

Occurrence, Shape and Size Of Foramen Vesalium in Dry Human Skulls

Pathmashri.V.P, Dr.Thenmozhi

Saveetha dental college and hospitals

*No.162, poonamelle high road, Vellappanchavadi,
Chennai -600077*

Abstract

Aim : The aim of the study was to find the occurrence of Foramen Vesalium in South Indian human dry skull.

Objective : Occurrence of Foramen Vesalium in human skull was studied and its occurrence is noted both in middle cranial fossa and in the extra cranial view of the skull.

Background : Foramen Vesalium also known as the "emissary sphenoidal Foramen", is present in the greater wing of sphenoid antero medial to the Foramen ovale, in the middle cranial fossa. Vein of Vesalium passes through this Foramen.

Materials And Method : For the study to be done 50 South Indian dry adult skulls were taken and examined for the presence of Foramen Vesalium. Examination was done in both middle cranial fossa and in extra cranial view and the results were recorded.

Result: In this study 50 human dry skulls were taken and examined for the presence of foramen vesalium in both the extra cranial view and intra cranial view. It is a very rare foramen and this Foramen was present only in 5 skulls out of 50. In case of presence of this foramen an emissary vein called "vein of vesalium" passes through it.

Keywords: foramen vesalium, vein of vesalium, foramen in greater wing of sphenoid, foramen Vesalii

INTRODUCTION:

The greater wing of sphenoid has a number of foramina. These foramina connect infra temporal fossa, orbit, temporal fossa with middle cranial fossa. Foramen rotundum, Foramen spinosum, Foramen ovale are the permanent foramina in the sphenoid bone. Foramen Vesalium - a rare foramen is also present in the greater wing of sphenoid. It transmits an emissary vein called "Vein of Vesalium" (5). It is also known as Foramen Vesalii or canaliculus sphenoidalis. Through this cavernous venous sinus and pterygoid venous plexus communicate. If it is present, it will be posteromedial to Foramen rotundum and antero medial to Foramen ovale, Foramen spinosum, and carotid canal. That is it will be present between Foramen ovale and Foramen rotundum, especially more close to Foramen ovale. Foramen venous and canaliculus sphenoidalis are the other names given to it. The importance of this passage lies in the fact that an infected thrombus from an extracranial source may reach the cavernous sinus. CT scans of the skull base and two three-dimensional reconstructions were reviewed to determine criteria for defining the normal appearance of the foramen of Vesalium. Three normal types were classified: (1) a well-formed foramen, 1-2 mm in size, (2) lack of visualization of the foramen and (3) partial assimilation of the foramen with the foramen ovale. The foramen was remarkably symmetric in a large number of cases (7). The small FV, if present, is generally situated posteromedially from the foramen rotundum (FR) and anteromedially from the foramen ovale (FO), foramen spinosum (FS), and carotid canal. The FV is located between the FO and FR, but particularly more closely to the FO, and thus neurosurgery may misplace the needle during percutaneous intervention targeting the FO for treatment of the trigeminal neuralgia, resulting in severe

complications such as intracranial bleeding (13).

The mean area of the foramen is small, which may suggest that it plays a minor role in the dynamics of blood circulation in the venous system of the head. For this research work 50 South Indian dry skulls were taken and examined for the presence of this foramen.



MATERIALS AND METHOD:

50 South Indian dry skulls, vernier caliper and the skulls without deformities and trauma were only selected. Each skull was examined for the presence of Foramen vesalium. And if it is present then its measurement was taken using a vernier caliper. This is a very rare foramen and it measures about 1mm - 2mm approximately. The measurement was taken many times for accurate measurement. And these data were recorded in the table soon after the measurement. Each measurement was taken very carefully.

DISCUSSION:

During development, most of the central skull base bones are preformed in cartilage and then ossify by the process of endochondral ossification with a small

contribution from membranous bone. At 11 weeks 5 days the entire skull base is preformed in cartilage and then ossification of skull base progresses in an orderly pattern from posterior to anterior. Postsphenoid and pre-sphenoid centres that appear at 14 weeks form the sphenoid bone and 17 weeks respectively with a contribution from orbitosphenoid and alisphenoid centres that appear at 16 weeks and 15 weeks respectively. The greater wings are formed from alisphenoid centres(9). Moreover, it has been shown that the foramen of vesalius represents the site of fusion between the membrane bone and medial cartilaginous, alatemporalis(8).

In the research done by Neha Gupta, 2Dr. Anjoo Yadav, 3Prof. R.J. Thomas, 4Ankit Shrivastava 1,2,3,4Govt. Medical College, Kannauj (U.P.),India FV was at a distance to the FO was 1.363±0.328mm on right side and 1.480±0.378mm on left side.Rossi et al11 (2010) found 1.853±0.303mm on right side and 2.464±0.311mm on left side,Shinohara et al17 (2010) found 3.15±1.64mm on right side and 2.53±1.30mm on left side, Vipavadee et al12(2012) found 2.05±1.17mm on right side and 2.464±0.311mm on left side and Rossi, Shinohara, Vipavadee(2). In a study done by Rossi, AC.1*, Freire, AR.1, Prado, FB.1, Caria, PHF.1 and Botacin, PR.2 1Department of Morphology, State University of Campinas – UNICAMP, Piracicaba, SP, Brazil 2 Department of Basic Sciences, Paulista State University – UNESP, Araçatuba, SP, Brazil, the foramen of Vesalius was found at a distance to the foramen ovale from anterior to medial was 1.853 ± 0.303 mm on the right and 2.464 ± 0.311 mm on the left. The average distance between the foramen of Vesalius and the foramen ovale in the study of Shinohara, Melo, Silveira et al., (2010) was 2.55 mm on the right and 2.59 mm on the left side, close to the results of our study. Kaplan , Erol , Ozveren , et al. (2007) reported the foramen of Vesalius with a distance of 4 mm (range 3-5 mm) anterior and medial to the foramen ovale(1). The morphology and morphometry of the foramina of the greater wing of the human sphenoid bone Jerzy Reymond1, Anna Charuta2, Jaroslaw Wysocki2 in this study the foramen of Vesalius was found in 17% of the skulls. If the occurrence of the foramen at least on one side is taken into account, a result is obtained of 22% of the number of skulls. According to other authors, this foramen is present unilaterally in 12.5–35% of skulls [10,11,12]. The result of our assessment falls therefore within this framework of values. However, the frequency of the bilateral occurrence of this foramen in our studies (5% of the skulls) is considerably lower than that reported by Boyd [11] (14.7% of the skulls). In this study 50 human dry skulls were taken and examined for the presence foramen vesalius in both the extra cranial view and intra cranial view. It is a very rare foramen and this Foramen was present only in 5 skulls out of 50. In case of Presence of this foramen a emissary vein called “vein of vesalius” passes through it.2

S.no	Skull number	Presence or absence	Shape	Size
1	Skull 1	Absence		
2	Skull 2	Absence		
3	Skull 3	Presence	Oval	Left-1.5mm,right-1.6mm
4	Skull 4	Absence		
5	Skull 5	Absence		
6	Skull 6	Presence	Oval	Left-1mm,right -1mm
7	Skull 7	Absence		
8	Skull 8	Absence		
9	Skull 9	Absence		
10	Skull 10	Absence		
11	Skull 11	Presence	Round	Left-1.1,right-1.3mm
12	Skull 12	Absence		
13	Skull 13	Absence		
14	Skull 14	Absence		
15	Skull 15	Absence		
16	Skull 16	Absence		
17	Skull 17	Absence		
18	Skull 18	Absence		
19	Skull 19	Absence		
20	Skull 20	Absence		
21	Skull 21	Absence		
22	Skull 22	Absence		
23	Skull 23	Absence		
24	Skull 24	Absence		
25	Skull 25	Absence		
26	Skull 26	Absence		
27	Skull27	Presence	Round	Left-1.4,right-1.2mm
28	Skull 28	Absence		
29	Skull 29	Absence		
30	Skull 30	Absence		
31	Skull 31	Absence		
32	Skull 32	Presence	Round	Left-1.1,right-1.0mm
33	Skull 33	Absence		
34	Skull 34	Absence		
35	Skull 35	Absence		
36	Skull 36	Absence		
37	Skull 37	Absence		
38	Skull 38	Absence		
39	Skull 39	Absence		
40	Skull 40	Presence	Oval	Left-1.0,right-1.2mm
41	Skull 41	Absence		
42	Skull 42	Absence		
43	Skull 43	Absence		
44	Skull 44	Absence		
45	Skull 45	Absence		
46	Skull 46	Absence		
47	Skull 47	Absence		
48	Skull 48	Absence		
49	Skull 49	Absence		
50	Skull 50	Absence		

CONCLUSION:

In this study 50 human dry skulls were taken and examined for the presence foramen vesalius in both the extra cranial view and intra cranial view. It is a very rare foramen and this Foramen was present only in 6 skulls out of 50. In case of Presence of this foramen a emissary vein called “vein of vesalius” passes through it. Through this cavernous venous sinus and pterygoid venous plexes communicate.the shape of the foramen was oval in 4 skulls and others it was round and the size varied from 1mm – 2mm.