

A Study of Morphometric Analysis of Infraorbital Foramen in South Indian Dry Skulls

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Abstract:**Aim and Objective:**

To study the morphometry of the infraorbital foramen with respect to nearby anatomical landmarks in different skulls of south indian population.

Background:

Infraorbital foramen is an important site for various surgical and anaesthetic procedures. The infraorbital foramen due to infraorbital vessels and nerve which pass through it is an important anatomic landmark and its location needs to be known for maxillofacial innervations. It allows passage for the infraorbital artery , veins, nerves, which are branches of maxillary branch of trigeminal nerve and maxillary artery.

Reason:

The purpose of this study is to verify the morphometric variations in the dry skull of south indian and to find out the exact positions of infraorbital foramen and its applications in various surgical procedures.

Keywords:Infraorbital foramen, surgical procedures, dry skulls, local anaesthesia.

INTRODUCTION:

The Infraorbital foramen (IOF) is an anatomical structure present bilaterally on the maxillary bone 1 cm below the infraorbital margin (IOM), at the uppermost part of the canine fossa. The infraorbital nerve is a terminal branch of the second division of the trigeminal nerve (maxillary), and exits through the IOF lying in the same vertical plane as the pupil when the eye is in forward gaze.(1) The infraorbital nerve is sensitive and it lengthens the maxillary nerve which crosses the IOF and branches to feed the skin in the upper portion of the face, the maxillary sinus mucosa, the maxillary incisor, the canine and premolar teeth and the adjacent gums portion , the lower eyelid skin and conjunctiva, part of the nose, skin and mucosa of the upper lip.(2) The infraorbital foramen is an opening by which the infra orbital canal giving passage to the infra orbital artery, vein and nerve and communicates with the face. The infraorbital foramen is an important landmark for oral and maxillofacial surgery when looked from the perspectives of surgery and local anesthesia.(3) Its anatomy varies according to the location , shape, size, laterality and incidence of accessory foramina. The study of the infraorbital foramen is significant in local anesthesia procedures in maxillofacial surgeries and consequently in protection against procedural neurovascular injuries. Therapeutic infraorbital nerve blocks are used in intractable and pharmacologically un responsive trigeminal neuralgia.(4) It has a relatively big diameter if its compared to the supraorbital foramen and can vary on the form and situation.(5) The presence of accessory infra orbital foramen may be difficult during anesthetization of the region innervated by infra orbital nerve.(6)

MATERIALS AND METHODS:

22 adult dry human skulls of unknown sex of south indian origin were investigated. The skulls which are damaged were excluded. The skulls were obtained from the Department of Anatomy, Saveetha Dental College, Chennai, Tamilnadu, India. All the parameters were measured in the following planes:

- Distance from center of IOF to IOM along sagittal plane
 - Distance from center of IOF to piriform aperture along the transverse plane.
 - Distance from center of IOF to lower end of alveolus of maxilla along sagittal plane.
 - Vertical and horizontal diameters of IOF.
 - Presence of accessory foramina.
 - Location.
- The measurements related to IOF were taken with vernier calipers to measure the distance. From the above measurements mean, standard deviation, median, and mode were calculated.

RESULT AND DISCUSSION:

The infraorbital foramen was studied in 22 adult dry human skulls and it was present in all the skulls. The location of infra orbital foramen has become mandatory for different procedures to reduce the risk in orbital surgeries.(7) Knowledge of the position of the IOF is very useful to dentists as well as to head and neck surgeons for both diagnostic and clinical procedures.(8) The measurements was taken using various parameters. From(table 1) The mean distance from centre of IOF and IOM was found to be 3.69 , the mean distance from centre of IOF to piriform aperture along transverse plane is 13.3, the mean distance from centre of IOF to lower end of alveolus of maxilla was found to be 18.86 and the mean of horizontal and vertical diameter was found to be 3.9 and 3.633.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Distance from centre of IOF and IOM along the sagittal plane	44	2.09	7.59	3.6977	1.01908
Distance from centre of IOF to piriform aperture along transverse plane	44	8.37	19.64	13.3009	2.83282
Distance from centre of IOF to lower end of alveolu of maxilla along sagittal plane	44	10.83	28.41	18.8620	4.20948
Horizontal diameter of IOF	44	2.00	6.70	3.9282	1.11773
Vertical diameter of IOF	44	1.94	5.60	3.6334	1.01422
Valid N (listwise)	44				

(Table 1)

From (table 2) it was found that about 52.3% IOF was found above second premolar and about 29.5% found above first molar and 18.2% found above first premolar.

Location

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid A1P	8	18.2	18.2	18.2
A2P	23	52.3	52.3	70.5
A1M	13	29.5	29.5	100.0
Total	44	100.0	100.0	

(Table 2)



(Figure 1) Distance from center of IOF to IOM along sagittal plane



(Figure 2) Distance from center of IOF to lower end of alveolus of maxilla along sagittal plane.



(Figure 3) Vertical and horizontal diameters of IOF.

CONCLUSION:

Knowledge of the position of infra orbital foramen is very useful to maxillofacial surgeons, dentists and for the regional block anesthesia. This study helps to determine the precise location of IOF in relation to various anatomical structures particularly IOM and lower end of alveolus of maxilla, The landmarks described could be identified and applied in various clinical scenarios thereby decreasing the risk of failures and complications during treatment.

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