

Assessment of location of fovea palatine in relation to vibrating line in South Indian population

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Abstract

Retention is one of the prime factor for successful delivery of complete denture to the completely edentulous patients. Fovea palatine acts as a guideline for the posterior extension of complete denture. The secretion of the mucous gland of fovea palatine spreads as a thin layer helping in the retention of the denture.

So study was done to find out the location of fovea palatine in relation to vibrating line among South Indian population. Sample size of 100 people with age groups above 18 years were selected.

The vibrating lines were marked using an indelible pencil and fovea palatine location were marked in relation to vibrating lines.

Results were analysed using SPSS Version 16.0 Data. The location of fovea palatine were mostly found to be present at 0.1-1mm below the anterior vibrating line among South Indian population. Thus, the dentists will be aware to record the location for the posterior extension of the denture.

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Introduction

Fovea palatine is one of the anatomical landmarks in maxilla. It is relief area which is need to be relieved during denture insertion. Relief areas are portion of the denture which is relieved to eliminate excessive pressure on specific parts of denture bearing supporting tissues. Maxillary relief areas are incisive papillae, mid palatine, fovea palatine and cuspid eminence.

Fovea palatine are the remnants of ducts of coalescence. Usually they are two in number on the either side of the midline in maxilla. They indicate the vicinity of posterior palatal seal area.

For past 20 century many authors have evaluated techniques relating to the location of the posterior border of the maxillary denture in which the most easiest and practical methods is using the anatomical land marks fovea palatine and hamular notches.¹ According to Boucher, fovea palatine are close to

vibrating line and always in soft tissue which as ideal guide for denture extension. All authors agreed about the relation between the vibrating line and the posterior border of the maxillary denture. The vibrating line of the palate is the junction between the movable and immovable portion of the soft palate.² Vibrating line is detected using 3 techniques :

- ✓ Phonation 'ah' sound
- ✓ Swallowing method
- ✓ Nose blowing method³

The retention of denture is primarily achieved by a valve-like seal between the border of denture and the underlying mucosa which prevents trapping of air and liquids beneath the denture. This kind of seal is difficult to achieve along the posterior border of maxillary denture prosthesis.⁴

Fovea palatine position also influence the extension of posterior border of the denture.⁵ In some patients with thick saliva, fovea palatine should be left uncovered as it causes denture displacement due to increase hydrostatic pressure. In other cases, denture may extent across 1-2mm.⁶

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Materials and methods

The test population size were 100 people. Both gender were included. The age groups were divided into three categories as young age (18-30), middle age (31-50) and old age (above 50). All the patient were dentulous or partially dentulous. The normal pink colour palatal mucosa with clinically visible fovea palatine in all soft palate types were selected and those patients with history of craniofacial trauma or surgery, congenital and acquired craniofacial anomalies, any inflammation or pathology of palatal mucosa and limited opening of mouth were excluded from the study.

The selected patient were taken to the procedure as inclusion criteria in each category. Mucosa of palate were dried using 2 X 2 cm gauze. When the patients attempted to pronounce the “ah” sound, both the fovea palatine and the vibrating line were marked using an indelible pencil (figure 1 - 4) and the procedure was repeated twice to verify the accuracy of markings.

The findings for the vibrating line were recorded in pro forma as to whether fovea existed anterior to anterior vibrating line, 0.1-0.5mm to ant vibrating line, 0.6-1mm to ant vibrating line, between anterior and posterior vibrating line, above or below posteriorly to posterior vibrating line.



Figure1-4. The fovea palatine and the vibrating lines were marked using an indelible pencil for different patients.

Results

The results were calculated using biostatistics (Figure 5). Mean, correlation in relation to both gender and age groups and significance were analysed using SPSS Version 16.0 by biostatistician. 80% showed fovea palatine is present .1-1mm to anterior vibrating line, 12% showed at anterior vibrating line, 3% showed behind anterior vibrating line and 5% in front of posterior vibrating line. Young age and middle age group showed significant results where as old age group does not showed statistically significant (Figure 6).

	Young Age		Middle Age		Old Age	
	Male	Female	Male	Female	Male	Female
At ant line	7	3	3	5	1	0
Behind ant line	2	1	0	0	1	0
Between .1-.5mm to ant line	11	12	10	9	1	4
Between .6-1 mm to ant line	2	8	2	6	0	1
Middle to ant and posterior line	0	0	0	0	0	0
In front of pst line	2	2	3	3	0	2
Total	24	26	18	23	3	7
Mean	4	4	3	4	1	1
Variance	17	22	14	13	0	3
SD	4	98	51	75	1	7
Correlation		0.732		0.872		0.114
P-value		0.075		0.012		0.826

Figure 5. Measurements of different age grouped patients in mm.

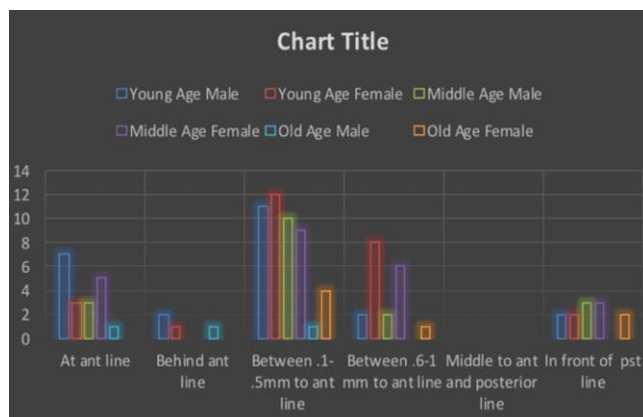


Figure 6. Graph showing the significance for young and middle aged groups.

Discussion

Fovea palatine is defined as “two small pits or depressions in the posterior aspect of the palatal mucosa, one on each side of the midline, at or near the attachment of the soft palate to the hard palate”.⁷ It appears as a small depressed point greyish red to coral pink in colour.⁸

Various studies have been performed regarding the position of the Fovea Palatine to Vibrating Line.⁹ Sicher had described the fovea as situated immediately behind the boundary between the hard and soft palates. According to Nagle and Sears, the fovea mark the posterior limit of the hard palate; while Anderson and Storer placed them in the glandular region of the soft palate, a view shared by Fenn and associates. Swenson concluded that the vibrating line passes about 2 mm in front of the fovea palatine. Silverman expressed the view that the posterior palatal seal could be extended further back (dorsally) than the Vibrating line by about 8.2 mm to substantially aid in the retention and stability of the upper denture. In accordance to this studies, a thorough investigation done by Lye for the location in relation to one another, together with the regional innervation and the inter-relation of the underlying soft and hard structures.¹⁰

The vibrating line and fovea palatine determines the useful limit of the posterior border of the denture.¹¹ In order to gain good retention of the maxillary complete denture an adequate seal must be obtained along the posterior border.¹² The seal must be situated in the compressible tissue but it must be anterior to the vibrating line from which visible movement of soft palate takes place, and this is of great importance.¹³ If the posterior border extends posteriorly beyond this vibrating line, dentist seal will be broken when the soft palate rises during deglutition and speech, and the denture will momentarily become loose and may drop, the patient is also likely to complain of nausea. If the posterior palatal border does not reach this compressible area, retention will be poor because the seal will be inefficient and again the patient may complain of nausea and the edge of the denture may irritate the posterior third of the tongue as it will not bed into the tissue.¹⁴

Lye carried out a study on 100 subjects and concluded that 92 of patients showed the presence of fovea palatini. The result of his study showed the vibrating line was anterior to the foveae palatini in 12 subjects (13.04 %). The foveae palatine and vibrating line coincided in 16 patients (17.39 %). The vibrating line was posterior to the foveae palatine in 64 subjects.¹⁰ A study was conducted by Alousi which

included 200 patients selected randomly without inclusion of soft palate types. He concluded that fovea palatini is a reliable anatomical landmark that helps in determining post dam area of denture.¹⁵ Chen et al. checked the reliability of the fovea palatini in determining the posterior border of the maxillary denture. Out of 104 subjects in his study, 72 had fovea palatini visible clinically. Among 72 of his selected subjects, 25% had their vibrating line present on the fovea palatine and 75% had their vibrating line located anterior to the fovea palatine and none of the subjects had the vibrating line present posterior to the fovea palatine.¹⁶ These findings are similar to the results of the current study. This study implies that location of fovea palatine is exactly located between both anterior vibrating line and posterior vibrating line. This exact location of fovea palatine helps the physician/ dentist as guidance for denture extension for all individuals.^{17,18}

Conclusions

The location of fovea palatine is almost present .1mm-1mm to anterior vibrating line according to our current study. Some are also present at anterior vibrating line and in front of posterior vibrating line. The exact location of fovea palatine is seen between both the anterior and posterior vibrating line. The border seal utilises the atmospheric pressure to resist transient lateral thrust. The factors of cohesion, adhesion, interfacial surface tension maintain the upper denture against the vertical dislodging forces.

However to maintain better retention in the maxillary denture the location of fovea palatine should be known to dentist. This location of relief area aid and act as ideal guide for posterior border of the maxillary denture.

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Declaration of Interest

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