

COMPARATIVE EVALUATION OF ORTHODONTIC TREATMENT OF CLASS 2 ANOMALIES IN CHILDREN WITH MIXED BITE

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Abstract

Distal malocclusion is the only type of malocclusion that requires urgent treatment as soon as possible before maxillary discrepancy occurs. The incidence in the population varies around 45%, depending on age, racial group and types of distal malocclusion studied. We studied the frequency of occurrence of distal occlusion and its varieties among 20 children and adolescents with dental anomalies aged 6-13 years. Determining the types of such a complex anomaly as distal occlusion allows for more thorough treatment planning and positive, lasting results.

Keywords: anomaly, distal occlusion, comparative assessment, myobrace, elastopositioner, twin block, bracket system.

Introduction

Relevance of the problem: The topic of distal occlusion is relevant, since it is one of the most common diseases in the maxillofacial area. A distal bite can cause a variety of problems, including difficulty chewing and speaking, and lead to dysfunction of the maxillofacial system.

Treatment of distal malocclusion is important not only from an aesthetic point of view, but also to ensure proper function of the teeth and jaws. This may include the use of orthodontic appliances, surgery, or a combination of different methods.

Understanding the causes and mechanisms of distal malocclusion, as well as possible treatments, is important for dentists and orthodontists to provide patients with optimal treatment and outcomes. Below we will get acquainted with the works of doctors who conducted scientific research in this direction.

One of the goals of functional hardware devices is to change the vertical growth pattern and solve several types of malocclusions. Austro-Martinez MD in his study evaluated the stability of the treatment of class II malocclusions with the Austro Repositioner followed by the use of fixed appliances, and also evaluated its ability to change vertical dimensions in brachyfacial patients. [4,7,15]

Intraoral distalizers associated with skeletal anchorage provide the primary benefit of facilitating molar distalization with minimal loss of anchorage and patient cooperation. This case report presents the treatment of a 17-year-old woman with a Class II, Division 2 malocclusion, maxillary dentoalveolar protrusion, mild mandibular retrusion, increased overbite, deep overbite, and lip deficiency. The treatment plan included initial distalization of the maxillary molars using a customized version of the dual-strength distalizer with skeletal anchorage.[1,6,13]



TMJ symptoms may occur while wearing a functional oral appliance, but symptoms will subside or resolve after treatment or during an observation period. Less compelling evidence suggests that the preexisting TMJ-to-condyle-glenoid fossa relationship will improve slightly after treatment. During treatment, there is anterior displacement of the TMJ discs, but most of them will later return to their normal position. Moderate evidence supports that FMA has no adverse effects on TMJ in adolescent patients.[2,8,14]

Distalization of the upper molars using clear aligners provides a valid alternative to the treatment of class II malocclusions without extraction, reducing extrusion of the upper first molars and improving control of the occlusal plane and vertical dimension.[3,9,11]

The main goal of the Popova NV study is to develop treatment algorithms for patients with class II malocclusions and incisor protrusion using a combination of a bracket system, a functional fixed telescopic apparatus (FFTA) and skeletal attachment, allowing for effective dentofacial compensation of skeletal forms. Class II malocclusions. The proposed treatment algorithm turned out to be effective for stable correction of skeletal class II malocclusions in patients who refused orthognathic surgery. [5, 7, 13]

Purpose of the study: The purpose of this study was to evaluate a comparative analysis of orthodontic treatment of class 2 anomalies in children with mixed dentition.

Material and methods: This cross-sectional study was a comparative analysis of orthodontic treatment of 20 children and adolescents of both sexes aged 6 to 13 years with class 2 anomalies in children with mixed dentition at the multidisciplinary clinic of the Tashkent Medical Academy. For all patients with class II occlusion anomalies, examination cards were filled out, the results of the clinical examination and additional research methods performed were entered into them. Diagnosis of distal occlusion was based on data from anamnesis, clinical examination, anthropometry of the face and oral cavity, examination of the temporomandibular joint (TMJ), and biometric examination of jaw models. To determine the degree of aesthetic disorders and those combined with anomalies in the vertical and/or transversal plane, facial anthropometry was used using the "Set of devices for facial anthropometry."

Children were treated in 4 different ways and 4 comparative groups of patients were compared. Some groups were treated using elastopositioners - myobrases, some - using a twin-block device, others - using a brace system and removable plates.

The twin block appliance consists of two removable plates that help move the lower jaw into an anterior position and straighten the teeth. Elastic positioners are transparent removable devices that help straighten teeth and correct bite. Braces are metal or ceramic braces that are attached to the teeth and allow them to be straightened by applying force. Plates are removable plates that help straighten teeth and correct bite.

Results and discussion: In mixed dentition, treatment was carried out through the use of removable therapeutic orthodontic appliances, since in the sample of studied medical histories of patients with distal occlusion, patients with a combination of distal and deep occlusion predominated, and almost all of them had a narrowing of the upper jaw; the devices of choice were more often a removable plate on the upper jaw with an inclined plane to eliminate deep bite and a removable plate on the upper jaw with a screw along the sagittal to expand the upper jaw. The best dynamics of correction of the sagittal gap from 3 to 5 mm occurred in patients using the Myobrace functional trainer.





Figure I. Elastopositioner in the oral cavity

In 2 patients, a Twin Block two-jaw appliance was used in late mixed dentition. One of the methods for treating distal occlusion is the use of an orthodontic appliance called a “twin block” or “twin block”. This appliance consists of two removable plates that allow the jaws and teeth to be properly aligned. The operating principle of the twin block appliance is based on the principle of functional orthodontics. The patient must wear the device for a certain amount of time every day to achieve the desired results. The device helps move the lower jaw into a forward position, which allows you to straighten your teeth and correct your bite.

The benefits of using a twin block appliance in the treatment of distal malocclusion include:

1. Non-invasive: the device does not require surgery and can be removed if necessary.
2. Efficiency: Correct use of the device can lead to significant improvements in occlusion and function of the maxillofacial system.
3. Convenience: the device is removable, which allows the patient to remove it when eating or brushing their teeth.



Fig. 2. Twin Block two-jaw apparatus in the oral cavity of a 12-year-old patient.

In addition to removable equipment in the mixed dentition, treatment with a brace system was also carried out in several patients. The data is included in table 1.

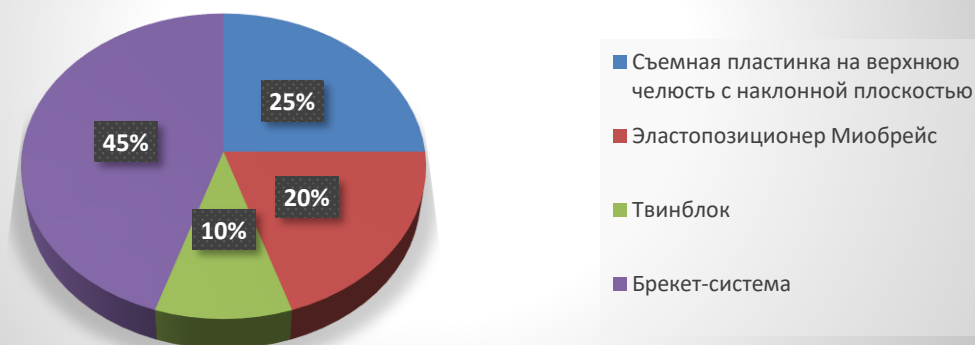


Table 1. Treatment methods for distal occlusion in patients with mixed dentition.

Equipment for treatment	Number of patients	Proportion of the total number of patients with distal occlusion in the shift period (%)
Removable plate for the upper jaw with an inclined plane	5	25
Elastic positioner Myobrace	4	20
Twinblock	2	10
Bracket system	9	45
Total	20	100

According to the data obtained, in 55% of patients with mixed dentition, removable appliances were used on the upper jaw to correct the distal bite. The brace system was used for treatment in 45% of patients.

ПРИМЕНЕНИЕ ОРТОДОНТИЧЕСКИХ АППАРАТОВ ПРИ ЛЕЧЕНИИ ДИСТАЛЬНОГО ПРИКУСА.



Treatment of distal occlusion in some patients in the study group was not completed due to the cessation of regular visits to the orthodontist, as well as due to lack of time to complete the study. Treatment was not completed in 14 people (70%) out of 20 patients with distal occlusion. In 6 patients with distal occlusion who completed orthodontic treatment, a normal dentition relationship and smile aesthetics were achieved. In 4 (66.7%) patients, as a result of treatment, a neutral occlusion was formed; in 2 (33.3%) patients, a neutral relationship between the canines and molars was achieved, but a slight sagittal gap was preserved (up to 2 mm). During the treatment, bad habits (such as biting the lower lip, sucking fingers and objects) were eliminated, and proper breathing and swallowing were normalized.

The average treatment period for distal malocclusion in the study was 18.7 months, with the average treatment period for patients with distal malocclusion in the presence of malocclusion in other planes being slightly longer.

The average treatment period in mixed dentition is 18.7 months, in the absence of malocclusion in other planes - 13.4 months, and in combination with malocclusion in other planes - 21.5 months.



During the period of mixed dentition, the most effective treatment of the gnathic form of distal occlusion is possible without the use of complex surgical methods, as well as treatment without removing teeth in the upper jaw. It is optimal to treat the gnathic form of distal occlusion in several stages.

Stage 1. Restraining the growth of the upper jaw, stimulating the growth and movement of the lower jaw to achieve the correct ratio of jaw sizes using functional devices (myo-functional trainer, LM - activator, Frenkel function regulator 1.2 types), functional - guiding (Twin - block) and combined action (Andresen-Goipl activator, open Klumpt activator)

2-stage. Normalization of the position of individual teeth using mechanical and combined action devices in a mixed bite or using a fixed mechanical action technique (Schwartz apparatus). The most effective in mixed dentition are combined-action devices that simultaneously act on the gnathic and alveolar components of the distal occlusion

3-stage. Retention period. The retention period in the mixed dentition is carried out only with the help of removable retention devices (base plate for the upper and lower jaws with retaining clasps) in order not to limit the normal growth of the jaws.

Conclusion.

Distal malocclusion has long-term consequences for dental growth and development. This broadly justifies the need for early treatment to normalize the occlusion and create conditions for normal jaw development. For successful treatment and stability, accurate diagnosis is necessary. In our opinion, if there are complications in a child with distal occlusion, it is important to detail the existing disorders of the maxillofacial area. In particular, it is necessary to inform pregnant women and parents about the rules of feeding, the use of pacifiers and basic preventive measures to prevent the development of distal occlusion pathology. Information should be provided in antenatal clinics, at appointments with a pediatrician and a pediatric dentist. It is important to focus on the greater effectiveness of treatment before the end of the child's growth period. Class II elastics provide similar correction of sagittal discrepancies in growing patients. SA demonstrated better control of lower incisor proclination. SAs and elastics can be a good alternative for the correction of mild Class II malocclusion in cases where proclination of the lower incisors is undesirable.

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