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MORPHOMETRIC ANALYSIS OF GREATER PALATINE FORAMEN IN DRY SKULLS

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ABSTRACT: **Introduction:** Greater palatine foramen is located at the either posterior angle of hard palate. It helps for the transmission of the descending palatine vessels and greater palatine nerves. Location of greater palatine foramen varies in different skulls in some it is present near the 3rd molar teeth or near 2nd molar or between 2nd and 3rd molar. **Aim:** To study about the morphometric analysis of the greater palatine foramen in South Indian skulls at saveetha dental college. **Methods:** The study is done in about 50 dry South Indian skulls. The dimension between greater palatine foramen to incisive fossa, middle saggital suture & posterior border of hard palate is to be taken. And the dimensions are taken using a metre scale and vernier caliper. **Reasons for the study:** It is important for maxillofacial and dental surgeons for giving anaesthesia in various dental procedures. Blocking of maxillary division of trigeminal nerve during local anaesthesia is a common practice in maxillofacial surgery, variation in position of greater palatine foramen poses difficulty in location of maxillary division of trigeminal nerve during local anaesthesia.

INTRODUCTION: The hard palate is situated within the superior alveolar arch, the palatine processes of the maxillae and the horizontal plates of the palatine bone together form the Hard palate. The greater palatine foramen which are two in number lie near the lateral palatal border of the transverse palatine suture⁴. Through the greater palatine foramen passes the greater palatine nerve and vessels. The greater palatine nerve is a branch of maxillary nerve, which is the second division of trigeminal nerve². It starts in the middle of the trigeminal ganglion and leaves the skull through foramen rotundum².

The greater palatine foramen (GPF) conducts the greater palatine nerve, responsible for the innervation of the posterior part of hard palate¹.

It descends through the greater palatine canal emerges upon the hard palate, through the greater palatine foramen and passes forward in a groove in the hard palate, nearly as far as the incisor teeth. The descending palatine artery is a branch of third part of the maxillary artery in the pterygopalatine fossa. It descends through the greater palatine canal along with the greater palatine nerve.

Once emerging from the greater palatine foramen, it changes names to the greater palatine artery and begins to supply the hard palate. As it terminates it travels through the incisive canal to anastomose with the sphenopalatine artery to supply the nasal septum. Most texts books locate the greater palatine foramen in one general way for example in posterolateral plate or opposite to last molar teeth. Clinical tests on anaesthesia are somewhat more specific in relating greater palatine foramen to molar teeth. So, Evaluation of the relative position of GPF is important for injection of local anaesthetic for optimal pain control in maxillofacial and dental surgeries³. The aim of the study is to evaluate the direction and opening of Greater palatine foramen and also in determining the

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relative distance, direction and variations in location of Greater palatine foramen.

MATERIALS AND METHODS:

The study was done on dry skulls with fully erupted third molar teeth. Skulls with bony abnormalities were excluded from the study to get a correct measurement. 50 dry skulls were studied from the Department of Anatomy, saveetha dental college. The measurements were taken using a digital vernier caliper and the values are mentioned in millimetre (mm). All the readings were taken symmetrically both left and right. After collecting all data, results were analyzed and values of mean & standard deviation [SD] were calculated using

Microsoft Office Excel.

The measurements were taken in the following manner,

- Distance between Greater palatine foramen (GPF) to Incisive fossa (IF) (Line A)
- Distance between Greater palatine foramen (GPF) to Middle maxillary suture. (MMS) (Line B)
- Distance between Greater palatine foramen (GPF) to Posterior border of hard palate. (PBHP) (Line C)

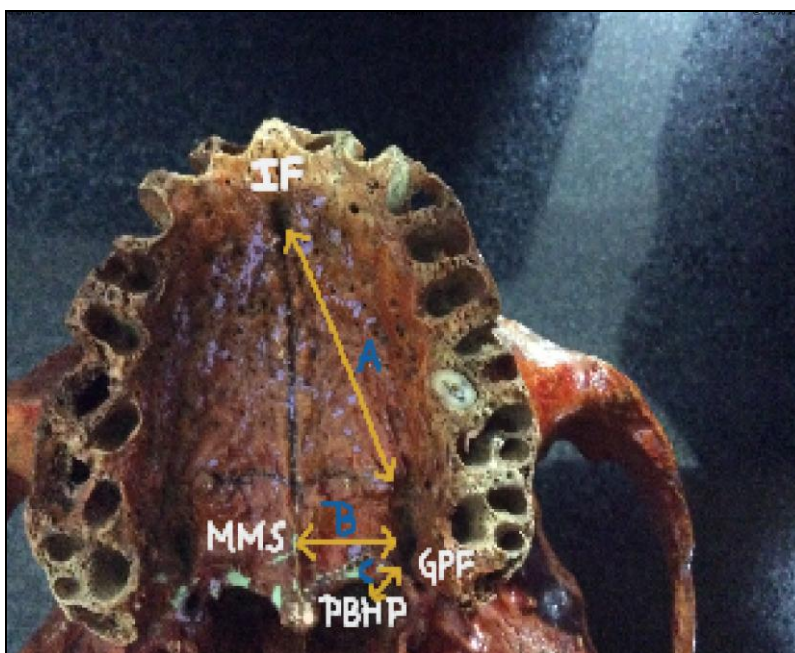


FIG.1: THE DISTANCE BETWEEN GREATER PALATINE FORAMEN TO INCISIVE FOSSA, MIDDLE SAGGITAL SUTURE & POSTERIOR BORDER OF HARD PALATE

RESULTS: The **Table 1** shows the mean and standard deviation (SD) of the distances of GPF from the MMS, from the IF and from the PBHP on the right and left side. The mean distance of GPF to IF was more on right side (37.9mm) than the left

side (37.3mm). The mean distance of GPF to MMS was more on right side (13.5mm) than the left side (13.16mm). The mean distance of GPF to PBHP was more on left side (4.3mm) than the right side (3.8mm).

TABLE 1: SHOWS THE MEAN AND STANDARD DEVIATION OF THE DISTANCES OF GPF TO IF, MMS AND PBHP

	Distances of Greater Palatine Foramen.			
	Left mean	Standard deviation	Right mean	Standard deviation
Gpf to Incisive Fossa	37.3	2.5	37.9	2.9
Gpf to Middle Maxillary Suture	13.16	1.7	13.5	1.5
Gpf to Posterior Border of Hard Palat	4.3	2	3.8	1

DISCUSSION: Table 2⁴ reported the distance between GPF to MMS on right side as (14.2mm) and on left side as (14.3mm). Reported³ the distance as (14.8mm) on both the sides. Reported⁵

the distance on right side as (14.3mm) and on left as (14.4mm). Reported⁶ a distance of (14.7mm) on both sides. The present study values are less compared to other studies.

TABLE 2: MEAN DISTANCE BETWEEN GPF TO MMS

Author	Right	Left
Ashwini H (2014)	14.2	14.3
Vinay K.V (2012)	14.8	14.8
Ajay kumar (2011)	14.3	14.4
Saralaya et al., (2007)	14.7	14.7
Present study (2015)	13.5	13.16

Table 3 Ashwini H (2014) reported the distance between GPF to IF on right side as (34.25mm) and on left side as (34.28mm). Vinay K.V (2012) reported the distance on right side as (36.6mm) and on left side as (35.9mm). Ajay kumar (2011) reported the distance on right side as (36.6mm) and

on left side as (35.7mm). Saralaya et al., (2007), reported a distance on right side as (37.2mm) and on left side as (37.3mm). The present study values are slightly high on right side and same on left side when compared to other studies.

TABLE 3: MEAN DISTANCE BETWEEN GPF TO IF

Author	Right	Left
Ashwini H (2014)	34.25	34.28
Vinay K.V (2012)	36.6	35.9
Saralaya et al., (2007)	37.2	37.3
Ajay kumar (2011)	36.6	35.7
Present study (2015)	37.9	37.3

Table 4 Ashwini H (2014) reported the distance between GPF to PBHP on right side (3.92mm) and on left side is (4mm). Vinay K.V (2012) reported the distance on right side (3.56mm) and on left side is (3.58mm). Ajay kumar (2011) reported the distance on right side as (3.57mm) and on left side

is (3.59mm). Saralaya et al., (2007), reported a distance of (4.2mm) on both the sides. The present study values are slightly high on left side and almost equal on the right side when compared to other studies.

TABLE 4: MEAN DISTANCE BETWEEN GPF TO PBHP

Author	Right	Light
Ashwini H (2014)	3.92	4
Vinay K.V (2012)	3.56	3.58
Saralaya et al., (2007)	4.2	4.2
Ajay kumar (2011)	3.57	3.59
Present study (2015)	3.8	4.3

CONCLUSION: Variations in position of GPF pose difficulties for clinicians anaesthetists and as well as for maxillofacial surgeons. The present study evaluated the relative position of greater palatine foramen in dry skulls which is useful for locating the greater palatine foramen better. And also in order to block the maxillary division of trigeminal nerve the present data can provide anatomical references to professionals, since it is important to locate the exact position of the GPF

for many surgical procedures in the maxilla. This data will be helpful in comparing the skulls with

those from various other regions as well as skulls of different races.

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