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RESULTS OF AESTHETIC ANALYSIS AND INTERDISCIPLINARY STUDIES IN PATIENTS AFTER COMPLETE DENTAL RESTORATION

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ABSTRACT

It has been proven that the close interaction of dental rows plays a significant role in the unity of the dentofacial system in terms of morphology and function. Their integrity is a necessary condition for the physiological functioning of the oral cavity. In the presence of dentofacial anomalies, chewing function, speech, and aesthetics are disrupted. The absence of even one tooth negatively affects not only the function of the dentofacial apparatus, the psychological state of the person, but also the entire organism as a whole. As a result of the loss of teeth, the process of chewing food is disrupted, which negatively affects digestion. The absence of teeth negatively affects the patient's articulation and communication capabilities, which cannot but affect their psycho-emotional status. Long-term presence of dental defects contributes to the distal displacement of the CNS, resulting in abnormalities in the anatomy and function of the CNS, as well as the activity of the maxillofacial nerve apparatus. Total adentia leads to significant changes in the facial skeleton.

Keywords: Oral cavity, dentofacial anomalies, adentia.

INTRODUCTION

The dentofacial system is a complex functional unit consisting of bones, joints, ligaments, teeth, and muscles, whose function is coordinated by the central nervous system (CNS).[4] Specifically, the position of the mandible is provided by the propriolective innervation of the temporomandibular joint (TMJ), masticatory muscles, and teeth (periodontal ligament).[1]

Dental occlusion is traditionally viewed as "the static ratio between the cutting or chewing surfaces (or their prostheses) of the upper and lower jaws." Currently, many authors believe that the condition of occlusion should be analyzed in three spatial dimensions, as its preservation is ensured by the anatomical interaction and functional properties of the teeth, the masticatory and facial muscles [6].

Occlusion disorders are thought to be based on:

- changes in the muscles of the maxillofacial region, in particular, compensatory muscle contraction and subsequent development of pain syndrome. In this case, the correct position of the joint head may be temporarily preserved, the joint disk does not shift.

prolonged violation of occlusal relationships in the form of compression leads to adaptive changes in tissues - muscle, fixation and bone, as a result of which morphological changes are observed in the joint discs, surfaces, ligaments and arm space. Subsequently, disc dislocation and changes in the tone of the teapot muscles occur [1-5].

The temporomandibular joint (TMJ) is a biological microsystem that includes a number of subsystems (articular space, disk, bilamine zone) and plays the role of an amortizing and stabilizing mechanism that ensures the position of the TMJ head in the joint cavity at different phases of jaw movement.

Regenerative processes occurring on the fibrous cartilage tissue and articular surfaces of the disc ensure the congruence of the surfaces of these elements [7]. Disruption of these processes, observed in various diseases and injuries, can lead to joint structure deformation, manifested in a number of clinical signs of left ventricular pathology [8].

Currently, many authors consider occlusal disorders as potential factors in the development of functional disorders in the temporomandibular joint [4]. At the same time, the most common dentofacial anomaly is distal dental occlusion (DDO), the frequency of which in the adult population, according to various data, ranges from 13 to 57% [9]. Children with COPD are diagnosed with a frequency of up to 70% at age 12 [10]. Occlusion disorders lead to increased load on the left ventricle, while increasing pressure on its components [3]. Long-term exposure with the development of degenerative changes in the context of reduced adaptive mechanisms of tissue structures leads to the development of left ventricular pathology, which is accompanied by impaired function of the masticatory muscles and harmonious movements of the left ventricle.[2]

When assessing the condition of the dentofacial system in general and the temporomandibular joint, in particular, when examining a patient, it is necessary not only to consider the history and clinical manifestations, but also to analyze the complex of anthropometric and functional indicators obtained using appropriate diagnostic methods.

It is assumed that the activity of the mandibular muscles in NCH movements is rhythmic and coordinated with the movements of the neck muscles. An increase in the activity of the neck and body muscles has been shown in jaw compression movements, both in sitting and lying on the back.[1]

It has been suggested that the combined contractions of the neck and masticatory muscles may be the result of complex neurophysiological interactions [6]. Parallel activation of m. streno-cleidomastoideus (SCM) and m. masseter [9] was observed at the maximum arbitrary jaw compression force. An increase in the activity of the cervical muscles was also shown at submaximal values of jaw compression.[2] The activity of the jaw (m. masseter and m. digastric) and neck (SCM and trapezoidal) muscles was assessed when chewing food with different sizes and densities. It was found that m. masseter and m. were more involved in this. SCM in ensuring increased chewing load.[4]

Results. An assessment of the number of patients with vertical smile line displacement showed that before treatment, displacement was observed in 195 (88.1%) patients in group 1 (A), 165 (84.6%) in group 2 (B), and 206 (88.0%) in group 3 (C).

Following treatment, the value of the indicator decreased - a shift was noted in 146 (67.0%) patients in the first group and in 100 (51.3%) cases in the second group. In the third group, the value of this indicator was 29.9% (79 cases) and was statistically significantly lower (p<0.05) than the corresponding values in groups 1 and 2.

One year after treatment, the observed proportion in the patient groups remained, while after 3 years, a slight decrease in the number of patients with vertical smile line interventions was observed. The values of these indicators were 148 (67.9%) cases in group 1, 97 (49.7%) cases in group 2, and 68 (29.1%) cases in group 3.

An assessment of the number of patients with smile symmetry disorders showed that the shift before treatment was observed in 201 (92.2%) patients in the first group, as frequently in 185 (94.9%) patients in the second group, and slightly less often in 206 (88.0%) patients in the third group. No statistically significant intergroup differences were noted.

The frequency of these disorders after treatment in group 1 was 61.5% (134 cases), in group 2 the value of this indicator was significantly lower (p<0.05) - 28.7% (56 patients), in group 3 the value of this indicator was 15.8% (37 cases) and was statistically significantly lower than the corresponding value in group 1 (p<0.05).

One year after treatment, the observed proportion in the patient groups remained, after 3 years, a slight decrease in the number of patients with smiling symmetry was observed, taking into account the width of the upper jaw teeth (14-24). In group 1, these disorders were observed in 128 (58.7%) patients, while in group 2, they were observed in only 52 (27.2%) patients, which is statistically significantly lower than in group 1 (p<0.05). In the third group, the frequency of smile symmetry disorders was minimal, which was detected only in 36 cases (15.3%), meaning it was significantly lower than in groups 1 and 2 (p<0.05).

Analysis of such indicators as the frequency of displacement of the gingival contour of the tooth neck showed that before treatment, this feature was detected in 165 (75.7%) patients in group 1, while in groups 2 and 3 it was detected equally frequently, in 151 (77.4%) and 177 (75.6%) cases, respectively (Table 3). After treatment, the shift was observed somewhat less frequently - in 144 (67.0%) patients in the first group, while in the second group, the value of this indicator was statistically significantly lower (p<0.05) - the shift was observed in 39 (20.0%) patients. In the third group, the value of this indicator was 9.4% (22 cases), statistically significantly lower than the corresponding values in groups 1 and 2 (p<0.05).

One year after treatment, the value of this indicator in group 1 was 63.8%, while in group 2 it was statistically significantly lower (p<0.05) and 21.0% (41 cases) than in group 1. At the same time, in patients of the third group (C), the displacement of the gingival contour in the tooth necks was observed only in 7 (3.0%) patients, which was significantly lower than in the 1st and 2nd groups (p<0.05).

The identified proportion of indicators in the patient groups persisted even after 3 years, during which a slight decrease in the number of patients with gum contour displacement in the tooth necks was observed. The values of these indicators were 60.6% (132 patients) in group 1, 29 (14.9%) in group 2, and 8 (3.4%) in group 3. At the same time, the frequency of detection of this shift in patients in groups 2 and 3 was statistically significantly lower than in the first group (p<0.05).

Analysis of the relationship between teeth and lips (dentolabial analysis). A dento-labial analysis was conducted at the next stage of studying the dynamics of aesthetic characteristics of patients included in the study. Assessment of the position of the cutters (interincisional line inclination) showed that the normal position was observed in 68 (31.2%) patients in group 1, slightly more in group 2 - in 74 (37.9%), and less often in group 3 - in 55 (23.5%) patients.

The right deviation was observed in 82 (37.6%) patients in the first group, 51 (26.2%) in the second group, and 94 (40.2%) in the third group. Left-sided deviation was observed in 68 (31.2%) patients in group 1, 70 (35.9%) patients in group 2, and 85 (36.3%) patients in group 3. No statistically significant intergroup differences were observed.

Following the treatment, 92 (42.2%) patients in group 1 showed a normal condition of the cutters, while in the second group, it was statistically significantly more common (p<0.05) - 135 patients (69.2%). The value of this indicator was also significantly higher in patients of group 3 than in group 1, reaching 73.5% (172 patients).

Right deviation was observed in 61 (28.0%) patients in group 1, slightly less often in groups 2 and 3 - in 30 (15.4%) and 24 (10.3%) patients. Left-sided deviation was found in 65 (29.8%) patients in the first group, 30 (15.4%) in the second group, and 38 (16.2%) in the third group. However, no statistically significant intergroup differences were observed in this indicator.

Similar ratios of values for this indicator in the groups persisted after 1 and 3 years.

A study of the dynamics of the condition of the cutters showed that before treatment, a normal condition was observed in 78 (35.8%) patients in group 1, in 64 (32.8%) patients in group 2, and in 65 (27.8%) patients in group 3 (Table. Right deviation was observed in 72 (33.0%) patients in group 1, 61 (31.3%) in group 2, 84 (35.9%) in group 3, 68 (31.2%) in group 1, 70 (35.9%) in group 2, and 85 (36.3%) in group 3. No significant differences were found between the groups.

The ratio of indicators after treatment was as follows. In the 1st group, the norm was observed in 82 (37.6%) patients, while in the second group it was statistically significantly more frequent ($p<0.05$) - in 125 patients (64.1%). In the third group, the norm was statistically significantly more frequently detected than in the first group ($p<0.05$), with the value of the indicator being 69.3% (162 patients).

The right deviation was observed in 71 (32.6%) patients in group 1, 40 (20.5%) patients in group 2, and 34 (14.5%) patients in group 3.

Left-sided deviation was found in 65 (29.8%) patients in the first group, 30 (15.4%) patients in the second group, and 38 (16.2%) patients in the third group.

Similar ratios of values for this indicator in the groups persisted even after 1-3 years. Meanwhile, the normal condition of incisors in group 1 was observed in 95 (43.6%) cases, while in groups 2 and 3 it was observed significantly more often ($p<0.05$) than in the first group. The values of the indicators were 130 (66.7%) and 165 (70.5%) cases, respectively.

Right deviation was observed in 56 (25.7%) patients in group 1, 29 (14.9%) patients in group 2, and 27 (11.5%) patients in group 3. Left deviation was observed in 67 (30.7%) patients in the first group, in 36 (18.4%) patients in the second group, and in 42 (18.0%) patients in the third group.

Right deviation was observed in 71 (32.6%) patients in group 1, 40 (20.5%) patients in group 2, and 34 (14.5%) patients in group 3.

Left-sided deviation was found in 65 (29.8%) patients in the first group, 30 (15.4%) patients in the second group, and 38 (16.2%) patients in the third group.

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Right deviation was observed in 56 (25.7%) patients in group 1, 29 (14.9%) patients in group 2, and 27 (11.5%) patients in group 3. Left deviation was observed in 67 (30.7%) patients in the first group, 36 (18.4%) patients in the second group, and 42 (18.0%) patients in the third group.

Following treatment, these disorders were observed in 144 (67.0%) patients in the first group, 30 (15.6%) in the second group, and 5.1% (12 cases) in the third group. The values of the indicator in groups 2 and 3 were significantly lower than in group 1 ($p<0.05$).

After 1 and 3 years, the number of patients with pronunciation disorders of the C sound decreased to 129 (59.2%) and 122 (56.0%) cases, respectively, in the groups. In the second group, the value of this parameter was 31 (15.9%) and 29 (14.9%) cases, respectively, the values of these indicators were statistically significantly lower than in group 1 ($p<0.05$).

In group 3, the number of patients with impaired pronunciation of the C sound at these times was 14 (6.0%) and 11 (4.7%), respectively. The value of this parameter was significantly lower than that of the first group ($p<0.05$).

The study of the maxillary corridor showed that before treatment, the number of patients in group 1 with normal parameters was 50 (22.9%). The values of these indicators were higher in the second and third groups: in group 2 - 70 (35.9%), in group 3 - 77 (32.9%) cases. No statistically significant intergroup differences were found.

The broad cheekway was found in 138 (63.3%) patients in group 1, in 100 (35.9%) patients in group 2, in 120 (51.3%) patients in group 3, in 30 (13.8%) patients in group 1, in 25 (12.8%) patients in group 2, and in 37 (15.8%) patients in group 3.

Normal width of the zygomatic cortex after treatment was observed in 28 (12.8%) patients in group 1 and statistically significantly more often ($p<0.05$) in group 2 - in 112 (57.4%) cases. In the third group, the value of this indicator was significantly higher than in the first group, where its value was 72.6% (170 patients).

An increase in the visualization of the central lobes under the red border of the lips was observed in 46 (21.1%) patients in group 1, in 20 (10.3%) and 25 (10.7%) cases in groups 2 and 3, respectively. The proportion of patients with a decrease in this indicator was 32.1% in group 1 (70 patients), while in groups 2 and 3, this indicator was slightly lower - 35 (17.9%) and 34 (14.5%) patients. No statistically significant intergroup differences were found.

A similar ratio of values for this indicator in patient groups persisted after 1 and 3 years.

CONCLUSION

The results obtained show that the use of the methodology of an interdisciplinary approach is a key factor in the high safety and clinical effectiveness of orthopedic treatment of patients in need of total restoration of the dental arch. It has been established that the use of the developed diagnostic and orthopedic rehabilitation planning algorithm contributes to the observation of significant changes in polysomnographic indicators, indicating improved sleep characteristics after treatment in this cohort of patients. These changes were confirmed by the normalization of basal saturation, minimum saturation, apnoe-hypopnea index, sleep effectiveness index, and sleep quality score in patients of the third and second groups compared to group 1.

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