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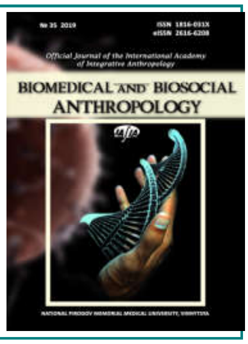

Modeling by regression analysis of the transverse dimensions of the upper and lower jaws and sagittal characteristics of the dental arch in young women with a very wide face, depending on the features of the odonto- and cephalometric indicators

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Providing maximum individual orthodontic care to the patient is impossible without the use of modern instrumental methods of research and considering odontometric and cephalometric characteristics of representatives of relevant populations of different sex and age. The purpose of the study is to develop and analyze regression models of computed tomography sizes necessary to construct the correct form of dental arches in young women with a very wide face, depending on the characteristics of odonto- and cephalometric indicators. Primary computed tomographic indices of tooth size and cephalometric parameters of 50 young women with normal occlusion close to orthognathic occlusion were obtained from the data bank of the scientific-research center of National Pirogov Memorial Medical University, Vinnytsya. Face type was determined using the Garson morphological index. The following distribution is established: with a very wide face - 21, with a wide face - 20, with a medium face - 6, with a narrow face - 3, with a very narrow face - 0. Therefore, only young women with a wide and very wide face were selected for further modeling. The development of regression models of linear dimensions necessary for the construction of the correct form of dental arches, depending on the features of odonto- and cephalometric indicators in young women with very wide faces, was carried out in a licensed statistical package "Statistica 6.0". It is established that young women with a very wide type of face with normal occlusion have built all 18 possible reliable models (with a coefficient of determination from 0.863 to 0.962) of linear computed tomography sizes used to construct the correct form of dental arches of the upper and lower jaws in depending on the features of odontometric and cephalometric indicators. Built models in young women with a very wide face type included more often odontometric (73.0 %) than cephalometric (27.0 %) data. Among the odontometric indicators, the most frequently included models are: width of crowns of teeth in mesio-distal direction (20.7 %); width of the teeth at the level of the anatomical neck in the mesio-distal direction (14.4 %) and width of the crowns of the teeth in the vestibulo-oral direction (10.8 %); and among the cephalometric indicators - the greatest length of the head (3.6 %); average width of face and height of lower lip (2.7 % each). Thus, in young women with a very wide type of face with normal occlusion close to orthognathic occlusion, all 18 possible reliable regression models of reproduction of the individual characteristics of the dental arches of the upper and lower jaws depending on the odonto- and cephalometric parameters were developed and analyzed.

Keywords: *regression analysis, young women with orthognathic bite, very wide face type, dental arch, odontometric and cephalometric indicators.*

Introduction

Dentistry, as an independent scientific discipline, does not have all the necessary tools to meet the current challenges of health care delivery. The problems of individual approach to each patient are the main need for dental care, especially when it comes to creating the perfect, harmonious smile. In such cases, the smile must first and foremost be harmonious to the face.

An excellent tool for solving this problem is anthropometry - an applied tool of physical anthropology. Previously used exclusively to address the needs of paleoanthropology and forensic anthropology, this tool is now effective in virtually every field of medicine (the possibility of predicting the development of acne, the individual size of various internal organs, etc.) [3, 9, 13], including dentistry [6, 10, 15].

This topic has gained a lot of attention in the last decade not only abroad but also in Ukraine. There are scientific works on determining the relationship between cephalometric indices and the size of certain teeth, work on identifying normative teleroentgenographic indices for the population of Ukraine, etc [8, 12, 20]. That is, this topic is extremely relevant at the moment.

The question of studying the effect of face type on the future parameters of dental arches is still a poorly researched question in both Ukrainian and world scientific literature. Only understanding the process of forming a smile as a complex mechanism of interaction of all odontometric and cephalometric parameters can allow dentists to further form correct, harmonious smiles. However, research in this field should consider both ethnic, age and gender characteristics of a person.

The purpose of the study is to develop and analyze regression models of computed tomography sizes necessary to construct the correct form of dental arches in young women with very wide faces, depending on the features of odonto- and cephalometric indicators.

Materials and methods

Primary computed tomographic indices of tooth size (determined using a Veraviewepocs 3D, Morita dental cone-ray tomograph) and cephalometric parameters of 50 young women with normal occlusion close to orthognathic occlusion were obtained from the data bank of the National Pirogov Memorial Medical University, Vinnytsya Research Center. All surveys of young men and young women were conducted on the informed consent principle.

According to the scheme developed by I.V. Gunas, N.A. Dmitriev and A.V. Marchenko [11], in the i-Dixel One Volume Viewer [Ver.1.5.0] J. Morita Mfg. Cor software, defined the metric values of the central (medial [4]) and lateral [4] incisors, canines, first and second premolars [4], as well as the first molars [4] of the upper and lower jaw. Since no differences were found in this study [11] when comparing the sizes of the same teeth of the right and left sides, in subsequent studies the average values of the corresponding teeth on the upper and lower jaws were used: upper or lower central incisors (11 or 41, respectively); upper or lower lateral incisors (12 or 42, respectively); upper or lower canines (13 or 43, respectively); upper or lower first premolars (14 or 44, respectively); upper or lower second premolars (respectively 15 or 45); upper or lower first molars (16 or 46 respectively).

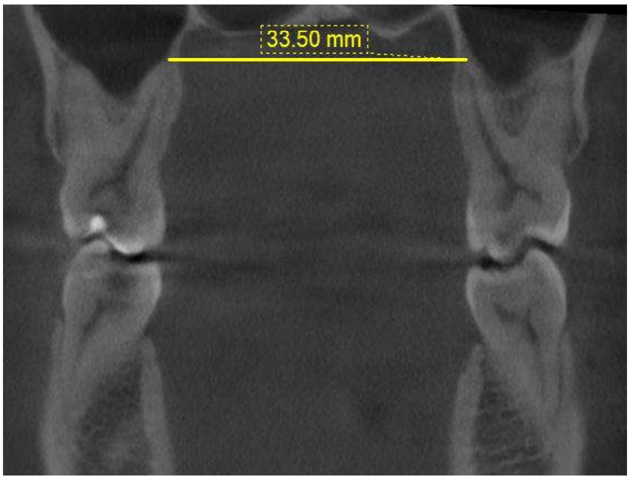

Fig. 1. The distance between the apexes of the palatine roots of the upper first molars.

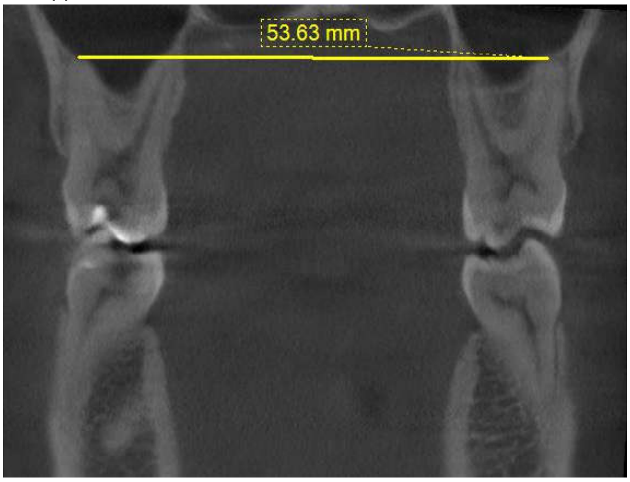

Fig. 2. The distance between the apexes of the distal buccal roots of the upper first molars.

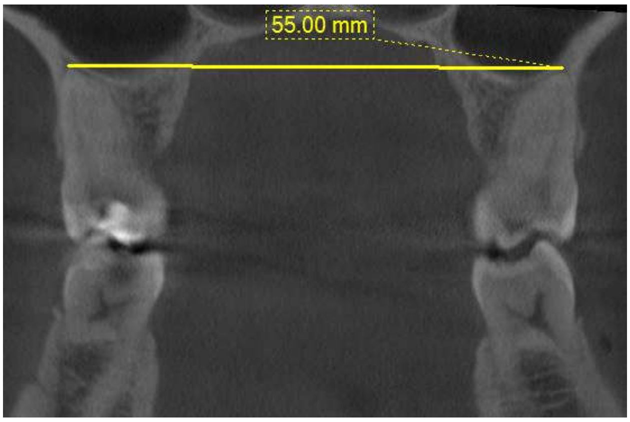

Fig. 3. The distance between the apexes of the medial buccal roots of the upper first molars

Cephalometric dimensions were measured using a soft centimeter tape and Martin's compass [5]. The type of face was determined using the Garson morphological

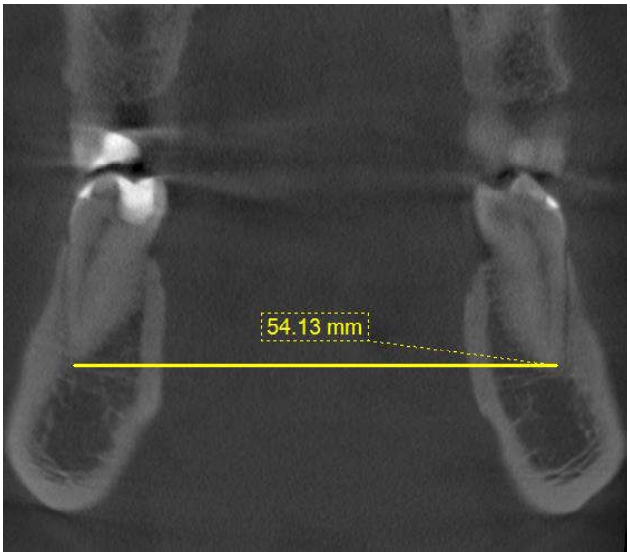

Fig. 4. The distance between the apexes of the medial roots of the lower first molars.

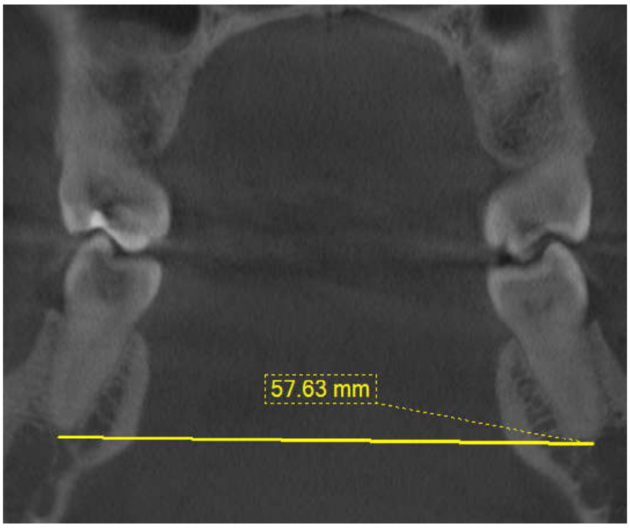

Fig. 5. The distance between the apexes of the distal roots of the lower first molars.

index - the ratio of the morphological length of the face (the direct distance from the nasion to the gnathion) to the width of the face in the area of zygomatic arches [22]. The following distribution of young women is established: with a very wide face - 21, with a wide face - 20, with a medium face - 6, with a narrow face - 3, with a very narrow face - 0. Therefore, to model the indicators necessary for correct construction of dental arches depending on the features of odontometric and cephalometric indicators, only young women with a wide and very wide face were selected.

By means of direct stepwise regression analysis in the license package "Statistica 6.0" we constructed mathematical models of the following characteristics of dental arches (mm): NAPX_16 - distance between the apexes of palatine (palatal) roots of the upper first molars (Fig. 1); DAPX_16 is the distance between the apexes of the distal buccal roots of the upper first molars (Fig. 2); MAPX_16 is the distance between the apexes of the medial buccal (vestibular) roots of the upper first molars (Fig. 3); MAPX_46 is the distance between the apexes of the medial roots of the lower first molars (Fig. 4); DAPX_46 is the distance between the apexes of the distal roots of the lower first molars (Fig. 5); PONM - distance between Pon molar points (Fig. 6a); PONPR - distance between premolar points beyond Pon (Fig. 6b); VESTBUGM - distance between the vestibular medial tubercles of the upper first molars (Fig. 7); BUGR13_23 is the distance between the tubercles of the upper canines (Fig. 8a); APX13_23 is the distance between the apexes of the roots of the upper canines (Fig.

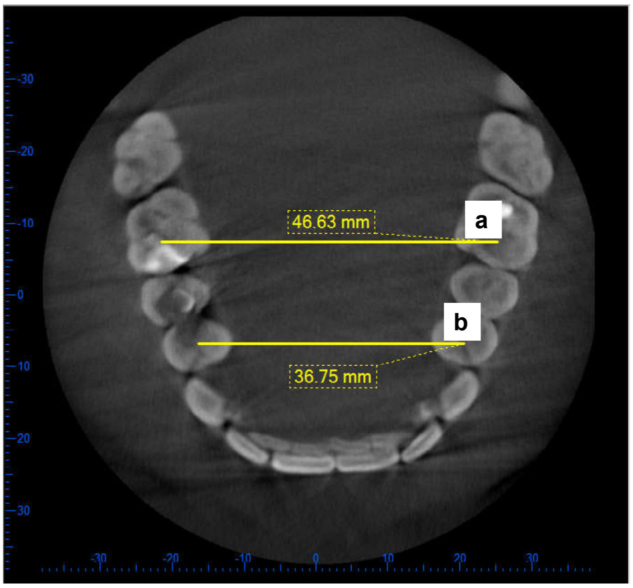

Fig. 6. The distance between the molar (a) and premolar (b) points by Pon.

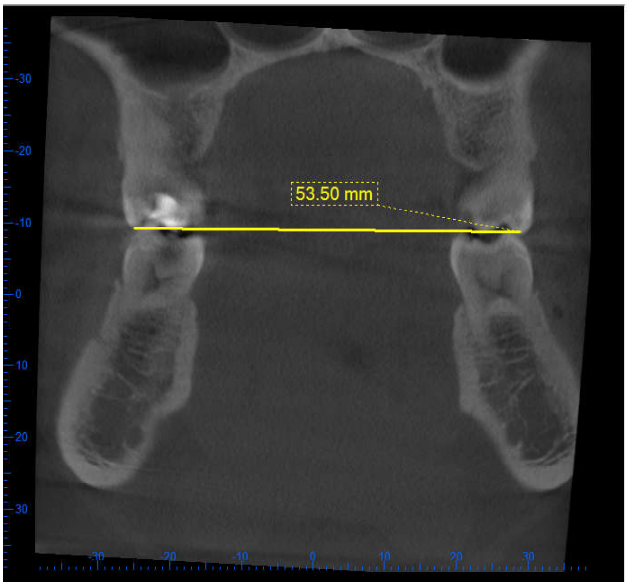

Fig. 7. The distance between the vestibular medial tubercles of the upper first molars.

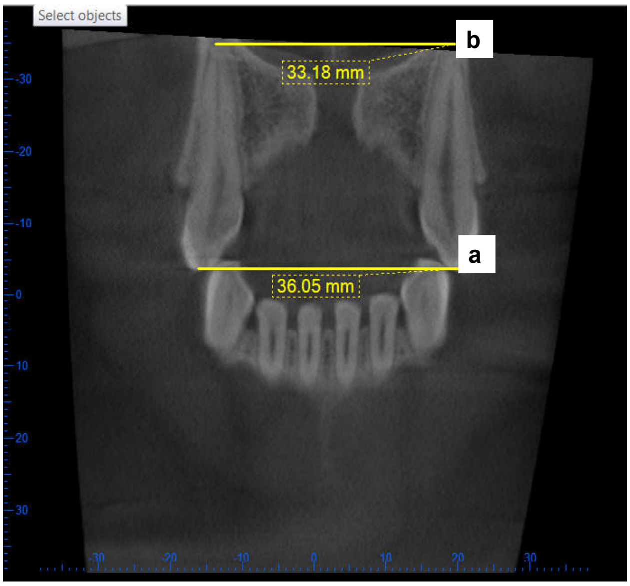

Fig. 8. The distance between the tubercles of the upper canines (a); the distance between the apexes of the roots of the upper canines (b).

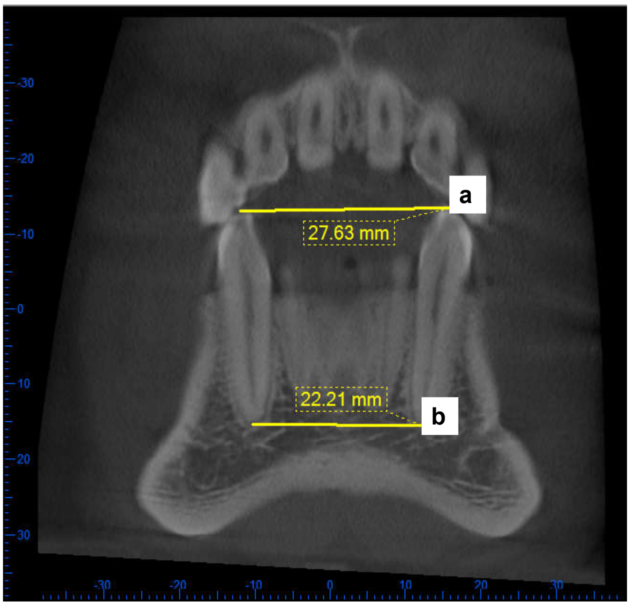

Fig. 9. The distance between the tubercles of the lower canines (a); the distance between the apexes of the roots of the lower canines (b).

8b); BUGR33_43 - distance between tubercles of lower canines (Fig. 9a); APX33_43 is the distance between the apexes of the roots of the lower canines (Fig. 9b); DL_C is the canine sagittal distance of the dental arch of the upper jaw (Fig. 10c); DL_F is the premolar sagittal distance of the maxillary dental arch (Fig. 10f); DL_S is the molar sagittal distance of the dental arch of the upper jaw (Fig. 10s); GL_1 - depth of palate at canine level (Fig. 11a); GL_2 is the depth of the palate at the level of the first premolars (Fig. 11b); GL_3 is the depth of the palate at the level of the first molars (Fig. 11c).

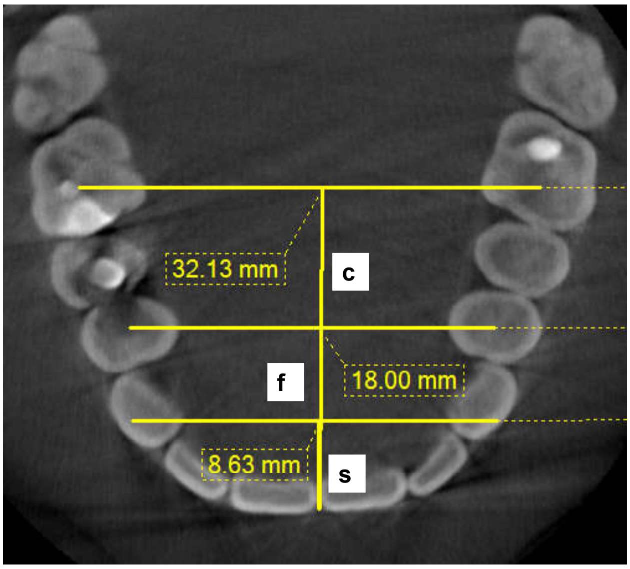

Fig. 10. Canine (c), premolar (f) and molar (s) sagittal distances of the maxillary dental arch.

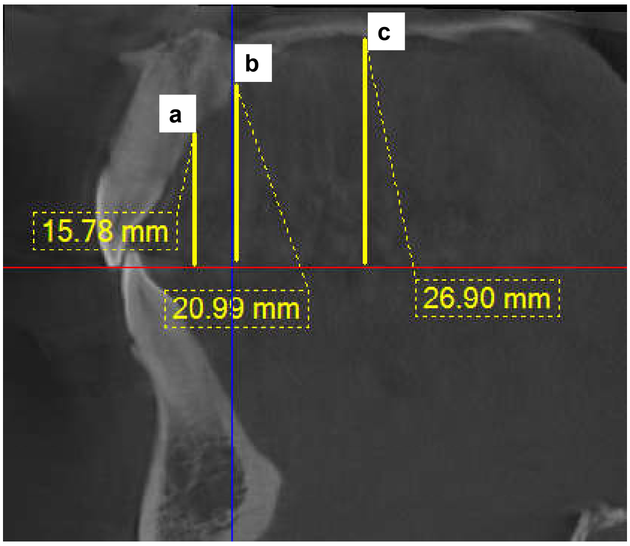

Fig. 11. The depth of the palate at the level of canines (a), first premolars (b) and first molars (c).

Results

In young women with a very wide face type regression models of linear sizes necessary to construct the correct form of dental arches, depending on the odontometric and cephalometric indicators have the following linear equations:

NAPX_16 = 35.88 - 0.686 x AU_GO + 2.245 x VSHIR_11 + 1.838 x TSHIR_44 + 2.537 x VSHIR_45 - 3.986 x MDDEG_43 + 2.513 x VSHIR_14 - 0.642 x VLROOT_11 (R^2=0.929; $F_{(7.13)}$=24.25; p<0.001);

DAPX_16 = 22.02 - 2.720 x L_14 + 2.625 x TSHIR_45 - 0.649 x STO_GN + 0.344 x G_OP + 3.183 x VSHIR_15 + 1.667 x MDDEG_11 (R^2=0.922; $F_{(6.14)}$=27.45; p<0.001);

MAPX_16 = -19.79 + 4.242 x VSHIR_11 - 4.486 x MDDEG_12 + 2.620 x TSHIR_13 + 0.091 x DUG_AU_AU - 0.914 x ALROOT_13 + 0.858 x L_42 (R^2=0.901; $F_{(6.14)}$=21.25; p<0.001);

MAPX_46 = 81.08 + 6.690 x TSHIR_43 - 1.690 x TSHIR_45 - 2.881 x VSHIR_16 - 0.267 x G_OP + 0.066 x DUGS_G_OP - 1.471 x VSHIR_14 + 0.788 x MDDEG_41 (R^2=0.945; $F_{(7.12)}$=29.30; p<0.001);

DAPX_46 = 36.75 + 4.814 x TSHIR_43 - 0.896 x ALROOT_41 - 3.987 x MDDEG_43 + 0.583 x STO_SPM - 3.409 x VDEG_43 + 2.726 x VDEG_12 + 0.527 x L_45 (R^2=0.904; $F_{(7.12)}$=16.21; p<0.001);

PONM = 15.15 + 2.965 x VDEG_12 + 0.183 x ZM_ZM - 3.846 x VSHIR_44 + 2.323 x MDDEG_42 + 1.573 x TSHIR_42 + 1.017 x MDDEG_41 (R^2=0.935; $F_{(6.14)}$=33.81; p<0.001);

VESTBUGM = 64.42 - 1.114 x L_44 + 3.303 x TSHIR_42 + 0.403 x MF_MF - 0.168 x AL_AL - 2.578 x VDEG_42 + 2.066 x VDEG_12 - 1.040 x TSHIR_11 (R^2=0.916; $F_{(7.13)}$=20.14; p<0.001);

PONPR = 21.23 + 0.065 x ZM_ZM - 2.258 x VSHIR_16 + 3.285 x VDEG_12 + 0.269 x SN_PRN - 1.452 x VSHIR_42 + 1.133 x VDEG_13 + 0.328 x ALROOT_13 (R^2=0.875; $F_{(7.13)}$=13.03; p<0.001);

BUGR13_23 = 34.88 + 0.221 x CHI_CHI - 1.113 x VSHIR_16 + 2.042 x TSHIR_41 - 1.043 x TSHIR_16 - 0.126 x AL_AL + 0.776 x MDDEG_12 (R^2=0.863; $F_{(6.14)}$=14.66; p<0.001);

APX13_23 = 70.79 + 0.247 x ALROOT_41 - 0.170 x AU_GN - 2.318 x L_43 + 1.708 x VLROOT_43 + 1.289 x VSHIR_44 - 0.396 x VLROOT_11 (R^2=0.887; $F_{(6.14)}$=18.34; p<0.001);

BUGR33_43 = -45.96 + 0.989 x ALROOT_41 + 0.531 x G_OP + 2.845 x MDDEG_11 - 2.612 x MDDEG_42 - 0.441 x ZY_ZY + 0.135 x ZM_ZM (R^2=0.877; $F_{(6.14)}$=16.65; p<0.001);

APX33_43 = -6.424 - 11.69 x VSHIR_44 + 1.778 x VLROOT_12 + 8.914 x VDEG_42 + 0.541 x N_SN + 1.118 x L_11 - 2.856 x TSHIR_42 (R^2=0.910; $F_{(6.14)}$=23.50; p<0.001);

DL_C = -4.562 + 1.598 ? VSHIR_11 - 0.994 ? VSHIR_15 - 0.084 x GO_GO + 0.923 x MDDEG_13 + 0.543 x VSHIR_42 + 0.042 x TR_GN (R^2=0.935; $F_{(6.14)}$=33.72; p<0.001);

DL_F = 3.138 + 1.889 x VSHIR_11 + 1.716 x VDEG_42 - 1.637 x VSHIR_41 + 0.875 x ALROOT_11 - 0.275 x STO_SPM - 0.348 x L_13 (R^2=0.962; $F_{(6.14)}$=58.58; p<0.001);

DL_S = -1.888 + 2.662 x VSHIR_11 - 2.568 x VSHIR_41 + 0.477 x L_14 + 0.032 x DUG_AU_AU + 0.108 x AU_GO - 0.639 x VDEG_13 (R^2=0.937; $F_{(6.14)}$=34.65; p<0.001);

GL_1 = 45.93 - 3.260 x MDDEG_43 - 1.023 x ALROOT_11 + 2.489 x MDDEG_13 - 0.053 x DUGS_G_OP - 1.417 x VSHIR_15 + 1.260 x MDDEG_42 (R^2=0.898; $F_{(6.14)}$=20.66; p<0.001);

GL_2 = -5.588 + 3.548 x TSHIR_12 - 0.626 x STO_SPM + 0.348 x ZY_ZY - 0.320 x AU_SN + 0.629 x VLROOT_11 - 1.221 x MDDEG_13 (R^2=0.933; $F_{(6.14)}$=32.54; p<0.001);

GL_3 = 2.837 + 0.429 x CHI_CHI + 1.792 x MDDEG_11 - 0.937 x VSHIR_13 - 0.263 x SN_PRN + 0.093 x G_OP - 0.148 x AU_SN (R^2=0.906; $F_{(6.14)}$=22.61; p<0.001),

where: AL_AL is the width of the base of the nose (distance between the alar points) (mm); ALROOT - root length of incisors and canines in mesio-distal direction (mm); AU_GN - distance from auricular point to chin (average) (mm); AU_GO is the distance from the auricular point to the angle of the mandible (average) (mm); AU_SN is the distance from the auricular point to the subnasion (averaged) (mm); CHI_CHI - width of mouth (mm); DUG_AU_AU - transverse arc, measured by the strap from the right tragus point to the left (mm); DUGS_G_OP - sagittal arch, measured by the ribbon from the glabella to the occipital point (mm); $F_{(!!)}$=!! - critical $_{(!,!!)}$ and obtained (!!, !!) Fisher criterion value; G_OP is the greatest length of the head, the distance from the glabella to the opisthokranion (mm); GO_GO - width of mandible (width between corners of mandible) (mm); L is the distance from the middle of the cutting edge to the apex of the root of the tooth in the vestibulo-oral (vestibulo-lingual [4]) direction (mm); MDDEG is the width of the teeth at the level of the anatomical neck in the mesio-distal direction (mm); MF_MF - inter-orbital (anterior inter-orbital) width (straight distance between the inner corners of the eye pits) (mm); N_SN - nose height (distance between the upper nose and lower nose points) (mm); R^2 is the coefficient of determination; SN_PRN - depth of nose (distance between sub-point and pronasion) (mm); STO_GN - height of lower face (distance from mouth to chin) (mm); STO_SPM - height of lower lip (distance from stomion to supramental) (mm); TR_GN - physiological length of face (distance from trichion to gnathion) (mm); TSHIR is the width of the crowns of the teeth in the vestibulo-oral (vertebral-lingual [4]) direction (mm); VDEG is the width of the teeth at the level of the anatomical neck in the vestibulo-oral (vertebral-lingual [4]) direction (mm); VLROOT is the distance from the anatomical neck to the apex of the root of the tooth in the vestibulo-oral (vertebral-lingual [4]) direction (mm); VSHIR - width of crowns of teeth in mesio-distal direction (mm); ZM_ZM - average width of face (distance between zygomaxillary points) (mm); ZY_ZY - face width (distance between zygomatic points) (mm).

Discussion

Thus, of the 18 possible computed tomography sizes used to construct the correct dental arch shape, for young women with a very wide face type constructed all 18 reliable models, depending on the features of odonto- and cephalometric indicators with a coefficient of determination from 0.863 to 0.962. Previous research by Marchenko A. V. [16, 17] and Petrushanko T. O, Gunas I. V. and Marchenko, A. V. [21] found in a similar sample of young women that 14 reliable models were constructed in the general group. (R^2 from 0.658 to 0.804), and all 18 models for mesocephals and brachycephals (R^2 from 0.771 to 0.994 and 0.803 to 0.934).

The analysis of our results showed that the models built in young women with a very wide face type more often include odontometric (73.0 %, of which 21.6 % belong to the upper incisors; 16.2 % to the lower incisors; 9.0 % to the upper canines; 7.2 % - on lower canines; 6.3 % - on upper premolars; 9.0 % -on lower premolars; 3.6 % - on upper molars) than cephalometric (27.0 %) indicators. Among the odontometric indices, the most frequently included models are the following: the width of the crowns of the teeth in the mesio-distal direction (20.7 %, of which 12.6 % in the upper jaw); width of the teeth at the level of the anatomical neck in the mesio-distal direction (14.4 %, of which 7.2 % in the upper jaw); the width of the crowns of the teeth in the vestibulo-oral direction (10.8 %, of which 7.2 % in the lower jaw). Among the cephalometric indicators, the most frequently included models are the largest head length (3.6 %); average width of face and height of lower lip (2.7 % each); transverse arch, width of face, width of the base of the nose, width of the mouth, depth of nose, distance from the auricular point to the angle of the mandible and distance from the auricular point to the sub-nasion (1.8 % each).

In studies by Marchenko A. V. [16, 17] and Petrushanko T. O, Gunas I. V. and Marchenko, A. V. [21] it is found that constructed models in young women also more often include odontometric (in the general group - 69.2 %; mesocephals - 61.2 %; brachycephals - 72.3 %) than the cephalometric parameters (respectively 30.8 - 38.8 - 27.7 %). Both the young women of the general group and the meso- and brachycephals most often include cutter sizes (45.2 - 31.6 - 41.0 %, respectively). The most commonly among tooth sizes models included sizes of the crown of the teeth in the mesio-distal direction (17.3 % in total; mesocephals 19.4%; brachycephals 17.9 %) and the distance from the middle of the cutting edge to the apex of the tooth root in the vestibulo-oral (vestibulo-lingual) direction (respectively 11.5 - 11.2 - 13.4 %). In addition, among young women of the general group and brachycephals, the tooth width at the level of the anatomic neck in the mesio-distal direction is also more often included in the models of the tooth sizes, respectively (10.6 % and 11.6 %); and for young women of mesocephals and brachycephals, the width of the crowns of the teeth in the vestibulo-oral (vestibulo-lingual) direction (respectively 11.2 % and 10.7 %). Among the cephalometric indices, the most common models for young women were: in the general group - the average width of the face (4.8 %), the greatest width of the head and the width of the mouth slit (2.9 % each); in mesocephals - ear diameter (5.1 %), average width of face, width of mouth slit and distance from auricular point to subnasion (3.1 % each); in brachycephals - interorbital width (3.6 %).

Löfstrand-Tideström B. and Hultcrantz E. studied the features of craniofacial and dental arch morphology in children with sleep disordered breathing. After study of 644 people with the help of odontological and cephalometry methods it was found that such children had reduced transversal width of the maxilla and more frequently had anterior open bite and lateral cross-bite [14].

A team of researchers examined 151 children aged 7-13 years. All of them were determined by the type of face. Facial pattern I was found in 64.24 % of children, pattern II in 21.29 %, pattern III in 6.62 %, Long Face pattern in 5.96 % and Short Face pattern in 1.99 %. Thereafter, a study was conducted regarding the relationship between face type and dental angle. The relationship between them was found in 63 % (Kappa = 0.27) [23].

Another group of scientists surveyed 72 students between the ages of 18 and 25 to find out how the shape of the face affects the type of dental arch and other odontometric indicators. The most frequently encountered type average type of face followed by wide type face. The average type of dental arch is most commonly associated with the average type of face in both men and women. The rarest was the narrow type of face [1].

Correlations between facial size and mesio-distal crown width and dental arch size in individuals with Class I occlusion were evaluated. 276 people were surveyed for the study. Significant correlations were found between the sagittal face variable and the size of the upper and lower dental arches; to a lesser extent, there is also a relationship between horizontal and vertical variables. Correlation values ranged from .01 to .60 for face and lower dental arch sizes, 01 to .49 for lower teeth, and .01 to .50 for upper teeth and facial and dental crowns [2].

During a cephalometric examination of 100 people, a statistically weak relationship was found between the width of the dental arch (between the intermolar and the first premolar width) and the vertical size of the face (p value for all results was >0.05) [7].

A team of Indian researchers linked face shape and dental arch in a survey of 40 people aged 20-25. Statistical analysis revealed that 54.6 % of persons with a mean facial type had an egg-shaped dental arch while 63.6 % of persons with a narrow facial type had a square arc [19].

Montasser M. A. and Taha M. had a goal to find relationship between dental crowding, skeletal base lengths and dentofacial measurements. For this study they worked with 45 patients. After statistical proceeding they found only significant difference (p=0.000) between the two groups of patients (Group 1 - 15 patients with mandibular crowding less than 3 mm; group 2 - 30 patients with mandibular crowding of 3 mm or more) was the size of the dentition in the lower arch. Direct high correlation (r=0.68; p=0.000) was found between the basal length of the upper jaw (Co-A) and the length of the base of the mandible (Co-Gn) and also found a direct high correlation (r=0.74; p=0.000) between the maxillary position (SNS angle) and the mandibular baseline position (SNB angle). Direct moderate correlation (r=0.45; p=0.002) was found between the maxillary and mandibular groups. The direct moderate correlation between the location of the mandible incisor and the anterior posterior jaw, measured by the ANB angle was found. The inverse moderate correlation between the location of the maxillary incisors and the vertical face size measured by the angle MP and SN showed was found [18].

Thus, it can be concluded that regression analysis is a powerful tool that can serve the dental industry. Building models of dental arches, considering the type of patient's face and gender, is the right key to improving dental care for the population.

Conclusions

In young women with a very wide type of face with normal occlusion close to orthognathic occlusion, all 18 possible (with a coefficient of determination from 0.863 to 0.962) reliable regression models of reproduction of the individual characteristics of the dental arches of the upper and lower jaws depending on the odonto- and cephalometric indicators were determined and analyzed.

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МОДЕЛЮВАННЯ ЗА ДОПОМОГОЮ РЕГРЕСІЙНОГО АНАЛІЗУ ПОПЕРЕЧНИХ РОЗМІРІВ ВЕРХНЬОЇ ТА НИЖНЬОЇ ЩЕЛЕП І САГІТАЛЬНИХ ХАРАКТЕРИСТИК ЗУБНОЇ ДУГИ У ДІВЧАТ З ДУЖЕ ШИРОКИМ ОБЛИЧЧЯМ В ЗАЛЕЖНОСТІ ВІД ОСОБЛИВОСТЕЙ ОДОНТО- ТА КЕФАЛОМЕТРИЧНИХ ПОКАЗНИКІВ

Позур Т.П.

Надання максимальної індивідуальної ортодонтичної допомоги пацієнту неможливо без використання сучасних інструментальних методів дослідження та врахування одонтометричних і кефалометричних характеристик представників відповідних популяцій різної статі та віку. Мета дослідження - розробити та провести аналіз регресійних моделей комп'ютерно-томографічних розмірів, необхідних для побудови коректної форми зубних дуг у дівчат із дуже широким обличчям в залежності від особливостей одонто- і кефалометричних показників. Первинні комп'ютерно-томографічні показники розмірів зубів і кефалометричні параметри 50 дівчат з нормальною оклюзією наближеною до ортогнатичного прикусу отримані з банку даних науково-дослідного центру Вінницького національного медичного університету ім. М.І. Пирогова. Тип обличчя визначали за допомогою морфологічного індексу Гарсона. Встановлено наступний розподіл: з дуже широким обличчям - 21, з широким обличчям - 20, з середнім обличчям - 6, з вузьким обличчям - 3, з дуже вузьким обличчям - 0. Тому для подальшого моделювання були обрані лише дівчата з широким і дуже широким обличчям. Розробка регресійних моделей лінійних розмірів, необхідних для побудови коректної форми зубних дуг в залежності від особливостей одонто- і кефалометричних показників у дівчат із дуже широким обличчям проведена в ліцензійному статистичному пакеті "Statistica 6,0". Встановлено, що у дівчат із дуже широким типом обличчя з нормальною оклюзією побудовані усі 18 можливих достовірних моделей (з коефіцієнтом детермінації від 0,863 до 0,962) лінійних комп'ютерно-томографічних розмірів, що використовуються для побудови коректної форми зубних дуг верхньої і нижньої щелеп, в залежності від особливостей одонтометричних і кефалометричних показників. До побудованих моделей у дівчат із дуже широким типом обличчя більш часто входять одонтометричні (73,0 %), ніж кефалометричні (27,0 %) показники. Серед одонтометричних показників до моделей найбільш часто входять: ширина коронок зубів у мезіо-дистальному напрямку (20,7 %); ширина зубів на рівні анатомічної шийки у мезіо-дистальному напрямку (14,4 %) та ширина коронок зубів у вестібуло-оральному напрямку (10,8 %); а серед кефалометричних показників - найбільша довжина голови (3,6 %); середня ширина обличчя та висота нижньої губи (по 2,7 %). Таким чином, у дівчат із дуже широким типом обличчя з нормальною оклюзією наближеною до ортогнатичного прикусу розроблено і проведено аналіз усіх 18 можливих достовірних регресійних моделей відтворення індивідуальних характеристик зубних дуг верхньої та нижньої щелеп в залежності від одонто- та кефалометричних показників.

Ключові слова: *регресійний аналіз, дівчата з ортогнатичним прикусом, дуже широкий тип обличчя, зубна дуга, одонтометричні та кефалометричні показники.*

МОДЕЛИРОВАНИЕ С ПОМОЩЬЮ РЕГРЕССИОННОГО АНАЛИЗА ПОПЕРЕЧНЫХ РАЗМЕРОВ ВЕРХНЕЙ И НИЖНЕЙ ЧЕЛЮСТЕЙ И САГИТТАЛЬНЫХ ХАРАКТЕРИСТИК ЗУБНОЙ ДУГИ У ДЕВУШЕК С ОЧЕНЬ ШИРОКИМ ЛИЦОМ В ЗАВИСИМОСТИ ОТ ОСОБЕННОСТЕЙ ОДОНТО- И КЕФАЛОМЕТРИЧЕСКИХ ПОКАЗАТЕЛЕЙ

Позур Т.П.

Предоставление максимальной индивидуальной ортодонтической помощи пациенту невозможно без использования современных инструментальных методов исследования и учета одонтометрических и кефалометрических характеристик представителей соответствующих популяций разного пола и возраста. Цель исследования - разработать и провести анализ регрессионных моделей компьютерно-томографических размеров, необходимых для построения корректной формы зубных дуг у девушек с очень широким лицом в зависимости от особенностей одонто- и кефалометрических показателей. Первичные компьютерно-томографические показатели размеров зубов и кефалометрические параметры 50 девушек с нормальной окклюзией приближенной к ортогнатическому прикусу получены из банка данных научно-исследовательского центра Винницкого национального медицинского университета им. Н.И. Пирогова. Тип лица определяли с помощью морфологического индекса Гарсона. Установлено следующее распределение: с очень широким лицом - 21, с широким лицом - 20, со средним лицом - 6, с узким лицом - 3, с очень узким лицом - 0. Поэтому для дальнейшего моделирования были выбраны только девушки с широким и очень широким лицом. Разработка регрессионных моделей линейных размеров, необходимых для построения корректной формы зубных дуг в зависимости от особенностей одонто- и кефалометрических показателей у девушек с очень широким лицом проведена в лицензионном статистическом пакете "Statistica 6,0". Установлено, что у девушек с очень широким типом лица с нормальной окклюзией построены все 18 возможных достоверных моделей (с коэффициентом детерминации от 0,863 до 0,962) линейных компьютерно-томографических размеров, используемых для построения корректной формы зубных дуг верхней и нижней челюстей, в зависимости от особенностей одонтометрических и кефалометрических показателей. К построенным моделям у девушек с очень широким типом лица более часто входят одонтометрические (73,0 %), чем кефалометрические (27,0 %) показатели. Среди одонтометрических показателей к моделям наиболее часто входят: ширина коронок зубов в мезио-дистальном направлении (20,7 %); ширина зубов на уровне анатомической шейки в мезио-дистальном направлении (14,4 %) и ширина коронок зубов в вестибуло-оральном направлении (10,8 %); а среди кефалометрических показателей - наибольшая длина головы (3,6 %); средняя ширина лица и высота *нижней губы (по 2,7 %). Таким образом, у девушек с очень широким типом лица с нормальной окклюзией приближенной к ортогнатическому прикусу разработаны и проведен анализ всех 18 возможных достоверных регрессионных моделей воспроизводства индивидуальных характеристик зубных дуг верхней и нижней челюстей в зависимости от одонто- и кефалометрических показателей.*

Ключевые слова: *регрессионный анализ, девушки с ортогнатическом прикусом, очень широкий тип лица, зубная дуга, одонтометрические и кефалометрические показатели.*