arch diagonal on the cleft and on the opposite sides was 32.34 ± 0.46 and 33.56 ± 0.41 mm, respectively.

Conclusion. The study has revealed anthropometric facial specifics and biometric values of dental arches in children with congenital unilateral cleft upper lip, alveolar process and palate. It was observed that on the cleft upper lip side, the external nose width, measured from the aesthetic center line, exceeded that on the intact side by an average of 2.5 mm. The biometric measurements have shown that the transversal dimensions of the anterior dental arch are most susceptible to alteration. The dental arch width, measured from the canines to the aesthetic center line, was significantly smaller on the cleft side — 11.49 ± 0.42 mm, while on the intact side the same parameter measured 16.32 ± 0.25 mm. The entire intercanine distance did not exceed 30 mm. The obtained data can be used in the clinical orthodontics for diagnosing anomalies in the dental arch shape and size, as well as to select the best orthodontic treatment offered to children with congenital unilateral cleft upper lip, alveolar process and palate.

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IMPROVING ODONTOMETRIC DIAGNOSTICS AT JAW STONE MODEL EXAMINATION

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Studying the teeth morphology is fundamental for identifying the gender, the race, the variability of the dentoalveolar system under different physique types, as well as the variability of the tooth shape subject to the somatic type [1, 5]. Biometric investigation of jaw stone models is of applied and practical importance in clinical dental practice. The major dimensions of teeth in people with physiological types of occlusion have been shown for various gnathic and dental arch types [3, 6]. Notable are researchers' recommendations pointing at the need to employ odontometric data to identify the correspondence between the tooth size and the parameters of the dentoalveolar system and the craniofacial complex as a whole [2, 4]. However, the same odon-tometric parameters are interpreted ambiguously by experts, which makes the research outcomes incomparable.

Aim. Developing a teeth measuring algorithm for evaluating odontometric parameters at studying jaw stone models.

Materials and methods. The biometric study was performed on jaw stone models obtained from 107 people (aged 20–25) with physiological types of occlusion and a full set of teeth. As the initial size for odontometry, we chose the mesial-distal width of the crowns on the teeth that constitute the dentition. Besides, on the first and second permanent molars we measured the vestibular-lingual diameter of the crown. For this, a conditional midline was applied on the vestibular and lingual surfaces of the teeth, which connected the medial points of the mesial-distal width near the occlusal surface and the clinical dental neck. The diameter was measured between the said lines at the points corresponding to the location of the tooth

equator. Following experts' recommendations, the size of the variable teeth in each group was compared with the size of the key teeth, using the coefficients that are common in dentistry. The comparative analysis of the size of teeth groups was carried through the Tonn and Bolton methods. Following the Tonn recommendations, the sum of the 4 mandibular incisors was multiplied by a ratio of 4/3 adding a coefficient value that was 0.5 mm at the lower incisors dimensions lying within the range of 22.2–28.1 mm. At smaller sizes, the correlation coefficient was 0.4 mm, while for larger dimensions it was 0.6 mm. To determine the correspondence between the remaining teeth size, the front and full Bolton ratios were used where the ratio of the lower teeth sizes (6 front teeth and 12 teeth constituting the lower dentition) to the antagonists was calculated. During that, the anterior ratio within the normal range was 77.2%, while the full ratio was 91.3%. The difference in the design and real values allowed determining the discrepancy between the upper and the lower teeth size. We used the methods common in statistics, and evaluated the arithmetic mean of the order sample. All the measurements were performed in the automatic mode of the Microsoft Excel software.

Results and discussion. Through the study, an odontometry algorithm was developed, where the first stage implied measuring the mesialdistal width of the crowns on six anterior teeth, namely, incisors and canines, on jaw stone models. Parameter estimation was performed employing the incisor and canine dental coefficients. For this purpose, the ratio of the lateral upper incisor size to the upper medial incisor was determined. The sizes were calculated only in case the value was 0.8.

Similarly, the value of the canineincisal coefficient (which under normal conditions, for the medial incisor was 0.9, and for the lateral incisor – 1.1) was calculated. In case the design values do not match the real values, a repeated measurement is recommended. In case of repeated mismatch between the indicators, one of the teeth was diagnosed with micro- and/or macrodontia.

The lateral incisors of the upper jaw are most vulnerable to reduction. Note to be made that the size of the canine was the most stable, due to which it is recommended to be considered a key tooth of the anterior segment. Further on, the ratio of the incisors in both jaws was compared, with the Tonn method employed for this purpose. The difference between the design values and the real values either required a repeated measurement or was indicative of the teeth size anomaly. The sizes of the 6 front teeth and the 12 teeth of the dental arch were compared with their antagonists, with the degree of discrepancy between the anterior and the full ratio determined.

Conclusion. The proposed odontometry algorithm allows carrying out a precision biometric analysis for stone models of jaws with permanent teeth physiological occlusion, as well as determining different classes of deviations in tooth size, which is of great importance in odontology, forensic medicine and clinical dentistry.

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