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# The individual, age and gender alteration characteristics of the distance between the middle posterior wall of pterygomaxillary fissure and round foramen

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**Abstract**
The current work has studied the individual, age and gender alteration characteristics of the distance between the middle poserior wall of pterygomaxillary fissure and round foramen in different stages of human postnatal ontogenesis by using cranioscopic, craniometric and variation-statistical methods. According to the results of the research, the mean number of the distance between posterior wall of pterygomaxillary fissure and round foramenis bigger in the left part during the first adulthood period. The comparison conducted between the parts of the adjacent age groups has shown that this distance in menhas a left-sided advantage in the I adulthood and senilityperiod rather than the youth andelderly period, whereas in women the distance has a right-sided advantage in senility period rather than the elderly period. Comparative analysis of sexual variability of this distance indicates its advantage during the I and II adulthood period in men in both sides, during the senile period in the left side and during the elderly period in the right side in comparison to women.

**Keywords:** pterygomaxillary fissure, round foramen, craniometry, age, gender

## Introduction
Topography of the round foramen that surrounds the pterygomaxillary fissure, as well as the individual, age and gender characteristics of the distance between the hole and pterygomaxillary fissure is one of the important study areas of Neurosurgery. Endoscopic interventions needed to be executed in ankle nerve going through pterygomaxillary fissure and middle cranial fossa without knowing the anatomic-topographic characteristics of pterygomaxillary fissure creates difficulties for the clinicians. (Zakiev I.I., 1983; Shadlinskiy V.B., 1989; Qafarova, 2002; Polkokova, 2009; Polev and etc., 2012; Borodulin V.Q., 2014; Robinson *et al*., 2006; Tan G., Ma Y., Li H., 2012) [5, 9, 4, 7, 6, 3, 17]. It is important to note that, to perform high-level rino endoscopy for determination of benign tumor of maxillary artery, trigeminal nerve and sphenopalatine ganglion, studying pterygomaxillary fissure and surrounding structures, as well as researching anatomic-topographic versions of the distance between round foramen and posterior wall of pterygomaxillary fissureduring different stages of ontogenesis is of scientific and practical significance. (Qafarova, 2002; Polkokova, 2009; Pollack I.F., Sekhar L.N., 1993; Krishnamurthy S., Holmes B., Powers S., 1998; George et al., 2012; Jang et al., 2010; Tang. et al., 2009) [4, 7, 16, 14, 11, 13, 19].

İt was determined that the injuries are happening mostly in posterior-upper wall of pterygomaxillary fissureduring the surgical interventions to neurovascular bundlesof sphenopalatine ganglion (Apinhasmit et al. 2004) [10]. As the other authors (Hosseini and Borghei, 2005) [12] mention, rhinocerebral infections could be spread from pterygopalatine fossavia pterygomaxillary fissure to In fratemporal fossa, soft tissues, as well as Middle cranial fossa.

İt is important to note that, there is not enough material in books about anatomy, otolaryngology, scientific articles and monogrpahs with practical significance about the individual, age and gender alteration characteristics of the distance between the middle part of back wall of pterygomaxillary fissure and round foramen in different stages of human postnatal ontogenesis. Therefore, pterygomaxillary fissure and adjacent bone structures, as well as studying anatomic-topographic characteristics of round foramen is one of the current issues.

## The AIM of the work
The aim of this work is to study the individual, age and gender alteration characteristics of the distance between the middle posterior wall of pterygomaxillary fissure and round foramen in different stages of human postnatal ontogenesis.

## Materials and Methodology
Certified human skulls preserved in fundamental museum of Azerbaijan Medical University's Human Anatomy Department were used as research materials. 167 macerated human skulls of different human age groups were investigated. The age groups used, were acknowledged during the VII Union Conference of the previous USSSR Pedagogic Science Academy in 1965 dedicated to age morphology, physiology and biochemistry problems.

To reach the aim, cranioscopic, craniometric and variation-statistical methods were used. Measurements were conducted by using caliper with a straight and curved legs and 0, 01 division referring to widely used methods in craniology.

There results were analyzed by using statistical variance method in «Statistical» and Microsoft Excel Windows 7 programmes. Average indicators, standard erros (m), minimum (min) and maximum (max) indicators of the rows and variation coefficient (VC) were calculated during the process.

**Results and discussion**

Round foramenis in the outer part of posterior wall of pterygopalatine fossa and connects it to the middle cranial fossa. The maxillary nerve which is the ganglion of the trigeminal nerve arises from the round foramen and branches out toinfraorbital, zygomatic and ganglionic nerves in pterygopalatine fossa. Ganglion branches help to form the sensory root of the sphenopalatine ganglion. It is important to differentiate the anterior hole of pterygoid canal and round foramen during the endoscopic interventions into the Middle parts of internal and external base of skull. Therefore it is important to define a bone crest between the mentioned holes. There were no bone crests found between the holes in 60 (18,0%) samples out of 334 investigated. This was observed during the investigation of women, as well as men skulls. Described bone crest could be used during chronic rhinitisas an orientation forneurotomy of pterygoid canal nerve and Middle parts of internal and external base of skull.

Study of characteristics of the distance betweenthe middle posterior wall of pterygomaxillary fissure and round foramen during different stages of ontogenesis has shown that, during I adulthood period the index number fluctuates between 5,0-10,7mm on the right side, 6,3-10,6mm on the left side, the mean number equals to 7,8±0,4mm and 8,9±0,3mm. Craniometric comparison of I adulthood period has revealed that this distance has incresed 1,1 times or 1,1 mm and statistically is greater on the left side. We have not observed it for juvenile, youth, IIadulthood (9,4±0, 6mm and 10,0±0, 5mm), senile(9,2±0, 6mm and 9,2±0, 6mm) andelderly period (7,7±0, 3mm and 6,6±0, 4mm).

It was defined that, the coefficient of variation of the distance between middle posterior wall of pterygomaxillary and round foramen has been increased 1,1 times (34,1% and 31,5%) on the right side in relation to left side during the youth perood, 1,5 times (22,5% and 14,9%) during I adulthood period, 1,3 times (35,5% and 28,3%) during II adulthood period. These indicators are not so different during senile period, but arehigher on the right side than the left side (27,0% and 25,5%). During adulthood period, the coefficient of variation of the parameter has been increased 1,1 times on the left part in relation to the right side and 1,5 times (17,0% and 25,7%)during the elderly period. According to the results,it can be concluded thatthe coefficient of variation of the distance between middle posterior wall of pterygomaxillary and round foramen in men is higher during youth, I and II adulthood periodon the right part, whereeas the numbers are higher on the left part during adulthood and senility period.

Comparative analysis of the adjacent age groups and mentioned parts gave different results. Mean number of the distance between posterior wall of pterygomaxillary fissure and round foramen is bigger on the left part during adulthood and senile period. The mean number of this distance fluctuates between 6,3-10,6mm during the I adulthood period on the left part, between 4,0-11,0mm during youth period and equals to 8,9±0,3mm and 7,0±0,7 mm. Morphometric indicator in senile period on the left part constitutes 5,7-13,0mm, during senility period changes between 4,0-9,2mm, final numbers are 9,2±0,6mm and 6,6±0,4 mm. There were slight differences in the numbers for the rest of the age groups which were statistically not important.

There was no significant difference in the mean number of comparison of these sides in the same age group for women. For instance, the distance between posterior wall of pterygomaxillary fissure and round foramen on the left and right part during the first maturity period changes between 4,0-9,0 mm and 4,3-9,5 mm, the mean numbers are 6,5±0,4 mm and 6,9±0,4 mm. The same results are valid for the youth, II adulthood, senile and elderly period as well.

According to the results, the coefficient of variation of the distance between middle posterior wall of pterygomaxillary and round foramen in women has increased on the right part in relation to the left part 1,2 times (27,2% 22,8%) during adolescent period, during I and II adulthood period 1,1 times (accordingly 24,3% and 22,4%; 28,0% and 24,9%). This indicator has increased 1,1 times during ahil and qocaliq period in the left side in comparison to the right side (accordingly 22,9% and 20,3%; 30,6% and 28%). According yo the results, the coefficient of variation of the distance between middle posterior wall of pterygomaxillary and round foramen in men is greater during first and second maturity period on the right side, during elderly and senile period on the left side.

Comparative analysis of the adjacent age groups and their parts in women has shown that morphometric indicator of the mean number of right part during senile period is bigger than the same part of elderly period. Morphometric indicator of the age fluctuations of the distance between middle posterior wall of pterygomaxillary and round foramenon the right part during senile period fluctuates between 5,4-10,3mm, between 4,0-9,7mm during elderly period, the mean number is 8,0±0,5mm and 6,4±0,5mm. As it is seen, mean number of merphomeric indicator of senile period is 1,3 times or 1,6 mm more than the during elderly period.

In the presented age groups, comparative analysis of the sexual characteristics of the distance between the middle posterior wall of pterygomaxillary fissure and round foramen has shown that, the number of morphometric indicators is significantly higher during the I and II adulthood period on both sides (accordingly 7,8±0,4mm and 8,9±0,3mm; 9,4±0,6mm and 10,0±0,5mm) than in women (accordingly 6,5±0,4mm and 6,9±0,4mm; 7,1±0,4mm and 6,5 ±0,3mm). This difference is obvious during senile period (9,2±0,6mm and 7,1±0,5mm) on the left side and during elderly period (7,7±0,3mm and 6,4±0,5mm) on the right side. There were no significant statistical differences in the other age groups.

Considering anatomic-topographic and clinic importance of round foramen it is also important to study individual, age and gender characteristics of morphometric indicators of this hole diameter during different age stages. As the results show, for both genders, mean numbers of the indicators of studied age groups on both sides are different but statistically not important.

Our research has shown that, the coefficient of variation of mean number of round foramen diameter is higher in men during youth and elderly period. The number of the coefficient of variation during adulthood and I adulthood period has increased 1,1 times on the left part in relation to the right side (accordingly 27,1% and 30,1%; 29,5% and 33,2%), during II adulthood and elderly period 1,2 times (accordingly 26,2%

and 30,7%; 31,0% and 35,9%). The number of the coefficient of variation in women is higheron the left side,like in men, during all age groups excluding adulthood and maturity period. This number is 1,1 times (26,5% and 27,7%) bigger during the first maturity period, 1,2 times bigger (27,1% and 33,3%; 29,9% and 35,4%) during secondadulthood and elderly period, 1,3 times (31,6% and 39,8%) bigger during senile period.

Comparative analysis of the same parts of adjacent age groups has shown no significant difference in mean number of round foramen diameter in women. The mean number of this parameter is 3,8±0,3mm during the first maturity period on the right side, 3,0±0,3mm during the youth time and 1,3 times or 0,8mm bigger. Results of the research about the gender characteristics of the mean number of round foramen diameter has shown no significant difference for the adulthood and youth period, as well as elderly period.

**Results**

In conclusion, the mean number of middle posterior wall of pterygomaxillary fissure and round foramen has increased on the left side compared to the right side during I adulthood period in men, however there was no significant difference spotted in women. Comparative analysis of the mentioned parts of adjacent age groups has shown that this distance is bigger on the left side during I adulthood and senility period compared to youth and elderly period in men. In women, this distance is bigger on the right side during senile period compared to elderly period. The distance between middle posterior wall of pterygomaxillary fissure and round foramen in men is bigger compared to women on both sides during I and II adulthood period, on the left side during senility period and on the right side during elderly period. Achieved results have again showed that, the mean number of the investigated distance is dependednt on the individual, age and gender characteristics. This differnce may be one, as well as two-sided.

**References**


1. Alekseyev VP, Debets QF. Craniometry: Methodolgy of antropological investigations. M, Science, 1964, 128.
2. Borovikov VP. Introduction into current data analysis in statistical system. M: Telekom, 2015, 288.
3. Borodulin VQ. Our experience of blocking the maxillary nerve and the pterygopalon by palatal access// Poc. Otorhinolaryngology, 2014; 1:12-15.
4. Qafarova RA. Morphological and topographic-anatomical features of the pterygoid node in different age periods. Synopsis of PHD wok, Баku, 2002, 22.
5. Zakiev II. The formation and progress of the nerve of the pterygoid canal// Azerbaijan Medical Journal, 1983; 3:20-24.
6. Polev QA, Daykhes NA, Vinoqradov VV, Labazanova MA. Surgical aspects of endoscopic anatomy of the craniobrine-unipolar artery//Russian idiopathology, 2012; 4:96-100.
7. Polkokova IA. Gender and age variability of dimensional characteristics and forms of the pterygoid-maxillary slit//Astrakhan Medical Journal. 2007; 2(2):150.
8. Rebrova OY. Statistical analysis of medical data. Application package. M. Медиа Сфера, 2002, 312.
9. Shadlinskiy VB. To the anatomy of the hard palate/materials of the Transcaucasian conference morphology. Baku, 1989, 271-273.
10. Apinhasmit W, Methatrathip D, Ploytubtim S, *et al*. Anatomical study of the maxillary artery at the pterigomaxillary fissure in a Thai population: its relationship to maxillary osteotomy//J Med. Assoc. thai., 2004; 87(10):1212-1227.
11. George A, Smatanova K, Joshi H, *et al*. Sphenopalatine, anterior ethmoid and internal maxillary artery intervention in the management of refractory epistaxis: their efficacy in 25 patients//Clin Otolaryngol. 2012; 37(4):321-325.
12. Hosseini S, Borghei P. Rinocerebralmucormycosis: pathways of spread//Eur Arch Otorhinolaryngol., 2005, 69-71.
13. Jang T, Kim Y, Shin S. Long-term effectiveness and safety of endoscopic vidianneurectomy for the treatment of intractable rhinitis//Clin Exp Otorhinolaryngol, 2010; 3(4):212-216.
14. Krishnamurthy S, Holmes B, Powers S. Schwannomas limited to the infratemporal fossa: report of two cases//J Neuro Oncology, 1998; 36:269-277.
15. Martin R. Kraniometrische Technik: A Kraniologie. Lehrbuch der Anthropologie in systematischer Darstellung, 1928; 2:579-991.
16. Pollack IF, Sekhar LN. Trigeminal neurilemmoma Surgery of Skull Base Tumors//New York: Raven Press Ltd., 1993, 737-746.
17. Robinson S, Wormald P. Endoscopic vidianneurectomy// Am J Rhinol. 2006; 20(2):197-202.
18. Tan G, Ma Y, Li H. Long-term results of bilateral endoscopic vidianneurectomy in the management of moderate to severe persistent allergic rhinitis//Arch Otolaryngol Head Neck Surg. 2012; 138(5):492-497.
19. Tang I, Shashinder S, GopalaKrishnan G, *et al*. Juvenile nasopharyngeal angiofibroma in a tertiary centre: ten-year experience Singapore//Med J. 2009; 50(3):261-264.