



## Central Diastema Management Following Frenectomy Using the Incision Below the Clamp Technique: A Case Report

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### ABSTRACT

**Introduction:** Central diastema is often a concern for patients due to aesthetic issues that affect their confidence, especially when smiling. One of the causes of central diastema is a high attachment of the frenulum, penetrating the papilla of the hard palate. The appropriate procedure to eliminate a high frenulum attachment is frenectomy, which with minimal bleeding can be performed using the incision below the clamp (IBC) technique.

**Objective:** To evaluate the effectiveness of the incision below the clamp (IBC) technique as an alternative option for frenectomy procedures in correcting a central diastema caused by an aberrant labial frenum attachment.

**Case:** A 30-year-old female patient complained that her front teeth had become spaced again after fixed orthodontic treatment three years ago. On objective examination, the superior labial frenulum was found to penetrate up to the papilla of the hard palate, causing a central diastema between teeth 11 and 21. A frenectomy was performed using the IBC method, which has the advantage of minimal bleeding. After the initial phase of treatment, the patient was educated on the need for frenectomy. During the next visit, the patient was asked to fill out the informed consent form, and the frenectomy procedure was performed using a scalpel.

**Outcome:** The IBC method was carried out by making an incision at the base of the frenulum, which had been clamped. Evaluation of the results was carried out up to 8 months after treatment. By the sixth month, spontaneous closure of the central diastema was observed. At the eighth-month follow-up, no recurrence of the aberrant labial frenum attachment or central diastema was detected.

**Conclusion:** The diastema was corrected, and the patient is satisfied with the treatment results. The IBC technique can be an alternative option for frenectomy procedures.

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## **INTRODUCTION**

Smile esthetics are determined by the harmonious relationship between teeth, gingiva, and the lips. A high labial frenulum attachment may create tension on the marginal gingiva and interdental papilla, predisposing individuals to central diastema. This condition may negatively affect smile esthetics and psychosocial well-being, as patients often express dissatisfaction or reduced self-confidence due to anterior spacing.<sup>1</sup>

Aside from esthetic concerns, a high labial frenulum attachment can contribute to other periodontal complications, including gingival recession and compromised oral hygiene.<sup>2</sup> Clinical assessment of a high frenulum attachment may be performed by elevating the upper lip until blanching of the frenulum becomes visible. Under normal conditions, the frenulum inserts within the mucosa; however, variations in attachment may extend into the gingiva, attached gingiva, or even involve the palatal region. Such aberrant insertion patterns can create tension on the anterior maxillary tissues and consequently lead to the development of a central diastema.<sup>3</sup> According to Placek et al. (1974), the frenulum can be categorized into four forms depending on its insertion site. These include: a mucosal type, with fibers ending at the mucogingival junction; a gingival type, with fibers attached to the keratinized gingiva; a papillary type, where fibers extend toward the interdental papilla; and a papillary penetrating type, in which the fibers traverse the alveolar ridge and reach the palatal papilla.<sup>4</sup>

Management of an abnormally high frenulum attachment typically involves frenectomy. Multiple surgical approaches are available, each with distinct indications and clinical outcomes. In this case, the incision below the clamp method was selected due to its favorable characteristics, including reduced intraoperative bleeding, efficiency, and technical simplicity. This technique is considered a refinement of the conventional frenectomy approach. The procedure involves placing a clamp on the frenulum, performing an incision inferior to the clamp, removing the fibrous tissue band, suturing the wound margins, and applying a periodontal dressing for postoperative protection.<sup>3</sup>

Although numerous surgical approaches for frenectomy have been reported, including conventional scalpel, electrosurgery, and laser-assisted techniques, published evidence specifically evaluating the clinical application of the Incision Below the Clamp (IBC) technique remains limited. Most available publications describing the IBC technique are isolated case reports or technical notes that primarily emphasize reduced intraoperative bleeding and improved surgical handling rather than comprehensive clinical outcomes or postoperative healing. Consequently, high-quality clinical evidence supporting its routine use is still lacking. Therefore, additional well-documented case reports are valuable to broaden the current clinical

evidence and to demonstrate the practical application, surgical feasibility, and postoperative outcomes of the IBC technique in patients with aberrant maxillary labial frenulum associated with midline diastema. This case report contributes to the limited literature by describing the clinical management of a patient treated with the IBC technique and documenting the postoperative clinical outcome as a reference for clinicians considering this modified surgical approach.<sup>2,3</sup>

This case report describes the clinical management of a patient presenting with a maxillary midline diastema associated with a high labial frenulum attachment treated using the Incision Below the Clamp (IBC) frenectomy technique, with emphasis on the surgical procedure and postoperative clinical outcome.

## **CASE**

A 30-year-old female patient presented to the periodontology clinic with a chief complaint of anterior diastema after removal of orthodontic appliances that had been placed 3 years earlier. She reported decreased self-confidence, particularly when smiling. The patient denied any history of systemic disease, medication or food allergies, and was not under medical care nor taking any routine medications. Extraoral examination revealed no abnormalities. Intraoral examination showed an OHI score of 1, GI of 0.13, and a PCR of 8.9%. The tongue, palate, buccal mucosa, and lips appeared within normal limits; however, the upper labial frenum was high-attached and extended to the attached gingiva (Figure 1).



**Figure 1.** Preoperative clinical view showing high-attached upper labial frenum and central diastema.

Based on the patient's history and clinical findings, the diagnosis was established as an aberrant labial frenum (AAP 2017: mucogingival deformities and conditions). After the

examination, the patient was informed about the proposed treatment plan. Initial periodontal therapy included scaling and root planing, followed by oral hygiene instructions to maintain optimal plaque control.

At the second visit, the patient continued with the surgical phase of treatment. A frenectomy was performed to eliminate the high-attached frenum. Prior to the procedure, informed consent was obtained regarding the frenectomy. Local infiltration anesthesia was administered at the surgical site. Once adequate anesthesia was achieved, an incision was made using a no. 11 blade. The incision was placed beneath the clamp and extended toward the apex of the frenum until reaching the attached gingiva (Figure 2). The area was then irrigated with saline and hemostasis was achieved (Figure 3). Interrupted sutures were placed along the incision line, followed by the application of a periodontal dressing (Figure 4). The patient was instructed to avoid vigorous rinsing, maintain a soft diet, and continue proper oral hygiene care.



Figure 2. Incision of the frenum using the incision below the clamp (IBC) technique

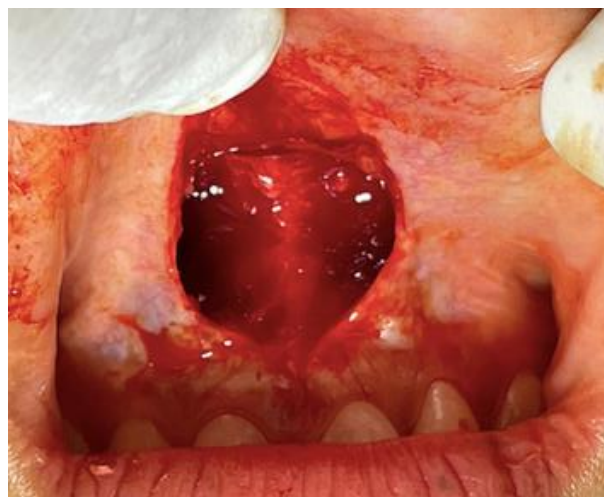


Figure 3. Post-irrigation surgical site achieving hemostasis after frenectomy



Figure 4. Interrupted sutures placed along the incision line and application of periodontal dressing.

At the third visit, the patient returned for follow-up one week after the frenectomy (Figure 5). The operator removed the periodontal dressing and cleansed the surgical site with saline. The sutures remained intact and stable. The sutures were removed at the subsequent visit (Figure 6).



Figure 5. Clinical appearance at the 1-week follow-up visit after periodontal dressing removal.



Figure 6. Healing status at the subsequent visit after suture removal.

The patient demonstrated good healing following the frenectomy procedure. At the first postoperative week, the surgical site showed satisfactory soft tissue adaptation with no signs of infection or excessive inflammation. The sutures remained intact and were removed at the subsequent visit without complications. Progressive improvement was noted during the monthly follow-up controls. At the third, sixth, and eighth months, the patient showed stable periodontal conditions, absence of relapse at the frenum site, and no discomfort during function (Figure 7). Notably, spontaneous closure of the central diastema was observed by the six month. The patient reported improved esthetics and increased confidence during smiling.



Figure 7. Long-term follow-up clinical views showing stable periodontal conditions and no relapse at the frenum site at 3, 6, and 8 months.

## DISCUSSION

Aberrant labial frenum is classified as a mucogingival deformity and may contribute to various clinical complications involving both periodontal tissues and dental esthetics. According to the 2017 AAP classification, mucogingival deformities such as high frenal attachment may be associated with gingival tension, impaired plaque control, and midline diastema formation. In this case, the high-attached frenum created a persistent tension in the marginal tissues following orthodontic treatment, which contributed to the patient's anterior diastema and esthetic concerns.<sup>5</sup>

Frenectomy is commonly used surgical treatment to eliminate the frenal pull and facilitate post-orthodontic stability.<sup>6</sup> Various techniques have been proposed, including conventional scalpel, electrosurgery, and laser-based approaches, each with distinct advantages regarding bleeding control, postoperative discomfort, and healing response.<sup>7</sup> In the present case, frenectomy was performed using the Incision Below the Clamp (IBC) technique. The IBC approach allows precise tissue removal while reducing surgical trauma by limiting the width and depth of the incision. This is consistent with previous reports suggesting that modified

frenectomy approaches may improve visibility and bleeding control during surgery while enhancing patient comfort.<sup>8</sup>

The clinical findings in this case are generally consistent with previous studies reporting favorable healing following conventional scalpel, electrosurgical, and laser-assisted frenectomy. Conventional scalpel frenectomy remains the most widely used technique because of its simplicity and low cost, although it is often associated with greater intraoperative bleeding and postoperative discomfort. Laser-assisted frenectomy has been reported to provide superior hemostasis, reduced postoperative pain, and faster healing; however, its clinical application may be limited by equipment availability and higher treatment costs. Electrosurgical frenectomy also offers effective bleeding control but carries a potential risk of thermal injury to adjacent tissues if not performed appropriately. Compared with these techniques, the modified Incision Below the Clamp (IBC) approach used in the present case provided satisfactory surgical access with minimal intraoperative bleeding and favorable postoperative healing. Nevertheless, because evidence regarding the IBC technique is still limited to a small number of clinical reports, no definitive conclusions can be drawn regarding its comparative effectiveness relative to other frenectomy techniques.<sup>2,3</sup>

Postoperatively, the patient demonstrated favorable healing without complications. In the present case, spontaneous approximation of the central diastema was observed during the eighth-month follow-up. Similar observations have been described in previous reports, suggesting that elimination of aberrant frenal tension may facilitate spontaneous approximation of the maxillary central incisors in selected patients, particularly after completion of orthodontic treatment.<sup>9,10</sup> The proposed biological mechanism involves the removal of mechanical tension exerted by the aberrant frenum, allowing supracrestal and periodontal fibers to reorganize and contribute to soft tissue stability.<sup>11</sup> However, because this report describes only a single patient, it cannot be concluded that the observed spontaneous diastema closure resulted solely from the IBC frenectomy technique. Further clinical studies with larger sample sizes are required to determine whether this finding can be generalized.

The outcomes observed in this case align with findings in the literature indicating that frenectomy performed under appropriate indications may yield both functional and esthetic benefits. No recurrence was found at eight months, suggesting that the IBC technique provided a predictable result with minimal morbidity. Regular follow-up remains essential to monitor stability, especially in post-orthodontic cases where diastema relapse is a known risk if etiological factors are not addressed.<sup>12</sup>

In cases where the midline diastema is relatively small, spontaneous closure may occur once the inhibitory force of the high-attached frenum is eliminated. The removal of this soft tissue barrier allows the anterior teeth to follow their natural tendency for mesial drift, a physiologic phenomenon driven by occlusal forces and periodontal ligament fiber tension. This mechanism has been described in the literature as a contributing factor to diastema reduction following frenectomy, particularly in post-orthodontic patients who have completed alignment but continue to exhibit residual spacing. Several authors have reported that mild diastema can close without mechanical assistance when frenal tension is resolved, provided that no other etiologic factors are present such as tooth size discrepancy, pathologic migration, or skeletal imbalance.<sup>13</sup>

Overall, frenectomy using the IBC approach represents a conservative and effective modality for correcting aberrant frenal attachment and improving esthetic outcomes in patients with mucogingival deformities. Proper case selection, technique adaptation, and postoperative oral hygiene contribute to optimal long-term stability.

This case report has several limitations. First, it describes the clinical outcome of a single patient and therefore cannot establish the effectiveness or predictability of the IBC frenectomy technique. Second, no control group or comparison with other frenectomy techniques was available. Third, quantitative measurements of diastema width before and after treatment were not performed, limiting objective assessment of the observed clinical changes. Fourth, the follow-up period was relatively short and may not adequately reflect long-term stability or the possibility of relapse. Finally, because multiple biological and orthodontic factors may influence diastema closure, a causal relationship between the IBC technique and spontaneous approximation of the central incisors cannot be established. Future prospective studies with larger sample sizes, standardized measurements, comparative designs, and longer follow-up periods are needed to further evaluate the clinical performance of the IBC technique.

## **CONCLUSION**

This case suggests that frenectomy using the Incision Below the Clamp (IBC) technique may be considered as a potential surgical option for the management of aberrant labial frenum attachment associated with maxillary midline diastema in selected patients. In the present case, the procedure was associated with favorable periodontal healing, spontaneous approximation of the central diastema during follow-up, and improvement in the patient's esthetic satisfaction and self-confidence. The modified IBC technique also appeared to provide satisfactory surgical access while minimizing incision width and intraoperative bleeding. However, because this

report describes the outcome of a single patient, no conclusions can be drawn regarding the overall effectiveness or predictability of the technique. Further studies with larger sample sizes and longer follow-up periods are required to evaluate its clinical effectiveness and long-term outcomes.

## **DECLARATION**

### **Authors Contributions**

MAP: Conceptualization, Investigation, Data Curation, Writing – Original Draft, Writing – Review & Editing, and Visualization. The author has read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

### **Conflict of Interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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### **Ethics Approval and Consent to Participate**

Ethical approval was not required for this case report because it describes the diagnosis and clinical management of an individual patient and does not involve experimental intervention or the collection of data for research purposes.

### **Consent for Publication**

Written informed consent was obtained from the patient for publication of this case report and any accompanying clinical photographs and imaging.

### **Data Availability Statement**

Data sharing is not applicable to this article as no new datasets were generated.

### **Declaration of Generative AI In Scientific Writing**

The authors declare that no generative AI or AI-assisted technologies were used in the writing or preparation of this manuscript.

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