

Frenula Treatment Recommendations for Pedodontic Patients According to the Guidelines

Nidhi Gupta^{1*}, Natasha Gambhir², Neeti Mittal³, Rashi Singh⁴, Divya Singh⁵

^{1*} Professor & HOD, Santosh Dental College and Hospital, Santosh Deemed to be University, Ghaziabad, Delhi NCR

^{2,3,4,5} From Department of Pediatric and Preventive Dentistry, Santosh Dental College and Hospital, Santosh Deemed to be University, Ghaziabad, Delhi NCR

Corresponding Author: ^{1*}Dr Nidhi Gupta

ABSTRACT

There are three distinct types of frenula, also known as folds of the mucous membrane that can be seen in the oral cavity. The primary purpose of these frenula is to support the lips and the tongue. Children might be affected by a wide variety of developmental issues due to abnormalities in their labial and lingual frenula. In recent years, there has been a rise in the number of people being diagnosed with this condition, as well as an increase in the number of surgical procedures performed to repair their attachment. The purpose of this research is to give diagnostic and therapeutic criteria, as well as conduct a literature review on the current guidelines of therapy for frenula in pedodontic patients. A review of the most recent research on diseases of the oral frenulum was carried out, and a search of the PubMed/MEDLINE database covering the last five years was carried out. In addition, a discussion of the most recent recommendations made by the American Association of Pediatric Dentistry was incorporated into the study (AAPD). Clinicians may find use in the most recent set of guidelines that have been proposed by the American Academy of Pediatric Dentistry. It is recommended, however, that additional research be conducted in order to discover whether or whether there is a causal association between difficulty in nursing, pronunciation problems, and improper frenal attachment.

Keywords: ankyloglossia, superior labial frenulum, inferior labial frenulum, lingual frenulum.

1. INTRODUCTION

There are three distinct types of frenula, also known as folds of the mucous membrane, that can be seen in the oral cavity. The primary purpose of these frenula is to support the lips and the tongue. There is the buccal frenulum in addition to the superior labial frenulum and the inferior labial frenulum. Children might be affected by a wide variety of developmental issues due to abnormalities in their labial and lingual frenula. The abnormalities typically consist of hyperplasia or attachments that are abnormally localised (1). In recent years, there has been a rise in the number of people who have been diagnosed with ankyloglossia, which is the congenital adhesion of the tongue to the floor of the mouth, as well as a comparable rise in the number of people who have undergone surgical procedures to correct their attachment. Between the years 2012 and 2016, this figure rose by 110% in the United States

(2). Different diagnostic criteria and therapy recommendations are presented in the research that is currently available.

AIM

The purpose of this paper is to conduct a literature review on the most recent guidelines for the care of frenula in pedodontic patients, as well as to give diagnostic and therapeutic criteria.

2. MATERIAL AND METHODS

Rules for the care of frenula in pedodontic kids were released by the American Academy of Pediatric Dentistry (AAPD) in the year 2019. (3). This article addresses these guidelines and adds to the conversation by discussing available clinical trials that have been carried out over the course of the last five years. In order to achieve this goal, a search of the PubMed and MEDLINE databases was carried out. Ankyloglossia, labial frenum, and lingual frenum were some of the MESH terms that were utilised when conducting the search. Articles that were originally written in English, meta-analyses, original papers, and reviews of previous research were all considered for inclusion. On the other hand, the following were considered to be ineligible for inclusion: case reports; the inability to access the full text of an article; and articles that were irrelevant to the topic at hand. It is also important to point out that in recent years, there has been a paucity of information on this topic in articles that have been made available in Polish. As a result, the review was augmented with publications written by Polish writers but excluded from the publication in the PubMed database (4).

3. RESULTS

Lingual frenulum: A fold of mucosa that runs in the medial plane and connects the dorsal surface of the tongue to the floor of the mouth is known as the lingual frenulum (5). Ankyloglossia is a condition that has traditionally been understood to be a developmental abnormality that involves adhesion of the tongue to the floor of the mouth. This adhesion can totally restrict the mobility of the tongue, a condition that medical professionals refer to as complete ankyloglossia. The partial restriction of mobility of the tongue that results from a shortening of the frenulum is referred to as partial ankyloglossia (1). The American Academy of Otolaryngology has suggested an additional classification for this disease (AAO; HNS, Head and Neck Surgery). Since a few years ago, ENT specialists have begun using the phrases "anterior" and "posterior" ankyloglossia to describe the condition. At this time, we use the word "anterior ankyloglossia" to refer to a frenulum that reaches the tip of the tongue or its vicinity and restricts the movement of the tongue. However, the definition of posterior ankyloglossia is not universally agreed upon by medical professionals. Others believe that this term refers to the submucosal attachment of the tongue to the floor of the mouth, while others believe that it refers to the frenulum that penetrates the posterior part of the tongue. Some authors use this term to describe the frenulum, which penetrates the posterior part of the tongue. The vast majority of researchers contend that this phrase does not accurately describe a distinct anatomical unit, and that consequently, the usage of this concept ought to be abandoned. The inconsistencies that exist not only within the definition but also within the categorization system make it difficult to reach a consensus on which technique of classification should be used. However, the lack of a standard classification does not influence the efficacy of treatment because the eligibility for surgery is established not by the

appearance of the frenulum itself but rather by the symptoms (6, 7). Ankyloglossia is thought to affect between 4.0 and 10.7% of the population in terms of its prevalence (8).

Ankyloglossia is a condition that is usually related with issues that arise during nursing a newborn or giving a bottle to a newborn, as well as nipple pain in moms. It is possible for a short frenal attachment to restrict tongue motions such as elevation and protrusion. However, the capacity of the tongue to elevate is more crucial for breastfeeding, speaking, and the development of dental arches than its protrusion. Feeding difficulties can be caused by a hyperplastic frenulum, which can lead to an earlier discontinuation of nursing (3). The patient's ability to move their tongue can be evaluated by having them touch the area of their hard palate that is near their upper incisors with the tip of their tongue while their mouth is open normally. If the patient is unable to execute this task, the attending physician should position themselves behind the patient and use their two index fingers to examine the movements of the patient's tongue (7). If you want your child to have the best possible growth, development, and health, the World Health Organization (WHO) recommends that you breastfeed your child exclusively for the first six months of their life. After that, you should continue to breastfeed your child up to the age of two and beyond, while also introducing complementary foods (9).

According to the findings of a study conducted by Cochrane, frenulotomy is an effective method for providing breastfeeding moms with short-term alleviation of nipple pain (10). In recent years, numerous studies have provided evidence in support of the long-term beneficial effects that correcting ankyloglossia has on feeding (11). Another one of the complications linked with ankyloglossia is a difficulty pronouncing words (12). On the other hand, the scientific literature does not agree on whether or not there is a connection between ankyloglossia and speech disorders.

In the natural world, there is a wide range of possible pronunciations, and subjective evaluations of articulation variances are common. Ankyloglossia is characterised by difficulties in pronouncing certain phonemes, including r, t, d, l, s, , d, sz, cz, d, and. Patients who have been diagnosed with ankyloglossia often experience difficulties in pronouncing these phonemes. The pronunciation of the letter "r" is particularly difficult because of these issues (4). One of the potential therapeutic options to increase tongue movement and the patient's capacity to communicate verbally is to combine speech therapy with surgical surgery. However, additional research is required to evaluate the benefits of surgical correction of ankyloglossia and its association with speech defects. This is due to the fact that many children and adults who have ankyloglossia are able to compensate for the defect and produce sounds in the correct manner (3). In recent years, there has been a growing interest in the investigation of treatment methods for congenital malformations characterised by the tongue's attachment to the floor of the mouth. This interest has been spurred on by the fact that such anomalies are rather common. Kim, Lee, and their colleagues' observations demonstrated that surgical repair of ankyloglossia considerably impacted the length of the tongue and enhanced the patient's ability to articulate consonants as early as three months after surgery. Classical frenectomy and four-flap Z-frenuloplasty produce results that are equivalent to one another (13).

There is no evidence that can definitively indicate that ankyloglossia and improper tongue position may affect the development of specific orthodontic diseases. This is because there is a lack of evidence to support such a claim.

It was discovered that young adults who had ankyloglossia had a shorter intercanine distance in the maxilla and mandible, as well as a shorter intermolar distance in the maxilla. This was in comparison to patients who had normal lingual frenulum length, which suggests that

ankyloglossia has an effect on the development of dental arch narrowing. In addition, it was shown that within the group of patients who had ankyloglossia, there was a steady increase in the overjet and a decrease in the mandibular base angle as the severity of this illness increased. This was discovered within the context of patients who had ankyloglossia (14). Ankyloglossia has also been linked to the development of class III malocclusions, according to the research that has been done on the subject (15). An elevated palatal arch and an extended soft palate are two additional characteristics that have been linked to ankyloglossia (16, 17). Because of this, it is imperative to do a comprehensive assessment, diagnosis, and treatment plan for orthodontics before surgery is carried out. Ankyloglossia is a condition that can make it difficult to practise good oral hygiene. This is because it is similar to anomalies that involve the superior and inferior labial frenulum (3).

Superior labial frenulum

The superior labial frenulum is a fold of the mucous membrane that may be found in the oral vestibule. It connects the gingiva to the upper lip and is situated above the gingiva. According to Plaek's division, the superior labial frenulum's attachment can be divided into the following categories based on the anatomical level of the attachment:

1. An attachment in the movable mucosal portion of the oral vestibule that is referred to as mucosal.
2. Gingival refers to the region of the connected gingiva in the mouth.
3. Papillary, which means it is attached inside of the incisal papilla.
4. Penetrating – it goes all the way through to the palatal suture, penetrating the incisal papilla (18).

Mucosal and gingival frenal attachments are the forms of frenal attachments that are seen most frequently in patients. The superior labial frenulum is a structure that, throughout a person's lifetime, alters both in terms of its level of penetration and its overall morphology. Even though a prominent superior labial frenulum in newborns, children, and teenagers is rather common, it often gives parents reason for anxiety. The papilla penetrating attachment is the most common type of attachment found in neonates (3).

When trying to determine what causes difficulty in breastfeeding or bottle feeding, there are a lot of different things to take into consideration. Among these are a lingual or superior labial frenulum that is abnormally shortened. It has been hypothesised that the frenulum, which restricts the function of the upper lip, may hinder the lips from adhering firmly to the breast while the infant is nursing. As a consequence, the lips do not cling firmly to the nipple. Before undergoing surgery to address the deficiency, a detailed analysis of the feeding problem should be performed. Additionally, an interdisciplinary approach should be followed in order to prevent undergoing surgery that is not required when it might have been avoided (19). Previous research has shown inconclusive findings, which can be attributed to the subjectivity of the evaluation (3, 20).

In cases of a midline diastema and when its secure closure following orthodontic treatment is required, surgical excision of the superior labial frenulum is also performed. This is done in order to prevent further complications. If the diastema is larger than 2 millimetres, it is quite improbable that it would spontaneously close as the child continues to develop. Frenulectomy is not recommended before the permanent canines have emerged from the gums since the space between the teeth may close on its own at that point (21).

When the frenal attachment exerts traumatising pressure on the gingiva, causing it to fade, pull, or detach the marginal gingiva when the upper lip is pulled, surgical therapy is also necessary. This can happen when the frenal attachment is too tight (3, 18).

It is hypothesised that a hypertrophic labial frenulum that penetrates the free or marginal gingiva can obstruct adequate oral hygiene. This can potentially lead to cervical caries, in addition to the beginning and advancement of plaque-related gingivitis. On the other hand, there is insufficient data to support this assertion; hence, additional research is required to verify the existence of a causal connection (3, 18).

Inferior labial frenulum

The attachment of the high inferior labial frenulum is the connection that travels all the way up to the alveolar region of the jaw. One of the risk factors is having a small oral vestibule (1). The movements of the lower lip that occur when chewing have the potential to draw gingival fibres that penetrate the free or marginal gingiva. When the inferior labial frenulum is attached to the lower lip in a high position, it can be difficult to clean the teeth effectively. Inadequate oral hygiene and the accumulation of bacterial plaque can also lead to the loss of a connective tissue connection, the establishment of pathological periodontal pockets, and recessions. It is therefore recommended to begin therapy as soon as possible with the primary focus being on effective plaque reduction (3, 22).

Treatment options

Frenectomy, frenulotomy, and frenuloplasty are the three surgical dental treatments that are performed for the treatment of frenal abnormalities. Frenectomy is the most invasive of the three. Each person's situation is unique, and as a result, the type, nature, and timing of any surgical intervention should be carefully examined.

Following surgery, patients are encouraged to consume soft foods, maintain a normal oral hygiene routine, and use analgesics as required. In addition, tongue muscle exercises and speech therapy that are adapted to the specific requirements of the patient are required in order to sustain the positive benefits of the treatment in the long run (7). Antibiotic medication during the perioperative period is not typically required for the procedure. It is also important to note that the injection of hyaluronic acid following surgery had a good effect on postoperative wound healing (23).

Studies have shown that the laser surgery technique is superior to the traditional surgical intervention in terms of reduced discomfort while speaking and chewing, shorter procedure time, better bleeding control, and less intraoperative and postoperative pain. These benefits can be attributed to the laser surgery technique (3, 24, 25). Patients are more likely to accept the procedure overall when it is performed with a laser because there is no longer a requirement for suture removal (26).

It is essential to obtain the patient's informed consent prior to surgery because postoperative complications are not commonly reported. However, increased bleeding, upper airway obstruction, infections, lip burn, ulceration on the floor of the mouth, tongue dysfunction, and tongue reattachment should be mentioned (10, 26).

4. CONCLUSION

In recent years, there has been a rise in interest in the topic of frenal dysfunctions. [Case in point:] [C]ase in point: [C Recent research provide useful information that can be used to identify appropriate diagnostic and treatment procedures. Clinicians may find the guidelines offered by the American Academy of Pediatric Dentistry to be a useful instrument in their professional work. It is recommended, however, that additional research be conducted to discover whether or whether there is a connection between difficulty in breastfeeding,

pronunciation issues, and improper frenal attachment (3). The subjectivity of this condition, together with the challenges involved with blinding research participants, is the primary barrier to progress in this area of study (20).

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