İst Tıp Fak Derg 2008;71:106-108
J Ist Faculty Med 2008;71:106-108
www.itfdergisi.com

VERMIAN FOSSA – AN ANATOMICAL STUDY

FOSSA VERMİANA- ANATOMİK BİR ÇALIŞMA

Ayşin KALE*, Adnan ÖZTÜRK*, Funda AKSU, Nurcan TASKARA***, Bülent BAYRAKTAR*, İlke Ali GÜRSES*, Fatma Gülşah ZEYBEK**, Özcan GAYRETLİ******

ABSTRACT

Objective: Vermian fossa (VF) is a shallow fossa of varying size which may occasionally be found on dorsal aspect of foramen magnum. Our aim was to find out frequency of VF and to measure length and width of the determined VF's and to classify them according to their shapes.

Materials and methods: We examined dry bones of collections of the Anatomy Departments of Istanbul University Istanbul Faculty of Medicine and Dokuz Eylul University Faculty of Medicine. Totally 129 separate occipital bones and 29 basicraniums were inspected. We searched for existence of a fossa on the inner surface of the squamous part of the occipital bone, posterior to foramen magnum and determined the frequency of VF. We measured the height and width of each VF by a digital caliper and calculated mean values of them. We classified the VF's determined in two groups according to their shapes. The VF's which resembled a triangle were classified as type 1, and the VF's which resembled a quadrangle were accepted as type 2.

Results: We found that 13 of the 158 (8.22 %) occipital bones had a VF. The average height and width of VF were determined as 27.8 mm and 18.4 mm, respectively. Type 1 and type 2 were determined in 7 and 4 cases, respectively. Two VF's were atypical.

Conclusion: As there is not enough information about frequency of VF in literature and as there is no information about its size and shape, we believe that our results will provide additional information.

Key words: Occipital bone, vermian fossa, middle cerebellar fossa of Verga, vermis

ÖZET

Amaç: Bazen foramen magnumun dorsal cephesinde değişik boyutlarda olabilen sığ bir fossa bulunabilir ve bu yapı Fossa vermiana (FV) olarak isimlendirilir. Amacımız FV'nın sıklığının bulunması, saptanmış FV'ların uzunluk ve genişliklerinin ölçülmesi ve FV'ların şekillerine göre sınıflandırılmasıdır.

Gereç ve yöntem: Çalışmamız İstanbul Üniversitesi İstanbul Tıp Fakültesi ve Dokuz Eylül Tıp Fakültesi Anatomi Anabilim Dalları'nın kemik laboratuvarlarındaki kuru kemikler üzerinde gerçekleştirildi. Toplam 129 ayrı os occipitale ve 29 basis cranii interna incelendi. Os occipitale'nin pars squamosa'sının iç yüzünde, foramen magnum'un arkasındaki FV'nın varlığı araştırılarak, bu oluşumun sıklığı bulundu. Saptanan her bir FV'nın yüksekliği ve genişliği dijital bir kaliper ile ölçülerek, ortalama değerleri hesaplandı. FV'lar şekillerine göre 2 gruba ayrıldı. Bir üçgene benzeyen FV'lar Tip 1, bir dörtgene benzeyen FV'lar Tip 2 olarak sınıflandırıldı.

Bulgular: İncelenen 158 os occipitale'nin 13 tanesinde (%8,22) FV bulunduğu saptandı. FV'nın ortalama yüksekliği ve genişliği sırasıyla 27,8 mm ve 18,4 mm olarak ölçüldü. 7 olgu Tip 1, 4 olgu tip 2 olarak sınıflandırıldı. 2 FV atipikti.

Sonuç: Literatürde bu yapının sıklığı ile ilgili yeterli bilgi ve ölçüleri ve şekli ile ilgili hiçbir bilgi bulunmadığı için, saptadığımız sonuçların bu yapı hakkında ek bilgi sağlayacağına inanıyoruz.

Anahtar kelimeler: Os occipitale, fossa vermiana, Verga'nın orta serebellar fossası, vermis

Dergiye geldiği tarih/ Date received: 08.04.2008 - Dergiye kabul edildiği tarih: 30.12.2008

* Istanbul University Istanbul Faculty of Medicine, Anatomy, Istanbul
(İletişim kurulacak yazar: aysinckale@yahoo.com)
** Dokuz Eylul University, Faculty of Medicine, Anatomy, Izmir
*** Erenkoy, İstanbul, Türkiye
**** Gulhane Military Medical Faculty, Anatomy, Ankara

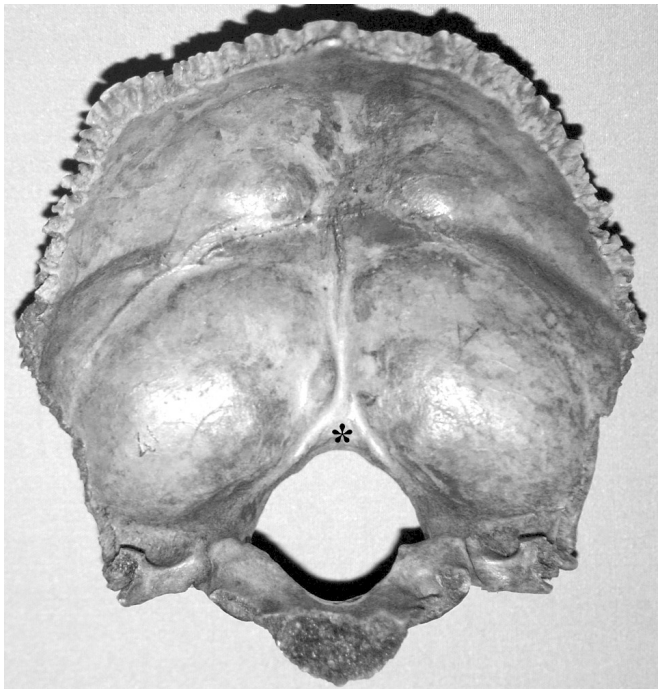


Figure 1: Asterisk shows the Type 1 vermian fossa

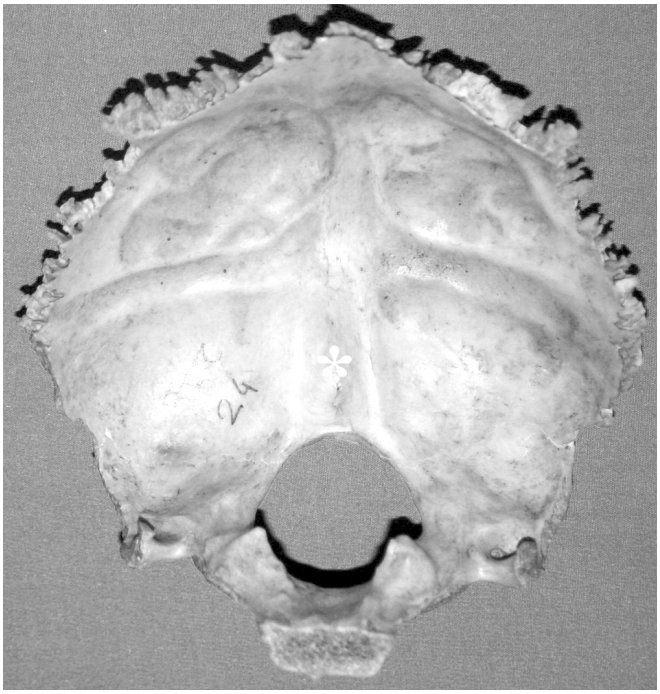


Figure 2: Asterisk shows the Type 2 vermian fossa

INTRODUCTION

At the inner surface of the occipital squama, there is an elevation named the internal occipital protuberance. From it a prominent median crest, the internal occipital crest, descends to the foramen magnum and forms an attachment for the falx cerebelli (4, 5). Occasionally just above the foramen magnum it splits in two to enclose a shallow, triangular depression of variable size, the vermian fossa (VF), which houses part of the inferior vermis of the cerebellum (1, 4, 5). This fossa, on the dorsal aspect of foramen magnum, is also known as the middle cerebellar fossa of Verga (1). We could find only two studies reporting the frequency of VF. Berge and Bergman (2001) had reported the frequency of VF as 4 % and Cireli et al. had reported the frequency of VF as 11.4 % (1, 2). Due to the lack of literature on frequency, the morphology and morphometry of this fossa, we decided to study on this matter.

MATERIAL and METHOD

We examined dry bones of the collections of the Anatomy Departments of Istanbul University Istanbul Faculty of Medicine and Dokuz Eylul University Faculty of Medicine. Totally 129 separate occipital bones and 29 basicraniums were inspected. We searched for the existence of a fossa on the inner surface of the squamous part of the occipital bone, posterior to the foramen magnum. We photographed every VF that we determined. Afterwards as the shapes of the VF's determined were quite different from each other, we classified them in two groups according to their shapes. The VF's which resembled a triangle were classified as type 1 (Figure 1), and the VF's which resembled a quadrangle were accepted as type 2 (Figure 2). We measured the height and the base of each VF by a digital caliper and the data obtained was collected in a table (Table 1).

Table 1: The results of the measurements of height and width of the VF's.

	Vermian fossa	
	Length (mm)	Width (mm)
1	25,6	27,6
2	19,7	15,9
3	37,7	21,3
4	39,0	20,0
5	45,6	24,7
6	19,8	19,4
7	18,1	17,3
8	26,9	20,5
9	29,5	14,3
10	36,2	19,1
11	18.3	10.2
12	31.1	16.3
13	14.5	12.5

RESULTS

We identified 13 VF's, 10 out of 129 occipital bones and 3 out of 29 basicraniums, of totally 158 bones (8.22 %). Type 1 and type 2 were determined in 7 and 4 cases, respectively. Two cases could not be accepted as type 1 or

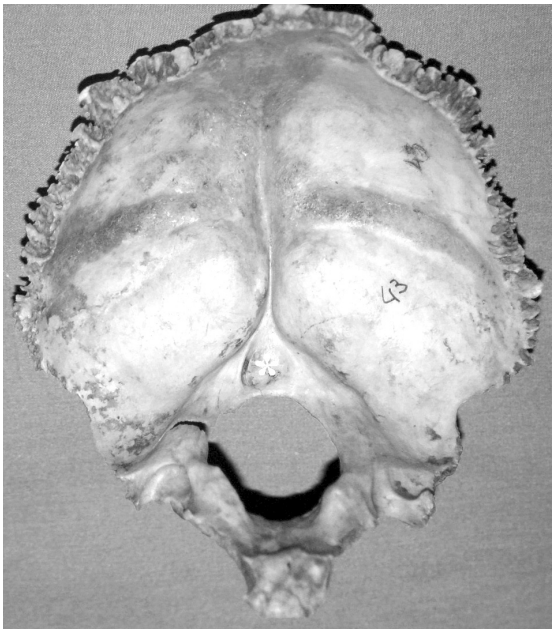


Figure 3: Asterisk shows the first atypical vermian fossa

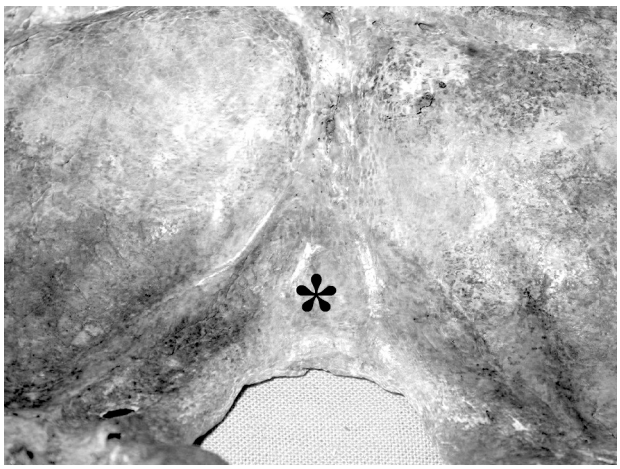


Figure 4: Asterisk shows the second atypical vermian fossa

type 2. The first atypical VF also looked like a triangle but it had a deeper fossa than the others (Figure 3). In the other atypical case, the lateral borders of the triangle were getting far away from each other, unlike the others (Figure 4).

The average height and width of the VF's were found as 27.8 mm and 18.4 mm, respectively. Measurements of each VF is stated out in the Table 1.

DISCUSSION

The shallow fossa of varying size which may occasionally be found on the dorsal aspect of the foramen magnum is named as the VF or middle cerebellar fossa of Verga (1). When present, VF is occupied by part of the inferior cerebellar vermis, which is divided into the tuber, pyramis, uvula and nodula from the back forward (5). In our study, we determined the frequency of VF as 8.22 %. Berge and Bergman (2001) had reported the frequency of VF as 4 % in their study, which was performed on 100 skulls (1). Cireli et al. had examined 210 occipital bones and reported the frequency of VF as 11.4 % (2). Any other studies, reporting the frequency of it, could not be found in the literature.

Moreover we could not find any information about shape or size of the VF in the literature. In our study, the mean length of the VF was found as 27.8 mm, and the mean width of the VF was found as 18.4 mm. Up to now, a classification of shape of VF hasn't been made. We classified this structure in two main groups according to its resembling to a triangle (type 1) or quadrangle (type 2). Nevertheless Elze and Braus had named the FV's resembling a guadrangle (our type 2 VF's) as fossa occipitalis mediana as they were the much more deep VF's (3). Cireli et al. also named these structures as fossa occipitalis mediana and reported the frequency of it as 2.4 % (2). We would like to name and classify these structures still as type 2 VF, because their locations are the same as VF's and the only difference between a VF and fossa occipitalis mediana is the deepness of the fossa. We believe that the distinction of deepness might be because of the size or shape of inferior cerebellar vermis. Consequently we believe that this classification also can provide clue about the shape of the inferior cerebellar vermis.

As we could find only two studies reporting the frequency of the VF and we could not find any study reporting the size of it and classifying it according to its shape in the literature, we think that our study may contribute to the literature.

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