



Correlation of Incisive papilla and the distance from the maxillary anterior teeth

Authors

Dr Suvit Maskey^{1*}, Dr Rosha Shrestha², Dr Rajiv Yadav³, Dr Neelam Yadav⁴

¹Principal Investigator, Department of Dentistry, Institute of Medicine, Kathmandu, Nepal

²KIST Medical College and Teaching Hospital Lalitpur, Nepal

³Department of dentistry, Institute of Medicine, Kathmandu, Nepal

⁴Consultant Prosthodontist

*Corresponding Author

Dr Suvit Maskey

Principal Investigator, Department of Dentistry, Institute of Medicine, Kathmandu, Nepal

Abstract

Introduction: *The incisive papilla is considered as an important landmark for fabrication of complete denture prosthesis. Many studies have been conducted to know the relationship of the incisive papilla and maxillary central incisors which can be helpful for artificial teeth replacement in denture construction for edentulous patients.*

Material and Methods: *The measurements were done on a stone cast with a digital vernier caliper comprised of 96 patients (46 males and 50 females). Measurements were taken from the incisal edge of the central incisor either from the posterior border of the incisive papilla (PIP), the anterior border of the incisive papilla (AIP) and the center of the incisive papilla (CIP) and the size of the incisive papilla (SIP). The Pearson correlation coefficient was used to investigate and quantify the correlation.*

Results: *The distance between the incisal edge of the central incisors and the incisive papilla (PIP, AIP, and CIP) were significantly different between male and female ($P < 0.01$). Pearson correlation coefficients showed moderate correlation*

Conclusion: *The size of the incisive papilla can be helpful in determining the distance between the incisal edge of the central incisors and the incisive papilla.*

Keywords: *Artificial teeth arrangement, Correlation, Incisive Papilla, Incisal edge of central incisor, Papilla incisor distance.*

Introduction

The incisive papilla is one of the most prominent landmark for assessing the position of certain teeth.^[1] The incisive papilla can be used as an important anatomic landmark for the placement of artificial teeth during denture fabrication.^[2] Incisive papilla is the small elevation on the maxillary arch palatal to the inter dental space between the two central incisors. It needs to be relieved during a complete denture fabrication because right underneath the soft tissue of the incisive papilla is the incisive foramen through which the nasopalatine nerves and some small

branches of greater palatine nerves transmit, along with sphenopalatine artery supplying the mucosa of hard palate. This area should be relieved during denture construction as repeated impinging of this area will affect the area supplied by these nerves and cause numbness or tingling sensation of this area. Its position in the edentulous mouth indicates where the anterior teeth should be set. As resorption progresses it comes to lie nearer to the crest of the ridge.

The average distance of incisors and canines from the incisive papilla could be used as reference points in the primary location of the anterior teeth during

construction of full dentures.^[3] According to Besford it is very important the patient is pleased with the outlook of his denture for the patients with the tooth loss.^[4] Aesthetics plays a major role and patient seeks aesthetics for any dental treatment .The face is the major feature in determining physical attractiveness. In clinical practice, the anatomical landmarks most commonly taken are nasion, tip of nose and incisive papilla.^[5] It is important for clinical practitioners to know the useful anatomic landmarks in locating the artificial teeth. According to Douglas, the good way is the use of pre-extraction records or old photographs for the selection of the maxillary anterior teeth^[6].The oral edge of incisive papilla can be helpful in determining the sagittal position of anterior teeth.^[7]. The aim of this research was to determine the relationship of incisive papilla for the positioning of anterior teeth.

Materials and Methodology

This is a cross-sectional study performed on 96 dental stone casts which were made in Department of Dentistry, Institute of Medicine and in dental clinics. The inclusion criteria were no history of prosthetic replacement, no history of previous orthodontic treatment, normal alignment with Angles Class I relationship and without any surgical reconstruction or maxillofacial surgery.

The data were analyzed in SPSS (Version 24, Inc, Chicago) for windows using descriptive statistics and the comparison of the different parameters was done using student t-test and pearson correlation coefficient. A p-value of < 0.05 was considered as statistically significant. We categories the pearson correlation coefficient into three degree of strength according to Jacob^[8]: Mild r =.10 to .29, Moderate r=.30 to .49, Strong r=.50 to1.0

Result

Out or 96 participants, 46 were male and 50 were females. The age range was between 20 to 45 years old. In our study we found that minimum value of Posterior Incisive Papilla to Central Incisor is 10.12 and maximum is 15.90 with mean and standard deviation 13.58±1.28.whereas the minimum value of Centre of IP to Central Incisor is 7.22 and maximum is 12.86 with mean and standard deviation 10.04±1.17. The minimum value of anterior border incisive Papilla to Central Incisor is 3.94and maximum is 10.70 with mean and standard deviation 6.43±1.14 whereas the minimum value of Incisive Papilla size (length) is 4.91 and maximum is 9.18 with mean and standard deviation 7.35±0.92 (Table 1)

The mean value of Posterior Incisive Papilla (PIP) to Central Incisor is greater in male than in female(male :14.17 ± 1.07, female: 13.03±1.21).The mean value of Centre of IP (CIP) to Central Incisor is greater in male than in female(male :10.58 ± 1.04, female 9.54±1.06).The mean value of Anterior border of incisive Papilla to Central Incisor is greater in male than in females.(male: 6.83± 1.26 , female:6.07 ±0.89).The mean value of Incisive Papilla size (length) is greater in male than in female(male :7.58± 0.99 ,female:7.13 ± 0.81).As we have discussed previously in individual sizes, there was significant differences in PIP,CIP,AIP and size of incisive papilla (p value <*0.01) (Table 2)

There was a moderate positive correlation between size of incisive papilla and posterior incisive papilla and statistically significant (r=0.468, p<0.01) whereas there was a negative correlation between size of incisive papilla and anterior incisive papilla but not significant (r=-0.162, p=0.116).For the size of incisive papilla and center of incisive papilla there was a mild positive correlation and statistically significant (r=0.226, p<0.05) (Table3)

Table 1: Showing the mean and standard deviation values and the range of PIP, CIP, AIP, SIP (N=96)

	Min	Max	Mean	S.D	95% CI
Posterior Incisive Papilla to Central Incisor	10.12	15.90	13.58	1.28	13.32 - 13.84
Centre of IP to Central Incisor	7.22	12.86	10.04	1.17	9.80 – 10.27
Anterior border incisive Papilla to Central Incisor	3.94	10.70	6.43	1.14	6.20 – 6.66
Incisive Papilla size (length)	4.91	9.18	7.35	0.92	7.16– 7.54

Table 2: Showing the PIP, CIP, AIP, SIP (N=96) in relation to gender

	Gender	N	Mean	Std. Deviation	T value	P value
Posterior Incisive Papilla to Central Incisor	Male	46	14.17	1.07	4.845	*0.00
	Female	50	13.03	1.21		
Centre of IP to Central Incisor	Male	46	10.58	1.04	4.849	*0.00
	Female	50	9.54	1.06		
Anterior border Incisive Papilla to Central Incisor	Male	46	6.83	0.89	3.405	*0.01
	Female	50	6.07	0.89		
Incisive Papilla size (length)	Male	46	7.58	0.99	2.427	*0.017
	Female	50	7.13	0.81		

Table 3: Showing the Pearson correlation coefficients for the Size of incisive papilla and the distances between PIP, CIP and AIP (N=96)

	PIP	CIP	AIP
Pearson (r) correlation	.468	- 0.162	.226
	.000	.116	.027

Discussion

According to Klemetti et al, the position of incisive papilla is affected mainly by the duration of teeth loss in the maxilla.^[9] Whereas Harper suggested the position of incisive papilla did not change after extraction of teeth until 7 years.^[10] In this study the mean distance from the incisal edge of the central incisors to the center of the incisive papilla was 10.04 ± 1.17 . This finding is within the ranges by Zakiah et al Grave et al and Fu Ps et al.^[11,12,13] Other studies showed that incisal edge of the central incisors to the center of the incisive papilla was 8-10mm^[14] The distance between the incisal edge of the maxillary central incisors and the posterior of the incisive papilla is 13.58 similar as the studies done by Soo and Tae and Grave and Becker.^[15, 16]

The present study found the PIP, CIP, AIP, SIP showed significant differences in males and females and the size is greater in males than in females.

These values can be helpful in prosthodontic treatment of edentulous patients for setting of artificial anterior teeth during complete denture construction.

Conclusion

There was a statistically significant difference between the distance of the incisal edge of the maxillary anterior teeth to the incisive papilla according to gender. It is important that the artificial anterior teeth are placed in the same anteroposterior position as the natural teeth for proper function and esthetics.

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