



CREATING ATTACHED GINGIVA IN POST FRENECTOMY DEFECTS USING INNOVATIVE FRENECTOMY TECHNIQUE: A CASE REPORT

Periodontology

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ABSTRACT

Introduction: The frenum is a fold of tissue that regulates the movement of associated organs and can vary in type, size, and position with growth. While typically a normal structure, an aberrant frenum may cause functional and esthetic concerns, such as maxillary midline diastema, gingival recession, or restricted lip and tongue mobility. Aberrant frenum attachments can contribute to issues like reduced vestibular depth and compromised oral hygiene. Addressing these abnormalities is essential to prevent further complications and restore esthetics and function. Traditional frenectomy methods may result in complications such as scarring or recurrence. This case report evaluates the clinical outcomes of Bagga's technique, an innovative surgical approach utilizing bilateral attached gingiva with pedicles flaps suturing at the midline for wound closure. The procedure was performed on two patients aged 20 and 28 years respectively. **Results:** Postoperative findings were highly favorable, with no bleeding, swelling, or significant discomfort reported immediately after surgery or during follow-up visits. Tissue healing was optimal, and no recurrence was observed during a three-month follow-up period. None of the patients required antibiotics. Improvements in Oral Health-Related Quality of Life (OHRQoL-UK) scores were observed for both the patients, with pre surgical score being 52/144 (Case 1) and 78/144 (Case 2) and post-op 03 months values to be 130/144 and 114/144 respectively, reflecting substantial benefits in physical, social, and psychological well-being. **Conclusion:** Aberrant frenal attachments can negatively impact gingival health, impede diastema closure, and interfere with orthodontic treatment. While several surgical techniques are available, Bagga's technique is a dependable option, providing both functional and aesthetic outcomes when sufficient attached gingiva is present. This method minimizes scarring, ensures effective healing, and promotes long-term stability, making it a valuable solution for managing abnormal frena.

KEYWORDS

INTRODUCTION

Frenum is a small band or fold of integument or mucous membrane that checks, curbs, or limits the movements of an organ or part [1]. Frenum in the oral cavity can be Labial, buccal or lingual and can vary in thickness, breadth, and fibrousness. It may also undergo changes in shape, size, and position throughout various stages of growth and development. In young children, it is typically wide and thick, gradually thinning and reducing in size as they continue to develop [2]. As individuals grow, the frenum tends to decrease in size and significance. Different types of frenum attachments exist, ranging from normal to aberrant. Placek et al. introduced a classification system based on the anatomical location of frenum attachment to differentiate between normal and abnormal frenum which ranges from mucosal, to papillary penetrating [3].

An aberrant frenum is an abnormal insertion of the frenum, which has the potential to cause gingival recession, create diastema, or restrict movements of the lip and tongue [4]. This abnormal attachment may also interfere with proper toothbrush placement or can prelude to gingival recession thus warranting its correction [5]. Several techniques for the frenectomy procedures like Conventional, Morselli, Z plasty, Vestibular sulcus extension, V-Y plasty, Submucosal, Minimally invasive techniques are present which can be performed either with the use of scalpel or Laser [6-9]. However, these techniques sometimes fail to achieve optimal clinical outcomes such as acceptable esthetics, functional correction, and/or scarring prevention.

The Bagga's frenectomy technique developed in 2006 was designed to reduce these complications by using a minimally invasive approach that ensures precise tissue removal, faster healing, and reduced postoperative discomfort [6]. This technique utilizes the adjacent attached gingiva on both sides of the frenum to create a uniform zone of attached gingiva over the excised frenum at the site frenectomy. This case report showcases two cases of aberrant frenal attachment successfully managed using Bagga technique.

CASES

Case 1

A 20-year-old female reported to the Department of Periodontics with a primary concern of a gap between her upper front teeth since 04 years. Examination revealed that there was a maxillary central diastema along with an abnormal maxillary labial frenal attachment. A comprehensive medical history was obtained. As per Placek's classification, the aberrant frenal attachment was classified as papillary type [3] (Fig. 1a,1b). Frenal attachment also revealed a positive tension test and blanching. Width of Attached Gingiva at 11 & 21 region was 4 mm (Fig. 1c,1d). Further intraoral examination did not render any abnormalities. Oral Health Related Quality of Life-UK score (OHRQoL-UK)¹¹ was also recorded for the patient prior to surgery and frenectomy was planned.

Case 2

A 28-year-old male patient with midline diastema in 11,21 was referred from the Department of Orthodontics for management of aberrant frenum. Intra-oral examination revealed a papillary penetrating type of maxillary labial frenum. Width of attached gingiva was 05 mm. Both systemic and intraoral examination did not reveal any abnormality. OHRQoL-UK score was recorded and patient was taken up for the frenectomy procedure.



CASE 1 : Fig. 1a Thick Hyperthrophied Papillary Penetrating Type of Frenum Fig. 1b Frenum Resected Fig. 1c Oblique incisions in attached gingivae and midline incision Extended Palatally to Undermine Palatal Fibers Fig. 1d Flaps In-situ Fig. 1e. Flap Secured Using 5-0 Prolene Sutures Fig. 1f Three months Post-Op Follow-up



CASE II : Fig. 1a Thick Hypertrophied Papillary Type of Frenum Fig. 1b Frenum Resected Fig. 1c Oblique incisions in attached gingivae and midline incision Extended Palatally to Undermine Palatal Fibers Fig. 1d Flaps In-situ Fig. 1e. Flap Secured Using 5-0 Prolene Sutures Fig. 1f Three months Post-Op Follow-up

SURGICAL PROCEDURE

Routine pre-surgical laboratory investigations were done in both the cases and the results were within normal limits. Considering the width of attached gingiva, both the cases were planned for frenectomy using Bagga's technique. After achieving profound local anaesthesia, the frenum was stabilized at its base using curved artery forceps.

Initial external bevel incisions were given at the gingival base of the frenal attachment to join at the tip, resulting in V-shaped defect (Fig. 1b). Tissue along with periosteum was separated from underlying bone (in our first case the incision also included the removal of fibrotic tissue from the palatal side utilizing a semilunar incision). The fibrous tissue attached to the lip was also dissected and undermining of labial mucosa was carried out. Two oblique-partial thickness incisions were then given on the adjacent attached gingiva beginning from the tip extending beyond mucogingival junction (Fig. 1c). Partial thickness flap was elevated on either side creating two triangular pedicle flaps (Fig. 3d). The two pedicle flaps were then approximated into one single flap using 5-0 Prolene (4-0 Silk in 2nd case) sutures from the base towards the midline while the tips of the flaps were kept stationary. Alveolar mucosa was undermined to facilitate repositioning of the pedicle without tension. Labial mucosal side of the lip was sutured using 5-0 Prolene (4-0 Silk in 2nd case) and then, laterally the pedicle flaps were approximated with the attached gingiva (Fig. 1e).

Periodontal dressing was given to cover the surgical site. The patients were given post-operative instructions, along with a prescription of analgesics 08 hourly for 03 days. 0.20% chlorhexidine mouthwash 10 ml twice daily was also prescribed for a duration of 10 days. Patients were recalled on the tenth day for suture removal, and were subsequently followed up every month post-operatively. OHRQoL-UK score was recorded 03 months post-operatively.

RESULTS

Post-operatively, tissue healing progressed optimally, and there was no relapse or scarring observed during the 3-month follow-up period in both the cases. Both cases revealed the presence of attached gingiva with an aesthetically pleasing color match in the frenectomy region (Fig. 1f). OHRQoL-UK scores showed marked improvement post-treatment. For Case I, the score increased from 52/144 preoperatively to 130/144. Similarly, for Case II, the score improved from 78/144 preoperatively to 114/144 post-operatively three months. Both the patients were further referred to Orthodontics Department for management of midline diastema.

DISCUSSION

The maxillary labial frenum forms as a remnant of the ectolabial band during the post-eruptive stage, typically around 8 to 10 weeks of intrauterine life. It extends from the tubercle of the upper lip to the palatine papilla. As the alveolar process grows, the attachment of the frenum typically shifts to a more apical position. Further, when the two central incisors erupt with significant separation, there is no deposition of bone below the frenum which leads to the formation of a V-shaped bony cleft between the central incisors resulting in an abnormal attachment of the frenum. Such aberrant frenum becomes excessively thick and broad which can disrupt the aesthetic appearance and contribute to the development of a diastema as seen in both our cases.

of fibers into Mucosal, Gingival, Papillary and Papillary Penetrating Type [3]. This classification is simple and easy to use. Our first case was classified as papillary penetrating and second case was of papillary type.

Prevalence of aberrant frenum in maxilla is **Mucosal:** 18.70%, **Gingival:** 65.30%, **Papillary:** 11.10%, **Papillary penetrating:** 5.00% [12]. Prevalence of aberrant frenum in mandible is **Mucosal:** 59.20% and **Gingival:** 40.78% [12].

Various treatment procedures have been advocated for removal of abnormal frenal attachment like Conventional, Morselli, Z plasty, Vestibular Sulcus extension, V-Y plasty, Submucosal, Minimally invasive technique etc [6-9]. These techniques are tailored to specific clinical needs such as esthetics, functional correction, or scarring prevention. The selection of technique should always be based on the individual patient's condition, the severity of the frenum, and the desired outcome. The V-shaped/conventional technique though easy to perform has chances of scar tissue formation and high relapse rate [6]. Z-plasty even though has less chances of scar tissue formation but has more aggressive approach [6]. Vestibular sulcus extension has high relapse rate while submucosal technique comes with increased morbidity with longer healing time⁶. V-Y plasty with all its advantages is a complex and time consuming procedure [8]. Therefore, to overcome these disadvantages, Dr Bagga introduced a novel technique of frenectomy which has been discussed in case report above [6]. It has various advantages namely healing by primary intention, increase additional width of attached gingiva, better marginal adaptation without any scar formation and excellent aesthetics as achieved in our cases. The significant improvement in OHRQoL-UK scores in these cases also commensurate with the treatment's substantial positive impact on the patients' quality of life and oral health perception [11].

However, the technique has certain limitations like requirement of adequate attached gingiva is technique sensitive and requires excellent tissue handling with multiple sutures in limited area [6].

There are very few case reports on this technique in literature wherein this technique has been used successfully and hence this case report further sets up a base for further studies on Bagga technique of frenectomy and establish it as an alternate to already available frenectomy techniques.

CONCLUSION

An aberrant frenum often acts as a roadblock in orthodontic treatment by causing diastemas, interfering with oral hygiene, or contributing to relapse. The technique's minimally invasive nature and precise tissue handling ensure optimal esthetic and functional outcomes, making it a valuable tool in comprehensive orthodontic care.

Abbreviations:

OHRQoL-UK: Oral Health-Related Quality of Life (United Kingdom)

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Placek classified frenal attachment based on the extent of attachment