The results of the studies showed the interrelation of the sizes of macrodontal dental arches of the upper and lower jaw. Dimensions of the teeth are large, and the sum of the width of the crowns of 14 teeth in people with macrodontal mesognathic types of dental arches was: on the upper jaw – 120.91 ± 2.92 mm, on the lower jaw – 112.42 ± 2.79 mm. The length of macrodontal brachygnathic dental arches was: on the upper jaw – 122.81 ± 2.98 mm, and on the lower jaw – 114.69 ± 2.89 mm. Dolichognathic macrodontal types of dental arches, according to odontometry, also did not differ significantly from other gnathic forms of dental arches. The sum of mesial-distal dimensions of 14 teeth was: on the upper jaw – 121.01 ± 2.93 mm, on the lower jaw – 114.1 ± 2.87 mm.

Dimensions of dental arches in the transverse direction had features depending on their gnathic type. In people with mesognathic macrodontal types of dental arches, the width of the anterior part of the dental arch of the upper jaw was 37.78 ± 1.21 mm, the inter-canine distance on the lower jaw was 28.15 ± 1.17 mm. The ratio of these dimensions of the upper jaw to the lower one was 1.34 ± 0.03. The width of the arch between the second molars of the upper and lower jaws was 64.78 ± 1.84 mm and 58.89 ± 1.92 mm, respectively. The ratio factor was 1.1 ± 0.01. The depth of the dental arch of the upper jaw is greater than the lower one and makes 46.95 ± 1.54 mm and 44.14 ± 1.22 mm, respectively. Frontal canine diagonal on the upper jaw is 21.47 ± 0.44 mm, at the lower jaw – 16.44 ± 0.51 mm. The front-molar diagonal was: on the upper jaw – 57.03 ± 0.63 mm, on the lower jaw – 53.04 ± 1.02 mm. Brachygnathic macrodontal types of dental arches differed from mesognathic dimensions in the transversal and sagittal directions. The width of the dental arches is larger in the region of the molars and was: 71.31 ± 2.03 mm on the upper jaw, 64.82 ± 2.24 mm on the lower jaw. For dolichognathic forms, a decrease (in comparison with other types of dental arches) of transverse dimensions is typical, and were 60.87 ± 2.38 mm and 55.34 ± 1.97 mm for the upper and lower jaws, respectively.

Conclusion. As a result of morphometric studies of linear parameters and dental indicators of macrodontal dental arches, intermaxillary relationships of sizes were established. For all gnathic types of macrodontal dental arches, the ratio of the sum of the width of the crowns of the 14 teeth of the upper jaw to those of the lower jaw is, on average, 1,065 ± 0,005. The ratio of the half sum of the width of the crowns of 14 teeth to the size of the front-distal diagonal is 1.065 ± 0.005 on both jaws. The ratio of the width of the dental arch of the upper and lower jaw is 1.1 ± 0.01, regardless of the type of dental arches. The obtained information can be used in anatomy to determine the correspondence of the main dimensions of the dental arches of the upper and lower jaws, for physiological occlusion characteristics. In addition, the obtained information on the relationship between the dimensions of dental arches can be useful in clinical dentistry for predicting the shape and size of dental arches in the treatment of patients with dentoalveolar anomalies.

References

1. **Hugoson A.** Oral health in 1000 individuals aged 3–70 years in the community of Jonkoping, Sweden / G. Koch // Swed. Dent. J. – 2002. – V.3. – P.69–87.
2. **Holm A.K.** A comparative study of oral health as related to general health food habits and socioeconomic conditions of 15–35-years-old Swedish // Community Dent. Oral Epidemiol. – 2005. – V.3. – P.34–39.
3. **Rusakova E. Yu., Zelezny P. A.** The state of factors of local immunity of the oral cavity in the process of complex orthodontic treatment // Pacific Medical Journal – 2013.– №1.– C. 26–28.

CORRELATION OF THE DEPTH OF THE FRONTAL PART OF THE DENTAL ARCH WITH ODONTOMETRIC PARAMETERS AND INTERCANINE VALUES

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The effect of tooth size on the depth of the dental arch in the anterior, posterior regions, as well as at different age periods was shown in the studies of domestic and foreign experts. The works of Korkhaus show that the depth of the anterior part of the dental arch is determined by the size of the teeth. The results of the study are presented in the form of a table showing the sum of the width of the crowns of the four upper incisors and the depth of the dental arch to the level of the horizontal line connecting the Pont points

on the premolars. Clear interdependent parameters are presented and correction factors are noted. However, other dimensions of dental arches characterizing their gnathic and dental types are not given in this study. In addition, the depth was determined to the level of premolars. In the clinic of orthodontics, the estimation of the anterior part of the dental arch, limited by permanent canines, is most important. At present, the classification of dental arches is proposed and their main parameters are given, both in physiological and pathological occlusion. The effect of the inclination of the anterior teeth in the vestibular lingual direction (torque) on the sagittal dimensions of the dental arches was noted. Dependence of the depth and width of the dental arches, including the anterior part, limited by the canines on the type of dental arches (meso-, dolicho-, and brachygnathic) was noted. At the same time, the difficulty of accurately determining the depth of the dental arch due to its small size was noted. But we did not find information on the relationship between the depth of the anterior part of the dental arch and the intercanine distance, taking into account the size of the anterior teeth.

The purpose of the study: to determine the proportional relationship between the depth and width of the anterior part of the dental arch, limited by the canine teeth, taking into account the size of the anterior teeth.

The study was conducted on gypsum models obtained from 85 patients of the first period of adulthood with physiological occlusion. Patients were divided into three groups: with normodont, macrodont and microdont type of dental arches. The width of the dental arch was determined between the points located on the tearing tubercles of the canine teeth. Considering the complexities and errors in measuring the true depth of the dental arch on the gypsum model, we used the technique of determining this parameter as the leg of a right-angled triangle whose hypotenuse was a canine diagonal. The second leg was a half-width of the dental arch. The determination of the canine diagonal was not difficult with a relatively correct arrangement of anterior teeth. The diagonal was measured between the incisal and canine points. With anomalies in the position of the anterior teeth, the size of the canine diagonal was calculated from the sum of the width of the crowns of the three teeth (incisors and canines of one side of the arch), taking into account the correction factor. Gnathic type of dental arch was estimated by dental index as the ratio of the sum of the width of the crowns of 14 teeth to the width of the dental arch between the second molars. With an index value of 0.9 to 0.97, dental arches were related to the mesognathic type. The sum of 14 teeth from 112 mm to 118 mm was regarded by us as normodontism. The increase in the indicator was characteristic for the macrodontic type, and the decrease was characteristic for the microdontic type of dental arches.

The results of the studies showed that, in people with orthognathic bite and mesognathic type of dental arches, the width between the points located on the tearing tubercles of the canines with normodontism was, on average, 36.55 ± 0.82 mm. A similar parameter for the macrodontic dental system is 38.78 ± 0.91 mm, and for microdontic – 34.13 ± 0.75 mm. Thus, the dimensions of the teeth affect the width of the anterior part of the dental arch with the same type of gnathic form.

The size of the incisive-canine diagonal in the mesognathic normodontic type of the upper dental arches was 21.33 ± 0.34 mm. With macro- and microdontism, the indices were 23.67 ± 0.42 mm and 19.24 ± 0.39 mm, respectively. The dimensions of the anterior part of the dental arch in the sagittal direction (the depth to the level of the canines) in the normodontic type were 11.09 ± 0.12 mm, for macrodontism – 13.57 ± 0.14 mm, and with microdontism this parameter was 8, 92 ± 0,11 mm. The ratio of the frontal canine diagonal to the depth of the anterior part of the dental arch with normodontism is 1.93 ± 0.23, with macro- and microdontism the indicated index was 1.75 ± 0.24 and 2.16 ± 0.24, respectively.

Conclusions.

1. The depth and width of the mesognathic-type dental arches is determined by the size of the teeth.

2. The determining factor is the diagonal size of the anterior part of the dental arch.

3. Canine diagonal depends on the size of the front teeth.

4. The depth of the dental arch is directly dependent on the transversal and diagonal linear parameters.

References

1. **Hamilton M.E.** Oral health knowledge and habits of senior elementary school students/ W.V.Coulby //J. Public. Health. Dent. – 2001. – № 51 (4). – P.212–219

2. **Attwood D.** A three year follow up study of the dental health 12 and 15-year old schoolchildren in Glasgow/ A.S.Drinkhorn., A.S.MacMillan // Community Dent. Health. – 2003. – V.72. – P.143–148

3. **Rusakova E.Yu.** Monitoring of the dental morbidity of children in the Primorsky Krai // Clinical stomatology. – 2011. – №2. – C. 114–117.