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Research Article

Localization and Morphometric Study of Supraorbital Foramen in Adult Human Dry Skulls

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Abstract: Supraorbital foramen is considered as an important landmark for various surgical and anesthetic procedures. Exact positioning of the foramen with respect to adjacent anatomical landmarks avoids damage to the neurovascular structures passing through them. Thirty one adult skulls were examined on both sides for the position of supraorbital foramen and its dimensions were observed and tabulated. The mean distance between the SOF/SON and the nasal midline were observed to be 22.96 ± 2.17mm on the right side and 22.41 ± 1.98 mm over the left side. The mean height of SOF from the superior orbital rim on the right side was observed to be 2.42 ± 0.78 mm and 2.54 ± 1.04 mm over the left side. The mean vertical diameter of SOF on the right side were observed to be 2.08 ± 0.49 mm and 1.82 ± 0.41 mm over the left side .The mean transverse diameter of SOF on the right side was observed to be 4.69 ± 0.72mm on the right side and 4.55 ± 0.49mm over the left side.The exact position and the morphometric values of the supraorbital foramen guides the experts to mobilize and safeguard the neurovascular structures during various procedures.
Keywords: Nasal midline, supraorbital foramen, supraorbital rim.

INTRODUCTION

A foramen is simply an opening through which structures enters or leaves. The supraorbital foramen is an opening located above the orbit and below the forehead. When the opening is completely surrounded by ossified ligament it is termed as the supraorbital foramen [1] and if partially covered by bone, termed as the supraorbital notch. The supraorbital foramen/notch transmits the neurovascular structures namely the supraorbital artery, veins and nerve and supplies the area around the eye, skin over the forehead. These neurovascular structures are prone to get injured during various procedures performed at their areas of supply and will lead to Paralysis of the structures being supplied by them [2]. Morphometric study of the supraorbital foramen/notches is essential to decide their normal location from anatomical reference points and facilitates various procedures like surgical, diagnostic, therapeutic, local anesthetic and other invasive procedures, without causing any injury to the vital structures present within [7]. Hence this study was carried out to ascertain the position of supraorbital foramina and notches with reference to anatomical landmarks inadulthuman dry skull bones.

MATERIALS AND METHODS

This study was conducted in adult skull bones from the Department of Anatomy, AarupadaiVeedu Medical College & Hospital, Puducherry.

All the skull bones which retained all the parts without any damage were taken in to consideration for this study which accounted to 31 skulls. Careful examinations of the sutures were done to confirm the skulls belonging to an adult.

The parameters in this study includes

- The distance between the SOF or SON and the nasal midline
- Height of the supraorbital foramen from the superior rim oforbit.
- Vertical diameter of SOF
- Transverse diameters of SOF

The midline of the forehead was marked by suspending a thread connecting the vertex of the skull to the anterior nasal spine by passing through the nasion (Fig-1). A digital vernier caliper was placed between the midline and the SOF/SON and the distance in-between were observed and tabulated which provides the position of SOF/SON from the midline.

The distance between the superior orbital rim and lowest point along the lower margin of the SOF is measured by the measuring tape (Fig-2) and the data's were tabulated which provides the position of SOF with relate to the supra orbital margin. A measuring tape is

used to measure the vertical and horizontal diameter of the SOF (Fig-3 &4).

Observations thus made were compiled; tabulated and statistical data were calculated. All the measurements were repeated twice by each examiner and the mean was taken for analysis. Analysis of data was done by using Statistical Package for Social Sciences (SPSS) 19 version.

OBSERVATIONS

Observations were made in 31 skull bones among which 14 skull bones presented with bilateral representation of SON, 7 skull with bilateral SOF, Unilateral representation of SOF were observed on right side for 6 skull and 4 skull over the left side.

Mean distance of SON/SOF from nasal midline (in mm)		**Mean height of SOF from the superior orbital rim (in mm)**		**Mean vertical diameter of main SOF (in mm)**		**Mean Transverse diameter of main SOF (in mm)**	
RIGHT (n=27)	LEFT (n= 25)	RIGHT (n=13)	LEFT (n=11)	RIGHT (n=13)	LEFT (n=11)	RIGHT (n=13)	LEFT (n=11)
22.96±2.17	22.41± 1.98	2.42 ± 0.78	2.54 ± 1.04	2.08±0.49	1.82±0.41	4.69±0.72	4.55±0.49

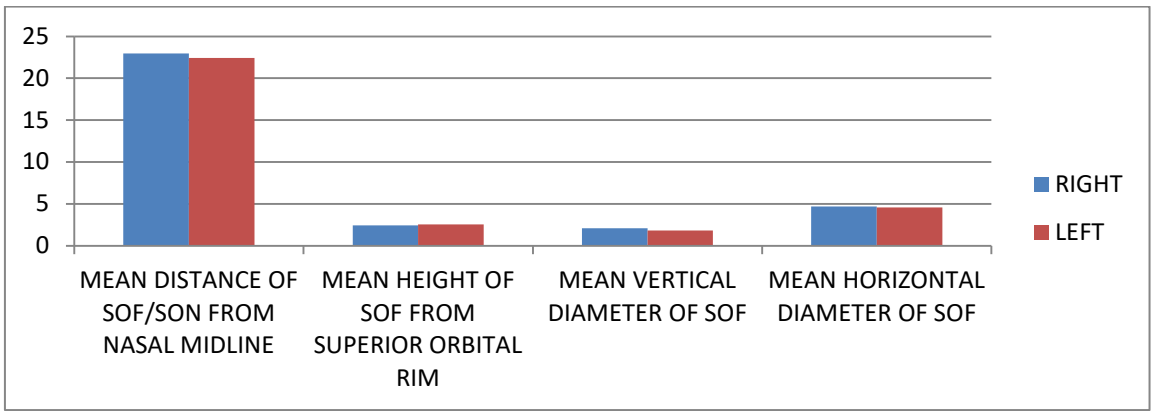

Fig-1: Nasal Midline

Fig-2: Height of SOF From Superior Orbital RIM

Fig-3: Vertical Diameter of SOF

Fig-4: Horizontal Diameter of SOF

DISCUSSION

The mean distance between the SOF/SON and the nasal midline were observed to be 22.96 ± 2.17mm on the right side and 22.41 ± 1.98 mm over the left side which is comparatively less than that of Trivedi et al.[3] who reports 24.3 mm on the right side and 23.7 mm over the left side.

The mean height of SOF from the superior orbital rim on the right side was observed to be 2.42 ± 0.78 mm and 2.54 ± 1.04 mm over the left side which is comparatively less than that of reported by Apinhasmit W et al.[4] (3.15 mm) and is more than that of reported by Webster R.C [5] (1.56mm).

The mean vertical diameter of SOF on the right side was observed to be 2.08 ± 0.49 mm and 1.82 ± 0.41 mm over the left side which iscomparatively less with that of the report given by Sharma N et al.[6] 2.75 ± 0.55 mm on the right side and 2.35 ± 0.23 mm over the left side, also less than the value reported by Trivedi et al.[3] 2.49mm on the right side and 2.45 mm over the left side.

The mean transverse diameter of SOF on the right side was observed to be 4.69 ± 0.72mm on the right side and4.55 ± 0.49mm over the left side which coincides with that of reported by Sharma N et al.[6] 4.62 ± 0.83mm on the right side and 4.31 ± 0.51 mm on the left side and found to be more than that of reported by Trivedi et al.[3] 3.67 mm on the right side and 3.54 mm over the left side.

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