

Managing Recurrent Traumatic Gingival Ulceration Secondary to Aberrant Frenal Attachment with Modified Kazanjian Vestibuloplasty: A Case Report

Nur Zety Mohd Noh^{1*}, Nurul Qamar Salehuddin², Farha Ariffin³

Keywords: *Frenum; recession; ulcer; vestibuloplasty*

ABSTRACT

The current study described tooth 45 buccal high frenum attachment of a 56-year-old male patient associated with shallow vestibule adjacent to the edentulous ridge of missing tooth 46 management. The patient reported recurring traumatic ulcers on teeth 44 and 45 buccal gingiva due to frequent toothbrush slippage. The patient also requested an implant for missing tooth 46. A modified Kazanjian vestibuloplasty was performed before replacing the missing tooth. Subsequently, the patient was reviewed at one and two weeks, one month, and monthly for up to six months. The patient did not report traumatic ulcer development within the surgery site and improved plaque control. Consequently, performing mucogingival surgery in cases of inadequate keratinised tissue width, decreased vestibular depth, and high muscle pull is recommended. The procedure facilitates plaque control, reduces or halts gingival recession, and enhances comfort during tooth brushing.

INTRODUCTION

Periodontics encompasses access flaps, resective, regenerative, implant and mucogingival surgeries. Friedman introduced the term mucogingival surgery in 1957, referring to surgical approaches for preserving gingiva, removing aberrant frenulum, and increasing vestibule depth [1]. Miller proposed the term periodontal plastic surgery in 1993, in which mucogingival surgery includes gingival augmentation, root coverage procedures, and alveolar ridge deformity and soft tissue aesthetic corrections [2].

In addition to addressing mucogingival problems, aberrant frenal attachment and inadequate width of keratinized tissue may adversely affect periodontal health [3–6]. Moreover, shallow vestibules further complicate the conditions. Shallow vestibules might impede proper oral

hygiene due to inadequate space for the toothbrush, resulting in plaque accumulation and traumatic tooth brushing. The issue is also commonly associated with lack of keratinised gingiva or aberrant frenal attachments which retracted gingival margins [7]. The co-existence of the factors impairs self-performed mechanical plaque control, predisposes gingival recession, and compromises prosthesis retention and stability [3].

Deepening oral vestibules could enhance oral hygiene and remove improper frenulum attachments and gingival margin pulling [7]. A vestibuloplasty procedure is a periodontal plastic and mucogingival surgery associated with restorative dentistry. The technique offers a solution for shallow vestibules. Although several complications have been reported [2], denudation or secondary epithelisation is typically performed [8,9]. Several reports documented that the modified Kazanjian technique reduced complications linked to vestibuloplasty approaches and demonstrated promising results in the anterior region [7,10,11]. The current study reported aberrant frenum attachment associated with shallow vestibule in the posterior region management with modified Kazanjian vestibuloplasty.

¹Kulliyah of Dentistry, International Islamic University Malaysia, Pahang, Malaysia

²Unit Periodontik, Klinik Pergigian Kuala Kangsar, Perak, Malaysia

³Centre of Periodontology Studies, Faculty of Dentistry, Universiti Teknologi MARA, Selangor, Malaysia

*Corresponding author email: zety_noh@iium.edu.my

CASE REPORT

A 56-year-old non-smoker male patient who is medically fit and healthy reported recurrent traumatic ulcers on the buccal gingiva of teeth 44 and 45 due to frequent toothbrush slippage (Figure 1a). The patient also requested an implant replacement for a lower right back tooth, which had been extracted due to an unrestored carious lesion.

The patient's clinical examination results revealed a notable frenal attachment buccal to tooth 45. The condition was associated with a shallow vestibule and 1 mm keratinized gingiva adjacent to edentulous ridge of 46 (Figure 1b). Furthermore, tooth 45 was associated with RT3 gingival recession [12], recording 6 mm and 2.8 mm mean clinical attachment level and recession depth, respectively. Edentulous ridge 46 cone beam-computed tomography radiograph of the patient also revealed an adequate bony structure for implant placement. Moreover, the edentulous ridge 46 demonstrated adequate mesiodistal and buccolingual dimensions, at 11 mm.

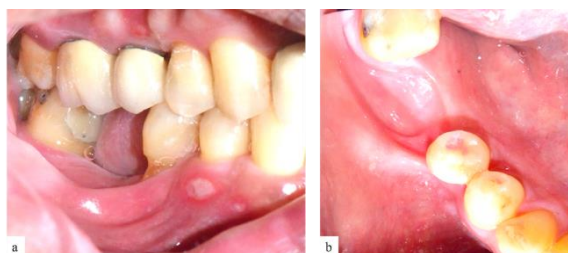


Figure 1 The (a) traumatic ulcers on tooth 44 buccal gingiva and (b) high frenal attachment buccal to tooth 45 associated with shallow vestibule

After a discussion with the periodontist and prosthodontist, the patient agreed to surgically remove the aberrant frenal attachment. The procedure would simultaneously augment the shallow vestibule and deficient keratinised tissue. Proper oral health education and hygiene instruction were provided to the patient preceding the surgery. The patient was advised on the employment of a soft bristle toothbrush and a combination of a modified Bass and Stillman technique on the indicated areas.

A mucogingival surgery comprising vestibuloplasty was planned for the patient involved in this study. Although an adequate bone structure was identified, a secondary epithelisation vestibuloplasty was proposed due to the shallow vestibule and lack of attached gingival tissue. The procedure removed aberrant frenal attachment that caused secondary toothbrush slippage,

deepened the vestibule, and augmented keratinised tissue dimension before prosthesis implementation [7,11,13].

The patient in this study underwent a modified Kazanjian vestibuloplasty before his missing tooth 46 replacement implant was installed. A horizontal incision was performed at the mucogingival junction level from tooth 42 distal to tooth 47 mesial (Figure 2a). The frenal attachment tips at teeth 44 and 45 were also incised and removed. Subsequently, a split-thickness flap was reflected towards the alveolar mucosa (Figure 2b). Muscle fibres and tissues were then dissected from the periosteum. Finally, the undermined flap was stabilised apically with simple interrupted sutures (4/0, Vicryl®) (Figure 2c) and protected with periodontal dressing (COE-PACK™).

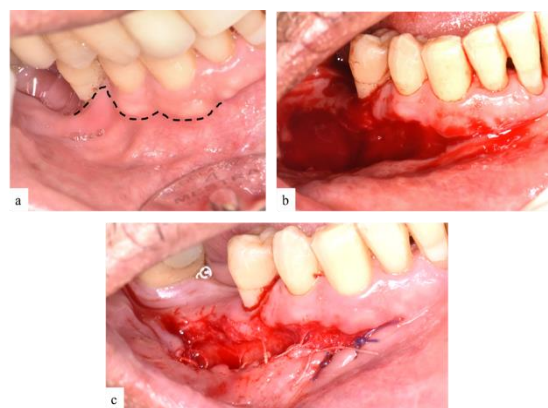


Figure 2 The (a) surgical outline, (b) split-thickness flap elevation, and (c) undermined flap stabilisation with simple interrupted sutures

Following the surgery, the patient was instructed to consume soft diets, avoid brushing the surgical site, and rinse with 0.12% Chlorhexidine (Oradex™) twice daily for a week. Subsequently, Ibuprofen 400 mg and 0.2% hyaluronic acid gel (Gengigel®) were prescribed thrice daily for five days. The patient's condition was reviewed at one and two weeks, one month, and monthly for up to six months. Furthermore, professional prophylaxis was performed when necessary.

After two weeks, the surgical site had healed with granulation tissue secondary healing, as evidenced by Figure 3a. Meanwhile, the healing was completed at six months (Figure 3c), demonstrating a 2 mm attached gingiva gain adjacent to the edentulous ridge of 46. A comparison between the six-month review and the baseline revealed a 5.3 mm mean clinical attachment level at tooth 45, indicating a 0.7 mm gain. The patient also did not report traumatic ulcer development within the

surgical area and improved plaque control. Nevertheless, tooth 45 mean recession depth remained at 2.8 mm. Figures 3b and 3c illustrate the baseline and six-month observations.



Figure 3 The (a) two-week, (b) baseline, and (c) six-month reviews

DISCUSSION

Oral mucosa trauma is common in dental practice. Several factors contributing to mucosal lesions include chemical, thermal, and mechanical contusions [14]. Recurrent gingival ulceration might also occur in response to repeated irritation to trauma, while tooth brushing reportedly results in gingival injuries [15]. Consequently, local factor removal is required to avoid recurrent traumatic ulceration. The patient in this study reported recurrent gingival traumatic ulceration due to limited space for oral hygiene, secondary to the toothbrush slippage caused by aberrant frenal attachments.

An interdisciplinary periodontics and prosthodontics approach is crucial, particularly in managing soft tissues around a future implant site. An excellent periodontium is also critical for aesthetically and functionally good prosthesis. Evaluating the edentulous area before placing a fixed dental prosthesis is vital to avoid issues that might arise during fixed dental prosthesis fabrication or placement [16].

Prosthesis cleanability and patients' home care are more critical in preserving tissue health than the type of material and contact with the tissue [17]. Consequently, a prosthodontist was consulted regarding the future implant-supported prosthesis, considering that his implant site was associated with a shallow vestibule, deficient keratinised tissue, and aberrant frenal attachment that

impeded proper tooth brushing and led to recurrent traumatic gingival ulcerations. A vestibuloplasty procedure was planned and performed to improve the patient's condition following careful assessment and discussion.

Vestibuloplasty is a standard mucogingival surgical procedure performed as part of pre-prosthetic preparation. Vestibuloplasty refers to a surgical approach that alters the gingiva and mucous membrane relationship by deepening the vestibule, altering the frenulum position, and widening the attached gingiva zone [18]. The three primary vestibuloplasty techniques are mucosal advancement, grafting vestibuloplasty, and secondary epithelisation [13]. Mucosal advancement is performed when the mucosa and bone structure are sufficient, not unlike grafting vestibuloplasty. Conversely, insufficient ideal mucosa and adequate bone structure require secondary epithelisation [11,13], which was applied to the patient in this study.

In 1924, Kazanjian introduced techniques to deepen the vestibules in edentulous patients [19]. A secondary epithelisation technique was also first described by Kazanjian to improve the mandibular mucosal quality [20]. Nonetheless, unsatisfactory results might be observed due to scar formation and frequent relapse from extensive areas of bone exposure. Modifying the Kazanjian technique offers solutions to the limitations, enabling relapse and postoperative pain prevention through periosteum conservation [10,11]. The findings in this study corroborated the results reported on mandibular anterior region investigations, where vestibular depth and gingival and clinical attachment levels were increased [7,10,11].

One of the most common mucogingival issues encountered in dentistry is gingival recession. The condition might be due to anatomical, behaviour-related, physiological, traumatic, and pathological factors [21,22]. High muscle attachment and frenal pull are among the local plaque retention elements predisposed to gingival recession. Furthermore, a high frenal attachment is linked to a notable muscle pull that retracts the marginal gingiva [4].

The lower right second premolar of the patient in this study exhibited gingival recession and an aberrant frenal attachment. Vestibuloplasty is a non-invasive and simple mucogingival procedure that offers a conducive environment for oral hygiene practice, which is advantageous over other mucogingival surgical techniques, such as free gingival or connective tissue grafts [2,21].

Consequently, the approach prevents toothbrush slippages and minimises further gingival recession risks.

Although interdental attachment loss impairs root coverage, potential root coverage is determined by the degree of interdental clinical attachment. The patient involved in the present study had overlapping RT3 gingival recession and Miller class IV, which prevented full root coverage [23]. Consequently, the patient agreed to observe RT3 gingival recession on tooth 45 first post-surgery and discuss further assessment accordingly.

The patient in this study reported no toothbrush slippages after the surgery and was satisfied with the outcome. Moreover, his surgical site healed without significant scarring and gained attached gingival dimensions. The results fulfilled the patient's expectations by allowing proper placement and adequate space for tooth brushing. The conditions also minimised the risk of traumatic ulceration caused by toothbrush slippages while preparing the site for implant placement. Conclusively, the modified Kazanjian vestibuloplasty method offers benefits (including

reduced patient discomfort and surgical time), as it does not require harvesting free gingival grafts from the donor site at the palatal area.

CONCLUSION

Typically, shallow vestibules are linked to deficient keratinised gingiva or abnormal frenal attachments. The conditions might compromise periodontal health and the longevity of a prosthesis. Consequently, mucogingival surgery offers a solution for inadequate keratinised tissue width, decreased vestibular depth, and high muscle pull in facilitating plaque control, reducing or halting gingival recession, and improving patient comfort during tooth brushing. Modified Kazanjian vestibuloplasty is also relatively simple, consumes less time, documented reduced morbidity, and has resulted in aesthetically pleasing tissue match.

DECLARATION OF INTEREST

Authors declare no conflict of interest.

REFERENCES

1. Friedman N. Mucogingival surgery. *Tex Dent J* 1957;75:358–362.
2. Pini PG, Clauser C, Cortellini P. Periodontal plastic surgery and mucogingival surgery. *Periodontol* 2000 1995;9:90–105.
3. Blessing EP, Rosaian AS. Vestibuloplasty using diode Laser: A case report. *J Dent Med Sci* 2019;18(8):43–47.
4. Tugnait A, Clerehugh V. Gingival recession - its significance and management. *J Dent* 2001;29:381–394.
5. Lang NP, Löe H. The relationship between the width of keratinized gingiva and gingival health. *J Periodontol* 1972;43:623–627.
6. Kassab MM, Cohen RE. The etiology and prevalence of gingival recession. *J. Am. Dent. Assoc* 2003; 134:220–225.
7. Wyrebek B, Gorska R, Gawron K, Gora MN, Gorski B, Plakwicz P. Periodontal condition of mandibular incisors treated with modified Kazanjian vestibuloplasty compared to untreated sites: A prospective study. *Adv. Clin. Exp. Med* 2021;30:681–690.
8. Ochseinbein C. Newer concept of mucogingival surgery. *J Periodontol* 1960;31:175–185.
9. Wilderman M. Exposure of bone in periodontal surgery. *Dent Clin North Am* 1964;8:23–26.
10. Khan M, Tripathi A, Jaishwal R, Agrawal P. Single-stage surgical procedure for increasing depth of vestibule and the width of attached gingiva. *J Oral Res Rev* 2015;7(2):58–61.
11. Vijay Kumar J, Chakravarthi PS, Sridhar M, Devi KNN, Kattimani VS, Lingamaneni KP. Anterior ridge extension using modified kazanjian technique in mandible—a clinical study. *J Clin Diagnostic Res* 2016;10(2):21–24.
12. Cairo F, Nieri M, Cincinelli S, Mervelt J, Pagliaro U. The interproximal clinical attachment level to classify gingival recessions and predict root coverage outcomes: An explorative and reliability study. *J Clin Periodontol* 2011;38(7):661–666.
13. Starshak T, Sanders B. *Preprosthetic oral and maxillofacial surgery*. Mosby 1980.

14. Bruce AJ, Dabade TS, Burkemper NM. Diagnosing oral ulcers. *J. Am. Acad. Physician Assist* 2015;28:1–10.
15. Oliveira SC, Slot DE, Weijden FVD. Is it safe to use a toothbrush?. *Acta Odontol. Scand* 2014;72:561–569.
16. Sharma S, Ahmed S, Kaushik M, and Mishra S. Periodontics-prosthodontics - An interdisciplinary approach. *Indian J. Public Heal. Res. Dev* 2022;13:243–249.
17. Abduo J, Lyons KM. Interdisciplinary interface between fixed prosthodontics and periodontics. *Periodontol. 2000* 2017;74:40–62.
18. Glossary of periodontal terms. *J Periodontol* 2001;67(4th edition):56. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/8667139>.
19. Kazanjian V. Surgical operations as related to satisfactory dentures. *Dent Cosm* 1924;66:387.
20. Kazanjian V. Surgery as an aid to more efficient service with prosthetic dentures. *J Am Dent Assoc* 1935;22(4):566–581.
21. Zucchelli G, Mounssif I. Periodontal plastic surgery. *Periodontol 2000* 2015;68(205):333–368.
22. Mohd Noh NZ, Noor E. Gingival recession at a glance. *BDJ Student* 2024;April:64–65.
23. Cortellini P, Bissada NF. Mucogingival conditions in the natural dentition: Narrative review, case definitions, and diagnostic considerations. *J Clin Periodontol* 2018; 89(1):S204–S213.

Editorial History

Date of Submission: 3 Jan 2024

Review & Revision: 12 Feb 2024 – 26 Aug 2024

Accepted: 27 Aug 2024

Published: 23 Sept 2024

License Information: This work is licensed under a Creative Commons Attribution