Setting the dentition for different jaw ratios

The models, fixed in the position of central occlusion using wax bases with occlusal ridges, are transferred to the dental technician for plastering them into an occluder or articulator.

Regardless of the method for determining the central relationship of the jaws, the placement of artificial dentition must be carried out on new wax bases with placement rollers. Bases with occlusal ridges, on which the central relationship of the jaws was determined, must be kept by the technician until the end of the work; if an error is detected, you can always determine whose fault it was made - the fault of the doctor or the technician. Having plastered the models into an occluder (articulator), they begin to select artificial teeth, focusing on the lines of the cosmetic center, fangs and smile, as well as choosing a method productions. In addition to the general rules of the above manipulations, it is necessary to take into account aesthetic factors, with the help of which, in the process of constructing dentures, artificial teeth are given a more natural look.

The aesthetic criterion for setting up artificial teeth is known as Nelson's triad. According to this author, teeth and dental arches generally follow the shape of the face.

According to the laws of harmony, a convex face profile corresponds to convex teeth, a convex forehead and round cheeks correspond to convex teeth with a sharply defined equator, a straight profile, a flat forehead and sunken cheeks correspond to flat teeth.

In older people, as a rule, teeth are darker in color and often have sharply defined, elongated necks; the cutting edges of the front teeth, especially the canines, are flattened due to their abrasion.

Some authors recommend following the principle of moderate asymmetry when setting teeth. Functional asymmetry is observed in nature, in particular in the structure of the body, face and dental system. Reproduction of this asymmetry and peculiarities of the arrangement of the teeth and the creation of three between the teeth, rotations of individual teeth, their crowding, etc. allows us to avoid the impression of “artificiality” in the perception of the prosthesis.

One way to give artificial teeth a more natural appearance is to position the teeth at different heights. The cutting edges of the front teeth should not be at the same level. A natural impression is created in cases where the central upper incisors and canines are longer than the lateral teeth. The central incisors can be turned with their mesial surfaces towards the palate, and their distal surfaces towards the lips. This type of placement is especially indicated in cases where there is a wide alveolar process. Rotation of the medial surfaces of the central and lateral incisors towards the lips, and the distal surfaces towards the palate, is advisable with a triangular shape of the alveolar process.

Diastema and tremata in an artificial arch are indicated for prosthetics in wide-faced patients. They can be combined with flattened cutting edges and an end-to-end setting with the lower teeth.

In order to give artificial teeth a more natural appearance, two-tone teeth can be used, in which the incisal edges are a lighter shade than the cervical part.

The construction of artificial dentition is carried out mainly in the following ways:

1) in a hinged glass occluder;

2) in a hinged occluder on spherical surfaces;

3) in a hinged occluder on individual occlusal surfaces;

4) in mid-anatomical (semi-adjustable) and universal articulators.

There are various forms of artificial teeth and methods for installing them.

Placing teeth on glass.

In our country, the most widespread is the anatomical placement of artificial teeth “on glass”, developed by M.E. Vasilyev.

The essence of this method is to replace the prosthetic plane of the occlusal ridge with a glass surface mounted on a model of the lower jaw.

After plastering the models into the occludator or articulator, take a special glass shaped like a semi-ellipse and lightly glue it with hot wax to the upper occlusal ridge. At the same time, make sure that the middle lines of the glass and the model coincide, and the outer contours of the glass are evenly oriented towards the upper occlusal ridge. Then the glass must be transferred to the model of the lower jaw. This can be done in various ways:

1) cut the lower occlusal ridge to the thickness of the glass from above and from the middle of the ridge along the vestibular edge, so that the perimeter of the lower occlusal ridge is oriented to the top of the alveolar ridge of the lower jaw;

2) install three posts of softened wax on the inside of the lower model and press and fix the glass against them;

3) make a new base for the lower model and a cushion that occupies only the lingual surface of the lower jaw.

After fixing the glass with molten wax on the lower jaw using one of the listed methods, the perimeter of the upper occlusal ridge, the midline and the canine lines are marked on the glass using a glass graph. These lines are landmarks for the convexity of the vestibular surface of the dental arch.

To maintain the cosmetic effect, the necks of the central incisors are placed at the level of the smile line, the lateral incisors - 0.5 mm lower, and the canines - slightly above the smile line. The necks of the premolars are located at the same level. The necks of the molars are raised relative to the prosthetic plane and parallel to the curve of Spee.

5. Position of artificial teeth in the dental arch.

When placed, the upper row of teeth should form a semi-ellipse, and the lower row should form a parabola. To correctly maintain the Bonville curve, the front teeth are placed in a circle, the lateral teeth in a straight line.

The placement of teeth begins with the upper central incisors, placing them symmetrically on both sides of the center line, then the lateral incisors and canines are placed, after which they proceed to the placement of the chewing group of teeth. All anterior teeth with their cutting edges must correspond to the vestibular contour of the upper occlusal ridge. The canines form a rotation of the dental arch, and the medial facet of the canine should be a continuation of the arch of the anterior teeth, and the distal facet should direct the arch in the area of the lateral teeth.

When placing the anterior group of teeth, the middle of the incisive papilla is considered a reference point. The distance from the labial surface of the incisive papilla is 8-9 mm, and the labial surface of the canine is located at a distance of 10-11 mm from the edge of the greater palatal fold.

The symmetry of the upper front teeth can be checked using a compass. The leg of the compass is installed along the sagittal line behind line “A” and the arc is drawn along the cutting edges of the teeth. When the upper front teeth are positioned correctly, the cutting edges form a semicircle.

It is better to place a group of lateral teeth on one side and then on the other. The chewing teeth are set according to the markings of the model so that their fissures are on the same straight line. The inclination of the axes of the chewing group of teeth should correspond to the inclination of the interalveolar lines.

The formation of sagittal and transversal occlusal curves is achieved by different positions of the lateral teeth in relation to the occlusal plane (in this case, to the glass).

Guidelines used in the placement of artificial teeth for the manufacture of complete dentures

6. Relationship between antagonist teeth.

After setting the upper teeth, remove the glass and begin setting the lower ones. The sequence of placement of the lower teeth in the occluder and articulator is different.

In the occluder, the placement of the lower teeth begins with the second molar, because its distal cusps indicate the level of location of the cutting cusp of the canine and determine the degree of frontal overlap. Then the canines, first molars and premolars and incisors are installed. The cutting edges of the lower central incisors are aligned. The tearing angle of the canine should be raised by 0.5 mm.

When installing the front teeth, it is necessary to create a gap of 0.5-1 mm, which is called a functional run-up. It can be created by setting it itself or by grinding the cutting edges. The upper front teeth are positioned so that their vestibular surfaces can serve as support for the upper lip,

and the vestibular surfaces of the lower front teeth serve as a support for the lower lip.

The necks of the lateral lower teeth are also located parallel to the curve of Spee, while the distance to the glass decreases. Of the frontal lower teeth, the lowest location is at the neck of the canine. At the lower lateral incisor, the position of the tooth neck is 0.5-1 mm higher than the canine neck; even higher at the central incisor - by 1-2 mm, depending on the size of the artificial teeth.

Teeth placed in an occluder require additional grinding. For this, standard recesses are made. On the upper jaw, the distal slope of the buccal tubercle at the first premolar is ground off; in the second premolar, both slopes of the buccal tubercle are smoothed; on the first molar, a depression is made on the medial slope of the medial buccal tubercle and on the ridge between the distal buccal and medial palatal tubercles. On the lower jaw, a notch is made on the distal slope of the lingual tubercle at the first premolar and on the molars - a notch is made on the distal slopes of the distal-lingual tubercles and a deepening of the groove between the buccal tubercles.

Having finished placing the teeth in the occluder, copy paper is placed between the dental rows and by lightly tapping the upper dental row on the lower one, black dots are obtained on the teeth, which are sanded off. In this way, teeth are polished in a vertical direction. With lateral movements, grinding is carried out in the patient’s mouth when applying a prosthesis.

In the articulator, the placement of the lower teeth begins with the second premolar, because they fit well between the first and second premolars of the upper jaw and on their chewing surfaces it is more convenient to set the amplitude of chewing movements within 2-3 mm. Then the molars and first premolar are installed, checking the presence of contacts on the working and balancing sides, and lastly the anterior teeth.

When arranging the anterior group of teeth, make sure that the central and lateral incisors are parallel, without tilting to the midline, and the cutting edges of the central incisors are

uniform load on the mucous membrane and bone tissue of the prosthetic bed. The chewing groups of teeth in the upper jaw have clearly formed palatal cusps. The teeth of the lower jaw are characterized by a “pronounced chewing groove - mini-segment.”

In an intact dentition, as a rule, the apices of the alveolar ridge and the alveolar part are located opposite each other. Natural teeth are located along the interalveolar connecting line in such a way that the lower lateral teeth are located somewhat orally in relation to the upper ones.

There is a known method of setting up artificial teeth that copies the arrangement of natural teeth - the so-called “set up according to the biogenic type”. But such an occlusal relationship of the dentition sharply worsens the stabilization of removable dentures, and in most cases it is impossible due to the difference in the degree of atrophy of the upper and lower jaws.

The process of atrophy of the upper and lower jaws leads to the fact that the interalveolar connecting lines in edentulous patients no longer run parallel. Therefore, when setting teeth, chewing forces acting in the buccal direction relative to the apex of the alveolar part should be avoided, since they dislodge the denture from the jaw, impairing its stabilization.

When using teeth according to Gerber, the palatal cusps and “chewing grooves”, and therefore the chewing load, are noticeably shifted in the lingual direction.

Ackerman also proposed, in addition to the lingually directed chewing load, selective grinding of the buccal cusps of artificial teeth. This idea was developed by Gerber and proposed the production of artificial teeth that do not have contacts in the area of the buccal tubercles of the masticatory group, which provided additional unloading of the artificial dentition on the buccal side, and thereby further contributed to the fixation and stabilization of plate dentures.

The artificial teeth proposed by Gerber have another feature of their shape. In an intact dentition, the teeth, with their buccal surfaces (equator) and partially buccal cusps, contact the mucous membrane of the cheek, preventing the retraction of soft tissues and thereby determining the appearance of a person’s face. In case of complete loss of teeth, retraction of the lips and cheeks is detected, which can be minimized in the case of a well-defined equator of the artificial tooth. In addition to everything, the author has reduced the area of the chewing surface, and the width of each artificial tooth of the chewing group in the equator region has been slightly increased. The pronounced equator of the tooth prevents cheek biting, which is possible in the absence of contact between the buccal chewing surfaces.

Positioning of teeth with a progenic jaw relationship.

After the loss of teeth and atrophy of the jaws, the alveolar process of the lower jaw turns out to be located anterior to the upper one. This jaw relationship is called secondary or senile progeny. However, one should keep in mind the possibility of congenital progeny in the patient, in which there was already a progenic relationship of the jaws, and atrophic processes in bone tissue associated with tooth loss further aggravate the discrepancy between the sizes of the upper and lower jaws.

The design of dentition with a mildly expressed progenic relationship of the jaws is possible in two options:

1) the placement of the anterior teeth is carried out according to the type of direct closure, and the chewing teeth - according to the type of progenic relationship;

2) the placement of teeth is carried out according to the type of orthognathic relationship, in this case they deviate from the rules for the location of teeth in relation to the center of the alveolar process - the frontal teeth and second molars are located vestibular from the center of the alveolar process.

With a pronounced progenic relationship of the jaws, the teeth are set in a progenic relationship with the individual value of vertical and horizontal reverse overlap for each patient. In this case, it is necessary to take into account:

1) due to the reduction in the size of the body of the upper jaw and the expansion of the alveolar arch of the lower jaw, the installation of 14 artificial teeth, subject to all the rules, is not possible. In this case, 14 artificial teeth are installed on the lower jaw, and the upper dental arch is shortened: the second premolars on both sides are not installed;

2) compensation curves are created with less curvature than with an orthognathic relationship of the dentition: this is due to the fact that during progeny, the sagittal incisal path falls out, causing the creation of a sagittal occlusal curve and a lateral incisal path, as a result of which the lateral occlusal curves depend only on the magnitude of the angles of the lateral articular path.

To facilitate the design of dentition in progeny, it is recommended to perform a cross placement of the chewing teeth: the upper right chewing teeth are placed on the left side of the lower jaw prosthesis, the upper left ones - on the right. With this setting, the teeth of the lower jaw overlap the teeth of the upper jaw, and smooth gliding of the dentition is ensured while maintaining multiple contacts.

In relation toArtificial teeth are installed to the glass as follows. The anterior teeth are positioned as in an orthognathic relationship. The first premolar touches the glass only with the buccal tubercle, the palatal one is 0.5 mm away from the plane of the glass. The first molar touches the glass with its medial cusps (buccal and palatal), the distal cusps are 0.5 mm from the glass. The second molar touches the glass with the medial buccal cusp, the remaining cusps are raised by 1.0-1.5 mm (distal ones are higher than the medial ones).

When setting the lower teeth, they are guided by the location of the teeth of the upper jaw, while making sure that the lingual cusps of the lower teeth are located above the cheeks, and the frontal teeth of the lower jaw overlap the upper ones.

To ensure multiple contacts when setting teeth in progeny, standard tooth grinding is required. To do this, the lingual surface of the lower frontal teeth is thinned and ground (polished) to the upper ones; at the first molar, the recess between the medial buccal and medial palatal cusps deepens; at the second molar the posterior slope of the distal-lingual cusp is smoothed out.

Positioning of teeth with a prognathic jaw relationship.

 This ratio occurs with true prognathia, when the upper jaw is overdeveloped. With this ratio, the alveolar process of the upper jaw is located in front of the alveolar process of the lower jaw, which must be taken into account when setting teeth.

Features of the setting during prognathism are that the lower arch is shortened by the first two premolars. To achieve an aesthetic optimum, the upper frontal teeth can be placed without artificial gums, that is, “on the edge” with them tilted towards the oral side, and the lower frontal teeth can be tilted vestibularly. The disadvantage of setting teeth “on the edge” is the violation of the marginal closing valve in the frontal area, which leads to disruption of the fixation of the prosthesis on the jaw. To achieve fixation, gingival plastic clasps and pelots are used. Chewing teeth are set according to the rules of the orthognathic relationship of the jaws.

Positioning of teeth in a straight bite.

A direct bite is characterized by the absence of frontal overlap, therefore artificial anterior teeth are installed in marginal closure. For better closure, the cutting edges of the lower front teeth are ground off the labial surface.

Chewing teeth are set according to the rules of orthognathic relationship, but to achieve tight contact on the lower first and second molars, recesses are made between the buccal cusps.

Positioning of teeth in a semi-adjustable articulator (Gnatomat type).

 The placement of teeth begins with the upper jaw. To do this, remove the bases with occlusal ridges. A new base is made onto the model with a positioning roller, onto which the landmarks of the incisive papilla and the greater palatine fold are transferred.

The position of the central incisors is determined by the incisive papilla - the teeth are placed in front of it. The canine is placed at the outer edge of the greater palatine fold at a distance of 2 mm from its outer border. The lateral incisor is installed between them. The symmetry of the setting of the anterior teeth is checked with a setting matrix, which is inserted into the lower part of the articulator. After this, the model of the upper jaw is removed and construction of the lower dentition begins.

First, the lower canines are placed in contact with the upper second and third teeth. To set the lower lateral teeth, a setting matrix is used, which is installed in the upper

the lower part of the device. The position of the lower lateral teeth in relation to the tongue is determined by Pound's lines, which run from the anterior upper edges of the canines to the inner surface of the mandibular mucous tubercles. In this case, the positioning matrix with its lower edge touches the distal slopes of the lower canines. The chewing teeth are so adjacent to the positioning matrix that the first premolars contact with the buccal cusps, the second with both cusps, the first and second molars with three cusps.

After the lower chewing teeth are placed, the matrix is removed, a model of the upper jaw is installed, and the chewing teeth on the upper jaw are placed along the lower teeth. The last to be installed are the lower incisors.

Setting teeth on spherical surfaces.

A common requirement of numerous theories of articulation is to ensure multiple sliding contacts between artificial dentitions in the phase of chewing movements (balancing theory, joint theory). From the point of view of fulfilling this general requirement, the spherical theory of articulation developed in 1918 by Monson should be considered the most correct. The spherical theory of articulation most fully reflects the spherical properties of the structure of the dental system and the entire skull, as well as the complex three-dimensional rotational movements of the lower jaw. Prosthetics on spherical surfaces provides:

1) articulatory balance in the phase of chewing movements;

2) freedom of movement;

3) fixing the position of central occlusion while simultaneously obtaining a functional impression under chewing pressure;

4) education without education

hilly chewing surface, eliminating the formation of shedding moments that disrupt the fixation and stabilization of the dentures.

Therefore, prosthetics on spherical surfaces are rational for the prosthetics of toothless jaws, the use of plate dentures in the presence of single natural teeth, the production of splints for periodontal disease, for the correction of the occlusal surface of natural teeth in order to create correct articulatory relationships with artificial teeth on the opposite jaw and targeted treatment for joint diseases . Supporters of the spherical theory are primarily

note that it is easier to place artificial teeth on spherical surfaces.

As a result of clinical studies, it was established that surface contact between the occlusal ridges during various grinding movements of the lower jaw is possible if the occlusal surfaces of the ridges are given a spherical shape, and for each patient there is a number of ranges of spherical surfaces that provide contacts between the ridges. A spherical surface with a radius of 9 cm is defined as the average.

To design occlusal surfaces on wax rollers and determine the correct prosthetic spherical surface, a special device has been proposed, consisting of an extraoral face bow-ruler and intraoral removable forming plates, the front part of which is flat, and the distal parts have a spherical surface of various radii. The presence of a platform in the frontal section of the forming plate allows the formation of rollers in accordance with the direction of the prosthetic plane. The use of wax bases with occlusal ridges with spherical surfaces makes it possible to check the contacts between the ridges at the stage of determining the central relationship of the jaws and use verified curves to design artificial dentition that does not require correction.

Staging technique. A spherical setting plate is glued to the spherical occlusal surface of the upper occlusal ridge. The lower occlusal ridge is cut to the thickness of the plate and a staging plate is also installed on it. The placement of the upper artificial teeth is carried out in such a way that they touch the plate with all their tubercles and cutting edges (the exception is 212). The teeth must be placed strictly along the crest of the alveolar process and taking into account the direction of the alveolar lines. The placement of the lower artificial teeth is carried out along the upper ones.

To improve the quality of prosthetics for patients with complete absence of teeth, individual parameters of the masticatory apparatus and, above all, recording of the movements of the lower jaw are necessary, from which it is possible to design artificial rows with occlusal surfaces that correspond to the functional characteristics of the temporomandibular joints and muscles.

Alignment of teeth according to individual occlusal surfaces.

 The technique consists of individual design of the occlusal surface for the anterior and lateral teeth, which is achieved by intraoral grinding of wax or stencil rollers with an abrasive mixture consisting of carborundum sand and gypsum.

The modification proposed by B. Boyanov for the formation of occlusal surfaces provides for the use of rigid bases and a special device that registers the interalveolar height, thanks to which possible changes in the interalveolar height during the grinding process are prevented, which determines the advantages of this technique over those proposed earlier.