



Assess of Labial Frenum Types and their Effect among School Children



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Abstract:

Background: Maxillary labial frenum is a normal structure that have many types of classifications according to morphology and morpho-function. Every type increase prevalence at specific age and gender.

Aim: To determine the prevalence of labial frenum types according to morphological and morpho-functional classifications among a group of children in Mansoura city regarding their age and gender.

Methods: A cross-sectional study was conducted over a period of one year. A sample of 2004 children aged 6 to 12 years old of both gender were selected from 8 primary schools of both educational districts in Mansoura city. Types of maxillary labial frenum were determined according to two different classifications (Placeck and Sewerin). All data were collected and statically analyzed by using the computer program SPSS (Statistical package for social science) version 23.0

Results: The most prevalent frenum attachment type was the gingival type according to Placeck classification. There was high a significant difference between age and gingival, palatal and palatal penetrating frenum types and no significant difference in mucosal type. Simple (normal) frenum type was the most prevalent frenum type according to Sewerin classification. Significant difference was clear between age and all of simple, bifid and recess Sewerin frenum attachment types. In relation of Sewerin frenum attachment types with gender there was no significant difference.

Conclusion: Most of children in this study had gingival frenum attachment type according to Placeck classification and Simple frenum attachment type according to Sewerin frenum classification. There was relation between types of frenum and age. Gender had no effect on frenum attachment types.

Keywords: Placeck, Sewerin, age, gender, maxillary labial frenum.

Introduction

The superior labial frenum is a 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 is a post-eruptive remnant of the tectolabial bands. 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 external layer, the maxillary suture's connective tissue, and the alveolar process.⁽¹⁻³⁾

There is lack of information about the different maxillary labial frenum types in Egypt. Additionally, there are deficient studies about the distribution of the labial frenum types so this study can provide valuable information about that distribution in sample of children in a dental and social Mansoura city.

Materials and methods

A cross-sectional study was conducted over a period of one year. A sample of 2004 children aged 6 to 12 years old of both gender were selected from 8 primary schools of both educational districts in Mansoura city. The sample group into 6-9 years old group and 9>-12 years old group. The participated children have no orofacial anomalies, no history of orthodontic treatment, no surgical intervention in

the maxillary labial area and no medications known to affect the gingival and soft tissues status.

All children were examined using a direct visual method. They were examined for type of frenum (according to Placeck⁽⁴⁾ and Sewerin⁽⁵⁾ classification), the gingival index of the central incisors, anterior upper teeth spacing and diastema. Children were examined lying in the supine position. A thorough intraoral examination was carried out to assess the morphology of the maxillary labial frenum and the frenum was classified into different groups according to the Sewerin's frenum classification.

RESULT:

This study was conducted among 2004 children of Mansoura primary schools' students of both genders aged 6 to 12 years old (with mean age = 8.90 ± 2.11 years). They were a located into two groups according to age (6-9 years) and (9>-12 years). The number of students who aged from 6 to 9 years old were 1180 (58.9%) while whose ages ranged from 9> to 12 years were 824 children (41.1%). According to gender 1038 male (51.8%) while 966 (48.2%) were female

Comparison between Placek classification of maxillary labial frenum attachment in relation to age and gender groups:

Table (1) showed that in the relation to age groups with Placek classification the most frenum type percentage was the gingival type in both age groups; (44.3%) in group 6-9 years and (51.2%) in 9>-12 years group. There was a

significant difference between age and gingival, palatal, and palatal penetrating types of frenum attachments ($p= 0.002$), ($p<0.001$) and ($p<0.001$) respectively with higher percentage in 6-9 years old regarding the palatal and palatal penetrating maxillary frenum attachment types while the opposite trend was seen regarding the gingival type.

Table (1) describe the relation between gender and morphofunctional frenum attachment classification (Placek). Boys group showed insignificantly higher percentages in mucosal and palatal types (39.6%) and (7.4%) respectively while girls group showed insignificantly higher percentages in gingival and palatal penetrating labial frenum attachment types (47.4%) and (7.6%)

Table(1): Comparison between Placek classification of maxillary labial frenum types in relation to age and gender groups:

Placek classification	Age				P	Gender				P
	6-9y		9>-12y			boys		girls		
	No	%	No	%		No	%	No	%	
Mucosal	448	38.0%	338	41.0%	0.16	411	39.6%	375	38.8%	0.7
Gingival	523	44.3%	422	51.2%	0.002*	487	46.9%	458	47.4%	0.8
Palatal Penetrating	104	8.8%	32	3.9%	<0.001*	63	6.1%	73	7.6%	0.18
Palatal	105	8.9%	32	3.9%	<0.001*	77	7.4%	60	6.2%	0.28

Sewerin classification of maxillary labial frenum attachment types according to age and gender groups:

Table (2) showed that significant differences were present between age with normal, persistence, bifid and recess frenum attachment types ($p<0.001$) for normal and persistence tecto-labial for bifid ($p=0.003$) while for recess ($p=0.001$) The persistence tectolabial type and the recess type of frenum were significantly more prevalence at age 6-9 years , while the normal and bifid types were more significant prevalence at age 9>-12 years.

Regarding morphological frenum attachment types (Sewerin classification) no significant difference was present between the two gender groups in all types of morphological frenum attachment types. Insignificant higher percentages of normal, simple with appendix, duplication and recess were present in males group, while female group showed insignificant higher percentages in all of simple with nodule, persistence, bifid and others.

Table(2): Sewerin classification of maxillary labial frenum attachment at the different age and gender groups:

Sewerin Classification	Age				P	Gender				P
	6-9y		9>-12y			Male		Female		
	No	%	No	%		No	%	No	%	
Normal	545	46.2%	454	55.1%	<0.001*	522	50.3%	477	49.4%	0.68
Simple with nodule	219	18.6%	132	16.0%	0.14	178	17.1%	173	17.9%	0.65
duplication	7	.5%	4	.4%	1.00	6	.6%	5	.5%	1.00
Persistence tectolabial	145	12.3%	59	7.2%	<0.001*	104	10.0%	100	10.4%	0.8
Simple with appendix	58	4.9%	26	3.2%	0.053	47	4.5%	37	3.8%	0.4
Bifid	35	3.0%	46	5.6%	0.003*	41	3.9%	40	4.1%	0.8
Recess	63	5.3%	20	2.4%	0.001*	46	4.4%	37	3.8%	0.5
Others	108	9.2%	83	10.1%	0.5	94	9.2%	97	10.1%	0.45
Total	1180	100.0%	824	100.0%		522	50.3%	477	49.4%	0.68

Discussion

The maxillary labial frenum very important and complicated structures in the oral cavity because it affects other oral structures. It is a dynamic and often changeable structure and is subjected to variations in shape, size, and position during the different stages of growth and development.

In this study, school children between 6-12 years of age were chosen, because it is the mixed dentition period which is the important psychological developmental age as primary education period. The school children were divided into two age groups early mixed dentition group age 6-9 years and middle mixed dentition age group 9>-12 years old. Also this study divided school children into boys or girls to study the gender effect on frenum and other effects.

In this cross-sectional study according to morpho-functional Placek et al⁽⁴⁾ classification, the prevalence of the most common maxillary labial frenum type was the gingival type (47.2%). The second most prevalent frenum type was the mucosal type (39.2%) followed by palatal type and palatal penetration frenum type represent (6.8%).

Placek et al⁽⁴⁾ 1974 disagreed with these results as they reported that the most common type was the mucosal frenum (46.5%) followed by gingival type (34.3%) then palatal penetration (16.1%) and the least common frenum type was palatal represent (3.1%).

Janczuk et al⁽⁶⁾ 1979 also disagreed with these result as they reported the most common type was mucosal type (39 %) followed closely by gingival type (36%) then palatal type (20%) and least common type was palatal penetrating represent (5%). This difference can be attributed to the age of the examined children as they examined older sample aged 15-17 years.

Bergese⁽⁷⁾ 1966 agreed with the results of this study as he reported that the most common frenum was the gingival type with a higher prevalence of (58.2%), then the mucosal type (29.9%), the palatal type (7.1%), and the least common was the palatal papilla which represented (4.8%).

Upadhyay and Ghimire⁽⁸⁾ 2012 reported that the gingival frenum type was most common (61.1%) in Nepal, but the second common type was the palatal type with higher percentage (17.2%) followed by the mucosal frenum type with a lower percentage (13.6%), and the least common type was the palatal penetrating frenum (8.1%).

This study found that the frenum distribution differs by age. The gingival frenum type was significantly prominent in children of older age, while children with papillary and papillary penetrating frenum types were significantly younger. The gingival frenum type in group 6-9 years was (44.3%) while in group 9>-12 years was (51.2%). The mucosal type in group 6-9 years was (38%) and in group 9>-12 years was (41%). Palatal and palatal penetration frenum types were (8.9%) and (8.8%) respectively in group 6-9 years while group 9>-12 years were (3.9%) for both.

Boutsi and Tatakis⁽⁹⁾ 2011 agreed with the result of this study. In addition to Upadhyay and Ghimire⁽⁸⁾ who reported that the prevalence of mucosal frenum type was (8%), gingival type was (46.6%), papillary type (31.8%)

and papillary penetration type (13.6%) in group(1) which aged 1-7 years while in group (2) which aged 8-14 years mucosal frenum type was (18.2%), gingival type was (72.7%), papillary type (5.5%) and papillary penetration type was (3.6%).

This study found gender had no significant difference on the types of gingival frenum. Boys group showed insignificantly higher percentages in mucosal and palatal types (39.6%) and (7.4%) respectively while girls group showed insignificantly higher percentages in gingival and palatal penetrating labial frenum attachment types (47.4%) and (7.6%).

Janczuk and Banach⁽⁶⁾ 1979 reported slight differences of frenum distribution between both genders which disagree with this study but didn't give more information. Boutsi and Tatakis⁽⁹⁾ 2011 reported no differences in the prevalence of frenum attachment type among both genders ($P = 0.52$) which agreed with the results of this study.

In this study, according to Sewerin⁽⁵⁾1971 classification, the most prevalent frenum type was the simple (normal) type (49.9%) followed by simple with nodule (17.5%) then persistent tecto-labial frenum type (10.2%) while simple frenum with appendix type (4.2%), bifid (4%), recess (4.1%), duplication (0.5%) and other types or combination between two or more variation types (10%). Nagaveni et al⁽¹¹⁾ 2010 reported in his study among mixed dentition group that the most common frenum type was the simple frenum but with a higher percentage (70%), followed by simple frenum with nodule with the also higher percentage (19.4%), and persistence tectolabial also third with same percentage (10%) while lower percentage were reported for double frenum type (0.3%), and bifid type (0.2%). For remaining frenum type, he reported that he did not find any case.

Townsend et al⁽¹⁰⁾ 2013 reported in their study in USA among children, adolescent, and adult the most common prevalent frenum type was simple frenum with higher percentage (68.64%), followed by frenum with nodule (17.42%) and frenum with the appendix type in the third with higher percentage (10.45%) while persistence tectolabial frenum type was in the fourth position with only (1.4%). Double frenum type exhibited (1.1%), while the bifid frenum type represent (0.7%) and lastly recess frenum type formed (0.4%). They did not report any variation frenum type. Sewerin⁽⁵⁾ 1971 reported in his study among children group aged 0-14 years in Denmark that the most common frenum type was simple frenum with higher percentage (65.6%) followed by simple frenum with appendix (13.7%), third frenum type was persistence tectolabial frenum type with lower percentage (7.3%), bifid frenum type with higher percentage (5.4%), simple frenum with nodule with lower percentage (3.2%), recess frenum type (2.9%), no duplication frenum type and lower variation and abnormal frenum types (1.9%).

In our study the age made a big different distribution for both simple frenum and persistence tectolabial frenum types which may evidence indicates that the attachment frenum in children will shift apical with increasing age changing form persistence tectolabial frenum to simple

frenum. In group, 6-9 years simple frenum type percentage was (46%) and persistence tectolabial frenum was (12%)

while in group 10-12 years simple frenum type was (54%) and persistence tectolabial was (7%). Nagaveni 2010⁽¹²⁾ compared in his study three groups: primary dentition group 3-5 years, mixed dentition group 7-14 years and permanent dentition group 15-16 years and he reported that the simple frenum type was (60%), (70%) and (78%) respectively. while persistence tectolabial frenum type was (21.2%), (10%) and (5.6%) respectively. This study found that no effect of gender on frenum distribution which agreed with Sewerin⁽⁵⁾ 1971, Townsend et al⁽¹⁰⁾ 2013 and Nagaveni⁽¹¹⁾ 2010.

This study is very important because there are lack of studies about maxillary labial frenum in Egypt and ethnic factor play role in frenum prevalence. The disappointment factor in this study that the accuracy of age determination according to child and parents memories and not accurate official certifications.

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