Anatomical variations of foramen spinosum in South Indian dry skulls

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Abstract:

TOPIC: Anatomical variations of foramen spinosum in South Indian dry skulls.

AIM: To conduct a study on foramen spinosum in human sphenoid bone of 50 skulls of South Indian Origin.

OBJECTIVE: To determine the exact size of the foramen spinosum in 50 dry human skulls, on the extra cranial view and in the middle cranial fossa.

MATERIALS AND METHODS:
The study will be conducted on 50 dry human skulls of South Indian origin. The skulls used for the research belong to the department of Anatomy in Saveetha Dental College. The foramen were measured using a pair of dividers and a ruler.

RESULT:
88% of the foramen lying on the right side are of the sizes between 2.0 and 3.0mm in length. Whereas, only 12% of the foramen on the right side are of the sizes between 3.1 to 3.5mm in length. 76% of the foramen lying on the left side are of sizes between 2.0 and 3.0mm. And only 24% of the foramen lying on the left side are of sizes between 3.1 and 3.5mm. Only one foramen on the right side was of size 4.0 mm, while no foramen on the left side was 4.0 mm.

Keywords: Foramen spinosum, sphenoid bone, middle meningeal artery, middle meningeal vein.

INTRODUCTION:
Foramen spinosum is an important opening on the infratemporal surface of the greater wing of the sphenoid bone and lies posterolateral to foramen ovale. It transmits the middle meningeal vessels and the nervous spinosus . [1,3]. Developmental studies have shown that the perfect ring-shaped formation of the foramen spinosum is observed by the 8th month after birth and the latest by 7 years after birth. The foramen may be absent in which case the middle meningeal artery enters the cranial cavity through the foramen ovale, the foramen spinosum and ovale may be continuous and the foramen spinosum may be duplicated, the foramen spinosum may be more or less incomplete. The foramen spinosum was small or altogether absent, this is in case of when the middle meningeal artery arises from the opthalmic artery, in some cases early division of the middle meningeal artery into a posterior and anterior division may result in a duplication of the foramen spinosum [1]. In the newborn, the foramen spinosum is about 2.25 mm. The foramen is very small compared to foramen ovale and is usually round in shape. The study aims to determine the exact range of measurements including sizes, variations and asymmetry using 50 skulls of South Indian origin.

MATERIALS AND METHODS:
The study will be conducted on 50 dry human skulls of South Indian origin. The skulls used for the research belong to the department of Anatomy in Saveetha Dental College. The foramen were measured using a pair of dividers and a ruler.
RESULT:

In my research the length of the foramina that were measured were as follows, , 88% of the foramen lying on the right side are of the sizes between 2.0 and 3.0mm.[Graph 1&2]. Whereas, only 12% of the foramen on the right side are of the sizes between 3.1 to 3.5mm. [Graph 3& Graph 4].

76% of the foramen lying on the left side are of sizes between 2.0 and 3.0mm.[Graph1& Graph 2]. And only 24% of the foramen lying on the left side are of sizes between 3.1 and 3.5mm. [Graph 3&Graph 4]. Only one foramen on the right side was of size 4.0 mm, while no foramen on the left side was 4.0 mm.

DISCUSSION:

The Foramen Spinosum is one of important foramina that lies in the greater wing of the sphenoid bone and provides communication between the infratemporal fossa and middle cranial fossa.[2,6]. The Foramen Spinosum also Transmits
middle meningeal artery, it contains a venous component, the middle meningeal vein which connects the cavernous sinus with the pterygoid plexus, this is an important factor for clinical evaluation of radiological images of the diseased region.[3,7]. Different authors have been reported in their studies that the Foramen Spinosum was present in the human skulls at the percentage of 99.6%[4], 99.2%[5], and 98.5%[2].

In the present study considerable variations were seen in the anatomy of foramen spino sum. In this study the characteristics of the foramen spino sum was analyzed both from the extracranial view of the skull base and the middle cranial fossa.

Our results show that, 88% of the foramen lying on the right side are of the sizes between 2.0 and 3.0mm. Whereas, only 12% of the foramen on the right side are of the sizes between 3.1 to 4.0mm. 76% of the foramen lying on the left side are of sizes between 2.0 and 3.0mm. And only 24% of the foramen lying on the left side are of sizes between 3.1 and 4.0mm. Only one foramen on the right side was of size 4.0 mm, while no foramen on the left side was 4.0 mm.

Similarly, in researches done by other researchers the results were, as follows,

The length of right and left foramen spino sum was 1.5 - 3.5mm and 1.0 - 4.0mm, respectively. The mean of the length of the right foramen spino sum was 2.34 ±0.05mm while that of the left was 2.36±0.05mm.[1,5].

The mean length of foramen spino sum in the dry skull was 3.31±0.84mm on left side and 3.73±0.63mm on right side.[2].

The maximum diameter of foramen spino sum was 2.92±0.65mm and 2.12±0.45mm was minimum.[3].

Length of foramen spino sum was ranging from 2 to 4 mm (maximum no. i.e. 30%) with 3mm. [4].

In a similar study on Nigerian skulls by Osunwoke et al it was ranging from 1 to 4mm. Study by Lang et al shows this range as 1.5 to 2.1 mm.[1,4,5].

CONCLUSION:

By identifying the variations in the Foramen Spinosum it is helpful in clinical and anatomical significance to medical practitioners in cases of trigeminal neuralgia and in diagnostic detection of tumors. And abnormal bony outgrowths that may lead to ischaemia, necrosis and possible paralysis of the parts of the body being supplied, drained or innervated by the contents of these foramina.

REFERENCES:


GRAPHS:

Graph: 1.

Size of foramen 2.5mm

Graph: 2.

Size of foramen 3.0mm

Graph: 3.

Size of foramen 3.2mm

Graph: 4.

Size of foramen 3.5mm