Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 09, pp.57134-57135, September, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

MORPHOMETRIC ANALYSIS OF THE HARD PALATE

[1,*]Nur Qistina Binti Ahmad Fauzi and [2]Yuvaraj Babu, K.

[1]Bachelor of Dental Surgery (Year 1,), Saveetha Dental College, Chennai-600077
[2]Assistant Professor, Saveetha Dental College and Hospitals, No 162, PH Road, Chennai-600077

ARTICLE INFO

Article History:
Received 21st June, 2017
Received in revised form
08th July, 2017
Accepted 25th August, 2017
Published online 29th September, 2017

Key words:
Hard Palate,
Greater Palatine Foramina,
Lesser Palatine Foramina,
Palatine Index.

ABSTRACT

AIM: To do the morphometric analysis of the hard palate.
OBJECTIVE: By analysing the palatine length and breadth, which is used to determine the palatine index, the position of the greater foramen (GPF), the distance of GPF from the middle maxillary suture (MMS) and the variation in number of lesser palatine foramina (LPF); the variations of the hard palate in South Indians can be seen.
BACKGROUND: The morph metric analysis of the hard palate is done by determining the palatine index, GDF, MMS as well as the LPF of unsexed South Indian skulls; which plays an important role in the passive articulation of speech. This information will also provide needed information about defects during development which can lead to conditions like cleft palate. The basis to this is that the osteological and morphological variations of the hard palate is of great clinical value.
REASON: The hard palate has got variations in age and race. There is a need to analyse and find out the Palatine Index for South Indian population. This could prove as a useful tool for plastic surgeons as well as anthropologist.

Copyright©2017, Nur Qistina Binti Ahmad Fauzi and Yuvaraj Babu. *This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.*

Citation: Nur Qistina Binti Ahmad Fauzi and Yuvaraj Babu, K. 2017. "Morphometric analysis of the hard palate", *International Journal of Current Research*, 9, (09), 57134-57135.

INTRODUCTION

Measurements of the hard palate assumes an important part in the examination of skeletal varieties, determination of history population, history characterization, and behavioral characteristics of bone morphology (Djuric-Srejic *et al*., 2001). The hard palate, is formed by the palatine processes of the maxilla and both the horizontal plates of the palatine bones. These bones are connected by a cruciform suture existing between the junction of the bones (Williams *et al*., 1989; DuBrul , 1988). The hard palate is significant especially in the production of speech. The structure of the hard palate differs in adults and children. In this study, the aim of it is to determine the palatine index, the position of GPF, the distance of GPF from theMMS and the variation in number of LPF; which at the end will show the variations of the hard palate in South Indian skulls.

MATERIALS AND METHODS

30 dried unsexed human skulls were obtained and studied from Department of Anatomy, Saveetha Dental College, Chennai, India.

Corresponding author: **Nur Qistina Binti Ahmad Fauzi,**
Bachelor of Dental Surgery (Year 1,), Saveetha Dental College, Chennai-600077.

The required measurements were made by using the Vernier Calliper to the nearest millimeter using the following way. (Figure 1)

- **LENGTH (a):** The distance between anteriorly; the orale (anterior end of incisive suture at the median point between the two maxillary central incisors) and posteriorly; the posterior nasal spine.
- **WIDTH (b):** The distance between inner borders of the upper second molar.
- PALATINE INDEX:

Calculated using the following formula:-

$$\frac{Widt}{Lengt} \times 100$$

- **POSITION OF GPF (c):** Determined with reference with the 2nd and the 3rd molar tooth.
- **DISTANCE OF GPF (d):** The distance from the MMS
- **THE NUMBER OF LPF (e):** Determination of the lesser palatine foramen on both the left and right sides.

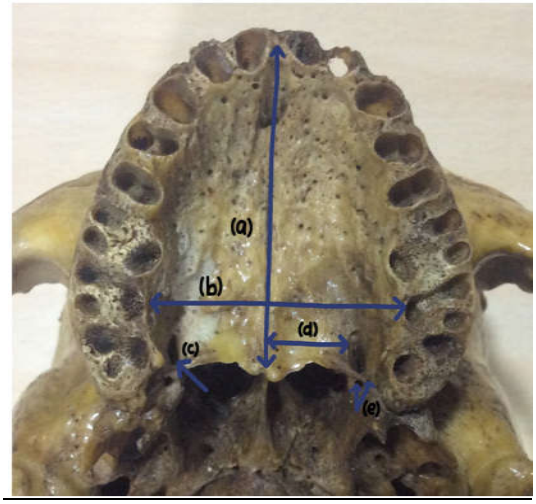

Figure 1. Measurements of the sections of the hard palate (a) = length, (b) = width, (c) = position of GPF, (d) = distance of GPF, (e) = number of LPF

RESULTS

From a total of 30 skulls that were observed, the 95% of skulls has a GPF opposite to that of the third molar and only 5% of the skulls had the foramina opposite to that of the second molar (Table 1)

Table 1. The GPF in relation to the maxillary molars

Relation of GPF to maxillary molars	Right side n (%)	Left side n (%)	Total n (%)
Opposite to the 2rd molar	2 (6.67%)	1 (3.33%)	3 (5%)
Opposite to the 3rd molar	28 (93.3%)	29 (96.7%)	57 (95%)
Total	30 (100%)	30 (100%)	60 (100%)

The distance of the GPF on the right side gives a mean value of 16.7 mm with a range of 10.0 mm to 2.5 mm. On the left side, the mean value is 16.9 mm with a range of 11.0 mm to 2.5 mm. In regards to the LPF of the skulls, 48.3% of the skulls have only one LPF, 38.3% of the skulls have two LPF while 11.7% have three LPF (Table 2).

Table 2. Number of LPF

No. of LPF	Right side	Left side	Total
0	1	0	1 (1.67%)
1	14	15	29 (48.33%)
2	14	9	23 (38.33%)
3	1	6	7 (11.67%)

Based on the palatine index, 10 % had wide skulls (Brachystaphyline), 73.33 % had narrow skulls (chamestaphyline) and the remaining 17% had intermediate skulls (orthostaphyline) (Table 3)

Table 3. Palatine Index

Palatine Index range	n (%)
Less than 79.9	22 (73.33%)
80.0-84.9	5 (16.67%)
Greater than 85	3 (10%)
Total	30 (100%)

DISCUSSION

Comparing to other studies that were done, in regards to the position of the GPF; Ajmani (1994) found that only 64% of it is positioned opposite to that of the third molar. From Saralaya & Nayak (Saralaya, 2007) , they observed 74.6% in the skulls obtained while according to Bruno *et al*. (2010), 54 % were seen. Based upon our study, 95% were seen in South Indian skulls. In accordance to the number of the LPF, Saralaya and Nayak (2007) observed 40% of the skulls observed had bilateral symmetry. Hassanali (Saralaya, 2007) on the other hand, obtained 40% had 2-5 LPFs present. Our study showed at most 48% of the skulls observed contained 1 LPF.

The palatine index that were observed on Kenyan skulls according to Hassanali (1984), 43.2% were brachystaphyline. According to the study done by Dave (Dave, 2013), 63% had leptostaphyline, 24% were mesotaphyline and the remaining 13% were brachystaphyline. On the other hand, based on the study done by Jotania (Jotania *et al*., 2013), the dominating type of palatine index was leptosaphyline while there was an equal value of mesotaphyline and brachystaphyline. Based upon our study, 10 % had wide skulls (Brachystaphyline), 73.33 % had narrow skulls (chamestaphyline) and the remaining 17% had intermediate skulls (orthostaphyline).

Conclusion

The study of the hard palate is of importance in terms of clinical practice for dental professionals. These includes the fabrication of complete dentures and during surgical procedures, involving both the soft and hard palate especially in the administration of local nerve blocks.

REFERENCES

Ajmani ML. 1994. Anatomical variation in position of the greater palatine foramen in the adult human skulls. *J Anat*; 184: 635-637 .

Bruno R. Chrcanovic, Antonio L. N. Custodio. 2010. Anatomical variation in the position of the greater palatine foramen. *Journal of Oral Science,* 52 (1): 109- 113.

Dave MR, Gupta S, Vyas K, Joshi HG. 2013. A study of palatal indices and bony prominences and grooves in the hard palate of adult human skulls. NJIRM. 4(1):7-11.

Djuric-Srejic M. LeticV, Zivanovic S. 2001. New Facial measurement used in the determination of palatine in- dex and thickness of the mandibular body index. Hu- man evolution; 16 (24): 143-149.

DuBrul EL. 1988. Sicher and DuBrul's oral anatomy. th *Biomedical Research 2012 Volume 23 Issue 2 175* 8 edition, Ishiyaku Euro America, St Louis; 269-284.

Hassanali J, Mwaniki D. 1984. Palatal analysis and osteology of the hard palate of the Kenyan Africanskulls, Ant Rec., 209: 273-280.

Jotania B, Patel SV, Patel SM, Patel P, Patel S, Patel K. 2013. Morphometric analysis of hard palate. *Int J Res Med.,* 2(2);72-5.

Saralaya V, Nayak SR. 2007. The relative position of the greater palatine foramen in dry Indian skulls. *Singapore Med J.,* 48: 1143-1146 .

Williams PL ,Warwick R, Dyson M, Bannster H. 1989. Gray's Anatomy.37th edition,London, 354.

****