



Medical Psychology Algorithm of Prevention and Treatment of Malocclusion among Children Aged 10-18

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Abstract: The development of tooth-jaw disorders and deformities is considered polyethiological. Including common etiological factors: low body weight at birth, pregnancy and birth defects, lagging fetal development, nervous system disorders, various diseases in infancy, food ration disorders, mental stresses: local etiological factors - negative changes in the activity of the jaw area as a result of harmful habits, improper treatment of milk teeth, premature loss of milk teeth, untimely elimination of defects in dental [3,4,5,17].

Keywords: medical activities; dentistry; anomalies and deformities.

Tooth-jaw and bite deformities are the second largest prevalence of dental diseases among children [7,8,14]. Their diagnosis and treatment are considered one of the urgent tasks in orthodontics, since they affect the functions of chewing, causing speech disorders, aesthetic defects and significantly reducing the quality of life, leading to restrictions on the manifestation of human potential [6,12,18].

In a crossed bite, the upper and lower jaw tooth rows intersect with each other as a result of the lower jaw being pushed to one side [9,15,16]. This pathological condition is a violation of the cosmetic condition, along with a violation of food chewing, various pathological changes also occur in the teeth-lower jaw joint [2,10,11]. When pathological bites are observed in adolescents, changes are also observed in their general psycho-emotional state. All of the above confirms that new approaches to the diagnosis and treatment of crossed bites in children are necessary [1,13,19].

Aim of the study. Improving the medico-psychological complex approach to the early diagnosis and treatment of interstitial bites in children.

Materials and methods. We examined 140 children, including 110 patients who were secondary general-education schoolchildren with crossed bites. They applied to the “Dental educational and scientific-practical center” of Bukhara Medical institute for treatment to a doctor-dentist specialist. The diagnostic process of children it was divided into two phases in accordance with the method proposed by Kopeykin V.N. (1998). At the first stage – information received directly from the patient was collected and analyzed, his opinion about what the disease began and how it developed was listened to. At the second stage-objective symptoms were prescribed, a detailed examination of the patient was carried out.

To study and assess the dental condition in the oral cavity (OC hygiene condition, periodontological index, caries indicators, biochemical composition of oral fluid (OF), TJS (morphometric parameters of teeth, jaw, face, head, face), Anamnestic and medico-social data were obtained from all 140 examiners living in Bukhara, both genders between the ages of 10 and 18; of these, 78 boys (55.71%) and 62 girls (44.29%). Of these, 110 examined were children with crossed bites (main Group – MG) and 30 examined were with normal bites (control group – CG). (Table-1.)

Table-1. Distribution of examined children by Group, n=140

Gender	Control group, n=30			Main group, n=110			Total					
	abs	M(%)	m	P	abs	M(%)	m	P	abs	M(%)	M	P
Boys	16	11,43	2,69	Xi-k square = 0,133; p = 0,715	62	44,29	4,20	Xi-square = 1,78; p = 0,182	78	55,71	4,20	Xi-square = 1,829; p = 0,176
Girls	14	10,00	2,54		48	34,29	4,01		62	44,29	4,20	
Total	30	21,43	3,47		110	78,57	3,47		140	100,00	0,00	
P	XI- Pearson square = 0,088; p = 0,767											

The dental examination and examination was carried out according to the generally accepted scheme with a standard set of dental equipment: survey, examination, examination of the oral mucosa, teeth and tooth rows, periodont tissue, chewing muscles and chakka-lower jaw joint. (Figure 1.) Previously, orthodontic treatment, surgical procedure in the face-jaw socket, what complaints the patient had, was performed with a facial examination to assess the fascial aesthetics.

When the face was assessed in profile, attention was paid to The Shape of the lower jaw body, the angular size and the relief of the edge. When evaluating proportions in Anfas, attention was paid to the symmetry of the face, the vertical ratio, the symmetry of the teeth with respect to the middle line, the closing character of the lips and the expressiveness of the folds. When the soft tissues were examined, attention was paid to the position of the lip red border and the position and size of the tongue surfaces, lips, gum edge, marginal parodont, where the lips and tongue grooves were attached, palate position and size. The condition of the hard tissues, non-existent teeth, The Shape of the tooth arches, anomalies of individual teeth, alveolar tumor configuration in the area of non-existent teeth were evaluated. When the mouth was opened and closed, the fluency of the movement of the lower jaw, the excursion of the joint heads, their location in the joint recesses were assessed. The adhesion character of the tooth rows in the sagittal, vertical and transversal directions was assessed. The functional part of the diagnosis was performed with dynamic samples (breathing, speech, swallowing).

Results. In children with crossed bites, the hygienic index was 2.8, the highest in the group of children aged 14-18 years. In the control group, too, more were observed in the group of children aged 14-18 years.

The data presented in Table 2 shows that the initial hygiene condition in children with intersecting bites, for whom complex treatment is planned, corresponds to an "unsatisfactory" condition, and a statistically significant difference in quantity and quality was not detected. In children with crossed bites, the value of the RMA index in parodont tissues and the inflammatory change in the pattern of Schiller-Pisarev are more clearly and reliably distinguished by the relevant data of an almost healthy group. In children with crossed bites, the first examination revealed a sign of frequent bleeding from gingiva.

Table-2. Hygienic index indicators in a group of children with cross bite and healthy children

Children's age	HI						P
	Control group, n=30			Main group, n=110			
	N	M	σ	n	M	σ	
10-13 years old	8	1,10	0,16	23	1,80	0,23	<0,001
15-18 years old	22	1,20	0,27	87	2,80	0,56	<0,001
Total	30	1,17	0,25	110	2,59	0,65	P<0,001

Note: P - Defincerity of reliability against the control group



Figure 1. Patient R, 15 years old. Unilateral cross bite

In the control group, dental calculus was detected in 10 children, which is 33%. Both groups of children needed "professional" oral hygiene, which included learning hygiene skills, motivation, and monitoring teeth cleaning, according to the CPITN index. According to the CPITN index, the need for these activities in the main group was 82.5%, in the control group - 55%.

Children's Quality of Life (HS) scale SF-36 - visual. The Short Form-36 is a non-specific questionnaire widely used in HS research in Europe and the USA. With the help of this questionnaire, it is possible to assess the patient's level of HS - the level of general well-being and the level of satisfaction with the areas of life that affect his sense of self. [Brazier John E., Roberts J., Deverill M., 2002]. The questionnaire can be used to assess Quality of life in any disease state, it also focuses the patient's attention on problems of a social and psychological nature. Diagnosing social-spiritual adjustment of the person (Rogers K. and Damon R) questionnaire can be used to study the peculiarities of social-spiritual adjustment and related aspects of personality. The methodology determines the level of adaptation and non-adaptation of a person in the social sphere. The answers in the methodology are differentiated on a 7-point scale. The authors distinguish the following 6 integral indicators: adaptation; accepting others; internality; self-acceptance; emotional comfort; striving for leadership. Each of these indicators is calculated according to an individual formula. Interpretation is carried out in accordance with the normative information provided by the individual choices of adolescents.

Treatment of crossbite was carried out step by step.

- 1) Preparation period provides for the implementation of activities for cleaning the oral cavity and Prevention of caries, surgical preparation, myogymnastics exercises, elimination of harmful habits, normalization of nasal breathing.
- 2) Treatment period it provides for the use of an orthodontic apparatus that normalizes the shape of dental arches, correction of the position of the upper and lower jaw teeth, normalization of the width of the tooth rows, correction of the occlusion plane. For this, removable orthodontic apparatus consisting of various elements, apparatus for expanding dental alveolar arches were used.
- 3) During the retention period, the final straightening of the upper and lower jaw teeth was carried out, the results obtained by achieving a dense fissur-contact with the help of non-removable retainer, removable retenting apparatus were stabilized.

In the orthodontic treatment of patients, orthodontic apparatus was used, which is mainly obtained from traditional methods of treatment.

The results of treatment were assessed according to the duration of treatment, the number of visits, the number of treated children who ended up with a positive result. The orthodontic effect was assessed using biometric measurement, photometry of radiological, control-diagnostic models before and after treatment. The procedure for using the apparatus was determined by the attending physician, and based on the mechanism of action of the orthodontic apparatus, the use of the apparatus in what way was explained to patients. The duration of observation was from 1 to 3 years. Control was carried out using plaster models.

Periods of complex treatment of patients:

- 1) Evening alternating bite - 10-13 years old: the use of myofunctional Cappas to normalize the jaw relationship, as well as orthodontic apparatus with removable mechanical action and Cappas to normalize the occlusion level.
- 2) Permanent bite - 14-18 years old: the use of non-removable mechanical-acting (brackets) orthodontic apparatus and Cappas to normalize the occlusion level in order to ensure the jaw relationship, the cipsification of antagonist teeth in the normative position.

Before conducting treatment according to clinical indications, the following were performed: recommendations for hygienic care of the oral cavity after the installation of the apparatus were made, and the duration of dispensary observation was set.



Figure 2. Patient A., 17 years old. Individual splint correcting occlusion level

In order to assess the effectiveness of medical preventive measures aimed at improving adaptation to orthodontic constructions, 110 children with intersecting bite anomalies aged 10-18 years were taken for hardware treatment. The children examined in the main group were divided into 2 groups.

Group 1A (87 children with crossed bites) – in combination with removable plasticine apparatus and bracket, a complex treatment method was used with the application of Omega 3-6-9. Taking into account the psychological state of children in combination with orthodontic treatment in the complex treatment of interstitial bites based on the study carried out and calming (sedative) means Palora-5-10 ml was given 3 times a day, 1 month before meals, as a result of which the effectiveness of the treatment was increased.

For the purpose of prophylaxis of inflammatory diseases of paradont, Ginginorm is obtained from a remedy from natural plants 15-20 min 3 times a day. rinsing before meals is prescribed and does not allow the development of complications.

Group 1B (23 children with crossed bites) – base therapy was used in orthodontic treatment.

The results of facial dimensions are presented in Table 3. Studies have shown that the highest rate of growth of the physiological height of the face was observed in healthy boys aged 14-18 years.

Thus, in children and adolescents with overbites, the morphological and physiological height of the face grows in different directions compared to healthy children (especially at the age of 14-18). In

healthy children, the anthropometric parameters of the face are almost the same in the same period of time.

Table 4 presents the results of the oral cavity and periodontal tissue hygiene study 6 months after orthodontic treatment in children with incised teeth.

The presented data justified the need for treatment and preventive measures before starting active treatment with orthodontic appliances. Professional oral hygiene was carried out in all groups of children: motivation using the "Understanding Dentistry" program, teaching individual oral hygiene, professional cleaning of teeth with instrumental removal of tartar, selection of hygiene tools and methods.

Table-3. Morphological parameters of the face in a group of 10-18-year-old children with cross-bite and healthy children

Face dimensions (cm)	Group	Gender; n= 140				U Manna-Whitney	
		Boy		Girl			
		M	Σ	M	σ	Z	P
Physiological height of the face	CG	19,01	0,63	19,00	0,18	-0,334	0,738
	MG	19,11	0,28	18,80	0,15	-5,872	0,000
P1		>0,05		<0,001			
Morphological height of the face	CG	13,01	0,07	13,00	0,07	-0,504	0,614
	MG	12,30	0,10	12,10	0,36	-3,514	0,000
P1		<0,001		<0,001			
Face top height	CG	6,80	0,16	6,65	0,07	-2,671	0,008
	MG	6,49	0,97	6,70	0,50	-1,047	0,295
P1		>0,05		>0,05			
Mid-face height	CG	6,41	0,10	6,80	0,10	-4,709	0,000
	MG	6,02	0,08	6,80	0,08	-9,118	0,000
P1		<0,001		>0,05		0,808	
Face bottom height	CG	6,21	0,07	6,80	0,14	-4,744	0,000
	MG	6,45	0,62	5,70	0,14	-6,818	0,000
P1		>0,05		<0,001			

Note: P - In relation to gender; P1 - The difference in reliability with respect to the control group

After the preparatory stage of treatment and prevention measures, the second clinical examination of children was conducted.

PMA index scores ($r < 0.01$) improved significantly in all groups compared to the previous survey data. Statistically reliable differences were found between the indicators of the PMA index in the children of the main group and the comparison group, taking into account the significance of the criterion $r < 0.05$ with a probability of $r = 0.95$. In children of the main group of children with crossed bites, the average gingivitis index has increased in analogy to fit healthy children ($R < 0.05$).

After the use of Professional Hygiene, basic and developed preventive complexes, the intensity of inflammation in the tissues of the gums in the initial state decreased, according to Schiller - Pisarev's test in all groups, which indicates the reliability of the differences ($R < 0.01$).

Table-4. Hygienic condition of the oral cavity and periodontal tissues 6 months after orthodontic treatment of incised teeth

Indicator	Inspection teams				P
	Control group (n=22)		Main group (n=87)		
	M	s	M	s	
PMA%	12,90	0,69	15,50	0,60	P<0,001
P1	P>0,05		P<0,001		
Schiller-Pisarev Test	1,00	0,05	1,30	0,43	P<0,001
P1	P>0,05		P<0,001		
Bleeding	0,13	0,03	0,16	0,05	P<0,001
P1	P>0,05		P<0,001		
Dental deposits	0,05	0,01	0,16	0,01	P<0,001
P1	P<0,001		P<0,001		
CPITN	0,19	0,05	0,19	0,04	P>0,05
P1	P<0,001		P<0,001		

Note: R - relative to the control group; R1-relative difference in reliability before treatment

In the main group, The Schiller - Pisarev Index - decreased by 59.7%, in the comparison group-by 45.1%. In all studied groups on this indicator, a statistically significant difference between the average arithmetic indicators was determined. After treatment and preventive measures, the index of bleeding from gums in all children decreased significantly. The bleeding symptom of milks was found at the same frequency in both the main group and on average 11% more in children of the comparison group compared to the control group. Thus, therapeutic and preventive measures significantly increase the hygienic condition of the tissues of the oral cavity and periodontal.

The values of the RMA index in children of the main group exceeded 1.4 times, while in children of the comparison group, the corresponding indicators of the control group increased by 1.7 times. In children of the main group with crossed bites, the symptom of bleeding from gums was reported in 17.5% of cases, in children with distal occlusion in the control group in 18.5% of cases, in children with distal occlusion in the comparison group in 15% of cases. Dental deposits on the gums were not detected. There were no significant differences in the Schiller-Pisarev test in all groups. Negative results of this test were obtained in 9 children in the main group (22.5%), 5 children in the comparison group (18.5%) and 25% of somatically healthy children who received 5 orthodontic procedures.

This table data shows a worsening of oral hygiene in children with interstitial bites, especially in the group where traditional treatment measures were used ($R<0.05$), which was more pronounced. In all groups according to the indices, the level of oral hygiene was assessed as "satisfactory". At the same time, no statistically significant difference was observed between the values of the Silness-Loe and Stallard index in the children of the main group and the control group. During this period, signs of inflammation in the tissues of the gums increased, increasing the indicators of the periodontal indices studied in all groups. In children with intersecting bite occlusion and healthy children a month after the start of the active stage of treatment, the PMA index indicators increased compared to those obtained before the fixation of the apparatus.

The symptoms of gingivitis were more diagnosed in children of the comparison group at a reliable ($R<0.01$) level compared to the data of the control group and the main group with an increase in the indicators of the periodontal fracture of the RMA and Schiller-Pisarev. In children of the main group and healthy group with crossed bites, no significant difference was observed in the indicators of Schiller-Pisarev's syndrome.

In children of the main group and in children of the control group, a symptom of bleeding gums was found - in 25% of cases, in children of the comparison group - in 33% of cases. Dental deposits on the gums were initially detected in 15% of children with the same frequency in certain groups compared to -18.5% of children with distal occlusion who used traditional treatment.

The presented histograms show clear differences in the dynamics of changes in hygienic and periodontal indices depending on the preventive complex used in the process of orthodontic treatment of children with crossed bites. In the group "Healthy Children" and "children with crossed bites", with small differences in the initial cases of hygiene indices, the values of the periodontal indices indicate a significantly higher level in the second case. With the implementation of treatment and preventive measures, there was a significant improvement in hygienic indices in all groups.

In children with crossed bites using conventional treatment, the periodontal rates were much higher than in comparison groups. When treatment and preventive measures were carried out in children with crossed bites using the developed complex treatment, the indicators of the hygienic index were stable, and the condition of the periodontal tissues was stable in accordance with the indicators of somatic healthy children. (Figure-2.)

Discussions. The complex approach to treatment, early detection and correct diagnosis of interstitial bite in children, ensures that the Morpho-functional development of the tooth-jaw system is timely, and cosmetic defects are obtained in children. In the complex treatment of Palora and Omega 3-6-9 in relation to the effectiveness of the methods provided for in orthodontic treatment activities, the simultaneous use of palora and Omega 3-6-9 as a general treatment with orthodontic treatments and the consideration of the emotional state of children together with a psychologist increases the effectiveness of treatment.

Early detection of a crossed bite in children, improvement of examination, joint carrying out orthodontic treatment with psychologists, will allow you to save on expensive treatment in the future. Economic efficiency is calculated based on the practical application of the recommended methodological recommendation.

Compared options when performing cost and efficiency analysis are characterized by the fact that efficiency is larger or smaller, but not equivalent, as opposed to cost minimization. In this regard, it is important to assess the feasibility of the analysis according to the degree of reliability of the data.

As a result of the analysis of the cost-effectiveness ratio, the "cost / efficiency" ratio was obtained.

Thus, the recommended guidelines for early detection of transverse occlusion in children and early initiation of treatment allow to identify the state of the dental system and prevent the pronounced development of complications of the disease, as well as save 1,500,000 Soums when evaluating the orthodontic prosthesis of the attending physician in patients undergoing examination with malocclusion.

Conclusions. Based on the results of the study, it was proved that the effectiveness of the complex treatment method of Palora and Omega 3-6-9 in the treatment of interstitial bites in children in comparison with the effectiveness of the methods envisaged in traditional orthodontic treatment activities is high in the same time as orthodontic treatments as a general treatment. (Figure-3.)

When the psychological state of children is approached psychologically, taking into account the treatment of crossed bites, the process of getting used to the orthodontic apparatus for children is reduced, and the patient increases the coefficient of use of orthodontic devices.

The developed complex treatment algorithm reduced the duration of treatment and made it possible to increase the effectiveness of treatment.



Figure 3. Unilateral cross-bite pre-treatment and post-treatment condition

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