

Clinical biomechanics of the masticatory apparatus

- In the clinic of orthopedic stomatology of the biomechanics of the masticatory apparatus emit articulation and occlusion.
- **Articulation** - it's all possible positions and movements of the lower jaw relative to the upper (chewing, speech, different types of clamping dentition) by chewing muscles.
- **Occlusion** - This is both a cross-sectional groups closing teeth or tooth rows in a certain period of time while reducing the masticatory muscles and the corresponding position of the elements of the temporomandibular joint. Occlusion - a special kind of articulation.
- There are five types of occlusion:
 - center;
 - front;
 - the left side;
 - right side;
 - rear.
- Each of these is characterized by the tooth, muscle and joint symptoms.
- **The front** is characterized by **occlusion of the** jaw thrust forward (protrusion). This occurs when the bilateral reduction of the lateral pterygoid muscle. This is achieved by closing the front teeth in the "joint", in the sides of the contact occurs between the distal tubercles second molars or absence (dezokklyuziya). Normally, when the front occlusion, the middle line is the same person with the line extending between the central incisors.
- **Lateral occlusion** occurs when the lower jaw movement outwards from the mid-sagittal line (laterotrusion). The head of the mandible on the offset side, slightly rotating, remains at the bottom of the articular tubercle, and on the opposite side it is moved to its top. Lateral occlusion accompanied by a unilateral reduction of the lateral pterygoid muscle, the opposite side of the displacement. The average person does not line coincides with the line extending between the central incisors
- **Rear occlusion** occurs when mixing the distal lower jaw from a central position. Bits mandible while shifted backward and upward. From this position possible lateral movement of the mandible.
- Under the **central occlusion** closure should be understood at a maximum of dentition contact their antagoniruyuschih steam when chewing muscles that raise the lower jaw, and at the same time uniformly stretched, and the mandible head is at the base of a slope of the articular tubercle.
- When the central occlusion the lower jaw occupies a central position in the skull.
- Correct intertubercular contact between the teeth with a stable vertical and horizontal position of the upper and lower jaws is a prerequisite for functional harmony. Violation of such contact may prevent or limit the closing of the dentition in a stable distal position of the mandible. Furthermore, it may interfere with the smooth movement of the mandible in forward and side within the contact between the teeth. This state is called "occlusal disharmony" in the result, which can be changed and disturbed functional coherence of the neuromuscular system. Therefore, in addition to the physiological occlusion, should be allocated to the pathological, in which a violation of the form and function of dental system.

- The central position of the mandible in the area of the facial skeleton is defined in the central occlusion serrated teeth. And in the absence of teeth - the heads of the lower jaw held in a symmetric joint pits the most laid-back position when still possible lateral movements of the mandible. Determination of the central relationship (position) of the jaws in the presence of antagonist teeth is not too difficult. In this case it is reduced to the determination and registration of the centric teeth. It is more difficult to do so if the lost teeth, not fixed height of the lower portion of the face, changed the position of elements of the temporomandibular joints. The ratio of the upper and lower jaws, when it corresponds to their central position, also called central.
- The height of the lower portion of the face is determined in the frontal plane, the front-rear position of the lower jaw - in the sagittal and transversal position of the lower jaw - in the horizontal plane.
- The position of the mandible in the space of the facial region is characterized by jaw besides muscle and joint components. Do not equate the central occlusion and central relation of the jaws.

- Central occlusion characterized by clamping opposing teeth, a central parity - the spatial position of the jaws in the facial skeleton.
- If abnormal types of malocclusion, as well as distal, mesial or lateral displacement of the mandibular central position does not correspond to the central occlusion. Since in this case the central occlusion is characterized already in other spatial as well as muscle and joint symptoms.

• Physiological central occlusion during orthognathic bite is characterized by several features:

- between the teeth of the upper and lower jaws has the most dense fissure-papulose contact;
- each upper and lower tooth merges with the two antagonists: the top - of the same and lower pozadistoyaschim; lower - with the same name and vperedistoyaschego top (with the exception of the upper third molars and the central lower incisors);
- center lines between the central upper and lower incisors are in the same sagittal plane;
- upper teeth overlap the lower teeth in the anterior region of not more than 1/3 of the crown length;
- the cutting edge of the lower incisors in contact with palatal tubercles of the upper incisors;
- It closes the upper first molar with two lower molars and covers 2/3 of the first molar and 1/3 second; mesial buccal cusp of the upper first molar enters the transverse fissure intertubercular lower first molar;
- vestibulooralnom in vestibular direction bumps lower teeth overlap vestibular tubercles of the upper teeth and oral bumps upper teeth are arranged in longitudinal fissure between the vestibular and oral tubercles of the lower teeth; occlusal wax cylinders.

• Determination of the central occlusion is the fit of mandibular occlusal cushion to the upper jaw and fixing mesiodistal relation of the jaws or occlusal fit of one of the rollers against the teeth opposite jaw while maintaining the clamping of teeth-antagonists.

- The teeth in the oral cavity are available, but no one pair of opposing teeth (teeth occlusion not observed). In this case we are talking about the central relationship of the jaws. It consists of several stages:
 - forming prosthetic plane;
 - determine the height of the lower portion of the face;
 - fixing mesiodistal relation of the jaws.
- To lock the centric relation of jaws in the 2 nd and 3 rd cases it is necessary manufacturing wax (preferably plastic) bases with occlusal wax cylinders.

- instrumental method involves the use of the device, the recording movement of the mandible in the horizontal plane. The position of the occlusion corresponds to the top of the "Gothic angle" formed by recording laterotrusion and Protrusion movement of the mandible. Partial absence of teeth, this method is rarely used, only in difficult cases of clinical practice. At the same time carry out forcible displacement of the lower jaw pressure of doctor's hands on the patient's chin to match.

There are several methods for determining the height of the lower portion of the face.

- Anatomical - based on the study of facial configuration.
- Anthropometric - based on data about the proportions of certain parts of the face.
- Anatomical and physiological method is based on determining the state of relative physiological rest of the mandible, this position of the lower jaw, in which the chewing muscles is in an undervoltage condition (tone), lips touching each other all over freely, without pressure, the corners of the mouth are slightly raised, nasolabial and chin folds clearly expressed dentition open (interocclusal gap in average 2 to 4 mm), the lower jaw of the head are located at the base of a slope of the articular tubercle. During the conversation with the patient is applied to the point of the nose portion of the base and projecting jaw. To hang up, when the lower jaw is in a state of physiological rest, measure the distance between the plotted points. Then introduced into the mouth of wax bases with bite block, the patient closes his mouth, mostly in the central occlusion and re-measured the distance between the two points. It should be less than the height of rest for 2 to 4 mm. When closing the distance is greater than or equal to the state alone, the height of the lower portion of the face is increased, it is necessary to remove the excess wax from the bottom roller. If received at the closing of the distance is less than 2 to 4 mm, the height of the lower portion of the face is reduced and should add a layer of wax on the roller. Sometimes a conversation test as a functional additions to the anatomical method. The patient is asked to say a few words - "satisfactory" and "now", while watching the degree of separation rollers. The normal separation of 2 to 3 mm. If the gap between the rolls more than 3 mm - height of the lower of the face is reduced, and if it is less than 2 mm, the inflated.
- To fix the mesiodistal relation of jaws on the top roller in a roller clamp mandibular make triangular notches on the plate thickness of the wax. On the roller contacting the antagonist teeth, remove 1 to 2 mm of wax and placed on the chewing surface of the softened wax plate, fix it with hot spatula to roller. Enter the bite block in the oral cavity of the patient, and he closes his mouth in the position of central occlusion of the wax to solidify. In the absence of the front group of teeth, apply the following guidelines:
 - cosmetic center line (center line) - for setting the central incisors;
 - line canines - the perpendicular from the wings of the nose on the vestibular surface of the occlusal cushion; This line determines the width of the front teeth to the middle of the canine;
 - smile line - to determine the height of the front teeth; I must smile when a patient positioned slightly above the necks of the teeth.
- Wax rollers are removed from the oral cavity, cooled, divide, remove excess wax, put on the formed grooves and ridges.
- After determining the central occlusion or centric relation fastened together model must be plastered to the articulator (occludator).
- bite called the relationship between dental arches in a position to central occlusion. Central occlusion, as is known, is called closing dentition, wherein the teeth have a maximum number of contact points and mandibular articular head arranged at the base disc participation ramp articular tubercles.

- bite we divide by function into two groups: physiological and pathological. To apply physiological bite, providing a full function, regardless of differences in morphological features; pathological - bite with dysfunction.

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restbite

- To restbite we include: orthognathic, direct, physiological prognathism and physiological opistognatiyu (fig.); to malocclusion - distal occlusion (pathological upper prognathism), mesial bite (lower prognathism or progeny), deep bite, sinking bite, open bite and slash the bite (Fig.).

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Fig. Physiological types of malocclusion:

- a - orthognathic;
- b- straight;
- in - biprognatiya;
- g - biprogeniya.

Pathological types of malocclusion:

- a - prognathism;
- b - progeny;
- in - depth;
- g - outdoor;
- d - Cross.

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Orthognathic bite. Ortognatiya characterized by morphological features, some of which relate to the whole dental arch, the other just to the front teeth, and the third only to chewing.

• Symptoms related to the entire dental arch.

1. The upper dental arch is elliptical shape, the lower - the shape of a parabola.
2. On the upper jaw dental arch over the alveolar and alveolar - more basal. In the mandible, there is an inverse relationship: lower dental arch alveolar, and the latter is less than the basement. Thus, the upper dental arch More the lower and the upper smaller than the lower alveolar arch. This explains "the fact that the presence of teeth in orthognathic bite upper dentition overlaps the bottom, and at loss of all teeth, even at low atrophy of alveolar processes observed inverse relationship alveolar arcs.
3. Each tooth merges usually two antagonists, of which the main one is called and the other - the side (Altukhov), except for the upper teeth and wisdom lower central incisors which have one antagonist. Each upper tooth merges with the same (mainly) and standing behind the lower teeth; each lower tooth merges with the same (mainly) and standing in front of the upper teeth.
4. The teeth of each of the dentition, adjoining to each other, mutual contact touch points on the approximal surfaces.
5. The height of the dental crowns gradually decreases from the central incisors to the molars (except for tusks).
6. The upper teeth are tilted outwards crowns and roots - inwards, the lower teeth, on the contrary, are inclined crowns towards the language, and back - outwards.

• Symptoms related to the closing of the front teeth.

1. The upper front teeth overlap (scissor) lower teeth for about one-third of the crown (1.5 to 3 mm).

- 2. Average line between the upper and lower central incisors are in the same sagittal plane.
- ***Symptoms related to the closure of posterior teeth.*** These attributes can be of two kinds:
 - a) at the closing of the bucco-palatal direction;
 - b) when closing in the anteroposterior direction.
- ***Symptoms related to bucco-palatal direction teeth clamping.***
 - 1. Cheek cusps of the upper teeth are arranged laterally on like hillocks of the lower teeth and the buccal cusps of the lower teeth - medially from the upper teeth of similar mounds, so the upper palatine hills fall into the longitudinal grooves of the lower teeth, and the lower cheek - in the longitudinal grooves of the upper teeth.
 - 2. lingual cusps of the lower teeth positioned medially from the palatal cusps of the upper teeth.
 - 3. The outer (buccal) and inner bumps both upper and lower posterior teeth on both sides of the jaws are located on different levels. The front section of the jaws through chewing teeth, going from right to left or vice versa, is a lateral curve, convex to concave upper teeth and the lower teeth.
- ***Symptoms related to the closing of posterior teeth in the anteroposterior direction.***
 - 1. Front buccal protuberance of the first upper molar is located on the buccal side of the first lower molars in the distal transverse grooves between bumps and the rear buccal protuberance of the upper first molar lies between the distal-buccal protuberance of the first lower molar and mesial-buccal protuberance of the second lower molar.
 - 2. The chewing surfaces of the lower teeth, from premolar and ending with the last molars, sagittal form a concave curved surface. The chewing surfaces of the upper teeth form a sagittal curve, but not the concave and convex, repeating the shape of the lower concave curve.
- the relationship between the dental arches for the following reasons.
 - a) The upper central incisors wider lower central incisors:
 - articulate with the two lower incisors, so the upper teeth are displaced distally against the lower teeth number and each tooth has two antagonists. Upper wisdom tooth has lower wisdom tooth, so the upper distal offset in respect of similar teeth aligned in the lower molars and rear upper and lower surfaces, wisdom teeth lie in a frontal plane. Closure of one, two antagonistic tooth is very important, because a roll of one another antagonist prevents tooth on the opposite jaw from displacement. From this perspective, the front teeth are less complete than the side.
 - b) standing next to one of a number of teeth touch each other with their surfaces aprokmalnymi. Lots of contact in dentistry referred to as contact points. This mutual contact of teeth has a great value for their stability and function. Firstly, it, protects teeth from shifts in the anteroposterior direction, reducing the amplitude of the physiological mobility of the teeth during the chewing action of the horizontal component of pressure, which is important from the viewpoint of the stability of the teeth. Secondly, the contact point on the interproximal surfaces of teeth prevent slippage of food towards the gingival papilla and thereby protect it from injury and food particles from sticking. Finally, if the teeth do not have contact, the tooth row, it would be a simple sum teeth and each tooth to act autonomously, in isolation from the totality of the other teeth. Due to the side contact not only one tooth is connected to the other, but the entire set of teeth on the amount of teeth, acting autonomously, is transformed into a system of closely related elements of the dental arch. Due to the physiological mobility of the teeth and contacts, on the one hand, the work of each tooth is dependent on other parts of the dental chain, and the other - the function of each tooth is reflected on the entire circuit.
 - c) Prevention dentition shift back and loosening it helps, according to Katz, the fact that the lower molars mesially inclined crowns and roots - distal and posterior teeth as if propped teeth, standing in front of.

- d) Starting from incisors height crowns decreases toward chewing teeth, particularly in the lower dentition. This also is a favorable condition for tooth health, for the functional value of posterior teeth should be above the functional value of the front teeth, and their chewing ability depends on the location, and from the height of the crown: the farther away the tooth from the middle line, the higher should be its functional value.
- d) In the upper jaw crowns directed outward, toward the cheeks and lips, and the roots - inwards. In the mandible crown directed towards the tongue roots - outwards. This upper dental arch more than the lower and upper dentition overlaps the bottom. All of these anatomical features greatly contribute to stability of the lower dental arch.
- The lower front teeth, like all others, have a tendency to movement in front, but the possibility of this is limited due to the lower teeth overlap the upper.
- For the upper jaw forward trend towards mobility is somewhat limited by the fact that the upper jaw is fixedly connected to the facial bones.
- e) The lower molars are tilted inwards crowns, and the top outward. It promotes penetration of the lingual cusps of the upper molars in the longitudinal grooves of the lower molars and the buccal cusps of the lower molars - in longitudinal brozdki upper molars. That way the teeth are held by the shift in the bucco-palatal direction. Since the upper dental arch more than the bottom, it covers the bottom as described arc inscribed, and front teeth are on the bolus as a cutting instrument, like scissors.
- scissor structure orthognathic occlusion increases, in addition, the chewing surface and provides a large scale chewing excursions of the mandible.

- Finally, the coverage of the upper dental arch bottom prevents pinching the cheeks and tongue during the closing of the teeth.
- g) The lower set of teeth formed in terms of sustainability is more perfect than the upper. The wedge shape of crowns, mesial-distal inclination of molars, the slope of the posterior teeth in the direction of language contribute to the stability of the dentition. In addition, AJ Katsu, the outer plate of the compact substance mandibular bone covers the entire dental arch. Finally, the stability of the side portions of the dental arch helps bend the cortical plate in the area of internal and external oblique lines.
- The upper set of teeth formed from the viewpoint of stability is less favorable. The crowns of the upper teeth are tilted outwards, therefore, when chewing movements directed outward in the upper jaw, dentition may become even more fan-shaped form. From that protect the upper dentition by three factors:
 - 1) the existence of a system of buttresses in the canines and posterior teeth;
 - 2) the palatine processes, connecting the side portions in the transverse direction;
 - 3) a large elasticity labial wall of the alveolar bone in the anterior region;
 - 4) the presence of the third root - palatal, available at the upper molars. All these features give the upper dental arch certain stability.

• **Level bite.** The second option is the direct physiological occlusion. Direct orthognathic occlusion differs from that cutting edge does not overlap the upper teeth, and fall directly tong like, on the cutting edge of the lower teeth. In the posterior region the relationship between the same teeth as in orthognathic bite.

• As a result, the forward bite occurs sometimes more rapid erasure of the teeth than when orthognathic. However, in this case the resulting polished surfaces characterized by high resistance to decay, the teeth are firmly in the alveoli and periodontal disease affects not more than in other forms of physiological occlusion.

• **Physiological opistognatiya and physiological prognathism.** Physiological opistognatiya and physiological prognathism characterized by the interrelation of dentition, which is peculiar and orthognathic bite. They differ from the latter only in the direction of the alveolar ridges and

frontal teeth. When opistognathic front teeth bite together with the alveolar ridges of both jaws are directed back at prognathic bite front teeth and alveolar ridges facing forward.

- Nature of clamping dentition in centric occlusion state occlusion at these same varieties as orthognathii and therefore they are also functionally usefulness.

- Ortognatiya is characterized by a certain relationship of dentition in three directions: sagittal, vertical and transversal.

- Deviations from the morphology orthognathii in the relationship of dentition in these planes entail occurrence of malocclusion in these three directions. By malocclusion in the sagittal or mesial-distal direction are distal (upper prognathism) and mesial bite (lower prognathism).

- To malocclusions in the vertical direction are deep and open bite. By malocclusion in transversal direction refers oblique bite.

- **The distal occlusion (upper prognathism).** When there is a physiological prognathism both the upper and lower jaw. However, often there is a prognathism - upper jaw, ie, not.. Physiological and pathological prognathism or distal occlusion.

- Due to the lower distal offset dentition, including molars, with respect to the upper and lower front teeth do not interlock with the upper and horizontal slot is formed between them. As a result of the lower anterior teeth are put forward and touch the cutting edges of the mucosa of the upper jaw, injuring her.

- When the distal occlusion mesial cusps of the upper first molars fall on mesial cusps of the lower first molar. Often prognathism so pronounced that the top teeth protrude and strongly raise the upper lip, as a result, it can link up with the lower lip only under great strain. Typically, the lower lip falls into the gap between the upper and lower teeth. All this adversely affects not only the external form of the patient, but also on chewing.

CLINICAL PICTURE In partial absence of teeth

- Treatment of diseases of the dental system in the clinic of orthopedic dentistry consists of the examination of the patient, determine the causes of disease (etiology), the mechanism of its development (pathogenesis), morphological and functional changes in organs, clinical features of the disease. The survey ends with diagnosis and preparation of orthopedic treatment plan.

- Survey Methods for the patient can be divided on subjective and objective. The former include the patient survey, to the second - instrumental, laboratory and other methods.

The clinical picture in the partial absence of teeth is diverse and depends on the number of extracted teeth, teeth in the dentition locations, by their function, of the form bite of periodontal and hard tissue, as well as the patient's general condition.

In the absence of front teeth in patients with predominant complaints:

- aesthetic flaw,
- speech disorder,
- splashing saliva while talking,
- impossibility of biting food.

In the absence of posterior teeth, patients complain of:

- A violation of the act of chewing
- Complain of discomfort when chewing,
- travmirovaniye and soreness of the mucous membrane gums.

- When collecting anamnestic data necessary to determine the cause of the removal of teeth, as well as find out whether the previously conducted orthopedic treatment, and if carried out, you can use any constructions of dentures.
- In the absence of front teeth on the upper jaw, generally facial asymptomatic, but there may be some retraction of the upper lip. In the absence of a large number of teeth is often marked retraction of the soft tissues of the cheeks and lips. If there are no teeth on both jaws without saving antagonists may reduce the height of the lower portion of the face.
- History taking is the first stage of the examination of the patient, which offer a memory play history and the history of life. History consists of the following sequence of presentation of sections: 1) the complaint and the subjective condition of the patient; 2) a history of the disease; 3) history of the patient's life; 4) family history
- **A survey** of the patient plays an important role in the diagnosis. Often followed by an objective study is the verification of an already established on the basis of a survey of the essence of the disease ..
- The survey allows us to study the complaints of patient, set the time of occurrence of subjective sensations and the sequence of their development, factors that precede the disease. The latter include common diseases of the body, as well as local changes in the oral cavity (bad tooth, tooth extraction, prosthetic, inflammatory diseases of maxillofacial area, etc.).
- The survey and inspection with partial loss of teeth is carried out according to the traditional pattern: find out the history of life and of the disease, by inspection, inspection of the oral cavity, the existing dentures, palpation, probing, determining the stability of teeth, etc. Be sure to carry out X-ray examination of alleged abutment teeth and their periodontal. It is important to determine the localization of dentition defect and its length, the presence antagoniruyuschih pairs of teeth, the condition of the hard tissues of the remaining teeth in the oral cavity, the mucosa and periodontal rate profile occlusal surface of the dentition.

EXTERNAL EXAMINATION OF THE PATIENT

- All patients should conduct an external inspection of the face. This is done invisibly to the patient during the interview. Pay attention to the symmetry of the face halves the height of the lower part of it, the protrusion of the chin, the closing line of the lips, chin, and the severity of nasolabial folds, the position of the corners of the mouth, baring teeth or alveolar part in conversation and a smile.
- Anatomical Educational lower third of the face:
 - a - nasolabial fold;
 - b -filter: in - the upper lip;
 - r - corner of his mouth: d - line between the lips;
 - e -; Well - red border of the lips;
 - h - chin tuck.
- In the clinic of orthopedic dentistry widespread division of the face into three parts: upper, middle and lower. The upper third of the face is located between the border of the hairy part of the forehead and the line connecting the eyebrows. The boundaries of the midface are the line connecting the eyebrows and the base of the nasal septum. The lower third of the face - that's part of the base of the nasal septum to the lower point of the chin.
- To establish any relationship between the height of the three parts of the face, can only be for those strict classical section. Generally facial height division into three parts conventionally, since the position of the points, whereby the division is performed, and individually rather during

the life of people may vary. For example, the boundary of the scalp to the forehead of the different actors is not the same and can be moved with age. The same applies to the lower third of the face, the height of which is variable and depends on the type of closure and tooth preservation. The least volatile middle third of the face. Despite the fact that between the sizes of these parts of the face can not be seen legitimate proportionality, the majority of people, they have a relative matching, which ensures optimum aesthetic. For orthopedic purposes it is important to distinguish between the two sizes lower face height. First measured at serried teeth, and it is called the occlusion. The second position is determined relative functional rest, when the lower jaw is lowered and there is a gap between the teeth. This - the height of the relative functional rest.

- Divide the face into three parts: a - top; b - average; in - the bottom third.

ORAL EXAM

- First Total determine the degree of mouth opening. Difficulty opening the mouth may have a place as a narrowing of the oral opening, and in the difficulties of movement of the lower jaw due to muscle or joint contracture. In itself, the difficulty in opening the mouth points to a certain pathology; moreover it impedes many manipulations associated with the prosthesis (the introduction of the prosthesis or impression trays). At the same time set the degree of separation of dentition when you open your mouth.
- Studying the degree of opening of the mouth, you should pay attention to the nature of the movements of the mandible; smooth, discontinuity, deviation to the right or to the left.
- Next, study the condition of the mucous membrane of the mouth: gums, transition folds, cheeks, hard and soft palate. Examine the tonsils, back of the throat, the tongue (the value of mobility, his state of the mucous membrane). The normal mucosa pale pink or pink, moist, shiny. However, it can become inflamed and become edematous, loosened and bleeds. There it hyperemia, sometimes combined with cyanosis.

Survey dentition

- dental examination is carried out in a specific order, starting with the upper jaw, and consistently examine each tooth on one side of the tooth to the wisdom of the eponymous the other. On examination, each tooth pay attention to the following: 1) its position; 2) form; 3) color; 4) the state of hard tissues (caries lesion, fluorosis, hypoplasia, s); 5) the stability of the tooth; 6) the ratio vnealveolyarnoy vnugrialveolyarnoy and parts of his; 7) position in relation to the occlusal surface of the dentition; 8) the presence of seals, their condition.
- Examination of teeth drew attention to their closure, the position in relation to its neighbors and antagonists. In the front section also should pay attention to the depth of overlap. The survey allows to get a preliminary idea of the nature of the occlusal surface and its possible deformations.
- Then should set the shape of the dental arches (ellipsoidal, parabolic, trapezoidal, flattened and others). It turns out the nature of the closing of dentition (bite). A great help in this facet may have erased called Engle occlusive. They are formed by the teeth during their friction articulation and have a well-defined arrangement depending on the type of occlusion.

survey periodontal

- can be obtained using clinical (inspection, palpation, probing, etc..) And paraclinical methods of data about the state of the supporting apparatus of teeth (periodontal). Clinical examination is important to evaluate the condition of marginal periodontitis. Here, first of all, you need to pay attention to the condition of the gums (inflammation, atrophy) and the tooth-gingival pocket (depth, suppuration).
- An important detail in the characterization of periodontal health is the ratio of extra- and intraalveolar part of the tooth. When atrophy gums clinical crown increases, and with it grows

and vnealveolyarnaya part of it. Increasing the outer arm entails a change in tooth biomechanics with the advent of functional overload of periodontal. Thus, the atrophy of the gums, increase in clinical crown, the formation of pathological pockets - the symptoms of periodontal disease and reducing its functionality. This is expressed in the appearance of unusual scope and direction of tooth movement (makroekskursii), otherwise known as pathological mobility.

Pathological tooth mobility

- There are physiological (normal) and pathological tooth mobility. The first is the natural and invisible to the naked eye. Its existence is confirmed by indirect signs of erasure points of contact and the formation of pads or special complex devices. For pathological mobility of teeth is characterized by a noticeable shift with little effort.
- Mobility of teeth - a very sensitive indicator of periodontal condition. In terms of build-up and it can be, to some degree, an idea of the condition of the support apparatus of the teeth, on the direction of development of the pathological process or its aggravation. Therefore, the study of pathological tooth mobility is of great importance for the diagnosis of disease, evaluation of treatment outcomes and prognosis. It is important to register early signs of tooth mobility. This will diagnose periodontal lesion in its initial stage.
- Pathological mobility is studied both in the open mouth, and in various movements of the mandible from the same occlusal position to another. The latter allows you to sometimes identify the cause of periodontal disease and related pathological mobility. These causes may be a violation of occlusion to form a blocking points in a particular phase of articulation.
- It is necessary to distinguish the degree of pathological tooth mobility. At the first degree have the tooth displacement in one direction (lead-bulyarno-oral). When pathologic tooth mobility of the second degree is visible displaceability in-vestibular and a medio-distal direction. When the third degree of pathologic tooth mobility also shifted in the vertical direction: when pressing it is immersed in the well, and then returns to its original position. Finally, in the fourth, at, degree of possible rotational tooth movement. The third and fourth degree of mobility suggest far advanced and, for the most part, irreversible changes of periodontal (DA Entin).
- Pathological tooth mobility is closely linked to the presence of pathological gingival pockets. The presence and depth of their check probe. At the same time find out the nature of the discharge and the condition of the gingival margin.
- A common method for determining the degree of mobility of the teeth by means of tweezers has serious drawbacks. These include a lack of precision, since the amplitude of oscillation is not determined in units; method detects only visible to the eye and a tooth excursions not identify those that begin on the border with the norm, and suggests developing pathology. These disadvantages do not allow to use the method for the early diagnosis of periodontal disease and therefore reduce its diagnostic value.
- The imperfection of this method of tooth mobility survey was incentive to find new ways, more accurate, and capable of recording not only the mobility but also to measure it in certain units (mm or degrees). However, all of the proposed devices do not differ that portability, ease of use and accuracy, much needed in the outpatient conditions

Examination of the toothless alveolar

- Examination of the toothless alveolar crest as part of prosthetic bed, first carried out by inspection, palpation, and subsequently study the diagnostic models of jaws.
- On examination, first of all pay attention to moisture and mucous membrane color (pale pink, bright red when flushing, bluish when stagnation), integrity (ulcers, bedsores), mucosal excess as "cockscorn". It is easy to determine the size, shape (rounded, pointed) of the alveolar ridge, the nature of its rays, atrophy (mild, medium), pronounced (even and uneven), the presence of stryh protrusions that appear after the removal of teeth with a bad treatment of bone injuries, exostosis,

overhanging edges with undercuts. On the upper jaw it is important to pay attention to the alveolar tubercle, its value, the thickness of the mucous membrane that covers it, and sometimes an excess of it, and on the bottom - a slimy bump that appears after the removal of the third molar.

Diagnostic model jaws

- Information on the closing of the teeth can be obtained directly during the inspection of dentition in the mouth. At the same time, this method has limitations because it does not allow to see the closure of the palatal and lingual cusps. For this model useful diagnostic jaws which are prepared as follows. Read the impressions of the upper and lower jaws, cast from plaster models. Base models make out with the help of special devices, or rubber molds are cut so as to conform to the corners of the plinth line fangs, and the base is parallel to the chewing surfaces. On models celebrate medical history number, surname, first name of the patient, as well as the date of withdrawal imprint. Such models are both diagnostic and control. They facilitate the diagnosis, treatment plan development and helping to judge the results.

- In the diagnostic models can examine the shape of the dental arches, their deformation, compared with the same name teeth right and left halves of the jaw, occlusal contacts palatal and lingual cusps, the degree of overlap of the front teeth of the lower top, the nature of the occlusal curve, deformation occlusal surface of the dentition, etc. You can also examine the position of the teeth, limiting defect, their displacement, tilt.

- Using diagnostic models manage to clarify the topography of the alveolar (smooth, bumpy), the degree of atrophy (minor, moderate, severe) and the nature of it (even and uneven), hypertrophy, strain after the injury. Diagnostic models also allow you to get an idea of the situation edentulous alveolar part with respect to the same, but located on the opposite jaw or natural zubam. Nakonets, they can take measurements, and special devices to draw a profile of its cross - section of the alveolar ridge in different departments.

- Diagnostic models
- jaws drawn up
- in the central position
- occlusion and fixed
- in the occluder

- Partial loss of teeth is characterized by a lack of continuity in the dentition, the collapse of the dentition of independent action functioning and non-functioning group of teeth, functional overload periodontal remaining teeth, deformation of the occlusal surface of the teeth, a violation of chewing function and speech, changes in the temporomandibular joint, violation of aesthetic standards.

- While some changes may be observed immediately after tooth loss, while others develop over time.

- partial absence of teeth is the lack of 1 to 15 teeth. If the defect is limited dentition teeth on both sides, it is included a defect if a defect is limited to only the medial side - terminal defect. According to EI Gavrilov distinguish 7 Classes

In order to meet the practical needs created by a simple classification based on attributes, the most important for clinicians, namely the localization of the defect in the dentition; it is bounded on one or both sides of the teeth; the presence of the antagonist tooth.

Classification Kennedy most easy to use and allows for selection denture rational design appropriate for a given clinical situation. The first three classes can have subclasses defined number of additional defects dentition.

- electric pulp test allows us to study the excitation threshold of pain receptors of the dental pulp. Electroexcitability pulp intact teeth is 2-6 mA. If the tooth reacts to the current less than 2 mA, it is possible to think of hypersensitivity, and 6-10 mA current from - to pulp necrosis. Radiographic studies are conducted as necessary (if indicated) in the following cases:

- • Teeth with large fillings;
- • previously covered with crowns;
- • discolored teeth;
- • movable teeth;
- • teeth with increased abrasion;
- • teeth with suspected cavity on the contact surface;
- • systemic and focal disease periodontal;
- • if necessary, control the quality of root canal filling;
- • if you suspect the presence of the root.

In the description of X-ray of the teeth is necessary to pay attention to the following:

- • condition of the periodontal ligament, the presence of bone pockets;
- • condition of the root canal, the nature of its filling a filling material (incomplete, to the apical opening of the root apex);
- • pathological changes of periapical tissue in the apex (loss of bone tissue, with clear and blurred, seal bone);
- • shape of the tooth root: straight, curved;
- • changes in the crown of the tooth (caries process gapping fillings, artificial crowns, fillings dangling at the gingival margin);
- • atrophy and mezhlunochkovoy interdental septum.

On radiographs of the temporomandibular joint is necessary to pay attention to the position of the head of the mandible, the width of the joint space, the structural changes of the joint elements.

Methods for determination of chewing pressure

- As noted, chewing muscles at reduction may develop a total power equal to 390 kg . The magnitude of the absolute strength of the masticatory muscles is calculated by multiplying the diameter of physiological masticatory muscles on Johnson-Weber ratio (10 kg per 1 cm² diameter muscle). The absolute power of the masticatory muscles, as well as other, apparently develops only in the moment of danger or emotional stress. In everyday life, a person is not necessary when chewing food to develop such a force. Therefore, researchers are interested primarily chewing pressure that develops in the specific area for biting and breaking of pumpable food (meat, bread, biscuits, etc.). It is also important to know the endurance of certain periodontal teeth to chewing pressure, which would be guided in maximum load it with different prosthetic dentures.

- Endurance periodontal measured by means of special devices, called gnathodynamometer. For the first time this type of device has been proposed in 1893 g . Black, which apparatus has created two studies chewing pressure, one for detecting the pressure in the oral cavity, and the second - to measure the force necessary to crush individual foods outside the mouth.

- New gnathodynamometer design proposed in recent years, sensing devices which are strain gauges (I.S.Rubinov, L.M.Perzashkevich, D.P.Konyushko and A.I.Drabkin).

Research chewing efficiency dentition

- Study of chewing efficiency is carried out using functional (chewing) samples, allowing to obtain a more accurate idea of the abuse this function.

- The first functional test has been developed Khristiansen. He proposed to determine the chewing ability by examining the degree of grinding food and a certain consistency of its mass. Researched allowed to chew 5 g forestry or coconut. After 50 chewing movements, he spit out a lot of food; it was dried and sieved through a sieve with a hole diameter of 2.4 mm . Chewing ability was calculated from the residue on the sieve.
- SE Gelman developed and simplified method of chewing the sample. Instead hazelnut it took 5 g almonds, 50 and instead suggested that the patient chewing movements during the 50 seconds.
- Further development of functional chewing tests conducted I.S.Rubinov. He believed that chewing 5 g almonds confronts the task of chewing apparatus that goes beyond the norm. Therefore I.S.Rubinov offered to the patient to chew 0.8g nut, which is approximately equal to the mass of the almond kernel. The sample was conducted as follows. The subject was given 0.8 g walnut and asked to chew it before swallowing reflex manifestations. Once the test will have a desire to swallow chewed nut, he spit out the contents of the offer in the kidney-shaped basin. Nut chewing time is ticking stopwatch. As a result of the functional test receive two indicators: the percentage of masticated food (chewing ability), and during chewing.
- Studies have shown that when orthognathic bite and intact tooth rows 0.8 g nut completely chewed for 14c. With the loss of teeth during chewing is extended; at the same time increases the sieve residue.

Graphical methods for the study of masticatory jaw movements

- Various diseases of the oral cavity and masticatory muscles break the biomechanics of the lower jaw. As the recovery of the patient movement of the lower jaw can be normalized. Normal movement of the mandible, and the violation of their recovery dynamics can be studied using graphical methods. Currently recording masticatory jaw movements produced in different devices: kymograph, oscilloscope and others.
- I.S.Rubinovym detail designed recording masticatory jaw movements (face-bow) and the decoded value of each of the constituent parts of the recording (Figure 32).
- Mastikatsiogramma registers chewing movements during chewing nuts weighing 0.8 g . Instead of the nut can take bread, carrots, but with the condition that all the studies in the same patient should be further carried out always with the same product.
- Analysis mastikatsiogrammy allows you to set that consists of consecutive waveform, conventionally called chewing waves. The chewing wave distinguish upward (AB) and downward (BS) of the knee. The first reflects the lowering of the lower jaw, the second - its rise. The lower loop between the individual waves are called loop closure. Each wave is characterized by height, angle between the ascending and descending tribes, the nature of the summit.
- Loop closure (occlusion area) is also characteristic. It can take the form of a flat line, and may have additional wave (01 to 01), indicating that the lateral shift of the mandible.
- In each period, chewing should distinguish 5 phases. The first rest -phase - corresponds to the position of the mandible at rest. On kymograms it is registered as a straight line (I). The second phase is in a nutshell the food into his mouth. On kymograms it corresponds to the first ascending knee (II), coinciding with the opening of the mouth when administered to food. The third phase - the start of chewing. On kymograms it starts from the ascending limb (IV), the corresponding opening of the mouth with the introduction of food. Depending on the consistency of food entry is modified. If necessary, adjust to the destruction of a piece of food, and overcome the resistance of the curve characterizing the movement of the lower jaw, there is a number of additional undulating climbs.
- Once for chewing food will choose the appropriate position and its resistance has been overcome, a decline curve, followed by the main phase of the bubble (the fourth). For her, while the remaining teeth and their correct closing characteristic rhythm of the waves and the chewing of the same magnitude. The fifth phase - the formation of food bolus and its ingestion. Along

with the record of chewing movements of the mandible on the tape kymograph (oscilloscope) is counting time. This makes it possible always to determine the time of any chewing phase.

- The nature of chewing wave loop closure, the characteristic of the individual phases depends on the size and consistency of the food, the type of malocclusion, occlusal relationships preserved teeth, the nature of the closing of artificial teeth, denture fixation, the state of the masticatory muscles, the temporomandibular joint and others.

- The main disadvantage of this method - no registration side dvizheniy- was eliminated Perzashkevichem LM and AP Bobrov, have offered three-coordinate face-bow. With it simultaneously recorded sagittal, vertical and transversal movement of the mandible.

Examination of the temporomandibular joint

- Diagnosis of diseases of the temporomandibular joint is based on anamnesis, clinical trial of oral, external and internal palpation, functional tests, radiographic studies.

- During the conversation with the patient is necessary to clarify its complaint. Most often, patients complain of clicking in the joint, pain, limitation of opening the mouth, crunching, headache, hearing loss. Many patients do not make complaints, but their examination detected one or another joint pathology. Thus, the study of the temporomandibular joint is a must for patients with abnormal dentition

- graphic recording mandibular movement, and - movement recording scheme kymograph (K): P - plastic case, R - rubber bulb, P - zone E - rubber bridge. T - rubber tube, M - Mareyevskaya capsule; b - mastikatsiogramma (I.S.R> bean): I - the resting phase, II - phase of the introduction of food into the mouth. III - Phase start chewing function (estimated). IV - the main phase of the chewing function, V - phase formation of food bolus and its ingestion. ABS - chewing wave; About - loop closure during the crushing of food; 01 - Loop during grinding food; at - ostsillogramma chewing movements bottom chelyu-sti (E.I.Gavrilov and N.I.Karpenko):

- I - resting phase, II - phase of the introduction of food into the mouth, III of - phase fragmentation of food, IV of - phase main masticatory function, the V - phase formation of food bolus and its ingestion, A - upward knee wave B - the top of the wave, In - knee downward wave A - occlusal space.

- (anomaly, complete or partial loss of teeth, deformation, excessive abrasion, periodontal disease, and others.).

- Next, it should be clarified when the disorder called sick, for example, clicking in the joint, and there were what he connects them (trauma, loss of teeth, sore throat, infection, mouth wide open while removing teeth, and others.). Which came first: the pain or clicking? Then you need to determine whether there are periods of remission, or symptom, called sick constant. Does the patient any drug treatment and whether it was effective? An important consideration in the collection of history is to link the loss of teeth with joint disease (the number of lost teeth and their topography), and whether the patient has a prosthetic and occurred after this relief?

- After interviewing the patients underwent joint palpation by applying to the skin of fingers, front tragus of the ear, or the introduction of the fingers into the ear canal. When joint palpation often felt tremors, snap and crunch. Therefore, as it is palpation and auscultation, although the noise, crunch, snap, you can listen to the stethoscope. Palpation catch allows the range of motion of the mandible head during opening and closing of the mouth, the movement synchronism of the left and right heads. At the same time it manages to be noted clicking, crunching, their combination and synchrony with the different phases of opening the mouth. For the heads of the lower jaw is characterized by two types of movement, determined by palpation, namely normal, smooth, without stepping over the top of the articular tubercle and the movement of large amplitude, with stepping to the top of the articular tubercle, or to the side. Some of these

excursions may be on the verge of subluxation. Finally, there may be habitual dislocation of the head with a full stepping out of the glenoid cavity, with the top of the hillock.

- For functional tests include checking mandibular excursions when opening and closing the mouth. At the same time the following two types of its movements can be recorded. The first is called a forward (normal, smooth), the trajectory of the cutting point on the sagittal plane of the opening and closing of the mouth does not move to the side. In the second - wave-like (zig-zag, step) incisive point at the lower jaw movement shifted to the right or left of the sagittal plane, forming a wave or zigzag, step. When the path of the cutting point combines elements of direct and wave-like movement of the mandible, talk about the combined motion. This type includes also those trajectories that when opening the mouth are rectilinear direction, and when closing the distorted wave or zigzag.

• Examination of the function of the masticatory muscles

- The function of masticatory muscle changes not only during the various movements of the lower jaw, but also due to pathological conditions of the masticatory apparatus: the loss of teeth, joint disease, change interalveolar height. Therefore, for complete characterization of the clinical picture accompanying this or that disease of the masticatory apparatus, it is desirable to obtain data on the functional status of the masticatory muscles by electromyography.

• Electromyography

- Under electromyography understand the research motor (chewing) apparatus by recording biopotentials skeletal (chewing) muscles. Fluctuations in the potential found in muscle in any form of motor response, are one of the more subtle indicators of a functional condition of the muscle. Record fluctuations special device - electromyography. There are two ways to exhaust the current action: cutaneous electrodes with a large area of abstraction and a needle with a small area of abduction, which is administered intramuscularly. Biopolyarnye cutaneous electrodes coated with a special paste and adhesive paste to the skin over the muscles contracted.

- functional condition of the masticatory muscles examined during the functional rest of the mandible, at the closing of the teeth in the front, side and central occlusion, swallowing and during chewing. An analysis of the electromyogram is to measure the biopotentials of the amplitude, frequency of oscillations per second, studying the shape of the curve, the relationship of rhythm to the period of active rest. The magnitude of the oscillation amplitude of biopotentials gives an indication of the strength of muscle contractions.

- EMG during chewing in people with normal dental arches has a characteristic shape. There is a clear change in the rhythm of the active and quiet, and volleys of biopotentials are fusiform shape. By the contraction of muscles working and balancing sides there is coordination, expressed in the fact that on the working side of the high amplitude of biopotentials, and balancing - less than about 2.5 times (M.M.Solovev, S.I.Vinogradov).

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- Electromyogram of masticatory muscles with unilateral right chewing 1 a left temporal muscle; 2 - left masseter, respectively;
- 3 - right masseter, respectively; 4 - the right temporal muscle.

- To facilitate the analysis of the electromyogram devices using analyzers and integrators who spend a mathematical treatment of various curves, decomposing them into components or summing them.

- Electromyography is used in prosthetic dentistry in the study of the function of the masticatory muscles with partial or complete loss of teeth, diseases of the temporomandibular joints and masticatory muscles, dentoalveolar anomalies. This method also makes it possible to record

changes in muscle function after orthopedic treatment (prosthetics, removal of anomalies and others.).

- Examination of complete diagnosis. Diagnosis should reflect both morphological and functional disturbances include basic characteristic of a pathological condition, complications, the concomitant pathological condition.
- After you determine the class of each defect dentition individually need to set the relationship of the remaining teeth in a position of central occlusion and relative physiological rest of the mandible. To this end, define the central occlusion. It is necessary to check whether the height of the lower portion of the face has changed, is not whether there was a distal displacement of the mandible, as well as to evaluate the position of the remaining teeth in relation to the occlusal plane. Various deviations particularly well revealed in setting using the occlusal rollers optimal height of the lower portion of the person in the position of central occlusion and indicate the development of complications.
- The diagnosis of "partial lack of teeth" can be established only in cases if additional studies revealed no other changes in the system of organs and tissues.
- Partial absence of teeth is to be differentiated from the accompanying, combined with diseases. Omission of periodontal disease (periodontitis localized initial stage without any apparent pattern of inflammation and abnormal mobility of teeth, in the absence of subjective sensations) and deformations of dentition lead to an erroneous choice of treatment.
- In those cases when a partial loss of teeth combined with a high erasure of hard tissue of teeth crowns preserved, it is essential to determine whether or not there is a reduction in the height of the lower portion of the face. This significantly affects the entire treatment plan.
- After the examination, the patient and the diagnosis should be a plan of remedial measures, which must include the preparatory measures, without which the orthopedic treatment can not be carried out.
- Preparation of the oral cavity for orthopedic treatment using prostheses include: the elimination of foci of infection in the oral cavity, tooth filling in the presence of dental caries and its complications, surgical treatment is associated with the removal of the teeth and roots, which can not be stored and used for fixation and prosthesis . It may also hold osteotomy, curettage, gingivotomy, resection of root apex et al., Including the treatment of periodontal disease, dental plaque removal, etc.
In preparation of the oral cavity to the orthopedic treatment is necessary, in addition to dental health, to pay particular attention to the special preparation techniques:
 - on depulcation filling of teeth with root canals, which made artificial crowns (with a considerable slope of the tooth, the need for a significant shortening of the crown of the tooth, in some cases - before the splinting of anterior teeth);
 - removal of exostosis;
 - Remove unnecessary mobile mucosa;
 - elimination of strands of the mucous membrane;
 - normalization of the lost height of the lower portion of the face orthodontic or surgical method, including through the removal of teeth;
 - removal of dentoalveolar anomalies.

- When choosing a prosthesis design should take into account the class and the extent of the defect dentition, periodontal status of the remaining teeth, the condition (tone) of the chewing muscles. On the final choice of medical device design can have a significant impact kind of bite and some professional habits of patients.
- With the removal of teeth begins violation of morphological and functional integrity of the dental arch, which breaks down while on the individual function-oriented group of teeth. Some of them are antagonists and may bite or chew food, others are deprived of antagonists and is not involved in the act of chewing.

Evaluation of mucosal prosthetic bed state

- Features removable prostheses consist in the fact that in contrast to the fixed prosthesis, they rely on the mucosa of the alveolar bone, and alveolar cleft palate. In this connection, the state of the mucous membrane is of fundamental importance in orthopedic treatment removable dentures. It is important to know that the mucous membrane prosthetic bed has a different malleability and flexibility in individual areas.
- . In the alveolar bone of the upper jaw mucosa is thick and is connected with the periosteum. Here it consists of stratified squamous epithelium and its own layer. In the front third of the hard palate mucosa consists of its own and submucosal layers, and in the median palatal suture - of stratified squamous epithelium and its own layer. In this area also the mucosa tightly coupled to the periosteum and of the small thickness can be easily injured. The posterior third closer to line A
- According to EI Gavrilova yielding mucosal associated with the location of the vasculature and its ability to quickly emptied under pressure and again filled with blood. They were identified buffer zones are located on the upper jaw orthopedic bed. The extensive vascular network in the submucosa, the pliable shell on this site. The highest yielding - in the posterior third of the hard palate. Areas of mucous membrane located between the base of the alveolar bone and the middle zone,
- have a dense vascular network density which increases towards the line A. Therefore buffering palate mucosa toward the line A also amplified. If we compare the compliance zones defined by different scientists, we see their great similarity.
- Supple has published one of the first common characteristic mucosal prosthetic bed with clinical positions. He identified four classes:
 - I of - dense, moderately supple mucosa;
 - II of - atrophic, thin, pale mucous membrane;
 - III of - friable, hyperemic, often-catarrhal inflammation of the mucosa;
 - IV of - freely movable on the alveolar ridge or the alveolar part, full-blooded, reminiscent of a cock ("dangling") crest.
- The nature of mobility are distinguished: active-mobile, passive-mobile and immobile mucosa. The mucous membrane, located in the muscles and make excursions during their contraction, called active-mobile. It covers the soft palate, cheeks, lips, floor of the mouth, pharynx, throat. In these areas the mucosa moves in all directions along the muscles and other tissue formations which it covers. Speech, chewing, swallowing and other functional state, accompanied by reduction in chewing, facial and other muscles, always lead to the displacement of the active-mobile mucosa.
- Passively-movable mucosa is called the neutral zone, which extends in the form of a strip of non-uniform width of the vestibular surface of the crests of the upper and lower jaws, on the

lingual surfaces of the lower jaw and the line A. The boundaries of this zone are on the one hand a place of transition active-mobile mucosa shell in a passive-mobile, ie, This transitional fold, which corresponds to the attachment points of the facial and masticatory muscles to the jaws; on the other side of the border passes the neutral zone on the place of transition passively movable mucosa fixed.

- In the frenulum, lips and tongue, buccal and palatal krylochelyustnyh folds and holes the width of the neutral zone no more than 1 to 3 mm , and in the intervals between these entities can reach 4 to 7 mm . The mucous membrane in the neutral zone has a well-developed in the form of submucosal loose connective tissue in which no muscle fibers. It can be moved horizontally and vertically, to gather in folds, but these movements are passive and appear under the influence of an external force.

- The neutral zone is easily determined by postponing the lips, the cheeks of the skin and at the same time clearly revealed transitional fold, while postponing the mucosa - the border with the fixed mucosa. It is more difficult to define the boundaries of the zone A, which is explained by the absence of the neutral zone is wide and transition folds and fixed mucosa palate goes into the mucosa of the soft palate. So here we are guided by the palatine fossa and the line connecting the point at the base of the upper jaw alveolar tubercles. The front boundary of the neutral zone goes through these three points and holes. The distal boundary overlaps the palatine fossa at 1.5 2.0 mm . Neutral zone in all of these areas must be fully blocked basis prosthesis.

- transitional fold is a bend of the mobile mucosa in the area of transition from the gums and cheek muscle fibers attach to the bone. It is the upper limit of the neutral zone on the upper jaw and the lower boundary - on the lower jaw.

- The term "orthopedic field" merged all tissues and organs located in the area of the prosthesis mediated and direct impact, and "a prosthetic bed" - the organs and tissues, which are in direct contact with the prosthesis. Thus, the concept of "prosthetic box" and "prosthetic field" refer to each other as part of the whole.

- The term "prosthetic space" means the space vacated by the loss of teeth and atrophy of bone structures, and you want to fill the prosthesis.

General principles of orthopedic treatment of dentures with partial loss of teeth must have the following:

- • restoring the integrity of the dentition;
- • achieving the maximum aesthetic effect;
- • achieving good fixation and stabilization of the prosthesis orthopedic bed;
- • achieving the maximum effect of functional orthopedic treatment;
- • preservation of the teeth and jaw tissues for subsequent prosthetics.

Clinical and laboratory stages of manufacturing removable plate dentures with dental defects

- prints obtained by the partial absence of teeth
- Determination of the central occlusion and centric relation jaws
- The main objective of determining the centric occlusion and centric relation of the jaws with the partial absence of teeth is to provide physiological or as close as possible to the physiological occlusion and articulation relationship of dentition of the upper and lower jaws.

- Under the central occlusion refers to the closing of the dentition with the maximum number of contacts of teeth-antagonists. At the same time the head of the lower jaw are located at the base of a slope of the articular tubercle of the temporal bone and masticatory muscles slightly tensed.
- There are three common variants of the partial absence of teeth, for which in many ways determine the central occlusion.

- The first option: antagoniruyuschie pair of teeth are arranged triangle - in the lateral (left and right) and the front portion of the jaw, and perhaps a comparison of models in central occlusion.

- The second option: there are one or two pairs antagoniruyuschih teeth, retained a fixed height of the lower portion of the face, but to match the model in the central occlusion position impossible.

- The third embodiment: in the mouth is not a single pair antagonists and thus have a fixed height of the bottom of the face. In this situation, it can only go about determining the centric relation of the jaws.

- wax roller merges with the antagonists, and there is a gap, nasolabial folds and chin smoothed between the teeth of the upper and lower jaws. It is necessary to cut the wax pad roller to achieve a uniform and dense closing of the teeth and wax cylinders.

- After performing this procedure, the physician should be cut with a roller platform layer of wax about the thickness of 1 mm, heat the new standard strip wax thickness of 2 mm, to fix it with wax on the occlusal surface of the cold wax cylinders, put in your mouth and ask the patient to close the teeth. On the surface of the roller should remain dental imprints. In the third option is necessary to determine the ratio of the central jaws. The central parity of the jaws - a rear position of the jaw at the optimum height of the lower portion of the face, from which a free, no effort can be played sagittal and lateral movement of the mandible.

Determination of the ratio of the central jaw is divided into several stages.

- Determination of the height of the lower portion of the face. There are several methods: Anthropometric, physiological and anatomical and others in a state of relative physiological rest distance between the dental arches or wax cylinders of the upper and lower jaws considered to be equal to 2- 4 mm. The chewing muscles in this case is in a state of relative physiological rest.

- - Enough wide practical application in the clinic of orthopedic dentistry was the anatomical and physiological method, which consists of several stages. In the first stage set the height of the lower portion of the face in a state of relative physiological rest and calculate the height of the lower portion of the person in the position of central occlusion. To do this, the patient engage in a short conversation that is not associated with prosthetics, and at the end of the conversation offer a relaxed, stress-free close my lips. The lower jaw is set in a state of relative physiological rest. Compass or ruler determines the distance from the chin to the point at the base of the nasal septum. Marker points are plotted at random. The value obtained, when from it to subtract 2 to 3 mm, the height will be the bottom of the face. In other words, the height of the lower portion of the face in a state of relative calm over the height of the lower portion of the person in the position of central occlusion for 2 to 3 mm.

- Formation of a wax base with occlusal ridges on the upper jaw. For this it is necessary to enter the oral cavity and set on the basis of the upper jaw with occlusive wax rollers. Contents vestibular surface of the roller. If the upper lip is excessively protruding - cut wax with vestibular surface if lip sinks - to increase the wax. Cutting off or increasing the wax roller adjustment, ensure that the occlusal surface of the wax base on the upper jaw in the anterior located on the line between the lips, or, if there is a detached teeth, the teeth on natural level. The plane of this department roller should be parallel to the pupillary line. In the posterior surface of the roller is formed parallel nosoushnoy line (Kamperovskaya horizontal). At the same time we must

remember that the wax basis with occlusal rollers is a guide for setting maxillary teeth. In the presence of natural teeth is their guide the chewing surface.

- • fit of the lower occlusal wax cylinders to the upper roller. At the height of the lower roller by cutting or wax build-up must be prepared so that at the closing of the jaws of the distance between the marked points on the face was smaller than at physiological rest for 2 to 3 mm . One of the highlights of ensuring the success of the work, a uniform contact biting edges and natural teeth when they are closing.

- • Fixing centric relation of the jaws. To perform this procedure, you must roll on occlusal maxillary make two wedge-shaped cross-shaped cutout depth 1.0- 1.5 mm . On the front of the lower jaw of the cutting roller remove wax layer thickness of 2 mm , and then on the same surface of the heated strip is applied the standard base plate wax dental technician, soften it with a heated spatula and monitor the patient batted teeth in central occlusion. After 10-20 connected with the block of the upper and lower rollers wax is removed from the mouth in a flask and cooled with cold water.

- If there is a defect in the anterior dentition must be applied anthropometric landmarks on the occlusal rollers. For this to dental spatula note:

- • center line - a reference to determine the average line is the middle line of the face;

- • canines line - perpendicular dropped from the outer wing of the nose passes through the middle of the canine;

- • in the absence of the front group of teeth to put a smile line corresponding to the upper edge of the lips with a smile.

- Next, you need to determine: location clasps; the size and boundaries of the bases (mark with an indelible pencil on a plaster model); style and color of artificial teeth of the future prosthesis (matching coloring with the remaining in the oral cavity of the patient teeth).

- Determining the relation of the central jaw is necessary for:

- occlusal analysis and evaluation of topography elements TMJ before orthodontic and orthopedic treatment.

- terminal defects of dentition;

- reduction of the occlusal height;

- suspicion of displacement of the mandible to the "forced" occlusion;

- loosening of the ligaments of the TMJ;

- prosthetics edentulous jaws;

- non-fixed bite,

when there is a sufficient number

of teeth-antagonists;

- wear of the teeth to produce the occlusal plan of reconstruction;

- before and after the preparation of a large number of teeth for the purpose of reconstruction of the occlusion;

- to identify superkontaktov back contact position.