UNIVERSITY OF LOUISVILLE® SCHOOL OF DENTISTRY

Introduction

Throughout development there are certain processes that occur to provide harmony between different functions throughout the human body. For the oral cavity while the tongue is developing, failure of cells to degenerate will give varying levels of attachment for the frenum (1). Attachment levels and morphology can vary greatly from one child to the next, thus understanding how to diagnose the maxillary frenum is important.

The maxillary frenum is a collagenous fibrous tissue fold of mucous membrane connecting the lip to the alveolar process in the midline of the maxilla (2).

An abnormal frenum can cause loss of papilla, recession, diastemas, cause difficulty with brushing, alignment of teeth and psychological disturbances (3).

The aim of this study is to determine the prevalence of a labial frenulum attachment at the mucogingival junction, type 1 attachment, or greater in the pediatric population being seen at the University of Louisville dental school and determine an anatomical classification instead of just the attachment level.

Hypothesis

For ages 0-11 we expect to see labial attachment levels closer to a grade 1 in the Louisville population.

By combining the current approaches of frenum measurement into one universal classification system we will be able to categorize and assess labial frenum attachments more effectively, compared to if we completed the current classifications from multiple measurement methods separately.

Methods

- 143 patients screened, 111 fit our inclusion criteria
- Each patients receives an exam including measurement of the labial frenum
- UNC 15 probe for measurement of thickness and depth
- The goal is to evaluate patients before permanent canine eruption.
- Kotlows attachment grades were used as part of the assessment
- Anatomical appearance was noted during attachment screening
- Clinical photos were taken and grouped into different graded groups

References

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- 2) Boutsi, E. A., & Tatakis, D. N. (2011). Maxillary labial frenum attachment in children. International journal of paediatric dentistry, 21(4), 284–288. https://doi.org/10.11111/j.1365-263X.2011.01121
- 3) Kotian, N., & Jeevanandan, G. (2020). Maxillary labial frenum morphology in children in chennai population: a cross-sectional study. Drug Invention Today, 14(5).

Labial Frenulum Attachment in Pediatric patients, Assessing **Attachment and Soft Tissue Anatomy**

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Pictures



Kotlow uses 4 grades

- **Grade 1** describes minimal alveolar mucosa and minimal attachment
- Grade 2 is used when the frenulum attaches primarily into gingival tissue at the junction point of the free and attached gingival margins
- **Grade 3** describes the frenum inserting just in front of the anterior papilla
- **Grade 4** describes a frenum attaching just into the anterior papilla and extending into the hard palate.



Normal frenum



Persistent tectolabial frenum



Duplication of the frenum





Recess of the frenum

Bifid frenum

	A	nator
•	Linear: 0.5% Pyramidal: 0.33%	0.60%
•	Column: 0.11%	0.50%
•	Out of 111 patients screened half appeared to have a more linear narrow	0.30%
	anatomical characteristic of the frenum attachment.	0.20% 0.10%



For the majority of patients screened during this study show attachment levels of class 1-2 and exhibit a linear anatomical presentation Chi-square test: p value of 0.1012

Conclusions

- Since the p-value is greater than the significance level of 0.05, we do not have enough evidence to say that there is a significant difference in the distribution of patients across the different Kotlow classifications, based on this data.
- Based on the information gathered from this study frenum attachments vary greatly among different age groups and prior to the eruption of the permanent canines.
- Patients that show a thicker and deeper attachment seem to be less likely to have tissue regress with age, which could impact how the maxilla grows/develops.
- Typically clinicians only assess the labial frenum if the patient presents with symptoms impacting overall health, clinicians should make this part of the periodic exam at each visit due to the variability in frenum presentation.
- Future research: ways in which this research can be used is to monitor how patients grow and develop when a thicker frenum is present and a more severe attachment and how this can impact the growth of the maxilla.