



STUDY OF SUPRA ORBITAL FORAMINA AND NOTCHES IN DRY UNKNOWN HUMAN SKULLS

Medical Science

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ABSTRACT

Introduction: The study on supraorbital notches [SON] and foramina [SOF] are very important for the surgical manovure of the eyebrow lift surgery
AIM OF THE STUDY: To know the percentages of incidences of supraorbital notches and foramina in unknown dry adult human skulls.

Materials & Methods: This study was conducted in Department of Anatomy of Jaipur National University, Jaipur, State of Rajasthan. Dried unknown human skulls from the department of Anatomy of the above institution of the University constituted the materials for the present study. Each skull was studied for supraorbital notches and foramina and their number location and their frequencies were noted down and results were tabulated.

Conclusion: Our work gives the presence of **supraorbital** notches and foramina which are of paramount importance in any surgical maneuver around the orbit.

KEYWORDS

supraorbital foramina, supraorbital notches, unknown human skulls, Supra orbital vessels & Nerves

INTRODUCTION:

Supraorbital notch present on supraorbital margin at junction of its lateral two third with that medial one third. This notch is sometimes palpable. Sometimes there will be ossification of the ligament that converts notch into foramina known as Supra orbital foramina. Sometimes the ligament that converts notch into foramina gets ossified [1]. Duke elder has named it as supraorbital ligament (2) Frequent conversion of notch into foramen has been claimed by Schaffer [3] Supraorbital notch/foramen passes supraorbital nerves and blood vessels through supraorbital foramina. Supraorbital nerve branch of frontal nerve which is branch of ophthalmic nerve ends by supplying upper eyelid and conjunctiva [4]. Also supplies frontal air sinus and cutaneous nerve supply to the skin of forehead. The levator palpebrae superioris, the diploë of the frontal bone, the frontal sinus, the upper eyelid, and the skin of the forehead and the scalp are supplied by Supraorbital artery [5].

MATERIALS AND METHODS:

Present study has been done on dry unknown human skulls obtained from different Medical Colleges of India. After taking consent from the head of the institution & head of department, about 195 skulls were studied in detail on supra orbital foramina and notches regarding their locations, numbers, directions, and various types of combinations of both notches and foramina.

Table-1, showing total number of skulls studied from different Medical colleges

S/No	Name of the Medical Colleges	Number of skulls studied
1	Raja rajeswari Medical College: Mysore road: Bangalore.	38
2	Narayana Medical College, Nellore; Andhra Pradesh	40
3	Mahatma Medical College: Pilliyarkuppam: Pondicherry.	32
4	Vellammal Medical College: Madurai: Tamil Nadu	29
5	Sri Devraj urs Medical College, Tamaka: Kolar, Karnataka	42
6	Saraswati Medical College, Unnao, UP	04
7	Jaipur National University Institute for Medical Sciences & Research Center, Jagatpur: Jaipur [JNUIMSRC]	10
	Total number of skulls studied	195

The above table show names of various Medical College where work has been done

Table-2, showing various combinations of Bilateral Supra orbital foramina and notches. [11 types].

S/No	Type of combinations	Number on the right side	Number on the left side
1	Bilateral Supra orbital foramina	47[31.756%]	47[35.07%]
2	Bilateral Supra orbital notches	23[15.540%]	23[17.16%]
3	Single Supra orbital notch and double supra orbital foramen	8[5.405%]	9[6.71%]
4	Double Supra orbital notches and Single Supra orbital foramen	5[3.378%]	4[2.985%]
5	Single Supra orbital foramen and double supra orbital foramen	3[2.027%]	5[3.731%]
6	Single Supra orbital notch and foramen	21[14.189%]	17[12.68%]
7	Double Supra orbital notch and absence of supra orbital foramen and notch	4[2.702%]	3[2.238%]
8	Double notches & double foramina	4[2.702%]	7[5.223%]
9	double foramina and single notch	18[12.162%]	08[.5.970%]
10	Supra orbital Notch & absence of both notches & foramina	03[2.027%]	02[1.492%]
11	Supra orbital Notch on one side and foramina on the other side	12[8.108%]	09[6.71%]
		148	134

The above table show maximum number of skulls having Bilateral Supra orbital foramina [47] followed by Bilateral Supra orbital notches [23], while least number of combinations are Supra orbital Notch & absence of both notches & foramina [3 & 2]

DISCUSSION:

At the superior and medial margin of the orbit in the frontal bone there is Supra orbital opening which is very small through which passes small supra orbital nerve branch of frontal nerve, which is again branch of Ophthalmic division of trigeminal nerve [5th cranial nerve] [6]. The Supra orbital foramen that is present on the innermost, lower margin of a groove divides supraorbital ridge into a central and two distal sections [7]. Through supraorbital foramen emerge the supraorbital nerve that supply region of skin of forehead. During different surgical and anasthetical manovures, these nerves may get injured [8]. Supraorbital nerve blocks are carried out during the procedures such as closure of wounds, biopsies, and other facial cosmetic surgeries. Hence clinician should have a thorough knowledge to bring about effective anesthesia of the supraorbital nerve [8, 9, 10]. The knowledge of the supraorbital notch and foramen is very important to prevent supra orbital neuralgia and other problems like neuropathies due to entrapment of nerves [11, 12, 13]. **Jaiswal**

Sonia et al conducted a study on one hundred dry human skulls by using vernier calipers to measure the distance of the supraorbital notch/foramen from the nasion and from the frontozygomatic suture taken from the department of Anatomy Their study showed higher incidence of Supraorbital notches[43.8%],when compared to foramina [17%].The distance of Supra orbital Foramen (SOF)/ Supra orbital Notch SON from the nasion was about 21.66mm on right and 21.51mm left side respectively where as Distance of SOF/ SON from the frontozygomatic suture on the right side was about 29.29mm while on the left side it was about 28.98mm.This study was done at Integral Institute of Medical Sciences, Era's Lucknow Medical College and King George Medical University. The parameters studied were measurement of distance between the supraorbital foramen/ notch and the frontozygomatic suture and distance between the nasion and the supraorbital notch and or foramen were taken[14]**Nishtha Singh et al** did a study on dry 71 human crania taken from North India on supraorbital notch or foramen, and their unilateral and bilateral percentages of incidences were calculated. Distance of supraorbital notch or foramen was also measured from the nasal midline and frontozygomatic suture. Incidence of supraorbital foramen was 19.01%, of them 11.27%; was bilateral while incidence of supraorbital notch was 80.99%,of them bilateral was seen in 73.24% and in 7.75% cases notch was seen on one side and foramina on the other side. Mean perpendicular distance of the supraorbital notch or foramen from nasal midline was 24.64 ± 3.35 . Mean perpendicular distance of the supraorbital notch or foramen from nasal midline was 24.64 ± 3.35 mm. on right side and 24.88 ± 2.63 mm. on left side where as mean distance of supraorbital notch or foramen from frontozygomatic suture was 30.94 ± 2.63 mm[15]. Clinicians should have perfect knowledge of the accurate position of SOF / SON especially while examining cases of supraorbital neuralgia which gives rise to severe headache in the forehead region followed by tenderness over the region of supra orbital foramina or notches[13]. **Apinhasmit et al** in [2006]found the frequency of Supra orbital notches to be 66.5%,[16]

IN PRESENT STUDY higher percentage of bilateral Supra orbital foramina [31.756%] on the right side 35.07%on the left side] was observed compared from the Bilateral Supra orbital notches [15.540% on the right side & 17.16% on the left side] .Among combinations of notches and foramina Single Supra orbital notch and foramen are 21[14.189%]on the right side and 17[12.68%]on the left side followed by double foramina and single notch 18[12.162%] on the right side and 08[5.405%].On the left side, Double Supra orbital notch and absence of supra orbital foramen and notch were 4[2.702%] on the right side and 3[2.238%]on the left side which are of rare combinations. **In the studies of Nishtha Singh et al done on 71 skulls of North Indian origin** observed that supraorbital notch were present in 80.99%,of them bilateral was seen in 73.24% and in 7.75% cases notch was seen on one side and foramen on the other side, While in our study it was observed that Supra orbital Notch on one side and foramina on the other side were seen it 12[8.108%] on the right side & 09[6.71%] on the left side. **Jaiswal Sonia et al [2016] who** conducted a study on one hundred dry human skulls showed higher incidence of Supraorbital notches [43.8%],when compared to foramina [17%].**However in our studies it** showed higher percentage of bilateral Supra orbital foramina 31.756% on the right side and 35.07%on the left side. The frequency of notches was 64.6% in Gupta et al studies [2008], **Apinhasmit et al in 2006**[16] found the frequency to be 66.5%, while in Jaiswal Sonia studies it was 67.79%.The frequency of notches in our study bilaterally was 23[15.540%]on the right side & 23[15.54%] on the left side.

CONCLUSION:

The variations observed on various combinations of notches & foramina both in our studies and others may be due to numerical difference, racial difference, population difference .Hence this study also has Physical Anthropology importance.

TAKE HOME MESSAGE:

The locations & dimension of SOF/SON are different in different races & in people of different region This knowledge of SON /SOF is of great importance when injecting local anaesthesia,during the ,procedures of Forehead face lift ,any surgical manouvers in ophthalmology and in craniofacial surgeries

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