The theme of the class № 12

Clinical manifestation and diagnosis of deep bite

The content of the topic:

Deep bite may be viewed as supraocclusion of the frontal teeth and infraocclusion of the lateral teeth (according to Betelrnan's classification of individual teeth position anomalies and Angle's classification of individual teeth position anomalies).

Covering occlusion may be of two types:

1) narrow – with vestibular location of the 2nd upper incisors;

2) wide – with regular location of the upper frontal teeth in the dental arch, but with different inclination in the lingual direction.

D.A. Kalvelis viewed deep bite as: - covering (opisthognathic); - combined with prognathism (roof-shaped). F.Y. Khoroshilkina divides deep bite into three degrees of deep overbite, which are detected by the height of the central incisors crowns:

- the 1st – from 1/3 to 2/3 of their height;
- the 2nd – from 2/3 to 3/3;
- the 3rd – more than crowns height.

Besides, the author evaluates the three degrees of deep overbite in millimeters:

- the 1st – less than 5 mm;
- the 2nd – from 6 to 9 mm;
- the 3rd – more than 9 mm.

L.V. Ilyina-Markosian singles out:

A. deep bite without lower jaw displacement;

B. deep bite with lower jaw displacement;

C. combined type.

In group A, in its turn, there are differentiated general deep bite and frontal deep overbite. General deep overbite is characterized by dento-gnathic lengthening in the anterior part of both jaws. There is dento-gnathic shortening in the region of lateral teeth. Frontal deep overbite differs from general deep overbite by the absence of changes in the region of lateral teeth.

According to the WHO classification deep bite is referred to dental arches correlation anomalies:

A) excessive overbite;

B) excessive covering occlusion.

Golovko N.V. with splat. proposed working scheme for clinical forms of deep bite:

1 form – dento-alveolar elongation in the anterior maxilla part;

2 form – dento-alveolar elongation in the anterior mandible part;

3 form – dento-alveolar elongation in the anterior upper and lower jaws;

4 form – dento-alveolar shortening in the lateral parts of jaws;

5 form – dento-alveolar elongation in the anterior maxilla in combination with dento-alveolar shortened in the lateral portions;

6 form – dento-alveolar elongation in the anterior mandible in combination

with dento-alveolar shortening in the lateral portions;

7 form – dento-alveolar lengthening in the frontal portion of both jaws, in combination with dento-alveolar shortening in the lateral portions.

Thus, deep bite is such a dental arches correlation in the frontal parts of the upper and lower jaws, at which the upper central incisors cover the lower ones by more than 1/3 of the tooth crown at the absence of cutting-tubercular contact.

Deep bite clinical presentation depends on its combination with distal or mesial occlusion, cross bite, dental arches anomalies, and individual teeth anomalies.

Facial signs may be in the form of supramental sulcus deepening, lower lip thickening and concomitant violations, characteristic of distal or mesial occlusion.

In the oral cavity there are observed changes in the from of the increase of the upper frontal teeth covering the lower ones by more than 1/3 at the absence of cutting-tubercular contact, dental arches flattening, the alveolar processes in the region of frontal teeth are high and overgrown, and in the lateral – low. At most evident violations (deep traumatic overbite) the lower frontal teeth bear with their cutting edges against the hard palate mucosa, repeating its form; sometimes the upper frontal teeth injure small interdental gingival papillae from the vestibular side of lower teeth and promote their desquamation.

At posterior occlusion, combined with upper frontal teeth protrusion, lower incisors not infrequently injure the mucous tunic of the palate, more rarely they do not touch it. At posterior occlusion, combined with upper frontal teeth retrusion, the dental arches are usually shortened; deep overbite at such a violation is called blocking, hampering lower jaw growth. Lower jaw protrusion becomes limited, which shows on the mastication muscles function.

At mesial occlusion and inverse overbite the dental arches form depends on the development degree of jaws basis and alveolar processes, teeth location, lower jaw displacement. Overbite depth also depends on the value of the basal and gonial angles.

Functional violations at deep bite declare themselves in the decrease of mastication efficacy, frontal teeth periodontal overload, and not infrequently – mucous tunic injuring, which promotes appearance and development of periodontal diseases. Mouth breathing, irregular swallowing and speech disturbance promote dental arches narrowing, upper teeth location strengthening and overbite deepening. At deep occlusion there is observed high tongue position, which causes palatine vault enlargement (roof-shaped deep overbite). Inter-occlusal space between the frontal and lateral teeth at the lower jaw being in quiescence (especially at bruxism in adults) is absent; in some cases at most evident Spee's curve the distance between the dental arches in quiescence reaches 9 mm (average norm is 2 mm), which testifies to considerable violation of the mastication muscles function.

F.Y. Khoroshilkina and L.P. Zubkova noted: if at a narrow face the total width of upper incisors crowns makes more than 33 mm, it may be the reason for upper dental arch oval increase and overbite deepening.

N.H. Snahina and co-authors analyzed the data of studying jaw models of 100 patients with marginal periodontal diseases, most of whom had deep overbite. The

authors found out that the dental arches width in the region of the 1st upper premolars was less by 3,99 mm on average, lower – by 3,85 mm, in the region of the 1st upper permanent molars – by 4,77 mm, lower – by 3,93 mm. At incisors retrusion the length of the anterior part of the upper dental arch was less by 2,36 mm on average, lower – by 2,94 mm. In all the patients there was found the narrowing of upper dental arch apical basis by 4,61 mm on average, lower – by 4,87 mm.

Lower dental arch and its apical basis narrowing in patients with deep overbite should be taken into account when planning treatment. It is not sufficient to find out the dental arches width and their anterior parts length at deep overbite. The data of Bjork, Schwarz, and Van der Linden concerning mesial dislocation of the lateral teeth during life prove the importance of measuring their sagittal dimensions. This promotes dental arches length decrease, may hamper the obtaining of constant results of treating deep overbite, influence the location of frontal teeth and dental arches form.

F.Y. Khoroshilkina noted that the center of the incisor papilla practically does not change its position in the process of upper jaw growth; therefore it may be used for the study of frontal and lateral teeth position in the sagittal direction. There was not found such a stable reference point in the region of the lower dental arch.

To diagnose deep bite varieties there is studied the crown width of the upper and lower incisors and their age location (correct position, protrusion, retrusion), the evidence of the upper incisors dental tubercles, contacts between the frontal teeth, bilateral correlation of the canine teeth and 1st permanent molars in the sagittal direction at the dental arches, closed in normal occlusion, early destruction or loss of temporary and permanent lateral teeth, diminution or mesial inclination of the upper and lower teeth to the place of destroyed or extracted ones, the evidence of morphological and functional disorders by the method of Zibert-Malyhin and complications of eliminating them with the help of Malyhin-Bilyi's method.

To diagnose deep bite one must measure and take into account:

1. the mesiodistal dimensions of the crowns of upper (SI) and lower (Si) incisors, their total;
2. the correspondence of the totals of the mesiodistal dimensions of the upper and lower incisors crowns by Tonn's index (1.35 mm);
3. he overbite depth;
4. the size of the sagittal fissure between the upper and lower central incisors;
5. the length of the anterior part of dental arches by Korkhaus;
6. dental arches width by Pont (with Lider and Harth's corrections).

The diagnose is put on the basis of clinical examination, the study of diagnostic models of jaws and measuring them, anthropometric study of face photographs of face and in profile, and also of lateral cephalometric of head (according to Schwarz, at deep overbite there is observed basal angle decrease, MT1 plane position is almost horizontal, the decrease of jaw height in the region of incisors and increase in the region of molars, vertical position of the upper incisors crowns, deep glenoid fossa of the TMJ), the evaluation of orthopantomographic jaws investigation data.

Facial signs of deep bite depends on its combination with sagittal anomalies of the bite, severity of pathology and age of the patient. They can manifest as:

1. Shortening of the lower face part.
2. The deepening of the lip-chin fold.
3. Eversion of lower lip.
4. Change the size of the angle of the mandible.

Inside the mouth symptoms are characterized by the following:

1. The increase in the cutting ages depth overlapping (stage 1 – from 1/3 to 2/3 of the height of crowns of the lower incisors, to 5 mm; stage 2 – from 2/3 to full coverage, from 6 to 9 mm; stage 3 – overlapping of more than the height of the crown of the lower incisor is 9 mm).
2. The retrusion of the frontal teeth.
3. In the presence of retrusion may be a shortening of the dental arches and, accordingly, crowding of the frontal teeth.
4. The changing shape of the occlusal plane in the frontal lengthening and shortening in the lateral portions.
5. The ratio first permanent molars can be neutral, distal (most common) and mesial.

When dento-alveolar form of a deep bite occurs:

1) front upper teeth with the protrusion of the alveolar process;
2) the rear location of the lower dentition with retrusion of alveolar bone;
3) the rear position of the upper and lower front teeth.

Gnathic form is frequently observed in the distal ratio dentitions, and is usually associated with a decrease in the mandibular angle and the front of the upper jaw. Symptoms of this form the following:

1) the basal angle is reduced;
2) the lower contour of the mandibular body is nearly horizontal;
3) the chin protrudes forward considerably, due to a decrease of the basal angle and angles of lower jaw;
4) the height of the jaws in the region of the cutters is increased and the area of lateral teeth reduced;
5) the upper incisors are upright, their crowns are below the occlusal and is dominated by the nomination of the lower jaw;
6) depression TMJ usually deep with a steep slope of the articular tubercle.

Gnathic form of deep occlusion is often combined with dento-alveolar form.