

Clinical assessment of diverse frenum morphology in Permanent dentition.

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Abstract

Aim: To determine the different frenum morphology in permanent dentition. **Material and Method :** The study was undertaken for 2 months . The frenum morphology was assessed according to Modified Sewerin's typology using the direct visual method under natural light and was conducted by three investigators among 1206 school going children (637 males and 569 females) between 12 to 17 years of age from six schools in Pune city, Maharashtra. Descriptive statistics were determined based on the collected data. Chi-square test was used to analyze the sex-wise difference with respect to the frenum morphology at 5% level of significance. **Results:** Superior labial frenum has diverse morphology. The most prevalent frenum observed was the simple frenum(70.6%) followed by simple with nodule (17.6%) and Persistent techtolabial(6.6%). There was no statistically significant sex-wise difference with respect to the frenum morphology.

INTRODUCTION

Superior labial frenum is a membranous fold of mucous membrane which provides stability and support for the upper lip. It is also called as Maxillary frenum or frenulum labii superioris. It extends from the interior surface of the upper lip to the middle portion of the buccal surface of the alveolar process between the central incisors. It is attached to the periosteum's external layer , the maxillary suture's connective tissue and the alveolar process ₁ .

Most often, during the oral examination of the patient the dentist gives very little importance for frenum examination , for assessing its morphology and attachment. However it has been seen that abnormal frenum can be an indicator of a syndrome ₂ . An abnormal frenum attachment can lead to frenal pull which may result in distension of gingival sulcus which in turn encourages plaque accumulation and increases the severity of periodontal pockets ₃ ; it may also prejudice the denture fit or retention ₃ ; it can serve as an etiology for midline diastema ₃₄ ; can cause recession ₅ ; can interfere with effective toothbrushing leading to patients inability to remove plaque ₆ . A torn labial frenum can be a indicator of child abuse ₇ . Biber JT ₈ in his review article has documented various complication resulting from oral piercings. Of the different piercing sites in the mouth, maxillary labial frenum piercing ₈ is also popular and can

result in complications ₉ .

Literature review reveals that superior labial frenum has diverse morphology. However, only one study by Diaz-Pizan et al ₁ could be retrived which was conducted among the deciduous dentition. Hence the aim of this present study was to determine the different morphology of superior labial frenum in permanent dentition

MATERIAL AND METHODS

The study was undertaken for 2 months (20th November '06 - 20th December '2006) in six schools which were the selected schools for the dental screening camp organized by the Community Department, Dr.D.Y.Patil Dental College and Hospital, Pimpri, Pune. Prior permission from the school authorities, parents and approval of the Institutional Ethics committee to conduct the study was obtained. All the children present in the school, on the day of the screening camp and willing to participate in the study constituted the study sample. The clinical examination was conducted by 3 investigators (SP, SP and TP, authors of the study) with the help of an dental assistant . The direct visual method under natural light was used and consisted of lifting the upper lip with the index finger and thumb of both hands. The morphology of the superior labial frenum was classified according to Modified Sewerin's typology ₁ .

Statistical Analysis: Descriptive statistics (frequency , percentage and proportion) were determined by using Microsoft Excel-2003 on the data collected .Chi-square test was used to analyze the sex-wise difference with respect to the frenum morphology at 5% level of significance.

RESULTS

The study sample consisted of 1206 school going children (637 males and 569 females) between 12 to 17 years of age from Pune city. The results of the study are summarized in Table 1.

Figure 1

Table 1. Sex-wise distribution of frenum morphology according to Modified Sewerin's typology.

Frenum Type.	Gender	
	Male n(%)	Female n(%)
Simple Frenum	451 (70.80%)	401 (70.47%)
Simple with nodule.	107 (16.80%)	106 (18.63%)
Persistent Tectolabial	42 (6.59%)	38 (6.68%)
Simple with appendix	29 (4.55%)	19 (3.34%)
Simple with nichum	5 (<1%)	3(<1%)
Bifid	2 (<1%)	1(<1%)
Double	1(<1%)	0
Two or more variation of the frenum	0	0
Absent	0	1(<1%)
Total	637(100%)	569(100%)

$\chi^2 = 10.51$, $p < 0.05$ (not significant)

Table 1 illustrates the frequency and percentage of males and females with respect to the different frenum morphology. The most prevalent frenum type was simple frenum followed by simple with nodule and then Persistent Tectolabial. There was one subject with absent frenum, double frenum and none with two or more frenum variations. There was no statistically significant sex-wise difference with respect to the frenum morphology.

Fig 1-9 shows the different types of frenum morphology.

Figure 2

Fig 1. Simple frenum



Figure 3

Fig 2. Simple frenum with appendix



Figure 4

Fig 3. Simple frenum with nichum and a lateral labial frenum



Figure 5

Fig 4. Simple frenum with nodule



Figure 6

Fig 5. Simple frenum with nodule and a lateral labial frenum



Figure 7

Fig 6. Bifid labial frenum



Figure 8

Fig 7. Persistent Tectolabial frenum



Figure 9

Figure 8.- Double frenum



Figure 10

Figure 9- . Absence of labial frenum



DISCUSSION

A modified Sewerin's typology of frenum was employed since the majority of the studies viewed this classification as practical, useful and easy to use₁.

Only one study, carried out by Diaz-Pizan ME et al₁ could be retrieved from the literature for comparison. The study design was similar but only differed with respect to the age of the sample which was 0-6 years (deciduous dentition) as against permanent dentition in our study. Table 2 illustrates the comparison of results of the present study with that of the study by Diaz-Pizan ME et al₁.

Figure 11

Table 2. Comparison of the results of the present study with that of the study by Diaz-Pizan ME et al

Frenum Type.	Present study results (Permanent dentition) n(%)	Results of Diaz-PizanME et al] (Deciduous dentition) n(%)
Simple Frenum	852 (70.6%)	798 (59%)
Simple with nodule.	213(17.6%)	163(12%)
Persistent Tectolabial	80 (6.6%)	334 (25%)
Simple with appendix	48 (3.9%)	49 (3.6%)
Simple with nichum	8 (<1%)	5 (<1%)
Bifid	3 (<1%)	1(<1%)
Double	1(<1%)	2 (<1%)
Two or more variation of the frenum	0	3 (<1%)
Absent	1(<1%)	0
Total	1206 (100%)	1355 (100%)

Overall the results were similar, with the most prevalent morphology been simple frenum. But variation was noted with the persistent tectolabial frenum which was 25% as against 6.6% in our study. This difference can be attributed to the difference in the age of the sample in the two studies (Deciduous dentition versus Permanent dentition). In younger children during the first few years of age the prevalence of tectolabial frenum is high, but as the age advances (permanent dentition) there is vertical growth of the alveolar ridges which allows the gingival insertion to change position further away from the alveolar ridge. The gingival insertion increases and the labial frenum decrease in size. Due to the primary dentition development and intra alveolar eruption of the permanent maxillary incisors, there is a apical migration of the frenum insertion₁. Hence, there is a high proportion of the persistent tectolabial frenum in the deciduous dentition to evolve to normal during the permanent dentition.

The simple frenum with appendix, nichum, bifid type, double, with two or more variation and the absent frenum are rarely found with less than 1% in the population. However the absent frenum is associated with

Holoprosencephaly₂₁₀₁₁. The bifid frenum is associated with W Syndrome₂.

CONCLUSION

This paper throws light on the fact that, although, superior labial frenum is a small anatomical landmark in the oral cavity, it is found to have diverse morphology. The dentist needs to give due importance for frenum assessment during oral examination.

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