



ASSESSMENT OF THE POSITION OF FOVEA PALATINI IN RELATION TO THE POSTERIOR VIBRATING LINE AND ITS CORRELATION TO THE ARCH FORM AND PALATAL DEPTH-ACROSS SECTIONAL STUDY.

Dental Science

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ABSTRACT

Background: The use of fovea palatine, posterior vibrating line and other landmarks are normally used for locating posterior palatal seal area which is an important clinical procedure for retention and determination of posterior extent of denture.

Aim: Assessment of the position of fovea palatini in relation to posterior vibrating line and its correlation to arch form and palatal depth in edentulous patients visiting the Department of Prosthodontics.

Objectives:

1. Evaluating the position and distance of fovea palatini in relation to posterior vibrating line and Maxillary arch form.
2. Correlating the distance of fovea palatini and posterior vibrating line with arch form.
3. Measuring the Palatal Depth and Correlating it to the measured distance between fovea palatini and posterior vibrating line.

Materials and methods: Maxillary Impressions of 50 Edentulous subjects reporting to Department of Prosthodontics, Sinhgad Dental College and Hospital were made. Evaluating position and distance of fovea palatini in relation to posterior vibrating line and evaluating maxillary arch form and palatal depth was done using impressions and casts. Descriptive analysis and Pearson's correlation test was used for statistical analysis.

Results: About 66% of the casts showed position of Fovea Palatini, anterior to posterior vibrating line and 34 % on the posterior vibrating line. Almost 13(26%) of patients had square arch form, 14(28%) had tapering arch form, 23(46%) had ovoid arch form. Shallow palatal depth was seen in 32% of the casts, normal in 64%, and deep palatal depth in 2%.

Conclusion- From clinical point of view, Fovea palatine is usually anterior to the PPS. However it cannot be regarded as a reliable guide or landmark for location of posterior palatal seal area.

KEYWORDS

Edentulous arch, posterior vibrating line, posterior palatal seal, complete denture retention.

Introduction-

Fovea Palatini is defined as two small pits or depression in the posterior aspect of palatal mucosa, one on each side of the midline near the attachment of the soft palate to the hard palate.^[1]

Posterior Palatal Seal Area: is a soft tissue area limited posteriorly by the distal demarcation of the movable and non movable tissues of the soft palate and anteriorly by the junction of hard and soft palates on which pressure, within the physiologic limits, can be placed, this seal can be applied by removable complete denture to aid in retention.^[1]

According to a study there is a highly significant co-relation between distance of vibrating line to fovea for different palatal contours.^[2]

There is some amount of variation as far as the position of fovea palatine is concerned. According to a study, 44 % showed fovea palatine at hard and soft palate junction, 24 % between junction and anterior vibrating line, 6 % at anterior vibrating line, 24 % between anterior and posterior vibrating line and 2 % at posterior vibrating line.^[3]

The placement of posterior palatal seal can be obtained by using Fovea as a guide line along with other important landmarks. The dentist who only observes the fovea and utilizes these anatomic landmarks as posterior extent of denture base may deprive his patients of several millimeters extending up to a centimeter or more of tissue coverage, depending on palatal configuration. This in return may have a direct effect upon the retention potential of denture base.^[4]

The extent of the Posterior vibrating line is one of the important factor for denture retention due to the fact that the fovea palatini is located close to the vibrating line and it serves as a guide for the location of posterior border of denture. Adequate clinical skills are required to properly consider the palatal extent of the dentures in order to obtain

adequate retention.

Therefore, the present study was conducted to evaluate the position of fovea and its relation to the posterior vibrating line and its correlation to arch form and palatal depth. Also, to see whether fovea can be considered as a landmark for locating the posterior vibrating line.

Materials and methods-

The study was conducted after approval from Scientific Advisory Committee and Institutional Ethics Committee of Sinhgad Dental College and Hospital. In this cross-sectional study, 50 adult edentulous subjects of either gender visiting Department of Prosthodontics, Sinhgad Dental College and Hospital, from 1st august 2017-31st august 2017 and willing to participate in the study were included. Subjects with any progressive oral disease, fractured palate or ridges, any soft tissue overgrowth seen on the arches or palate were excluded from the study. Impressions were made with impression compound using suitable trays. The posterior vibrating line was marked in the mouth by instructing the patients to say "ah" in short burst in a normal, unexaggerated fashion^[4], with an indelible pencil. Fovea palatini was identified on the edentulous patients, 1 on each side of the midline, then marked with an indelible pencil and connected with a straight line. The above markings were transferred on the impression and a cast was poured in dental plaster for the same. On the cast, the distance between the fovea palatini and posterior vibrating line was measured using a Vernier caliper. The arch form of the cast was analyzed and classified into 3 categories as square, tapering and ovoid. The deepest portion of the palate was marked with the indelible pencil on cast and the palatal depth was classified into 3 categories as deep, normal and shallow. The above findings were appropriately recorded.

Statistical Analysis:

Statistical analysis was done using Statistical Package for Social Science SPSS 21.0 v. Descriptive analysis was done to estimate the

mean distance of fovea palatine and the posterior palatal line. Pearson's correlation test was used to assess the relation between the position of fovea palatini in relation to posterior vibrating line and maxillary arch form and the palatal depth. The level of statistical significance was kept at $p < 0.05$.

Results:

In the present study, a total of 50 casts were examined (25 males and 25 females). About 13 casts showed square arch form, 14 showed tapering arch form and 23 showed ovoid arch form (Figure 1). Among 25 casts of males, 18 casts had fovea palatine lying anterior to posterior vibrating line while 7 casts had fovea palatine on the vibrating line. Among 25 casts of females examined, 15 casts had fovea palatine anterior while 10 casts had fovea palatine situated on the posterior vibrating line (Table 1). The mean age of the subjects whose casts were made was 56.52 ± 6.08 years and the mean distance between the Fovea palatine and the posterior vibrating line was 1.5 ± 1.3 mm (Table 2). Pearson Correlation between position of fovea palatine and arch form was assessed and it was not significant ($r = 0.031$). The Pearson correlation between the gender and position of fovea palatine was assessed and it was not significant ($r = 0.127$) and between arch form and gender was ($r = 0.09$) not significant. Among 50 casts, 16 casts had shallow palatal depth, 32 casts had normal palatal depth and 2 casts had deep palatal depth (Figure 2). Pearson Correlation between position of fovea palatini and palatal depth was assessed ($r = 0.06$) and between gender and palatal depth was ($r = 0.22$) not significant.

Discussion:

The fovea palatini have been used as guides or landmarks for locating the posterior border of the maxillary complete denture prosthesis due to their proximity to the vibrating line and their position in relation to the hard and soft palates. The results of the present study showed that the position of fovea palatine was approximately 1.5 mm anterior to the posterior vibrating line. According to a Clinical Comparative study conducted by Lye T.L in 1975^[5] on 100 edentulous patients it was seen that clinical, radiographic, and histological studies of fovea palatini indicated that they were positioned 1.31 mm anterior to vibrating line. The authors concluded that locating the position of fovea palatini and vibrating line is indicated in clinical aspect of complete denture.

Similar to the results of the present study, Singh K and Agarwal B in 2015^[6] concluded that there was no precise relationship of fovea palatini to posterior vibrating line and to the hard and soft palate. Fovea palatini for all subjects were anterior to vibrating line and were separated at variant distance.

In a clinical comparative study conducted by Keng S.B and Row A.M in 1983^[2], to determine the significance of vibrating line and fovea palatine and slope of palatal contour in edentulous patients, the phonation method was used to determine the vibrating line and slope of soft palate classified into flat, medium and deep contours. The distance of vibrating line to fovea was measured directly by means of the compass. It was found that, the vibrating lines are located approximately 2.62 mm anterior to fovea palatini. He concluded that the distance of vibrating line to fovea palatini and different palatal contours are correlated. The vibrating line at the soft palate, normally used as the guide to posterior border of denture, usually is located slightly anterior or posterior to fovea palatini. The present study however assessed that there was no correlation between fovea palatine with the palatal depth and fovea is located 1.5 mm anterior to posterior vibrating line irrespective of the palatal depths.

The study conducted by Thapa D et al in 2016^[3] verified the relationship between fovea palatini, anterior and posterior vibrating line and hard and soft palate junction and their role in locating posterior palatal seal area. Fifty edentulous subjects were randomly selected and in each subject hard and soft palate junction, anterior and posterior vibrating line and fovea palatini were located and marked. They found that 44% showed fovea palatini at hard and soft palate junction, 24% between junction and anterior vibrating line, 6% at anterior vibrating line, 24% between anterior and posterior vibrating line, 2% at posterior vibrating line. In 44% of the subjects, hard and soft palate junction coincided with anterior vibrating line. In the present study similarly, among 50 patients 66% had fovea palatine anterior to the posterior vibrating line, 34% had fovea palatine situated on the posterior vibrating line. Based on the above observations, using fovea palatine as reference for determination of posterior vibrating line should be discouraged. Other methods should be employed to decide the posterior vibrating line.

Conclusion:

The present study concluded that there was no constant relationship between the fovea palatini and the vibrating line as the distance separating the fovea palatini and the vibrating line varies from individual to individual. There was no significant relationship between position of fovea palatini and different maxillary arch forms also the study could not establish any correlation between various palatal depths and position of fovea palatini. However, it was interesting to note that in the present study, the fovea palatini was never posterior to the posterior vibrating line.

Conflicts of Interest:

The authors declare no conflict of interest.

FIGURE 1: Showing different arch forms

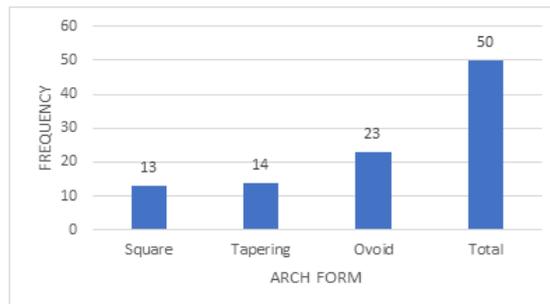


Figure 2: Showing different palatal depths.

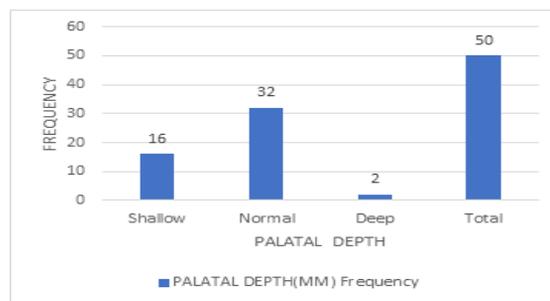


Table 1: Showing the frequency and percentage of the position of fovea palatini

Position	Percentage
Anterior	33(66%)
On	17(34%)
Total	50(100%)

Table 2: Shows mean age distance between fovea palatini and posterior vibrating line.

	Mean	Standard Deviation
Age (Years)	56.5	6.08
Distance (mm)	1.57	1.39

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