

PREVALENCE AND VARIATIONS OF THE MAXILLARY LABIAL FRENUM IN CHILDREN, ADOLESCENTS AND ADULTS

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ABSTRACT

To determine and compare the type of frenal attachment in different age groups, this cross sectional study was conducted on 356 individuals attending a dental hospital in Kathmandu. The age group of the participants was categorized as 1-18 years (first group), 19-35 years (second group) and > 35 years (third group). Mucosal, gingival, papillary or papillary penetrating type of frenal attachment was determined and was compared with different age groups. In the present study, the frequency of mucosal type of frenal attachment was 70.5%, whereas frequency of gingival type of frenal attachment was 28.4% and that of papillary type of frenal attachment was 0.8% and papillary penetrating type of frenal attachment was only 0.3%. Between the different age groups there was no statistically significant differences in the type of frenal attachment. In conclusion, Mucosal is the most frequent type of frenal attachment encountered in any age group. There was no statistical differences in the type of frenal attachment between different age group population. So the theory that the high frequency of high frenal attachment in children which will be self corrected is not accepted by the present study.

KEYWORDS

Adolescents, adults, children, frenal attachment, prevalence

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INTRODUCTION

Frenum can be defined as a “fibrous band of tissue attached to the bone of the mandible and maxillae, and is present superficial to muscle attachments.”¹The upper labial frenum is a small mucosal fold extending from the vestibular mucosa of the upper lip to the alveolar or gingival mucosa in the anterior midline of the maxillary arch.²The primary function of the frenum is to provide stability to the upper lip, lower lip, and tongue.² The upper labial frenum has demonstrated variations and anomalies depending on the attachment of fibers and structure of frenum.³

A high frenal attachment might pose a problem if tension from lip movement pulls the gingival margin away from the tooth, or if the tissue restrains the closure of a diastema during orthodontic treatment. Frenal attachments that encroach on the marginal gingiva distend the gingival sulcus thus, which accumulates plaque, increasing the rate of progression of periodontal recession and thus leading to recurrence after treatment.² Various classifications have been proposed regarding the variations in frenum, but the most widely accepted classifications were given by Mirko *et al.*⁴

Depending upon the extension of attachment of fibers, frena have been classified as:

- Mucosal – when the frenal fibers are attached up to mucogingival junction
- Gingival – when fibers are inserted within attached gingiva
- Papillary – when fibers are extending into interdental papilla
- Papilla penetrating – when the frenal fibers cross the alveolar process and extend up to palatine papilla.

The aim of the present study is to know the prevalence of type of frenal attachment in different age groups and also to compare the type of frenal attachments most prevalent in the different age groups.

The objective is to know if the younger age group has more prevalent papillary or papillary penetrating type of frenal attachment and whether the theory that as the age advances, there is shift in the frenal attachment to more apical position, thus limiting the need of frenectomy is acceptable.

MATERIALS AND METHODS

This cross sectional study was conducted on patients who visited Dental Department of a hospital based in Attarkhel for different purposes of dental treatments. The presented sample size as 363. The study started from March 2017 to August 2017. Written informed consent was taken from the patients undergoing the

study. Demographic information such as age and gender were recorded. Exclusion criteria included those whose labial frenum and adjacent mucosa was affected by trauma and whose frenum had undergone surgery. The frenal morphology was determined under dental light. Patients lip was gently stretched in horizontal direction away from labial alveolar process and the frenal attachment was classified as mucosal, gingival, papillary and papillary penetrating type. The age group of the participants was categorized as 1-18 years (first group), 19-35 years (second group) and > 35 years (third group). Data analysis was carried out using statistical packages, namely SPSS version 17.0.

RESULTS

There were 214 males and 149 females. Out of the total 363 participants, the frequency of mucosal type of frenal attachment was 70.5%, whereas frequency of gingival type of frenal attachment was 28.4% and that of papillary type of frenal attachment was 0.8% and papillary penetrating type of frenal attachment was only 0.3%. (fig.1)

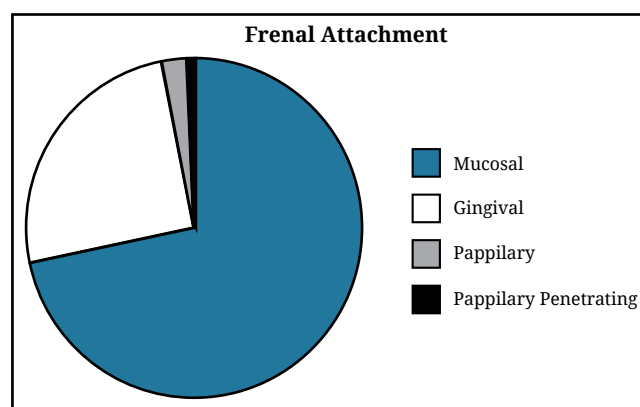


Fig.1: Frequency of frenal attachment

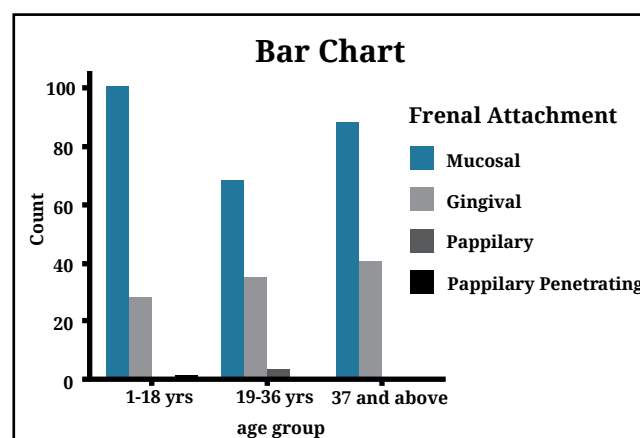


Fig.2: Association between age and type of frenal attachment

The frequency of mucosal frenal attachment in the first group was found to be 77.5% whereas the frequency of gingival type of frenal attachment was found to be 21.7% in the same group and while there was none in the category of papillary type of frenal attachment, the papillary penetrating type of frenal attachment was found to be 0.8%. Similarly in the second group, the frequency of mucosal attachment was 64.2%, gingival was 33% and papillary was 2.8%. Similarly, in the third age group, the mucosal attachment was 68.8% and gingival attachment was 31.3% with none in papillary and papillary penetrating type of frenal attachment. (fig.2). This difference was also statistically significant. (p value=0.023)

DISCUSSION

Sample size of the present study was calculated using findings from a study done to assess the pattern of prevalence of frenal attachment among individuals in Nepal.⁵

In the present study, the most frequent type of frenal attachment was mucosal type which was similar to study done by Nadar S⁶, Placek M et. Al⁷ and Janczuk Z et al⁸, and contradictory to other studies done by Kaimenyi et al.⁹, Addy et al.¹⁰, Upadhyay et al.⁵, Christabel et al.¹¹ In these studies the most frequent type was gingival type of frenal attachment.

The presence of abnormal frenal attachment has been associated with various syndroms such as Turner's syndrome¹², Ellis-van Creveld syndrome,¹³ Oro-facial-digital syndrome,¹⁴ Ehler-Danlos syndrome,¹⁵ and Pallister-Hall syndrome.¹⁶ Upper labial frenum has also been considered to be a modifying factor in denture construction as abnormal frenal variations with a broad base migrated near the crest of the residual ridge require surgical removal.¹⁷

In a cross sectional study done among 198 Nepalese children ranging from 1-14 years of age to study the

different types of maxillary labial frenum attachments, the most common one was gingival type (61.1%) and the least common one was papillary penetrating type of frenal attachment (8.1%). While comparing two age groups, the mucosal and gingival attachment was higher in older age group (8-14 years) whereas papillary and papillary penetrating was higher in younger age group (1-7 years).⁵

A study was done in 931 children of Chennai in which the most prevalent type was gingival (49.5%) followed by mucosal type of frenal attachment (38.8%). While papillary and papillary penetrating types were 9.8% and 1.9% respectively. This study also stated that the papillary penetrating type of frenal attachment decreased with age. Therefore dentists should correlate the age of the child and type of frenal attachment during clinical diagnosis to avoid unnecessary treatment.⁹

Studies state that with time, the frenal attachment appears to recede up the labial surface of the alveolar process. This movement actually is relative during the primary dentition, as new bone deposits increase the height of alveolar ridge while the frenal attachment remains in place.¹⁸

But in the present study, we have not encountered more patients with papillary or papillary penetrating type of frenal attachment in younger age group. So the theory that the high frenal attachment in children can be self correcting as the age advances cannot be proved in the present study. But more detailed study is required with increased sample size and longitudinal studies.

In conclusion, the type of frenal attachment is an important aspect of clinical examination as it can be associated with various diseases as mentioned earlier. Also, surgical removal should be done in an appropriate time to avoid abnormal frenal pull which can lead to gingival recession and midline diastema.

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