

Various Morphological Variations in Attachment of Maxillary Labial Frenum: An Observational Study

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ABSTRACT

Background: Frenulum labii superioris also commonly known as maxillary labial frenum is a mucosal fold that attaches upper lip to alveolar mucosa, gingival and the periostium. It also has septomaxillary ligament that transmits septal growth force to premaxilla. According to Delaire inadequate reconstruction of the labial frenum muscles can lead to growth abnormalities. The aim of the present observational study was to study different types of frenum variations amongst the subjects reporting to the hospital.

Materials and methods: The present cross sectional observational study enrolled 90 subjects, both males and females with age ranging between 15 to 30 years that came for periodontal consultation. Clinical evaluation of the frenum was conducted under adequate light by a single examiner to avoid any error at examiner's end. The site of attachment of frenum with its morphology was examined by upward extension of upper lip. All the data was arranged in a tabulated form and analysed using SPSS software. Student t test was used for the analysis of the data.

Results: The study enrolled a total of 90 subjects with the mean age of 18.98+/-2.19 years. There were 51 males and 39 females. There were 60% subjects in Class I, 53.3% subjects in class II and 13.3% subjects in Class III with mucosal attachment site. There was a significant difference between the three groups and p value was less than 0.05.

Conclusion: From the present study we can conclude that the prevalence of papillary and papillary penetrating type of frenum was more in Class III.

Keywords: Frenum, papillary, prevalence.

INTRODUCTION

Frenulum labii superioris also commonly known as maxillary labial frenum is a mucosal fold that attaches upper lip to alveolar mucosa, gingival and the periostium.¹ It is histologically composed of connective tissue, elastic fibres, mucous glands with central artery and vein on either side.² It exhibits wide diversity in position and structure and is of

physiological importance.³ The main function of frenum is to provide support to upper lip and to keep the lip growth in harmony with the growing maxilla.³⁻⁸ If the attachment of frenum is close to the gingival it leads to diastema, recession and bone loss. It hinders proper smiling and speaking.⁸⁻¹⁰ It also has septomaxillary ligament that transmits septal growth force to premaxilla.³ According to Delaire inadequate reconstruction of the labial

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frenum muscles can lead to growth abnormalities.¹¹ As per Mirko there are four types of frenum based on attachment site and as per Sewerin there are 8 morphological variations of the maxillary frenum.^{12,13} Various new morphological variants have also been described in literature.¹⁴ The aim of the present observational study was to study different types of frenum variations amongst the subjects reporting to the hospital.

MATERIALS AND METHODS

The present cross sectional observational study enrolled 90 subjects, both males and females with age ranging between 15 to 30 years that came for periodontal consultation. The study was approved by the Institutional ethical board and all the subjects were informed about the study and a written consent was obtained from all in their vernacular language. The subjects with trauma, frenal surgeries or any drugs that affect gingival were not included in the study. All the demographic details of the subjects were recorded in a tabulated form. The subjects were classified into three groups- Class I, Class II and Class III. Clinical evaluation of the frenum was conducted under adequate light by a single examiner to avoid any error at examiner's end. The site of attachment of frenum with its morphology was examined by upward extension of upper lip. All the required intraoral photographs were also taken. The midline diastema was recorded if the space between central incisors was more than 1 mm. All the data was arranged in a tabulated form and analysed using SPSS software. Student t test was used for the analysis of the data. Probability value of less than 0.05 was regarded as significant.

RESULTS

The study enrolled a total of 90 subjects with the mean age of 18.98+/-2.19 years. There were 51 males and 39 females.

Table 1 shows the gender distribution of the subjects. In Class I group the mean age was 19.21+/-3.76 years, in Class II the mean age was 18.73+/-1.88 years and in class III the mean age was 16.33+/- 2.19 years. In Class I there were 18 males and 12 females. In Class II there were 14 males and 16 females. In Class III there were 19 males and 11 females.

Table 1: Gender distribution on each group

Group	Age	Male	Female	Total
Class I	19.21+/- 3.76 years	18	12	30
Class II	18.73+/- 1.88 years	14	16	30
Class III	16.33+/- 2.19 years	19	11	30

Table 2: Type of frenum and attachment site in three groups

Attachment site	Class I	Class II	Class III	Total	P value
Mucosal	18(60%)	16(53.3%)	4(13.3%)	38	<0.05
Gingival	7(23.3%)	10(33.3%)	13(43.3%)	30	>0.05
Papillary	5(16.7%)	4(13.3%)	10(33.3%)	19	<0.05
Papillary penetrating	0	0	3(10%)	3	<0.05
TOTAL	30	30	30	90	

Table 2 shows the type of frenum and the attachment site. There were 60% subjects in Class I, 53.3% subjects in class II and 13.3% subjects in Class III with mucosal attachment site. There was a significant difference between the three groups and p value was less than 0.05. There were 23.3% subjects in Class I, 33.3% subjects in class II and 43.3% subjects in Class III with gingival attachment site. There was no significant difference between the three groups and p value was more than 0.05. There were 16.7% subjects in Class I, 13.3% subjects in class II and 33.3% subjects in Class III with mucosal attachment site. There was a significant difference between the three groups and p value was less than 0.05.

DISCUSSION

There have been various studies on the incidence of different varieties of maxillary labial frenum in different dentition types and its role in gingival recession and periodontal pocket creation in the maxillary anterior teeth and midline diastema.^{6,13,14} It exerts a passive relation with respect to growth of the alveolar process.¹³ The basic function of the frenum is to provide stable upper lip and maintains balance between growing bones.⁸ When the location of the frenum is closer to the gingival borders it hinders the growth and movement of the anterior maxilla.¹⁵ An adequate width of attached gingiva is crucial for maintaining the health of gingiva.^{16,17} Therefore, if the width and size of frenum is large and with no zone of attached gingiva or shifting of the interdental papilla in case

of extended frenum is regarded as pathogenic.^{18,19} The attachment of frenum is regarded as normal when its position is apically away from the gingival margin, at the mucogingival junction and has no pulling effect on the attached of marginal gingival.^{12,14}

According to the present study, there were 60% subjects in Class I, 53.3% subjects in class II and 13.3% subjects in Class III with mucosal attachment site. There was a significant difference between the three groups and p value was less than 0.05. There were 23.3% subjects in Class I, 33.3% subjects in class II and 43.3% subjects in Class III with gingival attachment site. There was no significant difference between the three groups and p value was more than 0.05. There were 16.7% subjects in Class I, 13.3% subjects in class II and 33.3% subjects in Class III with mucosal attachment site, which is similar to previous studies.^{12,20,21} According to a study done by Christabel SL he found that there were no papillary and papillary penetrating varieties of frenum in the permanent dentition.¹⁰ Any meddling in the allocation of the continuous band of connective tissue of can lead to midline diastema and also interferes with the growth of anterior portion of the maxilla. In these cases, frenum retains its maturational arrest. Therefore, papillary and papillary penetrating varieties are regarded as pathological in the permanent dentition. According to a study by Sewerin higher frequency of variations were seen amongst males.¹³ Only few studies documented significant difference amongst females.¹⁶

CONCLUSION

From the present study we can conclude that the prevalence of papillary and papillary penetrating type of frenum were more in Class III. Frenum present closer to the gingival margins interferes with the oral hygiene. Maintenance of oral hygiene is difficult in such cases.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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