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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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INDIVIDUAL ANATOMICAL VARIABILITY OF THE ANTEROPOSTERIOR LATERAL DIMENSIONS OF THE FACIAL SKULL IN MATURE ADULTS

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Abstract.

Despite the significance of anatomical variability in various specialties, there is currently limited research dedicated to this topic. Most studies focus on the brain, with only a small number examining the human skull, primarily in relation to anatomical variability in childhood.

Aim: Therefore, the aim of our work is to determine the individual anatomical variability of the lateral dimensions of the facial section of the adult human skull.

Materials and Methods: The study included 115 skulls of mature individuals, comprising 35 dry bone specimens from the anatomy museum collection and 80 results from human head CT scans without bone tissue pathologies. To detail the craniometric characteristics of the lateral surface of the facial section of the skull, polygons (polygons) were constructed with dividing of the facial section of the skull is into the orbital-frontal, nasal, and maxillary. The facial profilegram of the skull was formed as a set of predetermined dimensions between facial profile points, presenting a continuous line passing through points gl-n-rhi-ns-pr-id-pg, reflecting the shape, dimensions, and position of the cranial profile of mature adults regardless of sex or cranial type.

Results: It was established that the longitudinal anteroposterior dimensions of the facial skull exhibit a certain range of variability in mature individuals depending on gender. For instance, the distance between the points gl-po (glabella-porion) reaches its maximum values in individuals with a brachycranial skull shape, ranging from 107 mm to 130 mm in men and from 104 mm to 128 mm in women. In individuals with a mesocranial skull shape, this parameter gradually decreases to 109-126 mm in men and 107-124 mm in women. A similar decrease is observed in those with a dolichocranial skull shape, where the range is 109-121 mm in men and 109-120 mm in women.

The distance between n-po (nasion-porion) in brachycranial and mesocranial individuals remains within 96-123 mm and 102-123 mm, regardless of gender, indicating that this parameter is relatively stable. However, in dolichocranial individuals, this distance decreases to 104-115 mm.

Conclusions: Individual anatomical variability of the anteroposterior lateral dimensions of the facial skeleton in mature individuals has been determined. A more in-depth analysis of the existing range of individual variability in the profile configuration of the facial skull was conducted using sagittal polygons. It was found that the polygons gl-po-n, n-po-rhi, and rhi-po-ns relate to the structure of the bony profile of the orbital-temporal and nasal regions of the facial skull, reflecting the upper, combined orbital-nasal section of the head.

Key words. Individual anatomical variability, anteroposterior lateral dimensions, computer tomography, facial skull.

Introduction.

The study of individual anatomical variability currently occupies a leading position in many medical fields [1-3]. New knowledge about the specific structure of different body areas can facilitate surgical planning, aiding in the correct selection of surgical approaches [4,5] during operations. For example, a well-known approach is the surgical access to the pituitary gland [6] through the nasal cavity. Understanding the variations in facial skull structure is essential for choosing the optimal surgical approach to this area, potentially reducing operation time and minimizing costs.

Moreover, knowledge of skull and other body part structures can reduce the likelihood of intra- and post-operative complications [7]. It is crucial to recognize that understanding anatomical variability is not only essential in practical medicine but also in theoretical medicine [8]. For instance, creating models that account for anatomical variability is crucial for students to properly understand anatomical structures and practice surgical skills.

Despite the significance of anatomical variability in various specialties, there is currently limited research dedicated to this topic. Most studies focus on the brain, with only a small number examining the human skull, primarily in relation to anatomical variability in childhood. Therefore, the **aim** of our work is to determine the individual anatomical variability of the lateral dimensions of the facial section of the adult human skull.

Materials and Methods.

Our study included 115 skulls of mature individuals, comprising 35 dry bone specimens from the anatomy museum collection and 80 results from human head CT scans without bone tissue pathologies. Considering the possibility that the results obtained depend on the race of the persons the skulls of all studied individuals belonged to the group of Eastern Slavs. These materials were collected through collaboration agreements with medical diagnostic centers.

The study was approved by the Bioethics Committee of Kharkiv National Medical University. We certificate that the procedures and the experiments we've done respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2000 (5), as well as the national law after approval from the Regional Ethical Review Board at Kharkiv National Medical University

To detail the craniometric characteristics [9] of the lateral surface of the facial section of the skull, polygons (polygons) were constructed. These polygons visually represented the properties of the studied area depending on sex and established cranial type. The smallest structural unit of these figures was a triangle, constructed based on anterior-lateral dimensions and one closing dimension between facial profile points.

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Based on the cranial index, which is the ratio of the width to the length of the skull all skulls can be divided into:

1. Brachicrany: A skull with a high cranial index (above 80), indicating a broad and short head.

2. Mesocrany: A skull with an intermediate cranial index (between 75 and 80), indicating a medium or average head shape.

3. Dolichocrany: A skull with a low cranial index (below 75), indicating a long and narrow head.

The facial section of the skull [10] is divided into the orbital-frontal, nasal, and maxillary sections according to its development, functional significance, and structural features. Thus, polygons such as gl-po-n, n-po-rhi, and rhi-po-ns correspond to the orbital-frontal and nasal areas, while polygons ns-po-pr, pr-po-id, and id-po-pg are located in the maxillary section. Depending on the task, these figures can be combined to form other polygon varieties, such as quadrilaterals or pentagons.

Furthermore, a facial profilegram of the skull [11] was formed as a set of predetermined dimensions between facial profile points, presenting a continuous line passing through points gl-n-rhi-ns-pr-id-pg, reflecting the shape, dimensions, and position of the cranial profile of mature adults regardless of sex or cranial type. Graphical representations of the obtained polygon models and profilegrams are presented in Figure 1.

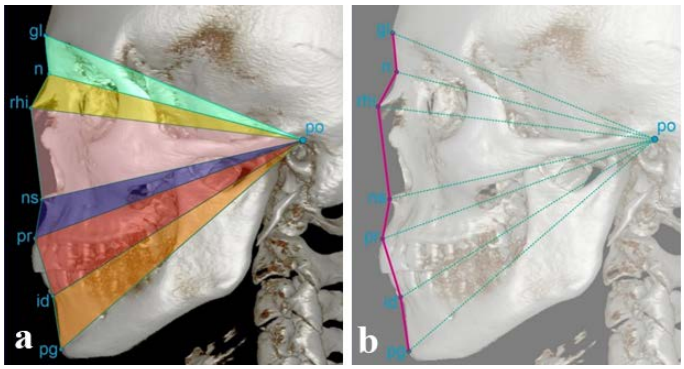

Figure 1. *External view of constructed models on the skull of an adult human. a-polygons; b-profilogram.*

The statistical analysis was conducted using methods of variation statistics. The normality of the distribution was evaluated with the Shapiro-Wilk test, which confirmed that the samples closely followed a normal distribution. The statistical results are presented as M±σ, where M represents the arithmetic mean, σ denotes the standard deviation, and t refers to the student's t-test. Correlation analysis was performed using Spearman's rank correlation coefficient. Differences between the studied parameters were considered statistically significant when p was less than 0.05.

Results and Discussion.

In line with the foundations of medical craniology, our study presents the craniotopographic and osteometric findings related to the facial skull observed in mature men and women, considering the existing cranial type. These findings aim to identify signs of individual anatomical variability in the lateral (anteroposterior and profile) dimensions of the skull.

In this context, the facial section of the skull was analyzed from the perspectives of modern dentistry and orthodontics, with descriptions of profilegrams and the formation of polygons between established craniometric points in the sagittal plane (side view). We systematically compared the longitudinal (anteroposterior) and height (profile) dimensions of the facial skull.

It was determined that there is a certain range of variability in the above-mentioned parameters, which were obtained by connecting craniometric points along the anterior contour of the facial skull with lines.

The properties of the lateral craniotopography of the facial section of the skull were thoroughly studied, particularly considering the construction of polygons between commonly accepted craniometric points and their distances from the external auditory canal (porion). This has significant practical implications in craniology, especially in terms of individual anatomical variability. This includes the identification of cranial types during life and the detailed description of their existing shapes and sizes. The measurement results and established size ranges for the studied dimensions are presented in Tables 1 and 2.

Table 1. *Range of Individual Variability in the Anteroposterior Lateral Dimensions of the Facial Skull in Adult Men (mm).*

Craniotype / Size	Brachicrany	Mesocrany	Dolichocrany
gl-po	107-130	109-126	110-121
n-po	97-123	103-123	105-115
rhi-po	105-134	100-127	109-120
ns-po	103-129	101-125	107-115
pr-po	104-128	106-124	103-117
id-po	118-134	125-136	130-137
pg-po	127-142	130-145	132-147

Table 2. *Range of Individual Variability in the Anteroposterior Lateral Dimensions of the Facial Skull in Adult Women (mm).*

Craniotype / Size	Brachicrany	Mesocrany	Dolichocrany
gl-po	104-128	107-124	109-120
n-po	96-122	102-121	104-114
rhi-po	104-132	100-125	108-119
ns-po	102-127	100-124	106-114
pr-po	103-126	104-123	101-116
id-po	116-132	123-134	128-134
pg-po	125-140	128-142	130-145

It was established that the longitudinal anteroposterior dimensions of the facial skull exhibit a certain range of variability in mature individuals depending on gender.

For instance, the distance between the points gl-po (glabella-porion) reaches its maximum values in individuals with a brachycranial skull shape, ranging from 107 mm to 130 mm in men and from 104 mm to 128 mm in women. In individuals with a mesocranial skull shape, this parameter gradually decreases to 109-126 mm in men and 107-124 mm in women. A similar decrease is observed in those with a dolichocranial skull shape, where the range is 109-121 mm in men and 109-120 mm in women.

The distance between n-po (nasion-porion) in brachycranial and mesocranial individuals remains within 96-123 mm and 102-123 mm, regardless of gender, indicating that this parameter is relatively stable. However, in dolichocranial individuals, this distance decreases to 104-115 mm.

The craniometric size between rhi-po (rhion-porion) varies as follows: in brachycranials, it ranges from 105 mm to 134 mm in men and from 104 mm to 132 mm in women. In mesocranials, the range is 100-127 mm in men and 100-125 mm in women, while in dolichocranials, it decreases to 109-120 mm in men and 108-119 mm in women.

The distance between ns-po (nasospinale-porion) is the greatest in brachycranials, ranging from 103 mm to 129 mm in men and 102 mm to 127 mm in women. In mesocranials, there is a slight reduction to 101-125 mm in men and 100-124 mm in women. The parameter further decreases in dolichocranials, where the range is 107-115 mm in men and 106-114 mm in women.

The distance between pr-po (prostion-porion) shows a gradual decrease from brachycranials, where it ranges from 103 mm to 128 mm regardless of gender, to mesocranials, where it ranges from 104 mm to 124 mm, and dolichocranials, where it ranges from 101 mm to 117 mm.

The distance between id-po (infradentale-porion) shows little individual variation: in brachycranials, it ranges from 118 mm to 134 mm in men and from 116 mm to 132 mm in women. In mesocranials, the range is 125-136 mm in men and 123-134 mm in women, while in dolichocranials, it ranges from 130 mm to 137 mm in men and from 128 mm to 134 mm in women.

Accordingly, the distance between pg-po (pogonion-porion) in brachycranials varies from 127 mm to 142 mm in men and from 125 mm to 140 mm in women. In mesocranials, it ranges from 130 mm to 145 mm in men and from 128 mm to 142 mm in women. In dolichocranials, the range is from 132 mm to 147 mm in men and from 130 mm to 145 mm in women.

To obtain reliable statistical data and construct profile craniograms, we conducted an appropriate analysis of each anteroposterior parameter of the facial section of the skull (Table 3).

Table 3. *Statistical Indicators of the Anteroposterior Dimensions of the Facial Skull in Adult Humans (mm).*

Statistical indicator / Craniotype	Male			Female		
	$\bar{x}$	σ	$m_{\bar{x}}$		σ	$m_{o\bar{x}}$
Size gl-po						
Brachicrany	118,60	1,63	1,01	117,36	1,23	0,84
Mesocrany	114,58	1,12	0,98	113,41	1,67	1,02
Dolichocrany	113,28	1,58	0,87	112,64	1,71	1,06
Size n-po						
Brachicrany	109,22	1,70	1,41	108,91	2,08	1,12
Mesocrany	108,88	1,32	1,48	108,38	1,69	1,26
Dolichocrany	107,58	1,26	1,32	107,42	1,44	1,59
Size rhi-po						
Brachicrany	115,82	1,76	1,11	114,22	1,41	0,94
Mesocrany	113,61	1,57	1,08	112,64	1,38	0,88
Dolichocrany	111,06	1,23	1,21	111,82	1,16	1,10
Size ns-po						
Brachicrany	113,68	1,26	1,06	112,77	1,72	1,01
Mesocrany	110,56	1,51	1,20	109,82	1,50	0,97
Dolichocrany	109,12	1,30	1,14	108,16	1,33	0,89
Size pr-po						
Brachicrany	114,88	1,77	1,11	113,28	1,28	1,10
Mesocrany	111,24	1,62	1,02	110,67	1,61	1,26
Dolichocrany	110,60	1,44	1,24	109,46	1,32	1,36
Size id-po						
Brachicrany	126,76	1,43	0,94	125,18	1,41	0,91
Mesocrany	130,14	1,63	0,98	129,42	1,28	0,98
Dolichocrany	135,10	1,41	0,89	134,60	1,16	1,06
Size pg-po						
Brachicrany	137,88	1,28	1,24	136,42	1,52	1,01
Mesocrany	138,62	1,87	1,07	138,16	1,36	0,94
Dolichocrany	141,16	1,62	1,18	140,67	1,28	0,87

The given table indicates that there is a certain range of variability in the anteroposterior dimensions of the facial skeleton, which is entirely dependent on the shape of the human head. For instance, the distance between the glabella and the external auditory canal (gl-po measurement) is generally greater in brachycranial individuals, with mean values of $\bar{x}$; = 118.60 mm, σ = 1.63, and $m_{\bar{x}}$; = 1.01 in men, and $\bar{x}$; = 117.36 mm, σ = 1.23, and $m_{\bar{x}}$; = 0.84 in women. In mesocranial individuals, this distance measures $\bar{x}$; = 114.58 mm, σ = 1.12, and $m_{\bar{x}}$; = 0.98 (men), and $\bar{x}$; = 113.41 mm, σ = 1.67, and $m_{\bar{x}}$; = 1.02 (women); in dolichocranial individuals, the measurement is $\bar{x}$; = 113.28 mm, σ = 1.58, and $m_{\bar{x}}$; = 0.87 (men), and $\bar{x}$; = 112.64 mm, σ = 1.71, and $m_{\bar{x}}$; = 1.06 (women).

The statistical indicators of the arithmetic mean confirm the variability of the gl-po dimension, with the largest values in brachycranial individuals and the smallest in dolichocranial individuals, regardless of sex. This is explained by a significant increase in the width of the facial bones in the former, starting with the frontal bone and the glabella, which results in the external auditory canal (porion) being positioned farther back.

The rhi-po dimension is an important facial skeleton distance in the sagittal plane, reflecting the position of the rhinion (rhi), the point where the anterior edges of the nasal bones converge. These bones determine the shape and size of both the internal and external parts of the nose. Accordingly, the arithmetic mean of this dimension reaches its maximum values in brachycranial individuals, depending on sex: men – $\bar{x}$; = 115.82 mm, σ = 1.76, and $m_{\bar{x}}$; = 1.11, women – $\bar{x}$; = 114.22 mm, σ = 1.41, and $m_{\bar{x}}$; = 0.94; intermediate values in mesocranial individuals: $\bar{x}$; = 113.61 mm, σ = 1.57, and $m_{\bar{x}}$; = 1.08 for men, and $\bar{x}$; = 112.64 mm, σ = 1.38, and $m_{\bar{x}}$; = 0.88 for women; and reduced values in dolichocranial individuals: $\bar{x}$; = 111.06 mm, σ = 1.23, and $m_{\bar{x}}$; = 1.21 (men), and $\bar{x}$; = 111.82 mm, σ = 1.16, and $m_{\bar{x}}$; = 1.10 (women).

This somewhat reflects the individual anatomical variability of the nasal region of the facial skeleton, reaching the highest average values in people with a brachycranial head shape.

A similar craniological correlation is seen in the next sagittal parameter, ns-po, which reflects an important profile characteristic of the facial skeleton structure. In brachycranial men, the arithmetic mean reaches its maximum value – $\bar{x}$; = 113.68 mm, σ = 1.26, and $m_{\bar{x}}$; = 1.06, while in women it is $\bar{x}$; = 112.77 mm, σ = 1.72, and $m_{\bar{x}}$; = 1.01. In mesocranial

individuals, this measurement decreases to $\overline{X}$; = 110.56 mm, σ = 1.51, and $m_{\overline{x}}$; = 1.20 (men) and $\overline{x}$; = 109.82 mm, σ = 1.50, and $m_{\overline{x}}$; = 0.97 (women); in dolichocranial individuals, the minimum value is observed – $\overline{X}$ = 109.52 mm, σ = 1.30, and $m_{\overline{x}}$; = 1.14 (men), and $\overline{x}$; = 108.16 mm, σ = 1.33, and $m_{\overline{x}}$; = 0.89 (women). The nasospinale point is located on the lower edge of the piriform aperture (nasal opening) and is the primary reference for the longitudinal configuration of the nasal part of the facial skeleton. This explains the increased ns-po distance in brachycranial individuals, with a gradual decrease in meso- and dolichocranial individuals.

Additionally, it was found that the next facial skeleton dimension, pr-po (prostion-porion), also shows a characteristic osteometric range depending on the cranial type.

In brachycranial individuals, the arithmetic mean of this parameter reaches the highest values in men – $\overline{X}$; = 114.88 mm, σ = 1.77, and $m_{\overline{x}}$; = 1.11, and in women – $\overline{X}$; = 113.28 mm, σ = 1.28, and $m_{\overline{x}}$; = 1.10. In mesocranial individuals, this distance decreases to $\overline{X}$; = 111.24 mm, σ = 1.62, and $m_{\overline{x}}$; = 1.02 (men), and $x;^{-}$ = 110.67 mm, σ = 1.61, and $m_{\overline{x}}$; = 1.26 (women); in dolichocranial individuals, the value decreases to $\overline{X}$; = 110.60 mm, σ = 1.44, and $m_{\overline{x}}$; = 1.24 (men), and $\overline{X}$; = 109.46 mm, σ = 1.32, and $m_{\overline{x}}$; = 1.36 (women). Accordingly, the anterior point of the mandible (pr), located between the central incisors, is more forward in individuals with a brachycranial skull type, with a corresponding cranio-metric decrease in those with meso- and dolichocranial cranial types.

The id-po dimension (infradentale-porion), which is measured between the central incisors of the mandible and the external auditory canal, fully reflects the variability of the lower part of the facial skeleton in the sagittal plane. It has been established that the smallest statistical values are characteristic of brachycranial individuals: $\overline{X}$; = 126.76 mm, σ = 1.43, and m $_{\overline{x}}$; = 0.94 in mature men, and $\overline{X}$; = 125.18 mm, σ = 1.41, and m $_{\overline{x}}$; = 0.91 in women. In mesocranial individuals, the first group shows average values: $\overline{X}$; = 131.4 mm, σ = 1.63, and $m_{\overline{x}}$; = 0.98, while in the second group – $\overline{X}$; = 129.42 mm, σ = 1.28, and $m_{\overline{x}}$; = 0.98. In dolichocranial men, the arithmetic mean reaches $\overline{X}$; = 135.10 mm, σ = 1.41, and $m_{\overline{x}}$; = 0.89, and in women with this cranial type – $\overline{X}$; = 134.60 mm, σ = 1.16, and $m^{\overline{x}}$; = 1.06. This indicates that meso- and dolichocranial individuals have a more pronounced protrusion of the mandible with the lower row of teeth more forward, while in brachycranial individuals, it is more retracted due to the characteristic sloping and rounding of the mandible.

Significant attention is also given to the lowest anteroposterior dimension of the facial skeleton, pg-po, which is measured between the pogonion (the most forward point on the chin) and the porion. In brachycranial men, the mean value of this parameter does not exceed $\overline{x}$; = 137.88 mm, σ = 1.28, and m_{x}; 1.24, while in women, it is $\overline{x}$; = 136.42 mm, σ = 1.52, and m_{x}; = 1.01. In mesocranial individuals, this indicator increases to $\overline{x}$; = 138.62 mm, σ = 1.87, and $m_{\overline{x}}$; = 1.07 (men) and $^{\overline{x}}$; = 138.16 mm, σ = 1.36, and $m_{x};^{-}$ = 0.94 (women); in dolichocranial individuals, it reaches maximum values – $\overline{x}$; = 141.16 mm, σ = 1.62, and $m_{\overline{x}}$; = 1.18 (men), and $\overline{X}$; = 140.67 mm, σ = 1.28, and $m_{\overline{x}}$; = 0.87 (women). This sagittal dimension is directly dependent on the previous parameter (id-po) according to the identified characteristics of the individual structure of the facial skeleton.

Based on the above, a more in-depth analysis of the existing range of individual variability in the profile configuration of the facial skeleton was conducted using sagittal polygons.

It was found that the polygons gl-po-n; n-po-rhi; and rhi-po-ns pertain to the structure of the bony profile of the ocular-temporal and nasal parts of the facial skeleton, which reflect the upper, combined, ocular-nasal part of the head. Therefore, these figures should be considered together.

The data obtained from this study are of great significance across various branches of medicine, including otolaryngology, neurosurgery, ophthalmology, neurology, prominent diagnostics, anatomy, stomatology, and pathological anatomy due to detected early connection of anatomical peculiarities and pathological process development [12,13] with compound pathogenesis [14,15] especially in conditions of harmful factor especially [16,17], inflammatory [18,19] and infectious processes [20,21]. New medical technology should be realized in significant achievement for treatment and diagnostic [22,23], but classical anatomical methods are still crucial [24,25]. In the future, these findings may be expanded [26,27], supplemented with new research methods, and integrated into the theoretical training of students and the practical work of physicians [28-30].

Conclusion.

1. Individual anatomical variability of the anteroposterior lateral dimensions of the facial skeleton in mature individuals has been determined.
2. A more in-depth analysis of the existing range of individual variability in the profile configuration of the facial skeleton was conducted using sagittal polygons.
3. It was found that the polygons gl-po-n, n-po-rhi, and rhi-po-ns relate to the structure of the bony profile of the orbital-temporal and nasal regions of the facial skull, reflecting the upper, combined orbital-nasal section of the head.

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Conflict of interest statement.

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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