

Gender Variation In The Morphology Of Supraorbital Notches And Foramina

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Abstract:

Introduction: The morphology of the supra orbital notch (SON)/supra orbital foramen (SOF) is important since they acts as the opening through which the neurovascular bundle emerges out of the orbit and supplies the area around the eye, skin over the forehead for the surgeons to be aware during various procedures at this region.

Methods: 54 skull bones were selected from the Department of Anatomy, Aarupadai Veedu Medical College and Hospital and observed for this study. Sexual dimorphism was done and the incidences of SON/SOF/ASOF along with its position were noted.

Results: This study revealed that SON is found to be more frequent than the SOF. The incidence of bilateral SON in male (25%) is found to be less than the female (27.77%) whereas SOF in male (13.88%) is more than the female (11.11%) and for the unilateral SON/SOF it is found to more in female (22.22%) than the male (16.66%). The bilateral and unilateral ASOF shows greater incidence in males (13.88% & 25%) than the females (11.11% & 22.22%). Absence of ASOF both in male and female remains equal (5.55%). Lateral position of ASOF with relate to main SON/SOF in male (42.85%) shows lesser incidence than the female (50%)

Conclusion: This study confirms the incidence of SON is more than the SOF as reported by the other researchers and variations in male and female sex along with frequency of ASOF and its varying positions in adult skull bones.

Keywords: Supraorbital notch, supraorbital foramen, Accessory supraorbital foramen.

I. Introduction

Adequate knowledge about the neurovascular bundle with respect to their point of emergence^[11] through the opening found on the superior rim of each of the orbit along with the area of supply is essential for the elective as well as emergency procedures performed at the region around the eyes and the forehead.

The opening exhibits in two forms namely SON* which when undergoes ossification of the above lying ligament^[12] later will be called as SOF**. The usual position of the SON/SOF is found at the junction of medial and middle one third of the superior rim of each of the orbit.^[1] any foramen accompanying along with SOF/SON is considered as ASOF***. The Morphology of the supraorbital notches/ supraorbital foramen has been studied by other researchers and has been reported, but the Morphology of these structures has not been done with respect to difference in sex. Hence this study has been aimed at finding the gender variation in the Morphology of supraorbital notch/foramen in the skull.

SON* – supraorbital notch, SOF** – supraorbital foramen, ASOF*** – accessory supraorbital foramen

II. 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 54 skulls. Careful examinations of the sutures were done to confirm the skulls belonging to an adult.

Sexual dimorphisms of the skull bones were done using the parameters like facial height, nasal height and nasal width and shape of superciliary arch.^[8,9]

The Morphology of SON/SOF and ASOF of both the sex were observed and tabulated.

Observation:

Table: 1 showing the number of male and female skull bones

GENDER	NUMBER	%
MALE	36	66.66
FEMALE	18	33.33

(n =54)

Table: 2 showing the distribution of SON/SOF/ASOF in male and female skull bones

TYPE	MALE (36)	%	FEMALE (18)	%
BILATERAL SON	9	25.00	5	27.77
BILATERAL SOF	5	13.88	2	11.11
UNILATERAL SON/SOF	6	16.66	4	22.22
BILATERAL ASOF	5	13.88	2	11.11
UNILATERAL ASOF	9	25.00	4	22.22
ABSENCE OF ASOF	2	5.55	1	5.55

Table: 3 showing the position of ASOF with respect to original SON/SOF in male and female skull bones

POSITION OF ASOF	MALE (14)	%	FEMALE (6)	%
SUPERIOR	5	35.71	2	33.33
MEDIAL	3	21.42	1	16.66
LATERAL	6	42.85	3	50.00

III. Result

Out of 54 adult skulls, 36 (66.66%) were males and 18(33.33%) were female skull bones. Bilateral representations of SON were found in 9 (25%) male skull bones and 5 (27.77%) female skull bones. Bilateral representations of SOF were found in 5 (13.88%) male skull bones and 2 (11.11%) female skull bones. SON to one side with SOF on the opposite side were found in 6 (16.66%) of male and 4(22.22%) of female skulls. Bilateral representations of ASOF were found in5(13.88%) male skull bones and 2 (11.11%) female skull bones. Unilateral representations of ASOF were found in 9 (25%) male skull bones and 4 (22.22%) female skull bones. Absence of ASOF was found in2 (5.55%) male skull bones and 1 (5.55%) female skull bones. With relate to the main SOF the ASOF positions itself 5 (35.71%) superiorly, 3 (21.42%) medially and 6 (42.85%) laterally in males and 2 (33.33), 1 (16.66%) and 3 (50%) in females.

IV. Discussion

The neurovascular bundle emerging out from the orbit through the SOF/SON includes the supraorbital artery, vein, and nerve which supplies upper eyelid, forehead and scalp as far behind as lambdoid sutures. These structures have to be well preserved in situations when they are mobilized during the various procedures done at their specific areas of distribution which is also reported by Erdogmus S [4]. Beer et al. documented five potential variations for the exit point of supraorbital nerve and vessels; no notch and no foramen, one or two notches, one or two foramina, medial notch and lateral foramen, medial foramen and lateral notch [6].

Detailed information on the variations of SOF/SON is must in order to safeguard the neurovascular bundle for which this study is aimed at and to find out the proportion of the same between the male and female skull bone.

In our study the incidence of SON is more than the SOF which coincides with the report of Chung MS where frequency of SON is (69.9%) and SOF is only about (28.9%) [2]. The presence of bilateral supraorbital notch is in male is 9 (25%) which is less than the female which is only 5 (27.77%) whereas Chavan W.M reported 52% in male and 30.8% in female [7]. The presence of bilateral supraorbital foramen in male is 5 (13.88%) male which is more than the female 2 (11.11%) whereas Chavan W.M reported 10.05% in male and 30.8% in female [7]. The presence of SON on one side with SOF on the opposite side accounts to 6 (16.66%) in male and 4(22.22%) of female skulls which coincides with the report of Trivedi DJ which is (16.73%) [3].

Bilateral representations of ASOF were found more in male 5(13.88%) than the female which is only 2 (11.11%) and surprisingly 9 (25%) male skullbones and 4 (22.22%) female skull bones presents with Unilateralrepresentations of ASOF. Collectively the incidence of ASOF is found to be more than that has been reported by Gupta T which is only (14%) [10].

Absences of the ASOF were found in equal proportion represented by2(5.55%) male skull bones and 1 (5.55%) female skull bones where the incidence is high withrelate to the report of Beer GM which is only (3%) [6]. The position of the ASOF with respect to main SOF is found to be 5 (35.71%) superiorly, 3 (21.42%) medially and 6 (42.85%) laterally in males and 2 (33.33), 1 (16.66%) and 3 (50%) in females. The above data clearly states that the incidence of the position of the ASOF is found more in lateral to the main SOF coincides with the previous study done by Ashwiniet al., [5], in whichthe position of superior, medial and lateral ASOF were 13(28.88%) , 8 (17.77%) and 28 (62.2%) respectively

V. Conclusion

This study had confirmed and concluded that the presence of SON is more common than SOF in adult skull bones as studied by other researchers and also provides adequate information on the Morphology and the variations between the male and female with the varying position of ASOF which enables for safe mobilization of the neurovascular bundle emerging through during various procedures.

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