

Frenectomy Technique for Correcting Low Insertion of the Upper Labial Frenum in Pediatric Dentistry: a Case Report

Técnica de Frenectomia para Correção de Baixa Inserção do Frênulo Labial Superior em Odontopediatria: Relato de Caso

Técnica de Frenectomía para Corregir la Inserción Baja del Frenillo Labial Superior en Odontopediatria: Informe de un Caso

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Abstract

The maxillary labial frenum consists of a fold of connective tissue, mucous membrane and, occasionally, muscle fibers. Its growth can be simple and benign, when it extends from the inserted gum, or abnormal, when this insertion is placed atypically. Frenectomy is the surgery used to remove the frenulum of the tongue or lip. A thick, wide and fibrous frenum interferes with the patient's aesthetics by forming diastemas. In addition, it impairs oral hygiene, causes retraction of the gingival tissue, restriction of lip movements and, consequently, occlusal and phonation interference. For treatment, total removal of the labial frenum is usually indicated, a surgery called labial frenectomy, with the intention of correcting diastemas. This study aimed to report the surgical intervention of a clinical case with removal of the maxillary labial frenum, due to the development of interincisor spaces. A 12-year-old male patient attended the Pediatric Dentistry Clinic of the University of Ribeirão Preto, Brazil (UNAERP) complaining of interincisal diastema in the region of teeth 11 and 21. The intraoral clinical examination revealed a pathological labial frenum with low insertion and fibrous, associated with interincisal diastema. The treatment plan proposed was surgical intervention of the upper labial frenum, using the frenectomy technique, with deep detachment, since the closure of the diastema is prevented by the interdental insertion of the pathological labial frenum. Clinical follow-up was performed at 7, 15 and 45 days, showing good healing and correct position of the labial frenum, and the patient was referred for orthodontic treatment. It can be concluded that the labial frenectomy technique is an important instrument for the treatment of abnormal labial frenum and, in the respective clinical case, it proved to be effective.

Descriptors: Frenectomy; Labial Frenum; Diagnosis; Pediatric Dentistry.

Resumo

O frênulo labial superior consiste em uma dobra de tecido conjuntivo, membrana mucosa e, ocasionalmente, fibras musculares. Seu crescimento pode ser simples e benigno, quando se estende a partir da gengiva inserida, ou anormal, quando essa inserção ocorre de forma atípica. A frenectomia é a cirurgia utilizada para remover o frênulo da língua ou do lábio. Um frênulo espesso, largo e fibroso interfere na estética do paciente ao formar diastemas. Além disso, prejudica a higiene bucal, causa retração do tecido gengival, restrição dos movimentos labiais e, consequentemente, interfere na oclusão e na fonação. Para o tratamento, geralmente é indicada a remoção total do frênulo labial, cirurgia denominada frenectomia labial, com a intenção de corrigir os diastemas. Este estudo teve como objetivo relatar a intervenção cirúrgica de um caso clínico com remoção do frênulo labial superior, devido ao desenvolvimento de espaços interincisivos. Um paciente do sexo masculino, de 12 anos, compareceu à Clínica de Odontopediatria da Universidade de Ribeirão Preto (UNAERP), Brasil, queixando-se de diastema interincisivo na região dos dentes 11 e 21. O exame clínico intraoral revelou um frênulo labial patológico, com inserção baixa e fibrosa, associado ao diastema interincisivo. O plano de tratamento proposto foi a intervenção cirúrgica do frênulo labial superior, utilizando a técnica de frenectomia, com descolamento profundo, uma vez que o fechamento do diastema estava sendo impedido pela inserção interdental do frênulo labial patológico. O acompanhamento clínico foi realizado aos 7, 15 e 45 dias, apresentando boa cicatrização e posicionamento correto do frênulo labial, sendo o paciente encaminhado para tratamento ortodôntico. Conclui-se que a técnica de frenectomia labial é um instrumento importante no tratamento de frênulo labial anormal e, no respectivo caso clínico, mostrou-se eficaz.

Descritores: Frenectomia; Frênulo; Labial; Diagnóstico; Odontopediatria.

Resumen

El frenillo labial superior consiste en un pliegue de tejido conectivo, membrana mucosa y, ocasionalmente, fibras musculares. Su crecimiento puede ser simple y benigno, cuando se extiende desde la encía insertada, o anormal, cuando esta inserción se encuentra de forma atípica. La frenectomía es la cirugía utilizada para remover el frenillo de la lengua o del labio. Un frenillo grueso, ancho y fibroso interfiere con la estética del paciente al formar diastemas. Además, perjudica la higiene oral, causa retracción del tejido gingival, restricción de los movimientos del labio y, en consecuencia, interferencias en la oclusión y en la fonación. Para el tratamiento, generalmente se indica la remoción total del frenillo labial, cirugía denominada frenectomía labial, con el objetivo de corregir los diastemas. Este estudio tuvo como objetivo relatar la intervención quirúrgica de un caso clínico con remoción del frenillo labial superior, debido al desarrollo de espacios interincisivos. Un paciente masculino de 12 años acudió a la Clínica de Odontopediatria de la Universidad de Ribeirão Preto (UNAERP), Brasil, con queja de diastema interincisivo en la región de los dientes 11 y 21. El examen clínico intraoral reveló un frenillo labial patológico, con inserción baja y fibrosa, asociado al diastema interincisivo. El plan de tratamiento propuesto fue la intervención quirúrgica del frenillo labial superior, utilizando la técnica de frenectomía, con despegamiento profundo, ya que el cierre del diastema estaba siendo impedido por la inserción interdental del frenillo labial patológico. Se realizó un seguimiento clínico a los 7, 15 y 45 días, mostrando buena cicatrización y correcta posición del frenillo labial, y el paciente fue derivado a tratamiento ortodôntico. Se concluye que la técnica de frenectomía labial es una herramienta importante para el tratamiento del frenillo labial anormal y, en el caso clínico respectivo, demostró ser eficaz.

Descriptores: Frenectomía; Frenillo Labial; Diagnóstico; Odontopediatria.

INTRODUCTION

The maxillary labial bridle consists of a fold of connective tissue, mucous membrane and, occasionally, muscle fibers¹. Its growth can be simple and benign, when it extends from the inserted gingiva, or abnormal, when this insertion is placed atypically¹. A thick, wide and fibrous bridle interferes with the patient's aesthetics with the formation of diastemas. It also impairs oral hygiene, causes retraction of the gingival tissues, restriction of lip movements and, consequently, occlusal and phonation interference.

The interincisor space is a normal aspect of childhood, affecting around 77% of children during deciduous dentition, and is a positive factor for the positioning of permanent teeth. During mixed dentition, at around 8 years of age, the roots of the anteroposterior teeth converge towards the apical region, which can lead to the appearance of a diastema due to the late transverse development of the face. However, with the eruption of the permanent teeth, including the lateral incisors and canines, the diastema tends to close naturally. However, if the labial bridle is in an abnormal position, the diastema may persist².

It is up to the dental surgeon to establish the treatment plan through clinical examination and diagnosis in order to obtain a satisfactory result. For diagnosis, we must observe whether the insertion exerts a traumatic force on the gum, causing the papilla to whiten when the upper lip is pulled, or whether the insertion causes a diastema greater than two millimeters, which rarely closes spontaneously during later development³. Treatment usually involves the total removal of the labial frenum, a procedure known as labial frenectomy. Different techniques are reported: excision, when the macroscopically visible anatomical portion of the brake is completely removed; and repositioning, where the anatomical position of the brake is changed, altering its morphofunctional characteristics⁴. When opting for upper lip frenectomy, its main objective is to change the anatomical position of the brake, altering its morphofunctional characteristics, providing a better aesthetic result, eliminating only the portion with undesirable insertion without the loss of periodontal structure (papilla).

The aim of the case presented is to report the surgical intervention on a labial bridle with low insertion, fibrous and presenting ischemia on traction, using the frenectomy technique, in a 12-year-old male patient who had an interincisal diastema between teeth 11 and 21 with an aesthetic complaint.

CASE REPORT

A twelve-year-old male patient attended the Pediatric Dentistry Clinic of the University of

Ribeirão Preto, Brazil (UNAERP), accompanied by his grandmother, complaining of interincisal diastema in the region of teeth 11 and 21. The intraoral clinical examination revealed a pathological labial frenum with low insertion and fibrous, associated with interincisal diastema (Figure 1 A-B). The treatment plan proposed was surgical intervention of the upper labial frenum, using the frenectomy technique, with deep detachment, since the impediment to closing the diastema is the interdental insertion of the pathological labial frenum.



Figure 1: Preoperative view (A) and (B).

After asepsis of the oral cavity with 0.12% chlorhexidine gluconate (Periogard®, Colgate Palmolive Ind. Bras., São Bernardo do Campo, Brazil), the surgical procedure was started. Topical anesthesia was then administered using benzocaine gel (Benzocaine® Interstate Drug Exchange, IL, USA) for 3 minutes (Figure 2 A-B). Bilateral terminal infiltration anesthesia was continued with the anesthetic lidocaine 2% (Alphacaine 2%-DFL®), reaching the superior alveolar nerve, and supplemented in the hard palate region. The anesthetic was infiltrated away from the frenulum to avoid deformation and make the surgical procedure more difficult.



Figure 2: Topical anesthesia with Benzotop for 3 minutes (A) and terminal infiltration anesthesia with lidocaine 2% (B).

Then, the incision was made with a 15 blade on a scalpel handle positioned at an inclination of approximately 45 degrees in relation to the edge, next to the insertion of the frenulum (Figure 3 A-C). When opening the surgical chamber, the periosteum was exposed and the entire frenum was resected (Figure 4 A-B). Subsequently, the labial frenulum was repositioned more apically and sutured to the periosteum with a simple stitch and 5.0 silk thread (Figure 4 B). Figures 5 A-C and Figure 6 show the postoperative period of 7, 15 and 45 days after frenectomy, showing good healing

and correct positioning of the labial frenum. After that, the patient was referred for orthodontic treatment.



Figure 3: Sectioning of the labial frenulum with a #15 scalpel blade (A), Intra-oral photograph after sectioning the labial frenulum via the buccal (B) and Intra-oral photograph after sectioning the labial frenulum via the palatal (C).



Figure 4: Intra-oral photograph after sectioning the labial frenulum through the palate (A) and Intra-oral photograph after suturing with 5.0 Silk suture (B).



Figure 5: Post-operative photograph 7 days (A), 15 days (B) and 45 days (C) after labial frenectomy.



Figure 6: Post-operative photograph 45 days after labial frenectomy.

DISCUSSION

The upper labial frenum is a thin, triangular anatomical structure formed in the third month of intrauterine life, located from the tubercle of the upper lip to the alveolar process, and its function is to limit lip movements⁵⁻⁷. The maxillary labial frenulum attachment can be classified with respect to its anatomical insertion level, as follows: mucosal (frenal fibers are attached up to the mucogingival junction); gingival (frenal fibers are inserted within the attached gingiva); papillary (frenal fibers are extending into the interdental papilla); and papilla penetrating (frenal fibers cross the alveolar process

and extend up to the palatine papilla)³. In the case presented, the present frenum is classified as papilla penetration.

When clinically normal, the frenum does not usually cause pathologies of great importance to dentistry, but when it has some alteration, it is closely associated with a series of syndromes such as causing limitations in lip, tongue and swallowing movements, impairing breastfeeding, tooth deformities, diastemas, difficulties in orthodontic movement, decreased airflow, speech problems and oral hygiene, by making brushing difficult and contributing to the formation of dental plaques³. The most common location for the development of frenum abnormalities is in the region of the upper and lower central incisors, canine areas, and premolars⁸. When the frenum maintains its insertion in the palatine papilla, causing its enlargement, it can act as a barrier to the mesial migration of the upper central incisors during eruption. This causes a median interincisor diastema, hinders lip movements, generates disharmony in the aesthetics of the smile, affects phonation and brushing, and can even cause food impaction, gingival retraction, and bad habits.

The diagnosis of an abnormal labial frenum is made in the mixed dentition, from the moment the permanent upper central incisors are present in the mouth. Ischemia of the palatine papilla is observed when the interincisal labial frenum and diastemas are pulled, along with other unfavorable clinical conditions⁹. In the presence of an anomalous frenum, the real cause of the diastema must be observed, since during the pressure exerted by the canines on the roots of the incisors, the apices move closer to the midline, pushing the crowns in the opposite direction. This phase of child development is also called the "Ugly Duckling Phase". Furthermore, it is important to evaluate the presence of anomalies such as odontomas, supernumerary teeth, growth disorders of the arches, mesiodens and absence or microdontia of the lateral incisors⁹. When diagnosing the patient in question, we were able to observe that the presence of diastemas was closely related to the anomalous labial frenum, since it presented low insertion and fibrous, also presenting ischemia upon traction. In addition, there was a complaint about the aesthetics of the smile, for which the conventional labial frenectomy technique proved to be well indicated. Once the diagnosis is complete, the treatment options for midline diastema and the sequence of care vary according to the patient's age and may include orthodontics, restorative treatment, frenectomy or a combination of these. However, in this case, a good alternative is surgical intervention to remove excess interdental tissue^{3,6}. A pathological frenum can be treated by frenectomy or frenotomy, and this technique may change

depending on the extension, insertion, and degree of involvement of the frenum with adjacent structures⁹. In the case in question, conventional labial frenectomy was chosen, considered a repositioning technique, which consists of the surgical removal of the upper or lower labial frenum, promoting an anatomical change of this frenum.

Several authors still question the use of this technique. According to Protásio et al.⁵, the use of this technique is considered very advantageous because it provides an aesthetic result and allows its morphological and structural maintenance, removing the edges of the fibrous structure and eliminating tension, repositioning only the necessary portion. On the other hand, there are authors who advocate performing the procedure with high-power lasers such as CO₂, erbium:yttrium aluminum garnet (Er:YAG), because it causes less bleeding, ensuring better visualization of the surgical field and does not require suturing, which prevents the accumulation of biofilm in the region¹⁰. However, the conventional technique performed with a scalpel still has a lower cost and a shorter learning curve, in addition to being highly successful and effective¹⁰, as can be seen in the clinical case in question.

The diagnosis and ideal time to perform the surgical procedure for the hypertrophic frenum are still widely discussed in the literature and are related to the presence or prevention of midline diastema formation, prevention of post-orthodontic relapse, aesthetics, and psychological considerations^{3,7}. It is recommended that it be performed after the eruption of the lateral incisors, but some authors suggest that this procedure should be performed after the eruption of the canines, due to the greater stability of the eruptive forces, thus obtaining a higher probability of success¹¹. According to the American Academy of Pediatric Dentistry³, any surgical manipulation is not recommended before the eruption of permanent canines, as it may result in orthodontic relapse due to scarring. The clinical case presented corroborates the literature, since the surgery was performed after the eruption of the lateral incisors and permanent canines, presenting favorable results and clinical success, evidencing that conventional labial frenectomy, with the use of a scalpel, when well indicated and well executed, guarantees the expected clinical success.

CONCLUSION

In summary, to provide the necessary treatment to patients with CHD it is mandatory to include consultations with physicians and cardiologists to reduce the risk of serious systemic complications while ensuring the successful completion of required dental treatment.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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