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Case Report

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Management Of Bifid Maxillary Labial Frenum Using A Vertical-Horizontal Incision Technique: A Case Report

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Abstract

Background: Aberrant maxillary labial frena are known contributors to midline diastema and may hinder orthodontic space closure. While several anatomical variations have been described, bifid frenum is rare and poorly documented in current literature. This case report presents a novel, modified scalpel frenectomy approach tailored for a bifid frenum to support successful orthodontic treatment.

Methods: A modified scalpel frenectomy was performed. A limiting suture provided traction, followed by a vertical incision to separate the bifid frenum and horizontal incisions to release remaining fibers. Complete excision was achieved, and the site was closed with 3-0 silk interrupted sutures and protected with periodontal dressing.

Conclusion: Healing was uneventful, with VAS pain score of 1 immediately postoperatively and 0 at 14 days. Soft tissue healing was excellent, with no residual tension or scarring. The patient was cleared to resume orthodontic space closure without obstruction. More documented cases and long-term follow-up are needed to establish standardized protocols for rare frenum variants.

Key Words: Frenectomy, Ethetics, Gingivoplasty

Introduction

The maxillary labial frenum is a mucosal fold composed of dense collagenous and elastic fibers that plays an important role in lip stabilization and maintenance of periodontal harmony. Aberrant frenal attachment has been linked to midline diastema, gingival recession, plaque accumulation, and compromised oral hygiene. [1] The classical morphological classification proposed by Placek et al. categorizes the maxillary frenum into mucosal, gingival, papillary, and papilla-penetrating types based on its site of attachment. [2] Among these, papillary and papilla-penetrating variants are strongly associated with pathological periodontal changes and orthodontic instability.

In addition to variations in attachment, recent population-based studies have documented multiple morphological variations, including double, persistent tectolabial, and bifid frenal forms. A bifid frenum is a rare morphological variant, with a reported prevalence of only 1.3% in a large cross-sectional study. [3] Evidence-based surgical protocols for managing such uncommon frena remain limited in published literature. While several surgical techniques exist including the classical frenectomy, Z-plasty, and electrosurgical or laser-assisted

approaches, selection of technique depends on frenal anatomy, orthodontic requirements, and long-term functional and esthetic considerations. [1,4,5]

This case report presents a novel surgical approach for the management of a bifid upper labial frenum in a young adult undergoing orthodontic space closure. Due to the uncommon nature of bifid frena and the lack of published scientific evidence, this report aims to contribute to the clinical understanding and management of this anatomical variant.

Case Report

A 25-year-old female was referred from the Department of Orthodontics to the Department of Periodontics, CSI College of Dental Sciences and Research, Madurai, Tamil Nadu, for evaluation of an aberrant upper labial frenum interfering with ongoing orthodontic space-closure mechanics.

The patient reported no pain or functional difficulty but was informed by the orthodontist that frenal interference was preventing complete midline space closure.

The patient was systemically healthy (ASA I), with no relevant medical, surgical, or family history. She was

not on any medications and reported no deleterious oral habits. Psychosocially, she expressed strong esthetic concerns regarding dental alignment.

The patient was undergoing fixed orthodontic treatment for correction of maxillary anterior spacing. No prior periodontal or frenal interventions had been performed.

On clinical examination, extraoral findings were unremarkable. Intraoral examination revealed a bifid upper labial frenum, a rare morphological variation.

[3] Each band of the bifid frenum inserted into the attached gingiva (gingival type) near the maxillary midline, producing visible tension upon lip traction (Figure 1). Oral hygiene status was satisfactory. Mild plaque deposits were present; therefore, oral prophylaxis was completed prior to surgery.

Diagnosis of aberrant bifid frenum was established using:

- Direct visual examination
- Tension/Blanching Test: positive, indicating a potentially pathogenic frenum, consistent with diagnostic criteria described in the literature.
- No radiographic changes or interdental bone loss were seen.

Given the absence of periodontal disease, the prognosis for healing was excellent. However, due to the rarity of the bifid variant, the long-term risk of recurrence was unknown, highlighting the need for a technique ensuring complete release.

A modified scalpel frenectomy was planned, designed specifically to manage the bifid anatomy.

Surgical Procedure:

- Local anesthesia (2% lignocaine with 1:80,000 adrenaline).
- A limiting suture was placed (Figure 2).
- A vertical incision was made to split the central attachment between the bifid frenum. (Figure 3).
- The bifid frenum was fully separated into two components. (Figure 4).
- Horizontal incisions were placed superiorly and inferiorly to release the remaining fibers and eliminate all aberrant frenal pull (Figure 5).
- Complete excision of frenal bands and release of periosteal fibers (Figure 6).
- Wound closure using 3-0 silk simple interrupted sutures (Figure 7).
- Placement of periodontal dressing. This technique ensured complete removal of the frenum, differing from conventional single-band frenectomy techniques described in literature (Figure 8).

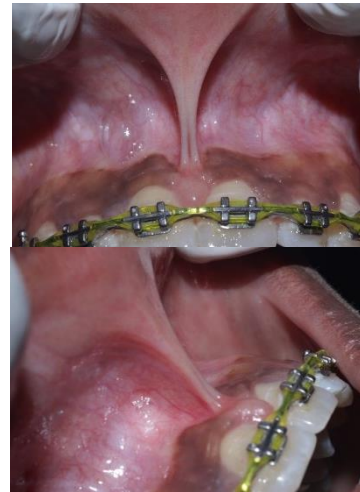


Figure 1: Gingival Type Of Bifid Frenal Attachment Of Maxillary Labial Frenum

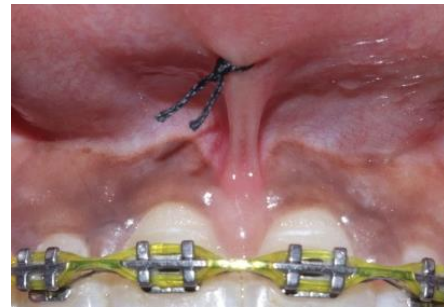


Figure 2: Limiting Sutures Placed

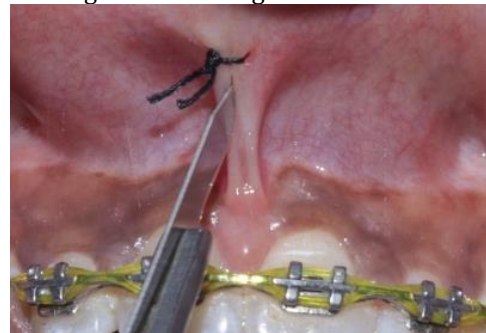


Figure 3. Vertical Incision Given

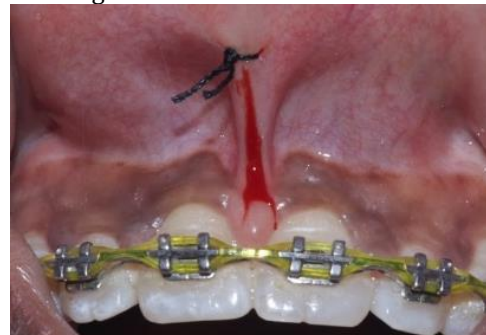


Figure 4: Splitting the Bifid Frenum

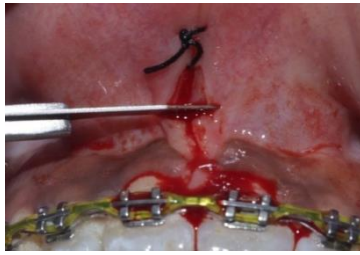


Figure 5: Horizontal incision given to relieve the Frenum

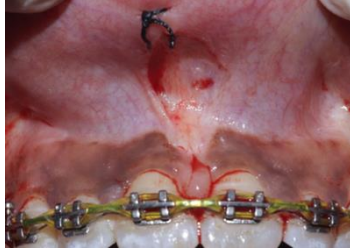


Figure 6: Frenal attachments relieved



Figure 7: Suturing done using 3-0 silk sutures



Figure 8: Periodontal dressing placed



Figure 9: Post-Op (Suture removal at 2 weeks)
Clinician and Patient-Assessed Outcomes:
Pain was assessed using the Visual Analogue Scale (VAS):

- VAS on Day 0 (postoperative): 1
- VAS on Day 14 (suture removal): 0

The patient was reviewed at 2 weeks for suture removal (Figure 9). Healing was excellent, with no scar formation, erythema, or residual tension. Periodontal tissues were healthy, and the orthodontist resumed space-closure mechanics without obstruction.

The last known status (3 months) showed stable soft tissue contour, absence of inflammation, complete patient satisfaction, no recurrence or residual frenal attachment.

Given the novelty of bifid frenum and this modified technique, longer follow-up is recommended.

DISCUSSION

Bifid (double) frena are uncommon anatomical variants and therefore under-represented in technique-focused publications. Kinney et al. report wide morphological variability of the maxillary labial frenum and a paucity of standardized treatment protocols, which helps explain why few technique papers address bifid frena specifically. [7] Population and case data likewise emphasize variable presentation and relatively low frequency of unusual morphologies, reinforcing that technique descriptions for bifid anatomy are scarce.

Conventional scalpel frenectomy remains a predictable option for eliminating frenal pull and restoring esthetics and vestibular depth when performed carefully; this is well illustrated by the scalpel frenectomy case series reported by Punse et al., where scalpel excision with primary closure produced satisfactory healing and esthetic outcomes. [1]

The outcomes of the present case also align with the randomized controlled trial by Tastan Eroglu et al., which showed that diode laser frenectomy reduces postoperative pain while scalpel techniques provide faster early epithelialization, though both approaches deliver comparable long-term clinical results. [10]

Minimally invasive modifications aimed at reducing wound size and morbidity are also described: the modified paralleling technique case series by Mishra & Chopra documented minimal postoperative pain, good color match, preserved vestibular depth and no recurrence at follow-ups, supporting the value of technique adaptations that conserve keratinized tissue while releasing terminal frenal fibers. [6]

The provider-survey and consensus-style work by Baxter et al. further emphasizes wide practice variation (scalpel, laser, and modified scalpel approaches are all used) and a clear need for more comparative evidence and standardized guidelines. [8]

A recent case report by Maansingh et al. further emphasizes the esthetic significance of managing aberrant maxillary frena in orthodontically treated patients. Their combined approach using scalpel frenectomy and gingivoplasty enhanced gingival symmetry and improved smile esthetics, reinforcing the importance of frenum correction as part of comprehensive periodontal-esthetic care. The favorable healing and functional improvement described in their report are consistent with the outcomes observed in the present case. [9]

A major strength of this case is the systematic diagnostic process, which incorporated visual examination, the tension/blanching test, and morphological classification aligned with established criteria by Placek et al. and Sewerin.^[2] This ensured accurate identification of the anomaly and proper decision-making prior to orthodontic space closure which is an essential step because aberrant frenal attachments can impair orthodontic stability or even lead to relapse if left untreated. Additionally, the use of a modified scalpel technique, involving a vertical splitting incision followed by horizontal releases, allowed full excision of both frenal attachments while preserving tissue integrity. Scalpel frenectomy remains the gold-standard procedure due to its precision, cost-effectiveness, and predictable healing, and this case demonstrates its adaptability for unusual anatomical variations. Another strength is the incorporation of objective and subjective outcome measures. The patient reported minimal postoperative discomfort (VAS 1 on Day 0; VAS 0 on Day 14), consistent with prior findings that careful scalpel techniques can result in low complication rates and rapid recovery. Clinically, wound healing was excellent by the two-week follow-up, with no hypertrophic scarring or residual frenal pull which is an important consideration since scarring may compromise esthetics or affect orthodontic biomechanics.

However, some limitations must be acknowledged. First, this report describes a single case, restricting generalizability. Although the technique was effective in this patient, variations in frenum thickness, periosteal attachment, or vestibular depth may necessitate alternative surgical approaches such as Z-plasty, V-Y plasty, or laser-assisted frenectomy, each carrying different implications for scar formation and healing. Second, the follow-up period was limited to three months. Longer-term evaluation is needed to assess stability, particularly after completion of orthodontic treatment, as recurrence or scar contraction is possible in high-tension anatomical regions.

To our knowledge, there is limited literature on the management of bifid frenum. Therefore, the vertical-horizontal incision described in the present report (separating the two mucosal frenal attachments, performing periosteal release, and achieving tension-free primary closure) therefore represents a pragmatic, novel adaptation of established principles (complete fiber release, conservation of vestibular depth, and primary closure) to a rare anatomical presentation. The excellent early clinical outcome in this patient (uneventful healing, preserved vestibular depth, normal mucosal texture and no recurrence at three months) mirrors the favorable results reported in both conventional scalpel and minimally invasive paralleling techniques, while adding a technique explicitly suited to bifid anatomy.

CONCLUSION:

This case highlights the successful management of a rare bifid maxillary labial frenum using a modified scalpel frenectomy adapted to its unique morphology. The technique allowed complete release of aberrant fibers, resulting in minimal postoperative discomfort, excellent healing, and unhindered continuation of orthodontic space closure. Given the scarcity of documented cases involving bifid frena, this report provides valuable clinical insight; however, larger studies with long-term follow-up are needed to validate and refine surgical approaches for such uncommon anatomical variations.

INFORMED CONSENT: Written informed consent was obtained from the patient for publication of the clinical details and images associated with this case report. The patient understood that all identifying information would be removed to ensure confidentiality.

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