentition is in a Class I relationship before the primary second molars are lost, so that the space derived from mesial drift and diastema is available, it is likely that emerging permanent teeth will assume correct alignment. Anteriorly, the maxillary incisors should erupt labial to the mandibular incisors; the mandibular incisors should erupt lingual to the maxillary incisors. It is at this stage that crowding can first appear as a result of the greater size of the permanent incisor teeth, mediated by relative tooth and diastema size, increase in inter-canine distance through normal growth, and the extent of the inclination of the incisor teeth. As the canine teeth erupt, the inclinations and spacing of the incisor teeth may give rise to the "ugly duckling" stage described by Broadbent et al (1975). At this time, if orthodontists perceive the influence of disruptive factors, such as sucking habits and premature loss of primary teeth, they may decide to recommend early interceptive treatment. The sum of the diameters of the primary molars and canine teeth is greater than that of their three permanent successors. This difference is transformed into residual room for emerging teeth and is called the leeway space.

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.I period of temporary occlusion continues?

from 6 months to 2.5 years

from birth to 6 months

from 1 to 3 years

from 1.5 to 3.5 years

from 2 to 4 years

2.I period of temporary occlusion entitled?

formation period

aging period
stable period
abrasion period
early period

3.The main feature of the first period of temporary occlusion are?
the eruption of deciduous teeth
no diastem and thremas
lack of occlusal curves
the presence of gaps between teeth
the signs of temporary molars abrasion

4.The 1st stage of the physiological height bite increasing corresponds eruption of?
temporary molars
temporary central incisors
temporary canines
temporary central incisors
temporary lateral incisors

5.The physiological height of bite increasing helps?
to increase the volume of the oral cavity
growth maxilla
growth of the mandible
growth maxillary sinus
growth of the nose

6.II period of temporary occlusion entitled?
stable period
formation period
aging period
abrasion period
late period

7.Distal surface of the second temporary molars in the first period of temporary occlusion are as follows?
located in the same vertical plane
have sagittal step
have a vertical step
have transversal step
without contact

8.The Tsylin'sky' symptom to predict the development of occlusion in this plane?

sagittal
vertical
orbital
transversal
Frankfurt

9. The features of the second temporary molars contact in the first period of temporary occlusion depends on?

their size medio-distal sizes
heredity
cusps abrasion
the presence of spaces between teeth
chewing efficiency

10. The II period temporary occlusion is characterized by?
dense of approximal teeth contacts, 1/3 incisors covering, no signs of teeth abrasion, distal surfaces v / v in a vertical plane

dense of approximal teeth contacts
lower incisors overlap the upper 1/3
no signs of teeth abrasion
there is no answer

11. 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

12. 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

13. 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

14. Orthognatic bite from orthogenic bite differs in next plane?

vertical

sagittal

transversal

frankfurt

nasal

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

incisors

canines

premolars

the first permanent molars

lateral teeth

16. 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

17. 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.

18. 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.

19. Sagital occlusal curve formed by?

different height of teeth crowns (1 to 8)

the presence of spaces between teeth

different heights of posterior teeth cusps

the inclination of the teeth

the abrasion of the posterior teeth cusps

20. Transversal occlusal curve formed by?
in different side inclination of the teeth
different widths of buccal and oral posterior teeth cusps
different heights of the posterior teeth crowns
the abrasion of the posterior teeth cusps
the presence of spaces between teeth

21. 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

22. 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
same name contact of molars
between the cusps of the first lower molar and the second premolar
between the cusps of the first and second lower molars
mesiobuccal cusp of upper 6 contact with lower second molar

23. The upper dental arch at the permanent orthognathic occlusion is?
semi-oval form
semi-circle form
parabola form
trapezoid form
triangular form

24. The lower dental arch at the permanent orthognathic occlusion is?
parabola form
semi-circle form
semi-oval form
trapezoid form
triangular form

25. Physiological types of occlusion in orthodontics believe?
Orthognathic and orthogenic
Orthognathic and prognatic
Orthognathic and progenic
Orthognathic and open
Orthognathic and deep

26. 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

27. Physiological permanent occlusion includes the following number of teeth?

28-32

24

20

30

16

28. 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

29. In what periods of child development the growth of frontal area mostly?

6-12 months 6-9 years

12-20 months and 9-10 years

2-2,5 years and 10-14 years

10-16 months and 8-10 years

1-2 years and 4-6 years

30. 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.

31. 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

32.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.

33.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

34.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

35.Who offered the keys to a perfect orthognathic occlusion?

Andrews
Angle
Betelman
Kalvelis
Malygin.

36.How many keys of “ideal occlusion” do you know?

6
7
10
2
4

37.The 1-th key which characterizes optimal occlusion by L.Andrews is?

the correct 6|6 teeth relation
the correct angulation
the correct torque
the presence of dense contacts between teeth

the Spee curve concavity

38. The 6-th key which characterizes optimal occlusion by L. Andrews is?

the Spee curve concavity

the correct 6|6 teeth relation

the correct angulation

the correct torque

the presence of dense contacts between teeth

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