https://doi.org/10.54500/2790-1203-2024-2-121-4-11
UDC 616-091
IRSTI 76.03.49

Original article

The Divided Hypoglossal Canal of Males and Females at Different Age Periods

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Abstract

The purpose of the study was to study the division of the hypoglossal canal in terms of age and gender.

Methods. The research material was 200 skulls (20 skulls of adolescence age, I adulthood age 68, II adulthood age 72, and elderly age 40. In total, there were 86 male skulls and 114 female skulls). For analyzing the obtained arithmetic data, the Pearson Chi-Square Test, Mann-Whitney U test, and Kruskal-Wallis H test were used. Statistical analysis was carried out using the program "IBM Statistics SPSS-26".

Results. The difference in the division of the left and right hypoglossal canals between the male and female skulls in the gender aspect was not statistically significant (for the left divided hypoglossal canal PU = 0.668; for the right divided hypoglossal canal PU = 0.284). The hypoglossal canal and its division in the gender aspect also showed statistical insignificance with the use of the Pearson Chi-Square Test (for the left divided hypoglossal canal Pχ2 = 0.888 and for the right divided hypoglossal canal Pχ2 = 0.506). The division of the hypoglossal canals in age aspect also showed that the difference is statistically insignificant (for the left divided hypoglossal canal Pχ2 = 0.538 and for the right divided hypoglossal canal Pχ2 = 0.355). In female skulls, the difference between age periods was statistically significant for the left hypoglossal canal (PH = 0.047). The difference between male and female skulls in terms of age does not appear to be statistically significant. Only in the elderly age period is the difference for the left divided hypoglossal canal weakly significant (PU = 0.051).

Conclusion. The data obtained on the age and gender characteristics of the divided hypoglossal canal are of interest when planning surgical interventions in the posterior cranial fossa.

Key words: the divided hypoglossal canal, male skulls, female skulls, age periods.

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2024; 2 (121): 4-11
Recieved: 15-01-2024
Accepted: 20-02-2024

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Introduction

The hypoglossal canal may be involved in various pathological conditions requiring surgical intervention. There are many surgical approaches for various operations that require correct morphometry of the hypoglossal canal. It is essential for neurosurgeons to understand the types of endocranial hypoglossal canals. This knowledge is especially important when accessing the posterior cranial fossa. Surgical strategy, as well as preserving adjacent structures, depend on detailed information about the anatomical relationships between the mentioned structures and the symmetrical organization of the hypoglossal canals. For transcondylar approaches, it is of great importance to consider the relationship between the occipital condyle and the hypoglossal canal [1-3]. Since the location and morphology of the hypoglossal canal are adjacent to the occipital lobe, the cerebellum, and the brain stem, it has the peculiarity of being a landmark for surgical intervention in cases of changes in the base of the skull and pathologies in this area (tumors, aneurysms, congenital or acquired malformations, trauma) [4].

The hypoglossal canal (or anterior condylar canal) begins slightly superior to the anterolateral portion of the foramen magnum and runs anterolaterally. It transmits the hypoglossal nerve, the meningeal branch of the ascending pharyngeal artery, and the emissary vein from the basilar plexus. The position of the hypoglossal canal was consistently located in the occipital bone. It is situated anteriorly, inferiorly, and slightly medial to the anteroinferior edge of the jugular foramen. The canal is surrounded superiorly by the jugular tubercle, superolaterally by the jugular foramen, laterally by the sigmoid sinus, and inferiorly by the occipital condyle [5-8].

A pair of endochondral ossification centers appear at week 12 of intrauterine life. These centers form exooccipital bones lateral to the foramen magnum, including the posterior two-thirds of the occipital condyles. By surrounding the hypoglossal nerves, they form the hypoglossal canals [9]. It is indicated that the failure of the obliteration results in the persistence of the hypoglossal arteries. In this case, the vertebral arteries are hypoplastic, and the ipsilateral vertebral artery may be present. The presence of the hypoglossal artery is frequently associated with other vascular or organic abnormalities and diseases [10-12]. The venous plexus of the hypoglossal canal, which occasionally appears as a single vein, connects the sigmoid sinus and the internal jugular vein. The inferior petrosal sinus passes through the anteromedial part of the jugular foramen on each side. A meningeal branch of the ascending pharyngeal artery accompanies it. Then the inferior petrosal sinus descends obliquely backwards to drain into the superior jugular bulb. It sometimes drains via a vein in the hypoglossal canal to the suboccipital vertebral plexus [13]. The hypoglossal nerve gives off multiple meningeal filaments to the dura mater that lines the posterior cranial fossa in the hypoglossal canal [14].

A bony spicule may divide the hypoglossal canal. In this case, a bony spicule separates the meningeal branch of the ascending pharyngeal artery from the hypoglossal nerve. Clinically, the double hypoglossal canal is important in diseases that affect the hypoglossal nerve and the canal at the base of the skull. Different types of diseases can be observed in the hypoglossal canal area: benign tumors such as large glomus jugulare neoplasms and other neoplasms of the skull base, metastases and myelomas, and tumors of neural origin such as neuromas and schwannomas. Meningiomas can also occur in this area [15, 16]. Osteotic anatomical variations in the hypoglossal canal are of clinical importance for the neural as well as the vascular structures passing through the canal. Spurs and partitions in the canal will divide the canal into compartments capable of compressing these structures [4].

According to [17], the morphology of the hypoglossal canal is quite variable. The spicules or even bone bridges are present inside the canal, which can lead to ensnare of the nerve during ossification of the occipital bone, causing changes in speech.

The significance of the hypoglossal canal and the structures passing through it is quite important in morphological terms. Studies conducted on various materials-cadaveric, craniological, or clinical-confirm this in general. Despite this, information regarding the gender and age characteristics of the canal is still very scarce. The same can be said about morphological studies devoted to the division, complete or partial, of the hypoglossal canal. Based on this, we set a goal to study the division of the hypoglossal canal on craniological material in terms of gender and age aspects.

The purpose of the study was to study the division of the hypoglossal canal in terms of age and gender.

Material and methods

The research material was 200 skulls from the craniological collection of the museum of the Department of Human Anatomy and Medical Terminology of the Azerbaijan Medical University.

The age periodization scheme adopted in 1965 at the 7th All-Union Conference on Problems of Age-Related Morphology, Physiology, and Biochemistry was used [18]. Thus, there were 20 skulls of adolescence age, I adulthood age 68, II adulthood age 72, and elderly age 40. In total, there were 86 male skulls and 114 female skulls. Skulls with a destroyed posterior section of the base were not used for investigation in the study. The division of the hypoglossal canals into “complete” and “partial” was carried out according to [19].

For analyzing the obtained arithmetic data, the Pearson Chi-Square Test, Mann-Whitney U test, and Kruskal-Wallis H test were used. Statistical analysis was carried out using the program "IBM Statistics SPSS-26". The presence of the complete and partially divided hypoglossal canal was determined by the cranioscopic method and the method of computed tomography.

Results

The results of the study were tabulated. Table 1 shows data on the division of the hypoglossal canal in the studied craniological material in a gender aspect.

Table 1 - The hypoglossal canal and its division in the gender aspect

Hypoglossal canal type		Gender					
		Male		Female		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Left divided hypoglossal canal	non-divided	64	74.4%	82	71.9%	146	73.0%
	partially divided	7	8.1%	9	7.9%	16	8.0%
	divided	15	17.4%	23	20.2%	38	19.0%
Right divided hypoglossal canal	non-divided	62	72.1%	90	78.9%	152	76.0%
	partially divided	8	9.3%	7	6.1%	15	7.5%
	divided	16	18.6%	17	14.9%	33	16.5%

The use of the Mann-Whitney U test showed that the difference in the division of the left and right hypoglossal canals between the male and female skulls in the gender aspect was not statistically significant (for the left divided hypoglossal canal PU = 0.668; for the right divided hypoglossal canal PU = 0.284). The use of Pearson Chi-Square Tests of the hypoglossal canal and its division in the gender aspect also showed statistical insignificance (for the left divided hypoglossal canal $P\chi2 = 0.888$ and for the right divided hypoglossal canal $P\chi2 = 0.506$).

The division of the hypoglossal canals in age aspect (Table 2) also demonstrated that the difference is statistically insignificant with the use of Pearson Chi-Square Tests (for the left divided hypoglossal canal $P\chi2 = 0.538$ and for the right divided hypoglossal canal $P\chi2 = 0.355$).

Table 2 - The hypoglossal canal and its division in the age aspect

Hypoglossal canal type			Age groups				
			Adolescence	I adulthood	II adulthood	Elderly	Total
Left divided hypoglossal canal	non-divided	Count	17	47	50	32	146
		Column N %	85.0%	69.1%	69.4%	80.0%	73.0%
	partially divided	Count	2	5	7	2	16
		Column N %	10.0%	7.4%	9.7%	5.0%	8.0%
	divided	Count	1	16	15	6	38
		Column N %	5.0%	23.5%	20.8%	15.0%	19.0%
Right divided hypoglossal canal	non-divided	Count	15	47	60	30	152
		Column N %	75.0%	69.1%	83.3%	75.0%	76.0%
	partially divided	Count	1	5	4	5	15
		Column N %	5.0%	7.4%	5.6%	12.5%	7.5%
	divided	Count	4	16	8	5	33
		Column N %	20.0%	23.5%	11.1%	12.5%	16.5%

The use of the Kruskal-Wallis H test showed that for the left divided hypoglossal canal PH = 0.290 and for right divided hypoglossal canal PH = 0.243.

On male skulls during the adolescent period, the left hypoglossal canal was not divided in 5 cases (83.3%) but partially divided in 1 case (16.7%). In this age period, we did not find complete division of the left hypoglossal canal. In the first adulthood, the left hypoglossal canal was not divided in 21 cases (75.0%) in male skulls; in 3 cases, the left hypoglossal canal was partially divided (10.7%); and in four skulls, the division of the left hypoglossal canal was complete (14.3%) (Figure 1).

In the second adulthood period, in 26 cases, division of the left hypoglossal canal was not observed in male skulls (76.5%). In the same age period, the left hypoglossal canal was partially divided into 2 skulls (5.9%); in 6 cases, the left hypoglossal canal was completely divided (17.6%). In the elderly age period on male skulls, the left hypoglossal canal was not divided in 12 cases (66.7%); on one skull there was partial (5.6%) and on five (27.8%) complete division of the left hypoglossal canal. Thus, on male skulls, the frequency of division of the left hypoglossal canal by age period was as follows: non-divided: 64 skulls (74.4%), partially divided: 7 skulls (8.1%), and divided: 15 skulls (17.4%).

The right hypoglossal canal, according to our investigation, was not divided on male skulls during the adolescent period in four cases (66.7%). In this period, we observed a partially divided right hypoglossal canal in one case (16.7%), and the number of skulls with complete division of the right hypoglossal canal was also one (16.7%). In the first adulthood period, the division of the right hypoglossal canal is characterized as follows: non-divided: 19 skulls (67.9%), partially divided: 3 skulls (10.7%), and divided: 6 skulls (21.4%).

Figure 1 - The male skull of I adulthood period. Left complete divided hypoglossal canal

The right hypoglossal canal was not divided on male skulls in the second adulthood period in 27 cases (79.4%), partially divided in two (5.9%), and completely divided in five cases (14.7%). In the elderly age period, the right hypoglossal canal was not divided on male skulls in 12 cases (66.7%), partially divided in 2 cases (11.1%), and completely divided in 4 cases (22.2%). Thus, according to our investigation, the right hypoglossal canal was not divided in 62 cases (72.1%), partially divided in 8 cases (9.3%), and completely divided in 16 cases (18.6%).

The difference is not statistically significant with the use of Pearson Chi-Square Tests in male age groups of skulls (for the left divided hypoglossal canal $P\chi2 = 0.722$, and for the right divided hypoglossal canal, $P\chi2 = 0.932$). The Kruskal-Wallis H test showed that for the left divided hypoglossal canal, PH = 0.742 and for right divided hypoglossal canal, PH = 0.718 in male age groups of skulls. The results of the study on female skulls are shown in Table 3.

Table 3 - The hypoglossal canal and its division in the age aspect on female skulls

Hypoglossal canal type			Age groups				
			Adolescence	I adulthood	II adulthood	Elderly	Total
Left divided hypoglossal canal	non-divided	Count	12	26	24	20	82
		Column N %	85.7%	65.0%	63.2%	90.9%	71.9%
	partially divided	Count	1	2	5	1	9
		Column N %	7.1%	5.0%	13.2%	4.5%	7.9%
	divided	Count	1	12	9	1	23
		Column N %	7.1%	30.0%	23.7%	4.5%	20.2%
Right divided hypoglossal canal	non-divided	Count	11	28	33	18	90
		Column N %	78.6%	70.0%	86.8%	81.8%	78.9%
	partially divided	Count	-	2	2	3	7
		Column N %	-	5.0%	5.3%	13.6%	6.1%
	divided	Count	3	10	3	1	17
		Column N %	21.4%	25.0%	7.9%	4.5%	14.9%

The difference is not statistically significant with the use of Pearson Chi-Square Tests in female age groups of skulls (for the left divided hypoglossal canal $P\chi2 = 0.116$, and for the right divided hypoglossal canal, $P\chi2 = 0.138$). The Kruskal-Wallis H test showed that for the left divided hypoglossal canal, PH = 0.047 and for right divided hypoglossal canal, PH = 0.257 in female age groups of skulls. Thus, the Kruskal-Wallis H test made it possible to discover that for the left divided hypoglossal canal, the difference is statistically significant in female age groups of skull (Figures 2 and 3).

a *b* *c*

Figure 2 - The female skulls of I (a, c) and II (b) adulthood periods. Complete (a, c) and partially (b) divided hypoglossal canal

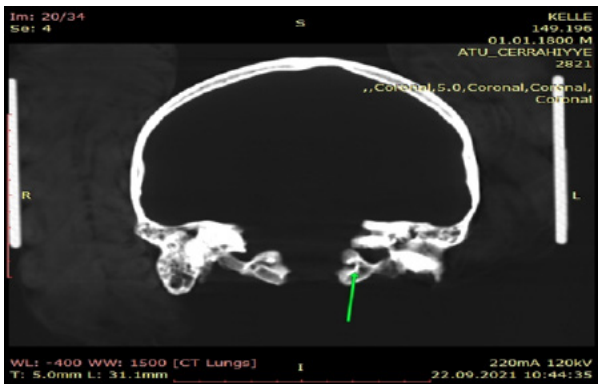

Figure 3 - CT of female skull. II adulthood period. Complete division of the left hypoglossal canal is indicated by an arrow

Table 4 shows the results of the study on gender features of the frequency of the division of the hypoglossal canal in adolescence. For the left divided hypoglossal canal, Pχ2 = 0,666; PU = 0.947; and for the right divided hypoglossal canal, Pχ2 = 0,292; PU = 0.703. Thus, the difference in the divided hypoglossal canal between the male and female skulls in adolescence was not statistically significant.

Table 4 - Age group: Adolescence

Hypoglossal canal type		Gender					
		Male		Female		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Left divided hypoglossal canal	non-divided	5	83.3%	12	85.7%	17	85.0%
	partially divided	1	16.7%	1	7.1%	2	10.0%
	divided	-	-	1	7.1%	1	5.0%
Right divided hypoglossal canal	non-divided	4	66.7%	11	78.6%	15	75.0%
	partially divided	1	16.7%	-	-	1	5.0%
	divided	1	16.7%	3	21.4%	4	20.0%

Table 5 demonstrates the difference between the same parameters in the first adulthood period.

Table 5 - Age group = I adulthood

Hypoglossal canal type		Gender					
		Male		Female		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Left divided hypoglossal canal	non-divided	21	75,0%	26	65,0%	47	69,1%
	partially divided	3	10,7%	2	5,0%	5	7,4%
	divided	4	14,3%	12	30,0%	16	23,5%
Right divided hypoglossal canal	non-divided	19	67,9%	28	70,0%	47	69,1%
	partially divided	3	10,7%	2	5,0%	5	7,4%
	divided	6	21,4%	10	25,0%	16	23,5%

For the left divided hypoglossal canal, Pχ2 = 0.259; PU = 0.282; and for the right divided hypoglossal canal Pχ2 = 0.660; PU = 0.963. Tables 6 and 7 clarify the results of the study on gender features of the frequency of the division of the hypoglossal canal in II adulthood and elderly periods, respectively.

Table 6 - Age group = II adulthood

Hypoglossal canal type		Gender					
		Male		Female		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Left divided hypoglossal canal	non-divided	26	76,5%	24	63,2%	50	69,4%
	partially divided	2	5,9%	5	13,2%	7	9,7%
	divided	6	17,6%	9	23,7%	15	20,8%
Right divided hypoglossal canal	non-divided	27	79,4%	33	86,8%	60	83,3%
	partially divided	2	5,9%	2	5,3%	4	5,6%
	divided	5	14,7%	3	7,9%	8	11,1%

For the left divided hypoglossal canal, Pχ2 = 0.417; PU = 0.265; and for the right divided hypoglossal canal Pχ2 = 0.644; PU = 0.384.

Table 7 - Age group = Elderly

Hypoglossal canal type		Gender					
		Male		Female		Total	
		Count	Column N %	Count	Column N %	Count	Column N %
Left divided hypoglossal canal	non-divided	12	66.7%	20	90.9%	32	80.0%
	partially divided	1	5.6%	1	4.5%	2	5.0%
	divided	5	27.8%	1	4.5%	6	15.0%
Right divided hypoglossal canal	non-divided	12	66.7%	18	81.8%	30	75.0%
	partially divided	2	11.1%	3	13.6%	5	12.5%
	divided	4	22.2%	1	4.5%	5	12.5%

For the left divided hypoglossal canal, Pχ2 = 0.116; PU = 0.051; and for the right divided hypoglossal canal Pχ2 = 0.243; PU = 0.209. According to the study, the difference between male and female skulls in terms of age does not appear to be statistically significant. Only in the elderly age period is the difference for the left divided hypoglossal canal weakly significant.

Discussion

Adequate knowledge of the anatomy of the hypoglossal canal and its associated bony, neural, and vascular structures is essential for the surgery of lesions involving this area. Detailed knowledge of the microsurgical anatomy of the hypoglossal canal region is critical when performing operations for lesions of the condylar region, inferior clivus, and ventral brainstem [8]. The study [20] included 56 dry skulls. According to the authors, 14 hypoglossal canals were divided into two compartments by a septum. As stated in the study, with the transcondylar approach, anatomical landmarks must be well known to perform a safe resection of the occipital condyle.

The investigation in [21] is devoted to the study of the variant anatomy of the hypoglossal canal using osteological material in the North Indian population. The study was a cross-sectional, that was conducted on 80 intact, dry adult skulls. The age and gender of the skulls used in the study were not known. In this study, the authors reported 18 cases (22.5%) of "double" hypoglossal canal. They also observed bilateral duplication in 3 skulls (3.75%). Unilateral duplication was observed in 15 skulls (18.75%) (7 on the right and 8 on the left).

Our investigation set the goal of studying the division of the hypoglossal canal in terms of gender and age. In the above study, the work was carried out on osteological material without studying the gender and age of the skulls.

The study [16] was also conducted on craniological material without studying the gender and age of the skulls investigated. Of the 84 skulls, 34.5% showed doubling of the hypoglossal canal. Among them, 10 (11.9%) had bilateral duplication, and 19 (22.61%) had unilateral duplication, of which 9 (10.7%) had left-sided duplication and 10 (11.9%) had right-sided duplication.

An assessment of the incidence of double hypoglossal canals in Japanese using multislice computed tomography showed that double hypoglossal canals were found in 16.9% of subjects, of which 14.7% were unilateral and 2.2% were bilateral [22].

According to [15], the study of the skull and its openings provides information about the evolutionary history of man. Regarding the cranial variant associated with bony spicules, unilateral bony spicules were observed on 25 skulls. On the right side, there were 11 skulls, and on the left, there were 14 skulls. Bilaterally complete bony septation, according to the authors, was observed in three dry skulls. A unilateral double hypoglossal canal was found in 25% of dry skulls. A bilateral double hypoglossal canal was found in 3% of dry skulls. As indicated in the study, knowledge of the size of the hypoglossal canal is necessary for radiologists and neurosurgeons when performing posterior fossa operations for tumors such as schwannoma of the hypoglossal nerve and treating sleep apnea.The study did not touch upon the age aspect of the division (complete or partial) of the hypoglossal canal. In our study, male and female skulls were divided into four age groups (adolescence, I adulthood, II adulthood, and elderly), with an adequate number of skulls for a morphological study [23] indicated that the size of the hypoglossal nerve and the number of axons it contains do not appear to correlate significantly with the size of the hypoglossal canal. The authors concluded that hypoglossal canal size is not a reliable indicator of speech.

In most studies, the uni- and bilaterality of the divisions of the hypoglossal canal were investigated rather than age and gender aspects. In the study [17], a double unilateral hypoglossal canal was found in 16% of cases (7 on the left and 3 on the right) and bilateral in 2% of cases. Also noting the clinical significance of determining the frequency of separation of the hypoglossal canal by spur or septa, the authors are inclined to conduct studies at the population level [24]. The authors indicated that the presence of a spur or septa in the hypoglossal canal was present in more than half of the North Indian population skulls examined, which is higher compared to other studies. But according to [25], further conservative and experimental evaluations are needed to determine the utility of cases of hypoglossal canal bridging or double use as a powerful discriminator in population-based and family history skeletal studies.

Conclusion

Our study made it possible to identify gender and age characteristics of the frequency of partial and complete division of the hypoglossal canal. In female skulls, the difference between age periods was statistically significant for the left hypoglossal canal using the Kruskal-Wallis H test (PH = 0.047). Also, according to the our study, the difference between male and female skulls in terms of age does not appear to be statistically significant. Only in the elderly age period is the difference for the left divided hypoglossal canal weakly significant (PU = 0.051).

The data obtained on the age and gender characteristics of the divided hypoglossal canal are of interest when planning surgical interventions in the posterior cranial fossa; also, given the importance of the neurovascular elements passing through this canal, it can explain the cause of a number of pathological processes that occur in them.

Conflict of interest. The authors declare that they have no confict of interest.

Financing. During this work, there was no funding from outside organizations or medical representatives.

Author contributions. Conceptualization – Sh.V., Writing – A.A., Editing – Sh.V., Data collection and analysis – A.A.

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Ерлер мен әйелдердегі тіласты каналдың әртүрлі жас кезеңдерінде бөлінуі

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Түйіндеме

Зерттеудің мақсаты тіласты каналының бөлінуінің жас және гендерлік аспектілерін зерттеу болды.

Әдістері. Зерттеу материалына 200 бас сүйек (20 кәмелетке толмаған бас сүйек, 68 бірінші, 72 екінші жетілген және 40 қарт бас сүйек) кірді. Алынған арифметикалық деректерді талдау үшін Пирсонның Хи-квадрат тесті, Манн-Уитни U тесті және Крускал-Уоллис H тесті қолданылды. Статистикалық талдау IBM Statistics SPSS-26 бағдарламасы арқылы жүргізілді.

Нәтижелері. Жынысы бойынша ерлер мен әйелдердің бас сүйектері арасындағы сол және оң жақ тіласты каналдарының бөлінуіндегі айырмашылық статистикалық маңызды емес (сол жақ бөлінген тіласты канал үшін PU = 0,668; оң жақ бөлінген тіласты канал үшін PU = 0,284). Тіласты канал және оның гендерлік бөлінуі де Пирсонның Хи-квадрат тесті арқылы статистикалық маңыздылықты көрсетті (сол жақ бөлінген тіласты канал үшін Pχ2 = 0,888 және оң жақ бөлінген тіласты канал үшін Pχ2 = 0,506). Тіласты каналдарының жас бойынша бөлінуі де айырмашылықтың статистикалық маңызды емес екенін көрсетті (сол жақ бөлінген тіласты канал үшін Pχ2 = 0,538 және оң жақ бөлінген тіласты канал үшін Pχ2 = 0,355). Әйелдердің бас сүйектерінде жас кезеңдері арасындағы айырмашылық сол жақ тіласты канал үшін статистикалық маңызды болды (PH = 0,047). Сонымен қатар, жас бойынша ерлер мен әйелдердің бас сүйектерінің арасындағы айырмашылық статистикалық маңызды емес. Тек егде жастағы кезеңде сол жақ бөлінген тіласты каналдағы айырмашылығының маңыздылығының әлсіз екені анықталды (PU = 0,051).

Қорытынды. Бөлінген тіласты каналдың жас және гендерлік сипаттамалары туралы алынған деректер артқы бас сүйек шұңқырына хирургиялық араласуды жоспарлау кезінде қызығушылық тудырады.

Түйін сөздер: бөлінген тіласты канал, ерлердің бас сүйектері, әйел бас сүйектері, жас кезеңдері.

Разделенный подъязычный канал у мужчин и женщин в различные возрастные периоды

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Резюме

Целью исследования явилось изучение разделенного подъязычного канала в возрастном и половом аспекте.

Методы. Материалом исследования послужили 200 черепов (20 черепов юношеского возраста, 68 первого, 72 второго зрелого возрастов и 40 черепов пожилого возраста). Для анализа полученных арифметических данных использовали критерий Хи-квадрат Пирсона, U-критерий Манна-Уитни и H-критерий Краскела-Уоллиса. Статистический анализ проводился с использованием программы «IBM Statistics SPSS-26».

Результаты. Разница в разделении левого и правого подъязычных каналов между мужскими и женским черепами в половом аспекте не была статистически значимой (для левого разделенного подъязычного канала PU = 0,668; для правого разделенного подъязычного канала PU = 0,284). Подъязычный канал и его разделение в половом аспекте также показали статистическую недостоверность с применением критерия Хи-квадрат Пирсона (для левого разделенного подъязычного канала Pχ2 = 0,888 и для правого разделенного подъязычного канала Pχ2 = 0,506). Разделение подъязычных каналов в возрастном аспекте также показало, что разница статистически недостоверна (для левого разделенного подъязычного канала Pχ2 = 0,538 и для правого разделенного подъязычного канала Pχ2 = 0,355). В женских черепах разница между возрастными периодами была статистически значимой для левого подъязычного канала (PH = 0,047). Кроме того, разница между мужскими и женскими черепами с точки зрения возраста не является статистически значимой. Лишь в пожилом возрастном периоде разница по левому разделенному подъязычному каналу слабо значима (PU = 0,051).

Выводы. Полученные данные о возрастных и половых особенностях разделенного подъязычного канала представляют интерес при планировании оперативных вмешательств на задней черепной ямке.

Ключевые слова: разделенный подъязычный канал, мужские черепа, женские черепа, возрастные периоды.