

Improving the Comprehensive Prevention and Treatment of Distal Occlusion

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Relevance. Distal bite can be formed due to various structural disorders of the facial skeleton: changes in the position and size of the jaws, anomalies of the dental arches, mainly in the sagittal direction, anomalies in the position of individual teeth. This pathology causes significant anatomical, functional and aesthetic disorders, negatively affects the psychoemotional status of the patient, is accompanied by impaired functions of swallowing, chewing, speech, creates prerequisites for increased morbidity of periodontal tissues, temporomandibular joint. Diagnosis and determination of the causes of skeletal and dental alveolar malocclusion is a prerequisite for proper and, as a result, successful treatment. According to modern views, one of the important factors determining the treatment tactics of patients with distal occlusion is the creation of a harmonious state between morphology and function, which obviously presupposes the normal functioning of the maxillary system in the presence of physiological occlusion of the dentition and good facial aesthetics. In adult patients with Engl class II skeletal condition caused by retroposition or underdevelopment of the mandible, there are the following treatment options: extending the mandible forward using orthognathic surgery, dental alveolar compensation by removing premolars in the upper jaw. Currently, a large number of different operations are performed on the jaws to eliminate malocclusion or other dental deformities.

Distal occlusion is more motivated to be treated orthodontically than to undergo surgery, since most people prefer to solve problems using the least invasive method. In patients with developed labial muscles, premolar removal is not indicated, which can lead to a deterioration in the profile of the face due to loss of lip support.

Over the past 20 years, many scientists have proposed a large number of functional non-removable devices for correcting class II Engl anomalies. In our country, attention has also increased to this group of devices that allow correction of distal skeletal bite by extending the lower jaw. However, in the Republic of Belarus, many significant issues related to the use of this group of devices remain unresolved. The lack of proper information and clinical experience precludes the use of non-removable functional devices in the daily practice of an orthodontist. In this regard, it became necessary to develop and improve the treatment protocol for patients with skeletal distal bite after the end of the period of active jaw growth.

The effectiveness of the treatment of distal bite by extending the lower jaw, all patients were divided into groups: a) according to the type of bite: II class 1 and 2 subclasses according to the Engl classification (hereinafter II class 1 and 2 subclasses) of these, 22 (43.14%) patients with class II anomalies of division 1 and 29 (56.86%) patients with class II anomalies of division 2; b) according to the potential of bone maturity: 29 (56.86%) people with residual jaw growth and 22 (43.14%) patients with complete skeletal growth. Of these, 38 (74.51%) people have been cured, 16 (42.11%) patients with class II anomalies of division 1 and 22 (57.89%) patients with class II anomalies of division 2, 10 (19.61%) patients continue treatment, 3 (5.88%) people interrupted orthodontic treatment. In order to obtain objective data, the following methods were used in the study: clinical, anthropometric (study of diagnostic models of dentition), X-ray, magnetic resonance, photometric, statistical. The clinical examination was carried out according to the generally accepted methodology. The preliminary diagnosis was formulated according to F.Y. Khoroshilkina's scheme. The Eschler–Bittner diagnostic clinical test was performed for the differential diagnosis of distal occlusion. It was noted that in 37 (72.54%) of the examined patients, distal occlusion was combined with anomalies in the vertical direction: with an open bite – in 2 (3.92%) people, deep bite – in 35 (68.63%) of the examined; with

anomalies in the horizontal plane – in 7 (13.73%) patients. The average size of the sagittal fissure in patients with abnormalities of class II, division 1, was 7.73 ± 0.4 mm. The methods of V.D. Ustimenko, L.P. Zubkova, A. Lundstrom, G. Korkhaus, A. Pont, H. Gerlach, and W. Bolton were used in the study of 89 pairs of diagnostic models of dentition rows. The X-ray examination scheme was compiled individually, based on the data of the clinical trial.

The structure of their hard tissues, the condition of the periapical and periodontal tissues, and the condition of the bone tissue of the jaws were confirmed by the analysis of orthopantomograms of the jaws. To identify the skeletal maturity of the body, clarify the possibilities of jaw growth and the choice of treatment method in patients aged 13-15, hand radiographs were analyzed using the Schopf method. To study the structural features of the facial skeleton, its growth, to assess the position of teeth relative to the bases of the jaws, the hard- and soft-tissue profile, the prognosis of orthodontic treatment, as well as to identify changes occurring during treatment, telereöntgenograms of the head (TRG) in the lateral projection were performed [2.4.6.8.10]. The obtained results were compared with the values of the norms according to I.V. Tokarevich, F.Ya. Khoroshilkina, R.J. Paolo, A.M. Schwarz, A. Bjork, G. Steiner, Subtelny, R. Ricketts, H. Panchez. 52 (25 angular, 27 linear) parameters were studied on each lateral telereöntgenogram of the head. A total of 4628 measurements were carried out. Assessment of the condition of the temporomandibular joint (TMJ) In patients with distal occlusion, the condition of the TMJ bone elements was analyzed according to X-ray examination and the condition of the soft tissue elements according to magnetic resonance imaging (MRI).

Conclusion. With a distal bite, magnetic resonance imaging of the temporomandibular joints revealed changes in the bone and soft tissue elements of the joint, which were not visible during zonography, and progressed from disorders of the position and shape of the articular disc to osteoarthritis. Based on the study of panoramic zonograms, it was found that after the use of non-removable functional devices in patients with class II, class 1 anomalies, the articular head in the usual occlusion occupied an anterior-lower position relative to the bottom of the articular fossa, in patients with class II, class 2 anomalies, the articular head shifted anteriorly.

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