ORIGINAL RESEARCH

THE DISTRIBUTION AND PATTERN OF FOVEA PALATINA IN DENTULOUS SUBJECTS

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ABSTRACT

Aim & Objectives: The purpose of this study was to look at the distribution and pattern of Fovea Palaltina among dentulous people.

Materials & Methods: A clinical investigation was conducted for the presence and variations of fovea palatina in 300 dentulous subjects ranging in age from 18 to 40 years, with 150 males and 150 female patients. The posterior palatal seal area, the posterior extension of the upper denture, and the vibrating line have all been linked to the Fovea palatina, an important anatomical landmark in edentulous people.

Results: The findings of this study can be used to compare the location and presence of fovea palatina in dentulous subjects. The square arch form was present in 113 subjects but not in 177. The square tapered arch form was present in 32 subjects but absent in 258. The tapered arch form was present in 105 subjects and absent in 185. The ovoid arch form was present in 33 subjects and absent in 257. Fovea palatine was present bilaterally in 111 subjects and absent in 179. It was present unilaterally in 69 subjects and absent symmetrically in 221 others. It was symmetrical in 29 subjects and non-symmetrical in 261 subjects. It was clinically visible in 142 subjects but not in 148. This was barely visible in 287 subjects and only partially visible in three. The U-shaped palate was present in 251 subjects but not in 39. The V-shaped palate was present in 18 subjects but not in 272. Flat shape palate was present in 25 subjects but not in 265 subjects. In 111 people, fovea palatina was present bilaterally. The fovea palatina was present symmetrically in 29 subjects but was not clearly visible in 142.

Conclusion: Each individual's distribution pattern and transition from dentulous to edentulous may differ. As a result, both technical and physiological parameters should be considered when determining the location of the PPS area in the maxillary arch using the fovea palatina in both dentulous and edentulous patients.

KEYWORDS
Dentulous patients, Fovea Palatina, Palate, Landmark

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Introduction

Fovea palatina are two small pits or depressions which are small ductal openings of the surrounding mucous glands seen in the posterior region of the palatal mucosa, on each side of the midline, at or near the junction of the soft palate and the hard palate. Although it is a regular anatomic feature of the edentulous maxillary ridge, in a few cases it is also absent. So far there is a study to show the presence and distribution of fovea palatina in the edentulous subjects. Further, the transition of the structure from dentulous to edentulous period is also not known. Therefore, this study was undertaken with the objective to ascertain its pattern of distribution reflected in the dentulous maxillary ridge.

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Material and Methods

A total of 300 subjects between 18 to 24 years of age were clinically examined to study the presence or absence of fovea palatina. The other two selection criteria were the shape of

the palatal arch and the shape of the arch form. Subjects with U shape, V shape and flat palatal arch forms and subjects with square, tapering, square tapered and ovoid arch form were considered for the investigation. Each subject was made to rinse his mouth in 0.12% chlorhexidine mouthwash for one minute prior to a clinical examination. Before examination, the palatal area to be examined was wiped dry using sterile gauze. Subjects were seated in a reclined chair position and observation was done using magnified mouth mirror against the halogen light source in a chart representing the upper edentulous jaw. The occurrence of fovea palatina to the midline was recorded. To eliminate error a second observer was asked to follow the same procedure to record its occurrence. Only when there was a total agreement between the two observers the position of fovea palatina was recorded.

To minimize the errors the same procedure for recording the position of fovea palatine by blowing through the nose as in Valsalva manoeuvre was done and the position of fovea palatine was observed. A few variations in the fovea palatina was observed which included striations alongside the fovea palatina. One such variation was the presence of rugae pattern near the fovea palatina(Figure1). Another variation was the presence of a striations in a peanut shaped pattern near the fovea platina(Figure: 2)

Results

The statistical results were categorized based on the presence or absence of fovea palatine, the shape of the palate and the arch form. Table 1, 2, 3and 4 compares the difference in the arch form. The square type of arch form was present in 113 subjects, it was absent in 177 subjects. The square tapered arch form was present in 32 subjects and absent in 258 subjects. The tapered arch form was present in 105 subjects and absent in 185 subjects. The ovoid arch form was present in 33 subjects and absent in 257 subjects. Table 5 and 6 compares the presence of fovea palatine unilaterally and bilaterally. The presence of fovea palatine was present bilaterally in 111 subjects and absent in 179 subjects. It was unilaterally present in 69 subjects and absent in symmetrically in 221 subjects. Table 7 compared the symmetry of fovea palatina. It was symmetrical in 29 subjects and non-symmetrical in 261 subjects. Table 8 compared the clear visibility of fovea palatina. It was clinically visible in 142 subjects and not visible in 148 subjects. Table-9 compared the faint visibility of fovea palatina. It was faintly not visible in 287 subjects and only visible to some extent in 3 subjects. Table 10, 11 and 12 compared the shape of the palate. U-shaped palate was present in 251 subjects and not present in 39 subjects. V-shaped palate was present in 18 subjects and not present in 272 subjects. Flat shape palate was present in 25 subjects and not present in 265 subjects. Among the arch forms square-shaped arch form was most commonly present among the subjects. Bilaterally presence of fovea palatina was present in 111 subjects. The fovea palatina was symmetrically present in 29 subjects and it was not clearly visible in 142 subjects.

Discussion

According to this study there are variations in the presence and distribution pattern of fovea palatina in dentulous patients. A lot of studies were earlier done in edentulous patients to check the distribution pattern of fovea palatina. Fovea palatina is considered as one of the important anatomical landmarks in edentulous patients to locate the presence of the vibrating line in the PPS region. Fovea palatina are two small glandular openings present within the tissues of posterior portion of the hard palate usually lying on either side of the midline. The fovea palatina are small ductal mucous openings. Studies done by Chen et al[1,2] concluded that fovea palatina cannot be used as a reliable landmark in determining the position of the vibrating line. A total of 72 patients used the nose blowing method to check the vibrating line and fovea palatina. The results of this study were 25% of the sample had their vibrating line laying directly on the fovea palatina and 75% had their vibrating line posterior to their fovea palatina and no patient had the vibrating line lying anterior to their fovea palatina He considered the patients with vibrating line that coincides with fovea palatina, to be posterior .placed. He concluded that the fovea palatina are unreliable guides for locating the centre portion of the posterior border of the maxillary denture, while in our study the results showed that fovea palatina may be considered as a reliable anatomical land mark. According to Lye et al fovea palatina are located on an average of 1.31mm anterior to the vibrating line in 100 subjects. Studies done by Lye et al and Fenn et al[3] stated that fovea palatina may be used as a reliable guide in identifying the position of vibrating line which is used to locate the position of the maxillary denture. Nagle and Sears concluded that the fovea palatina marks the posterior extent of the maxillary denture. Swenson stated that the vibrating lines pass 2mm in front of the fovea palatina[4]. A study conducted by Yasmeen et al on 200 patients concluded that 50.9% had their vibrating line at the fovea palatina, 44.5% percent in front and 6.4% percent behind. This study concluded that fovea palatina can be used as a reliable landmark in the location of the posterior extent of the maxillary denture[5]. This review article stated that posterior palatal seal can be used as a significant landmark for enhancing the retention of the maxillary denture by utilizing the atmospheric pressure[6]. A study done by Bhaskar et al stated that the fovea palatina was located anterior to the vibrating line and there is no

constant distance between the fovea palatine and the vibrating line. Radiographic studies concluded that the fovea palatina was located in the soft tissue of the hard palate. It is not located on the compressible tissue surface of the hard palate[7]. A study conducted Dipak Thapa et al stated in 66% of the patients the fovea palatina was located anterior to the vibrating line. It was also stated that the fovea palatina cannot be used as a reliable landmark for locating the PPS region[8, 9].

In this study, the distribution and pattern of fovea palatina has been studied in dentulous subjects. The variations which were checked in this study are the shape of the palate, arch form, symmetry, visibility and bilateral or unilateral presence of fovea palatina. Among the arch forms, square- shaped arch form was present in 113 subjects, followed by the tapered arch form in 105 subjects, ovoid arch form was present in 33 subjects and square-tapered arch form was present in 32 subjects. The U- shaped palatal form was present in 251 subjects, flat shape arch form was present in 25 subjects and V shaped arch form was present in 18 subjects. The bilateral presence of fovea palatina was present in 111 subjects and unilateral presence of fovea palatina was present in 69 subjects. Clear visibility of the fovea palatina was present in 142 subjects. Symmetrically the fovea palatina was present in 29 subjects and it was faintly visible in 3 subjects. Thus based on this study the square type of arch form, U-shaped palatal form , the bilateral presence of fovea palatina and clear visibility of fovea palatina were present among the subjects included in the study.

Conclusion

Within the limitations of the study it is concluded that the fovea palatina have a varied distribution pattern among the dentulous subjects. The distribution pattern and transition from dentulous to edentulous may vary for every individual. Fovea palatina is a very important landmark present anterior to the vibrating line in the maxillary arch in both edentulous and dentulous patients. The posterior palatal seal is an integral part in the fabrication of maxillary denture. Hence the technical and physiological parameters should be taken into consideration for the location of PPS area which is identified with the help of fovea palatina in the maxillary arch in both dentulous and edentulous patients.

Clinical Significance

Fovea palatina are small pits or openings present anterior to the vibrating line. It is used to locate the posterior palatal seal area which aids in the retention of the maxillary denture.

Authors Contribution

Anusha S: Manuscript editing, Literature search, data collection
Rathika R: Data Analysis, manuscript editing
Emeritus EGR S: Manuscript drafting

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Conflict of Interest All the authors declare no conflict of interest

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Table-1-Difference in the Square Arch form

Square	Male	Female	Total	Chi Square Value	P Value
Yes	11	102	113	7.856	0.012
No	4	173	177		
Total	15	275	290		

Table-2-Difference in the Square Tapered arch form

Square Tapered	Male	Female	Total	Chi Square Value	P Value
No	14	244	258	0.307	1.000
Yes	1	31	32		
Total	15	75	290		

Table-3-Difference in the Tapered arch form

Tapered	Male	Female	Total	Chi Square Value	P Value
No	13	172	185	3.583	0.094
Yes	2	103	105		
Total	15	275	290		

Table-4-Difference in the ovoid arch form

Ovoid	Male	Female	Total	Chi Square Value	P Value
No	14	243	257	0.348	1.000
Yes	1	32	33		
Total	15	275	290		

Table-5-Presence of Fovea Palatina Bilaterally

Bilateral	Male	Female	Total	Chi Square Value	P Value
No	11	168	179	0.915	0.633
Yes	4	107	111		
Total	15	275	290		

Table-6-Presence of Fovea Palatina Unilaterally

Unilateral	Male	Female	Total	Chi Square Value	P Value
No	11	210	221	0.142	0.932
Yes	4	65	69		
Total	15	275	290		

Table-7-Difference in the symmetry of Fovea Palatine

Symmetrical	Male	Female	Total	Chi Square Value	P Value
No	14	247	261	0.195	1.000
Yes	1	28	29		
Total	15	275	290		

Table-8-Difference in the clear visibility of Fovea Palatina

Clearly Visible	Male	Female	Total	Chi Square Value	P Value
No	8	140	148	0.033	1.000
Yes	7	135	142		
Total	15	275	290		

Table-9-Difference in the Faint visibility of Fovea Palatina

Faintly Visible	Male	Female	Total	Chi Square Value	P Value
No	15	272	287	0.165	1.000
Yes	0	3	3		
Total	15	275	290		

Table-10-Presence of U-shaped palate among individuals

U Shape	Male	Female	Total	Chi Square Value	P Value
No	0	39	39	2.458	0.235
Yes	15	236	251		
Total	15	275	290		

Table-11-Presence of V-shaped palate among the individuals

V Shape	Male	Female	Total	Chi Square Value	P Value
No	15	257	272	1.047	0.610
Yes	0	18	18		
Total	15	275	290		

Table-12-Presence of Horizontal shape in the palate

Horizontal Shape	Male	Female	Total	Chi Square Value	P Value
No	15	250	265	1.492	0.627
Yes	0	25	25		
Total	15	275	290		

VARIATIONS IN THE DISTRIBUTION PATTERN OF FOVEA PALATINA

Figure-1: Presence of feather shaped rugae pattern near the fovea palatina

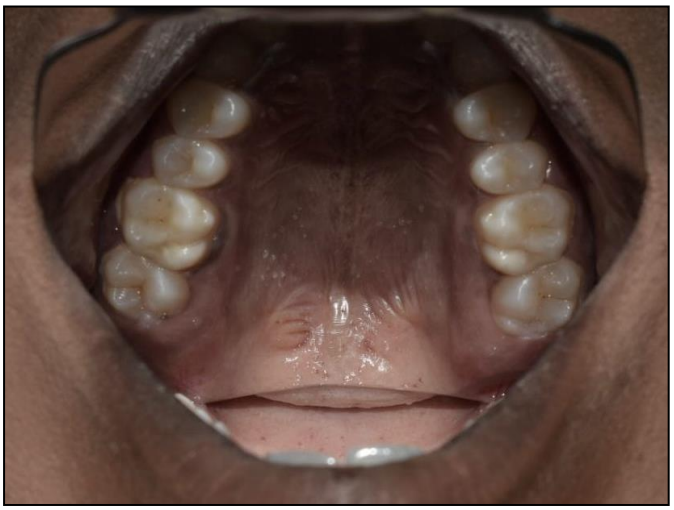

Figure2: Presence of a striations associated in a peanut shaped pattern near the fovea palatina