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CASE REPORT

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Z PLASTY – AN ESTHETIC APPROACH TO FRENECTOMY: CASE REPORT

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ABSTRACT

Introduction: The endless quest for harmony of the smile has indeed led to great advances in Dentistry. Developmental abnormalities frequently occur, particularly diastemas. During the treatment of these abnormalities, such as the pathological labial frenum, some obstacles may be encountered, which may not only favor their appearance, but may also make it difficult to establish the prognosis of the case if the frenectomy is not correctly performed. **Aim:** The aim of this study was to present a clinical case of maxillary labial frenectomy by means of the Z-plasty technique. **Case Report** The patient, a 22-year-old woman, used an orthodontic appliance and had a pathological labial frenum. After being evaluated, her therapeutic planning was determined. This included frenectomy performed using the Z-plasty technique, with the intention of diminishing the appearance of a scar, and preventing recurrence of the diastema after conclusion of the orthodontic treatment. **Conclusion:** Although frenectomy is considered a simple method, there is wide variation among the technique for removal of the hypertrophic frenum. The Z pattern is efficient because it promotes redistribution of the tension in the skin, and minimizes scar formation.

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INTRODUCTION

The endless quest for harmony of the smile has indeed led to great advances in Dentistry. In order to obtain the esthetic appearance desired by the patient, meticulous evaluation and planning must be carried out, taking into consideration all the factors that affect the harmony of the smile, and that may interfere in achieving the desired results (Naldi et al., 2012). Developmental abnormalities frequently occur, with emphasis on diastemas that may cause functional and esthetic disturbances, leading the individual to seek orthodontic solutions in order to obtain a more harmonious smile (Texeira et al., 2008). However, some obstacles may be encountered, such as the pathological labial frenum. In the majority of cases, this anomaly not only favors the development of interincisal diastema - one of the main problems of orthodontic treatment - but when frenectomy is not performed, it may also make oral hygiene difficult to perform, cause gingival tissue retraction and restrict lip movements (Macedo et al., 2012). In these cases, meticulous clinical evaluation must be made to determine the adequate treatment (Rosa et al., 2018).

Evaluation is made by applying the Bowers test, consisting of traction on the lip in the vestibular and apical directions. In the case of movement or ischemia of the papilla, removal of the frenum is indicated for both esthetic and functional reasons (Bowers, 1963). Differently from bone tissue, the frenum is a structure that is not resorbed in a short period of time. Its elastic and collagen fibers predispose to high potential for recurrence of the diastema after use of the orthodontic appliance (Macedo et al., 2012). Generally, the diastema appears on the midline between the maxillary and mandibular central incisors, in a triangular shape, forming fold or pleat in the alveolar mucosa that interconnects the internal surface of the lip with the gingiva and periosteum (Rosa et al., 2018). It is classified according to the extension of fixation of its fibers as: mucosal (when the fibers are united up to the mucogingival junction); gingival (when the fibers are inserted into the attached gingiva); papillary (when the fibers extend up to the interdental papilla) and papillary penetrant type (when the fibers cross the alveolar process extending up to the palatine papilla) (Mehrotra et al., 2018). Clinically, the papillary and papillary penetrant types of frenum are considered

pathological types (Pitale and Sethia, 2014). The options for removal are frenectomy and frenotomy (Rosa et al., 2018). Frenectomy is the surgical procedure in which complete removal of the frenum is performed, including the area interconnected to the bone (Mehrotra et al., 2018), while in frenotomy, it is partially removed, showing a high incidence of recurrence (Rosa et al., 2018). At present there are various techniques for performing frenectomy - the conventional, using a manual scalpels, electrosurgery and laser. These are differentiated according to operating time, post-operative period and prognosis (Bowers, 1963). Furthermore, the conventional technique has some variations, such as the Miller, Z-Plasty and VY-Plasty techniques (Mehrotra et al., 2018). The aim of this study was to present a clinical case, in which the patient was submitted to maxillary labial frenectomy, with the intention of removing the hypertrophic frenum, applying the conventional method with use of the manual scalpel, by means of the Z-Plasty technique.

CASE REPORT

The patient, a 22-year-old white woman, without any changes in systemic or local health, classified as ASA I, presented to the School Clinic of the Independent College of the Northeast - FAINOR - in the Southeast of Bahia, with the chief complaint of esthetic appearance of her smile. On clinical exam, the use of the orthodontic appliance and fibrous maxillary labial frenum were observed (Figure 1).



Figure 1 Maxillary labial frenum with ischemia

The Bowers test was carried out (Bowers, 1963), by performing traction of the lip in the apical and vestibular directions, in which ischemia of the frenum was observed, and classified as being a papillary frenum. Thus, therapeutic planning for frenectomy of the maxillary labial frenum was determined, due to the high chance of recurrence of the interincisal diastema, if the frenectomy were not performed. The technique of choice was Z-Plasty with the intention of enhancing esthetics in the operated area by diminishing the scars. Before surgery, extraoral antisepsis was performed with PVPI, and intraorally, with 0.12% chlorhexidine digluconate solution (PERIOGARD, Colgate – Palmolive Company, São Paulo, Brazil). The anesthetic of choice was based on 2% Alphacaine 1:100.000 (DFL Indústria e Comércio - RE 2898 - Jacarepaguá, Rio de Janeiro, Brazil), by anesthetizing the superior anterior alveolar nerve bilaterally. In this technique, no clamps were used, only the lip was displaced in order to apply traction to the frenum.



Figure 2. Incisions performed with 15C scalpel

Incisions were made with a 15C scalpel blade (LAMEDID, Bunzul Saúde LTDA, São Paulo, Brazil); one vertical along the maxillary frenum and two lateral horizontal incisions in opposite directions, at the extremities of the vertical incision, of approximately the same length (Figure 2), forming two triangles of equal size, with an angle of 60° at the junction of the two incisions (Figure 3). Afterwards, using Stark forceps with a 12 cm serrated edge (Nova Brasília, Joinville – Santa Catarina, Brazil) the tissue was delicately separated and the insertion fibers were removed with the aid of the scalpel, taking care not to damage the apices of the flaps (Figure 4).

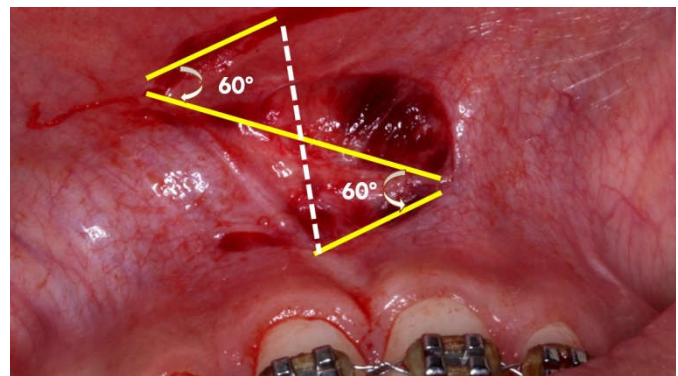


Figure 3. Demonstration of forming angle by means of incisions

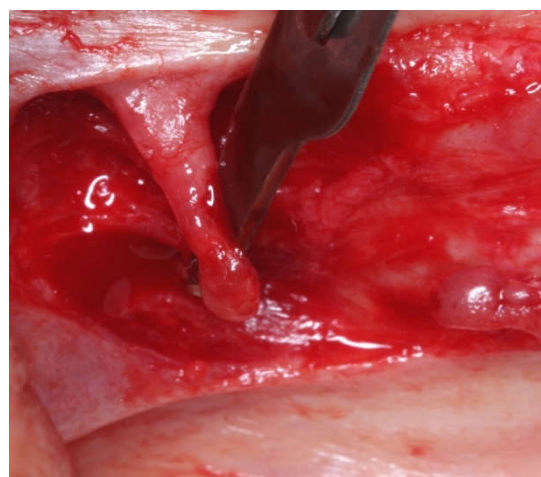


Figure 4. Removal of fibers with aid of scalpel

The area was cleaned and abundantly irrigated, and the flaps formed (Figure 5) were turned and transposed to the side opposite to the apex of each flap. Sutures were performed with 5.0 nylon thread (Shalom Sutures, São Luiz de Montes Claros GO, Brazil) and began across the apices, to verify that the flap was adequately repositioned, and to close the entire incision (Figure 6).

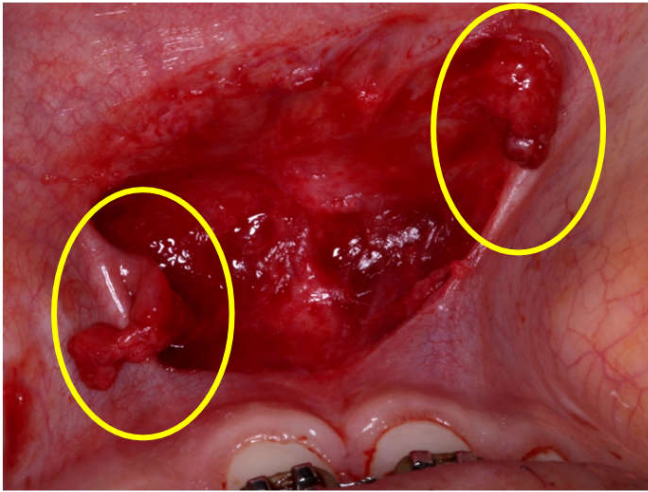


Figure 5. Fibers removed and flaps formed

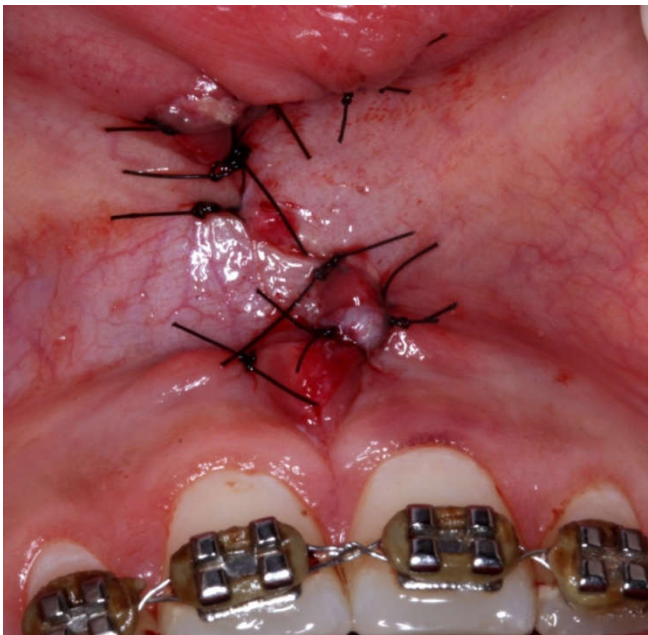


Figure 6. Suture with 5.0 nylon thread

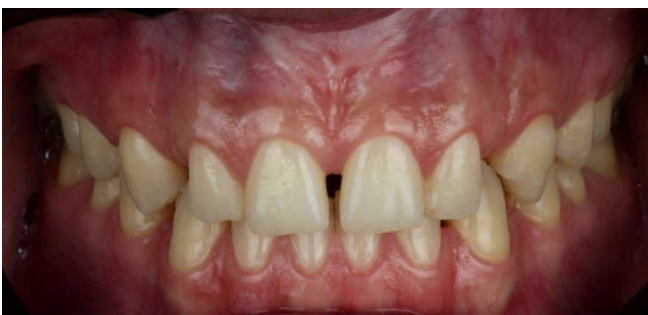


Figure 7. Minimal scar formation and excellent tissue color match

The patient was provided with all the instructions for post-operative care and oral hygiene, and medications were prescribed, as necessary. These were: 100 mg Nimesulide every 12 hours for 4 days; 500 mg Amoxicillin every 8 hours for 7 days and 500 mg Sodium Dipyron, every 6 hours for 3 days. The surgical procedure occurred without intercurrentence, and the sutures were removed 7 days post-operatively, with good tissue healing. After 3 months, minimum scar formation

could be observed, and excellent match of tissue colors (Figure 7).

DISCUSSION

The labial frenum is an anatomic formation which, under normal conditions, causes no pathological consequences. In some cases, however, it may become a significant problem of a periodontal, orthodontic, prosthetic and/or phonetic nature, and in these cases, surgical correction would be necessary. The purpose of this would be to remove the excess interdental tissue, reduce the tension on the marginal gingiva, prevent and/or contribute to the treatment of diastemas that would compromise esthetics, and in some cases, dental occlusion (Mourão et al., 2013). Conventional frenectomy is a highly safe and predictable method, however, it may have unsatisfactory esthetic results. Although it is considered a simple procedure, several authors have reported technical modifications with a view to achieving improvements in the post-operative period (Silva et al., 2018). One of these is the “V-Y” plasty technique, indicated for elongating the area with an ample frenum (Castillo et al., 2013). Another frenectomy technique developed by Morselli et al. (1999), called the “triangular flap” consists of performing three incisions forming a triangle, the base of which is performed at the junction of the free and attached gingiva and the lateral incisions, in order to involve the frenum on the midline. A fourth incision is made on the right side of the initial triangle, two to three millimeters from its apex, forming a “triangular edge” with the aim of amply exposing the musculature above the periosteum, with a shorter time of healing and tissue contraction, which favors reducing the size of the scar (Bagga et al., 2006). Bagga et al. (2006) published a description of another technique with a full thickness V-shaped incision made at the gingival base of the frenum, creating an external bevel making it possible to diminish scar marks (Morselli et al., 1999). In this clinical case report, the technique of choice was Z-Plasty, indicated in cases of hypertrophic frenums with low insertion or associated with the presence of an interincisal diastema and short vestibule, which promote redistribution of tension in the skin, and minimize scar formation (Mehrotra et al., 2018). Each method has its advantages and disadvantages. With Z-Plasty, it is possible to promote a more natural scar (Pitale and Sethia, 2014). The basic flaps of this technique are made by using angles of 60° bilaterally, forming equilateral triangles (base and sides of equal lengths). Frenectomy performed in a Z lengthens the scars by 75% while the other methods using designs of 30° and 45° elongate them by 25% and 50% respectively (Pitale and Sethia, 2014) and angles of 90° increase them by 120% (Donald and Hudson, 2000). The larger the flaps the greater the elongation obtained, however, the longer the individual triangular flaps, the more difficult it will be to transpose them. For example, incisions longer than 60° require more tension to perform closure, in comparison with one with a small Z-plasty. However, the applicability of a plasty smaller than 60° will also be limited, because it would have a triangle with a base that would be smaller than its length, which would make it fragile from the vascular point of view (Donald e Hudson, 2000). The frenectomy in Z form consists of creating two adjacent and parallel triangular flaps that transpose synchronously with each other (Figure 11), thereby redistributing tissues from a loose area to where they are needed. For this to occur, sufficient elasticity is required to allow re-distribution of the tissues. Although the majority of scars contract, the transposition performed in this technique

prevents the occurrence of excess contraction and favor elongation of the scar, thereby diminishing the tension in the skin (Donald and Hudson, 2000). In comparisons made between Z-Plasty and V-Y, improved maneuver is observed with the incision made in Z form, due to the transfer of tissue from one area to another; while in V-Y, the excess tissue remains in the same line of movement as the flap (Donald and Hudson, 2000). Furthermore, the plasty in V form results in a longitudinal surgical incision and a scar, which may lead to periodontal problems due to the damaged gingiva and an unesthetic appearance (Mehrotra et al., 2018). The Z-plasty avoids poor results associated with tissue healing and allows better redistribution of the scar contracture lines. The efficacy of treatment of the hypertrophic frenum depends on the diagnosis and correct surgical technique. The interincisal diastema is directly related to environmental and genetic factors, therefore definition of its etiology is indispensable for application of the therapy; in addition to multidisciplinary intervention for obtaining a better prognosis (Rosa et al., 2018).

Conclusion

Although frenectomy is considered a simple method, there is wide variation among the techniques for removal of the hypertrophic frenum. Although it may be removed by any of the methods, a better functional and esthetic result could be obtained by choice of the adequate technique, based on the type of insertion of the frenum. The technique of choice in the present study was one of the most discrete in plastic surgery, and offered many advantages due to its capacity for redistributing the tension in the skin, minimal scar formation and an excellent tissue color match, showing an outstanding esthetic and functional result.

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