SUCCESS BY USING MODERN METHODS MORPHOMETRY IN DIAGNOSTICS AND TREATMENT OF PATIENTS WITH DENTAL DEFECTS IN STANDARDS OF DIAGNOSTICS AND TREATMENT

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ABSTRACT

This article demonstrates the importance of using current morphometric methods in the care of patients with dentition defects, such as performing a necessary anthropometric analysis that includes measuring the width of the face between the tragus points (t-t), between the wings of the nose (ac-ac), and the face diagonal (t-sn). Using a coefficient of 2.3 to calculate the relationship between the width of the face and the intermolar size, as well as the diagonal dimensions of the face and arcs.

Keyword: Dentition defects, odontometry, dental arch testing techniques, craniometry, standards care

I. INTRODUCTION

Permanent teeth [4, 22]. It has been established that the absence of one or more teeth, especially in the anterior region, affects both the aesthetics of the face and the quality of life of patients [16]. In this case, the teeth located on different sides of the defect are often displaced in different directions, aggravating the occlusion anomaly [8]. The presence of defects in the dentition is reflected in the biocenosis of the oral cavity, disrupting the microbiological status [14]. The classifications of defects are reflected in detail in the manuals and presented in the ICD-10 [15]. The features of the protocols for the management of patients with partial and complete absence of teeth are shown and recommendations are given for the preparation of an outpatient card for a dental patient [21]. The standards for the treatment of patients with dentition defects complicated by occlusion anomalies have been determined [22]. At the same time, it was noted that anthropometric studies should be an integral part of diagnostics. This section is of great importance in applied and clinical medicine [1, 2, 7, 10]. Shown are the linear dimensions of the face and dental arches in physiological occlusion, taking into account the individual characteristics of the cranio-facial complex [12, 13, 17]. Correlations between latitudinal and diagonal parameters of the face and arcs with the numerical values of the coefficients have been established [3, 9, 23]. Based on the obtained morphometric data, modern classifications of face types and dental arches are presented, which with a greater common in people with physiological occlusion [24]. Methods for the study of the maxillofacial region have been proposed, which make it possible to simulate the shape of dental arches in case of pathological occlusion or in the absence of teeth [6, 25]. Patients with partial missing teeth are usually treated by dentists.

orthopedists in various dental facilities. In this case, various prosthetic constructions are used, taking into account the localization and topography of the defect, age and features of the maxillofacial region [5, 22]. In case of anomalies, orthodontic treatment is performed [11,8] Nevertheless, patients are often not satisfied with the quality of medical care, indicating a variety of reasons [19]. It has been noted that the responsibility for the proper quality of medical care lies with orthopedic dentists [20]. Our preliminary observations have shown that patients' complaints are often justified and associated with diagnostic errors [22]. The recommendations for the treatment of patients with missing teeth indicate that anthropometric studies are usually aimed at measuring the vertical parts of the face, in particular: the gnathic, frontal and nasal parts. Other parameters that indicate individual characteristics the maxillofacial area is practically not taken into account. No recommendations were given on the proportionality of teeth to the diagonal dimensions of the face, the proportionality of the predicted dental arches and the transverse parameters of the face, which served as the subject of the study. Purpose. Determination of the effectiveness of the inclusion of modern morphometry methods in the standards of diagnosis and treatment of patients with dentition defects.

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II. MATERIAL AND RESEARCH METHODS.

To determine the effectiveness of the inclusion of modern morphometry methods in the standards of diagnosis and treatment of patients with dentition defects, the medical histories of elderly patients (60–75 years old) with long dentition defects and complete absence of teeth were analyzed. Patients of group 1 (27 people) were treated in multidisciplinary dental polyclinics in the structure of which there were departments of orthopedic dentistry. The treatment was carried out in accordance with the protocol for the management of patients with partial absence of teeth and clinical guidelines (treatment protocol) "Complete absence of teeth". Patients of group 2 (24 people) were treated at the dental clinic of a medical university, where additional research methods were performed, in particular, morphological measurements of the face and dental arches, taking into account the individual characteristics of the cranio-facial complex. The width of the face was measured between the tragus points, and the width of the outer nose between the points "ac" (alar curvature). The width of the dental arches (both natural and artificial) was determined between the second molars and tearing tubercles of fangs. The diagonal dimensions of the face were determined from the tragus to the subnasal point. On the dental arches, the diagonal was the distance from the interincisal point to the molar point located at the apex vestibular distal tubercle near the occlusal contour. The Gnathic Index was defined as the cent ratio of diagonal and latitudinal parameters with definition of face types and arcs. Occlusal status was determined using computer analysis. The study of the sequence, synchronicity, area and strength of each occlusal contact was carried out in patients using the T-scan III (Tescan), Arcus Digma (KaVo) system. The computer program made it possible to evaluate the contact points, the magnitude of the load and the magnitude of the chewing pressure. Evaluation of the effectiveness of treatment was carried out according to the following criteria: conformity of face types and dental arches; correspondence of the linear parameters of the face and arcs; correspondence of the size of the teeth to the parameters of the face; compliance of the occlusal relationship with the signs of the age-related functional norm.

Research results and their discussion

The results of the study showed that the treatment helped to normalize the main functions of the maxillofacial area in patients of both study groups. The efficiency of chewing in most cases was in accordance with the requirements of the protocols. Treatment of patients with partial and complete absence of teeth. Patients’ quality of life improved significantly and facial aesthetics. However, the number of patients in whom the main indicators of the effectiveness of treatment corresponded to our proposed criteria, were different in the studied groups (table. 1).

<table>
<thead>
<tr>
<th>Study groups</th>
<th>The number of patients (in%) in whom the correspondence of the parameters was determined:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>37.04 ± 9.47</td>
<td>44.44 ± 9.75</td>
<td>40.74 ± 9.64</td>
<td>55.56 ± 9.75</td>
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<tr>
<td>Group 2</td>
<td>87.5 ± 6.89</td>
<td>95.83 ± 4.17</td>
<td>91.67 ± 5.76</td>
<td>83.33 ± 7.77</td>
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<tr>
<td>p</td>
<td>≤ 0.05</td>
<td>≤ 0.05</td>
<td>≤ 0.05</td>
<td>≤ 0.05</td>
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Note: 1 - correspondence of gnatic types of face and arches; 2 - correspondence of the transverse dimensions of the face and arches; 3 - correspondence of the size of the teeth to the parameters of the face; 4 - compliance of the occlusal relationship with the functional norm.

Despite the fact that the treatment of patients of group 1 was carried out in accordance with the protocols, only in 10 out of 27 people after treatment (37.04 ± 9.47) the correspondence of gnatic and dental face types to the main linear parameters of dental arches was determined. At the same time, when treating patients of group 2, 21 out of 24 examined people (87.5 ± 6.89) had gnatic and dental types of face and dental arches that matched each other, which was significantly more (p ≤ 0.05) than in the first group. A similar situation was determined when evaluating other indicators of the effectiveness of treatment. A clear example of the effectiveness of the inclusion of modern methods of morphometry in the standards of diagnosis and treatment of patients with defects in the dentition is a clinical example. Patient D., 68 years old, came to the dental clinic with complaints of poor fixation of prostheses even after relocation in the dental clinic at the place of residence. There were removable dentures in the oral cavity. The occlusal relationship did not correspond to the signs of physiological occlusion. The midline was displaced to the right, the artificial teeth of the right side were in contact with one of the posterior teeth, the anterior teeth were in direct occlusion with the lower incisors, the posterior teeth of the upper jaw did not overlap the antagonists (Fig. 1). Morphometric examination showed that the width of the face between the tragus points was 154 mm, the width
between the wings of the nose was 37.5 mm, and the diagonal from the tragus to the subnasal point was 132 mm. At the same time, the width of the dental arch, taking into account the available prostheses, was 60.5 mm, and the diagonal dimensions were 50.5 mm. Thus, the ratio of the diagonal and latitudinal parameters of the face was 85.7, which corresponded to mesognathic face type. At the same time, the diagonal dimensions of the face corresponded to the macrodont face type.

Fig. 1. The state of the oral cavity of patient D., on the right (a), in frontal projection (b) and on the left (c), when visiting the clinic.

The ratio of the width of the face to the width of the dental arch was 2.54, which did not coincide with the calculated values and characterized the narrowing of the dental arch in the region of the molars. A similar situation was when assessing the width of the anterior part of the dental arch (33.4 mm) with the width of the external nose and also indicated a narrowing of the artificial dental arch in the area of the canines, which was reflected in the nature of the occlusal relationship. Taking into account the above morphometric data, the patient was made new prostheses that correspond to specific to the individual characteristics of the face (Fig. 2).

Fig. 2. The state of the oral cavity of patient D., on the right (a), in frontal projection (b) and on the left (c), after prosthetics, taking into account the type of face and dental arches.

The manufactured prostheses, taking into account the proposed morphometric studies, contributed to the change the configuration of the face (Fig. 3).
Fig. 3. Facial signs of the patient D.’s face profile, in the presence of old prostheses (a) and after prosthetics taking into account the morphometry of the face and dental arches (b)

If, in the presence of old prostheses, the patient had a retraction of the lips, the upper lip did not reach the Dreyfus line, the nasolabial and chin folds were sharply expressed, the gnathic part of the face was smaller than the rest of the vertical parts, then after prosthetics the facial features corresponded to the age norm. At the same time, the main linear parameters of the face and dental arches correlated with each other in accordance with the proposed coefficients.

III. CONCLUSION.

Thus, the inclusion of modern morphometric methods in the standards of diagnostics and treatment of patients with dentition defects contributed to the effectiveness of prosthetics. After treatment, the number of patients in whom the occlusal relationship corresponded to the individual characteristics of the maxillofacial region significantly increased. In this regard, we consider it necessary to carry out a mandatory anthropometric study, including measuring the width of the face between the tragus points (t-t), between the wings of the nose (ac-ac) and the diagonal of the face (t-sn). To determine the correlation between the width of the face and the in termolar distance, as well as the diagonal dimensions of the face and arcs, use a coefficient of 2.3.

REFERENCES


