Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 2834 - 2838

S-Shaped Precision: A Case Report on Innovative Frenotomy with Bilateral Pedicle Flap Design

[1] Dr. Balasubramaniam Vajravel, [2] Dr. Kaviyapriya, [3] Dr. J. Bhuvaneswarri, [4] Dr. Lavanya Dharmendran, [5] Dr. Anitha Balaji

[1] Postgraduate Student, Department of Periodontology, Sree Balaji Dental College and Hospital, Chennai India
[2] Postgraduate Student, Department of Periodontology, SRM Dental College and Hospital, Bharathi Salai, Ramapuram, Chennai, India
[3] Professor, Research Scholar, Department of Periodontics, Sree Balaji Dental College, Biher, Chennai, India
[4] Assistant Professor, Asan Dental College and Hospital, Chengalpatu, India
[5] Professor& HOD, Department of Periodontics, Sree Balaji Dental College, Biher, Chennai, India

**Corresponding author e-mail: balashadz96@gmail.com*

(Received: 12 February 2026 Accepted:26 March 2026 Published: 13 April 2026)

KEYWORDS

S-Shaped Frenectomy Aberrant Frenum Labial frenm Esthetic Frenectomy Periodontal Plastic Surgery, Soft Tissue Management, Minimally Invasive Dentistry, Scarless Healing

ABSTRACT:

Background: The frenum is a mucous membrane fold that attaches the lip and cheek to the alveolar mucosa, gingiva, and underlying periosteum. Aberrant frenum attachments may interfere with oral hygiene and cause gingival recession or diastema.
Purpose: This case report aims to highlight a novel S-shaped frenectomy technique designed to overcome the limitations of traditional straight-incision methods. **Case(s):** A 32-year-old female patient presented with an aberrant maxillary labial frenum causing midline spacing and aesthetic concerns.
Case Management: An S-shaped frenectomy was performed to reduce tension and enhance healing. The incision design aimed to minimize scarring and promote better tissue adaptation.
Conclusion: The S-shaped frenectomy technique demonstrated superior aesthetic and functional outcomes compared to conventional approaches, offering a viable alternative in cases requiring refined soft tissue management.

1. Introduction

A timeless proverb that highlights the importance of appearance, especially facial aesthetics, in influencing the idea of beauty is "A thing of beauty is a joy forever." A smile's color, shape, and alignment all have a significant role in how attractive a person's face seems. Furthermore, defining smile harmony is greatly influenced by the color and contour of the gingiva.[1]Midline diastema or gingival recession in the maxillary or mandibular anterior region is a common aesthetic concern in adult patients. This condition is frequently brought on by high frenal attachment or aberrant frena.[2]

A mucosal membrane fold called the frenum joins the gingiva, underlying periosteum, and alveolar mucosa to the lip and cheek.[3]The gingiva may be pulled by an abnormal or hypertrophic frena, resulting in recession, spacing, and trouble with hygiene, all of which need for corrective surgery. The frenum is clipped and repositioned during a frenotomy, which entails removing it from its apex to its base at the alveolar process. Complete excision of the frenum is part of a more extensive treatment called a frenectomy. Electrosurgery, laser-assisted treatments, and the traditional knife method are methods used for frenectomy.[4] Traditional surgical methods like Miller's Technique, V-Y Plasty, Z-Plasty, and the Conventional (Classical) Frenectomy are frequently used.[5]Bilateral pedicle flap and T-shaped frenotomy incision, which improved access and produced a tripod flap configuration to promote removal and healing.[6]

Building on these developments, the current case study outlines a brand-new S-shaped frenectomy method designed to get beyond the drawbacks of the linear incisions utilized in traditional operations. This method

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 2834 - 2838

aims to reduce postoperative problems, enhance aesthetic outcomes, and increase s oft tissue recovery. Presenting an unusual and novel clinical case with a distinctive incision design that could improve results in treating high frenal attachments serves as the justification for this investigation.

2. Case report:

Case(s):

A 32-year-old female patient presented to the Department of Periodontology with a chief complaint of an unaesthetic appearance due to spacing in the upper front tooth region. On intraoral examination, a midline diastema was noted between the maxillary central incisors (teeth 11 and 21, Zygmondy system), accompanied by gingival inflammation and an aberrant maxillary labial frenum. The frenum was classified as a simple type with papillary attachment, extending into the interdental papilla, indicating a high frenal insertion. The periodontal phenotype was assessed as thick scalloped with inadequate vestibular depth (Figure 1). The blanching test confirmed a strong pull of the frenum during lip movement. The patient's medical history was non-contributory, and routine hematological investigations were within normal biological limits. Based on the clinical findings, a novel S-shaped frenotomy was planned to reposition the frenum apically while reducing frenal and vestibular tension.

Case Management:

The surgical procedure was initiated under local anesthesia, with bilateral infiltration at the lateral borders of the labial frenum. A curvilinear S-shaped incision, equal in length to the width of the frenal band, was made using a No. 15 scalpel blade (Figure 2). The incision extended from the apical direction coronally, reaching the base of the frenum. Careful dissection was carried out to avoid trauma to the surrounding tissues. Using fine tissue forceps, the submucosal tissues were dissected through the base of each flap into the loose, non-attached tissue planes, creating three distinct pedicles (Figure 3A).

Flap adequacy was confirmed by assessing the apices and tension-free approximation of tissue margins. The flaps were spaced evenly to ensure a precise closure along the cut edges of the attached mucoperiosteum and labial mucosa. The frenum was then relocated apically and sutured with 3-0 absorbable vicryl sutures (Figure 3B and 3C). The procedure emphasized soft tissue preservation, optimal healing, and patient comfort.

Postoperative care included routine instructions, analgesics, and chlorhexidine mouth rinse. The patient was reviewed on the 7th postoperative day for suture removal, which revealed excellent healing with no visible scar formation (Figure 4). The outcome was esthetically pleasing with complete resolution of the midline tension and improved vestibular depth.

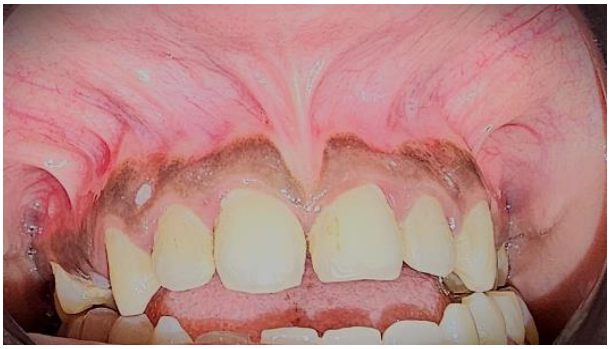


Figure 1; Preoperative picture showing high frenal attachment and associated midline diastema

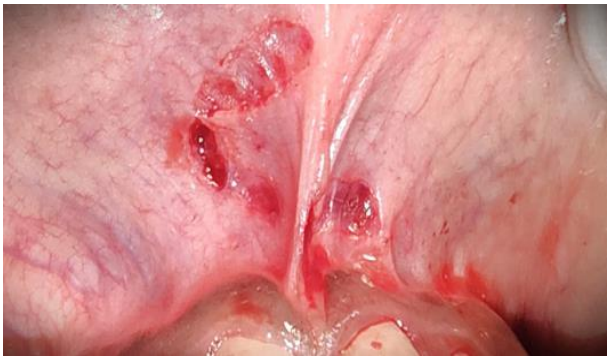
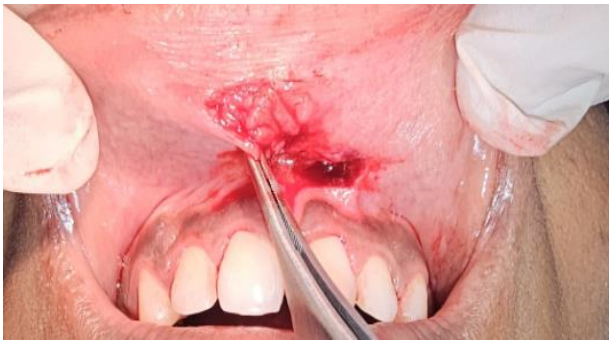
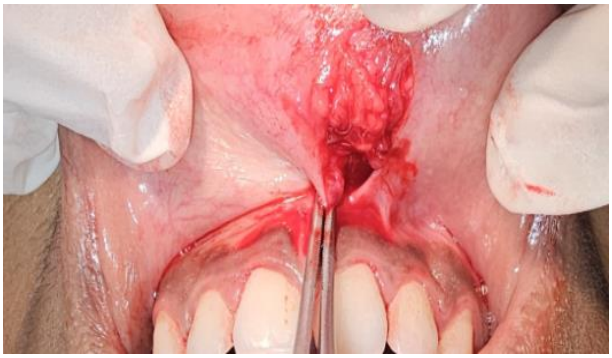


Figure 2; Surgical procedure done with S shaped incision.

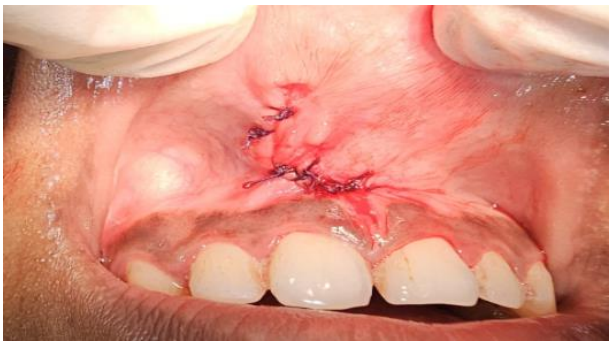


(A)

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 2834 - 2838



(B)



(C)

Figure 3; Surgical procedure with s shaped incision; A) Flap elevation done following s shaped incision, B) relocation of the frenum to apical position; and C) Suturing

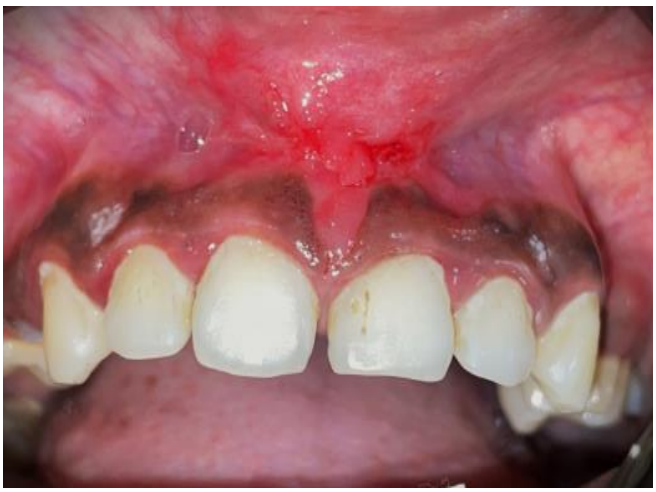


Figure 4; Surgical site at 7th postoperative day revealing adequate healing and apical positioning of frenum

3. Discussion

This case report aimed to address a common aesthetic and functional challenge posed by aberrant maxillary labial frenum by introducing a novel S-shaped frenotomy technique. The main finding of this report is that the curvilinear S-shaped incision allows for apical repositioning of the frenum with minimal scarring, preservation of interdental papilla, and improved vestibular depth, all of which are critical for achieving both esthetic and functional success.

Scientific interpretation of the case findings supports the rationale behind using a curved incision path. By distributing tension more evenly across the wound site and avoiding straight-line tissue retraction, the approach allows for more physiologic repositioning of soft tissue.[6] Furthermore, maintaining the integrity of the papilla and mucogingival junction avoids creating anatomical defects, which is crucial in preventing plaque accumulation and subsequent periodontal deterioration.

The management strategy directly aligns with the original objective stated in the introduction, to explore a more refined approach that overcomes the limitations of traditional frenotomy techniques. The conventional methods Frenum is a narrow band of tissue which is normally found in the anterior part of the jaw and serves to link the top lip. Based on the location, Frenum's are of two types: the lingual frenum and the labial frenum.[7] One of the causes of mucogingival irregularities, which can impair both appearance and functionality and eventually impact periodontal health, is aberrations in the frenum. The muscle pull can cause problems like midline diastema, resulting in space between the upper anterior teeth, and subsequently poor aesthetics.[8] while effective in removing the frenum, often compromise esthetics due to scarring and may not adequately address the tension exerted by frenal fibres on the gingiva. In contrast, the S-shaped approach demonstrated enhanced healing, reduced tension at the surgical site, and no visible scar formation, supporting the goal of minimally invasive periodontal therapy that retains natural anatomy and function.

According to Mirko et al.'s 1974 taxonomy, there are four main types of frenum attachments: mucosal, gingival, papillary, and papilla-penetrating. The frenal fibers in the gingival type are inserted inside the associated gingiva, whereas in the mucosal type, they are connected to the

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 2834 - 2838

mucogingival junction. Papillary fibers extend into the interdental papilla, while papilla-penetrating fibers continue up to the palatine papilla after crossing the alveolar process. [9]

A clinical test used to diagnose aberrant frenum is the tension test. It is accomplished by looking at the papillary tip or by noting if there is blanching brought on by regional ischemia in addition to alterations in the interdental papilla's color and texture. These characteristics indicate aberrant frenum attachment, which leads to a positive tension test result. [10]

In comparison with other techniques reported in the literature—such as Z-plasty, V-Y plasty, or Miller's classical frenectomy—the current method stands out for its tissue-conservative approach.[11] While Rudha et al. 2024 introduced a T-shaped incision with a tripod flap design to improve access and healing, their method involved more extensive tissue manipulation. In contrast, the S-shaped incision employed in this report achieves comparable or superior outcomes with less surgical trauma, making it particularly suitable for anterior esthetic zones.

Additionally, frenum is positioned more apically in this approach rather than being entirely eliminated. The only parts that are cut are those that enter the bone. The frenum's natural function is thus preserved via the lip's attachments to the gingiva and alveolar bone. This technique's ability to preserve the papilla, minimize scarring, and increase flap flexibility for improved adaption is another benefit.[12] Figure 6 describes the graphical depictions of the suturing, frenectomy, and S-shaped incision procedures. Similarly, Krishnan et al**.** described a bilateral pedicle flap approach for frenectomy that showed promising results in terms of wound stability and post-surgical tissue contour.[13]Techniques such as V-Y plasty, described by Shirbhate et al.**,** offer good depth extension but often involve more extensive dissection, which may increase healing time.[14] In a series of cases, Sethna, emphasized the importance of technique selection based on tissue biotype and esthetic demand, reporting variable success with classical and modified approaches.[15] Sleman et al. further validated a papilla-preservation flap technique that provided esthetic benefit while minimizing trauma and improving patient comfort.[16]

Although the observed clinical outcomes were positive—specifically, the absence of relapse, enhanced vestibular depth, and excellent soft tissue adaptation—it is important to note that these findings are based on a single-patient case. This limits generalizability and underscores the need for further case series and clinical trials.

In conclusion, the S-shaped frenotomy technique offers a viable alternative to traditional frenectomy methods, with potential benefits in esthetic zones, especially where papillary preservation and minimal scarring are essential. It addresses known drawbacks of existing methods by allowing for functional preservation, anatomical repositioning, and favorable soft tissue healing. To validate these promising outcomes, future studies with larger sample sizes, comparative analyses, and long-term follow-ups are warranted. Comparative trials with Z-plasty and V-Y plasty could provide additional insights into optimizing frenotomy techniques for various clinical scenarios.

4. Conclusion

By preserving the interdental papilla and producing very little scarring, the current S-shaped frenotomy technique allows for the frenum to be moved effectively without creating large defect areas. To enable evidence-based decision making, the results of the technique's clinical use in further patients need to be evaluated.

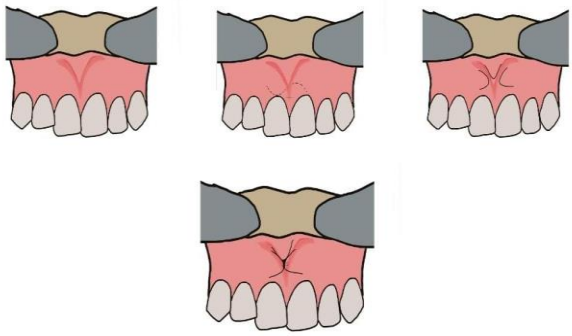


Figure 6: Pictorial representation of the novel S shaped incision

Reference:

1. Zhang YL, Le D, Hu WJ, Zhang H, Liang LZ, Chung KH, Cao ZQ. Assessment of dynamic smile and gingival contour in young Chinese people. Int Dent J. 2015 Aug;65(4):182-7. doi: 10.1111/idj.12174. Epub

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 2834 - 2838

2015 Jul 14. PMID: 26173652; PMCID: PMC9376507.

2. Jati AS, Furquim LZ, Consolaro A. Gingival recession: its causes and types, and the importance of orthodontic treatment. Dental Press J Orthod. 2016 Jun;21(3):18-29. doi: 10.1590/2177-6709.21.3.018-029.oin. PMID: 27409650; PMCID: PMC4944726.
3. Jhaveri H. Jhaveri Hiral., editor. The Aberrant Frenum. Dr. PD Miller the father of periodontal plastic surgery. 2006:29–34.
4. Devishree, Gujjari SK, Shubhashini PV. Frenectomy: a review with the reports of surgical techniques. J Clin Diagn Res. 2012 Nov;6(9):1587-92. doi: 10.7860/JCDR/2012/4089.2572. PMID: 23285469; PMCID: PMC3527809
5. Coleton SH. The mucogingival surgical procedures which were employed in re-establishing the integrity of the gingival unit (III). The frenectomy and the free mucosal graft. Quintessence Int. 1977;8(7):53–61.
6. Rudhra K, Mari R, Balaji A, Valiathan M. Mari's novel T shaped incision in frenotomy technique with bilateral pedicle flap-an aesthetic approach. Journal of Oral Biology and Craniofacial Research. 2024 Nov 1;14(6):782-4.
7. Gujjari SK, Shubhashini PV. Frenectomy: a review with the reports of surgical techniques. Journal of clinical and diagnostic research: JCDR. 2012 Nov;6(9):1587.
8. Pitale U, Lachhwani S, Chandra P, Mankad H, Pandey R, Management of gingival type of aberrant frenal attachment with classical frenectomy: a clinical case report Int J Curr Adv Res. 2018;7:15957–15958
9. Mirko P, Miroslav S, Lubor M. Significance of the labial frenum attachment in periodontal disease in man. Part 1. Classification and epidemiology of the labial frenum attachment. Journal of periodontology. 1974 Dec;45(12):891-4.
10. Singh K, Nautiyal A, Bali S, Aggarwal P, Garg A. Frenectomy: A literature review. Journal of Survey in Fisheries Sciences. 2023 Apr 27:871-5.
11. Verma M, Khan MA, Pathak A, Lal N.Z-plasty - a classical esthetic eraser for aberrant labial frenum. Int J Sci Res. 2022;11:43–45
12. Kadkhodazadeh M, Amid R, Kermani ME, Hosseinpour S. A modified frenectomy technique: a new surgical approach. General dentistry. 2018 Jan 1;66(1):34-8.
13. Krishnan A, Bhatnagar S, Gupta P, Mehra S. Frenectomy managed by a bilateral pedicle flap: a case report. J Clin Diagn Res. 2024;18(3):ZD01–ZD03.
14. Shirbhate U, Dole V, Pawar R, Jadhav S. Management of aberrant frenal attachment using V-Y plasty approach: a case report. Int J Surg Case Rep. 2024;108:108073.
15. Sethna G. Management of aberrant frenal attachments—A case series. Dent Oral Health Care. 2024;3(3):1–5.
16. Sleman N, Reddy B, Al-Mahdi H, Kaur T. Comparative evaluation of modified frenectomy with papilla protection flap. Ann Med Surg (Lond). 2025 Mar; 94:104987.