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Treatment of Aberrent Frenum: Case Series

Dr. Maya S. Indurkar[1], Dr. Manjiree S. Awad[2]

[1]Prof.& HOD in periodontology GDC & Hosptal Auragabad, India
[2]PG Student GDC Aurangabad, India

Abstract: ***The frenum is a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum. A frenum that encroaches on the margin of the gingiva may interfere with plaque removal and cause tension. Frenectomy is the complete removal of the frenum that can be made by scalpels or with soft tissue lasers. This article describes 4 case reports of different frenectomy techniques used for management of aberrant frenum.***

1. Introduction

A frenum is an anatomic structure formed by a fold of mucous membrane and connective tissue and sometimes muscle fibres that attach the lip and cheeks to the alveolar mucosa and/or gingiva and the underlying periosteum. Depending upon the extension of attachment of fibres, frenum has been classified by Placek[1,2] et.al.(1974) as follows: 1.Mucosal 2.Gingival 3.Papillary 4.Papillary penetrating. Clinically, papillary and papilla penetrating frenum are considered as pathological and have been found to be associated with loss of papilla, recession, diastema and plaque accumulation. There are several surgical techniques for removal of labial frenum. This article is a compilation of series of clinical cases of an aberrant frenum which were approached by various surgical frenectomy techniques like conventional (classical) technique, Miller's technique, Laser technique, Z-Plasty.

2. Materials & Methods

These surgical techniques were undertaken at Government Dental College and Hospital, Aurangabad. The subjects underwent frenectomy for periodontal or orthodontic reasons. A frenum was considered abnormal when it was unusually broad or there was no apparent attached gingiva in the midline or the interdental papilla was stretched by the frenum.

3. Case Reports

Case 1 - A female patient aged about 19 years was otherwise healthy with a negative drug history. On intraoral examination revealed high attachment of upper labial frenum, of papilla penetrating type (Fig 1a). The classical frenectomy procedure was planned to remove the frenum. Frenum was engaged with a haemostat which was inserted into the depth of the vestibule [Fig-1b] and incisions were placed on the upper and undersurface of the haemostat until the tissue became free. The triangular resected portion of the frenum was removed along wi88th the haemostat. A blunt dissection was done to relieve the fibrous attachments (Fig 1c). Interrupted sutures were applied at the edges of diamond shaped wound [Fig-1(d)] with 5-0 vicryl sutures. The area was covered with a periodontal pack (Coe-pack). The pack and the sutures were removed 1 week postoperatively.

Figure 1 (a) (pre-Op) Figure 1 (b) Figure 1 (c) Figure 1 (d) Figure 1 (e) (At 15days)

Classical Frenectomy

Case2 –A female patient of 22 yrs reported with a midline diastema. The patient was systemically healthy with a negative drug history. On intra oral examination it was found that there was aberrant upper labial frenum extending into the interdental papilla between upper central incisors. Case was operated with Z-plasty technique. Scalpel incision was given along the whole length of the frenum. At each end of the incision another two incisions of equal length was made with angulation between 60° and 90°. The submucosal tissues were dissected beyond the base of each flap into the loose non-attached tissue Schematic Diagram of Z-plasty technique planes. Care was taken not to damage the apices of the flaps. These flaps were then mobilised and moved through 90° to close the previous vertical incisions [Fig-2(d)]. Stabilisation of the flap was done by placing black silk (4-0) sutures beginning from the apices of the flaps to ascertain the adequacy of the flap repositioning. Then sutures were evenly spaced along the edges of the flaps to close the wound along the cut edges [Fig-2(e)]. A periodontal dressing was placed. After 1 week the dressing and sutures were removed.

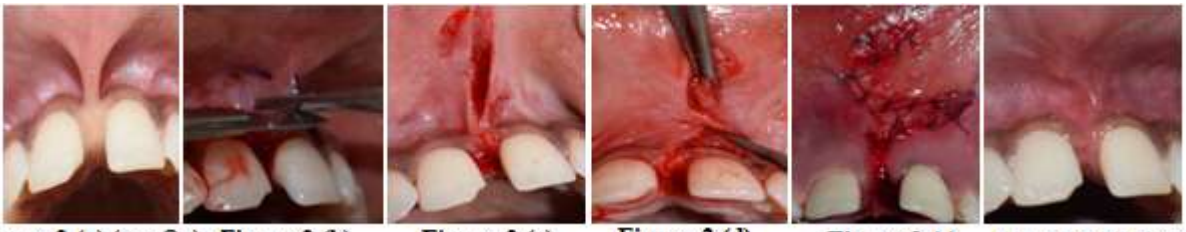

Figure 2 (a) (pre-Op) Figure 2 (b) Figure 2 (c) Figure 2 (d) Figure 2 (e) Figure 2 (f) (15days)

Z plasty procedure

Case 3- A female patient of 24 yrs reported with postorthodontic diastema. Thus, millers technique is performed in this patient. After adequate local anaesthesia, a horizontal incision was taken to separate the frenum from the base of interdental papilla. This incision was extended apically up to the vestibular depth to completely separate the frenum from alveolar mucosa (Figure 3a). Any remnant of frenum tissue in the mid line and on the under surface of lip was excised (Figure 3b). A vertical parallel incision was taken on the mesial side of lateral incisor, 2-3 mm apical to marginal gingiva, up to vestibular depth. The gingiva and alveolar mucosa in between these two incisions were undermined by partial dissection to raise the flap. A horizontal which was inserted into the depth of the vestibule and incisions were placed on the upper and the under surface of the haemostat until the haemostat was free. The triangular resected portion of the frenum with the haemostat was removed. A blunt dissection was done to relieve the fibrous attachment (Figure 1b). The edges of the diamond shaped wound were sutured using 4-0 black silk with interrupted sutures (Figure 1c). The area was covered with a periodontal pack. The pack and the sutures were removed 1 week post-operatively.

Figure 3 (a) (pre-Op) Figure 3 (b) Figure 3 (c) Figure 3 (d) Figure 3 (e) Figure 3 (f) (post –op)

Laser Assisted Frenectomy

Case 4- A female patient of 18 yrs reported with high frenum attachment pathologically extending to the palatal inter-incisal region. It was decided to perform laser frenectomy with infiltrated anaesthesia. The laser fiber was applied vertically and laterally to the frenum initially causing disruption of the mucosa continuity. This easily allowed performing a deeper cut of the frenum in a horizontal dimension. The design of the frenectomy was rhomboidal allowing easy pass of the fiber-optic between the central incisors and from the buccal to palatal area. The whole procedure was performed in about five minutes, without pain. No sutures were required. Haemostasis was optimum immediately after the procedure (Figure 3). The patient was comfortable with no pain, either intra-operatively or post-operatively. The patient described the procedure as totally painless. Ten days later the healing was found to be uneventful.

Figure 4 (a) (pre-Op) Figure 4 (b) Figure 4 (c) Figure 4(d) (At 10 days)

Laser Assisted Frenectomy

4. Discussion

Frenectomy is a complete removal of frenum, including its attachment to the underlying bone, and may be required in the correction of an abnormal diastema between the maxillary central incisors. In the era of periodontal plastic surgery, more conservative and precise techniques are being adopted to create more functional and esthetic results. The management of aberrant frenum has traveled a long journey from Archer's and Kruger's "classical techniques" of total frenectomy to Edward's more conservative approach[3]. In present study we performed different techniques of frenectomy in each case. Classical frenectomy is indicated in the midline diastema cases with an aberrant frenum to ensure the removal of the muscle fibres which were supposedly connecting the orbicularis oris with the palatine papilla[4,5]. In case 1 classical frenectomy was performed. The conventional scalpel technique involves the routine risks of

surgery like bleeding and poor patient compliance. Z plasty technique is indicated when there is hypertrophy of the frenum with a low insertion, which is associated with an inter-incisor diastema, and when the lateral incisors have appeared without causing the diastema to disappear and also in cases of a short vestibule. In second case, frenectomy using basic Z‐plasty technique gives more esthetic and functional outcome due to its inherent properties of redirecting and lengthening effects on tissues which are not possible with other techniques. It also lengthens the scar in favorable way so that the labio‐buccal sulcus depth and lip height are brought to the normal dimension from original shallow one. Complications of Z‐plasty may be flap necrosis, hematoma formation, wound infection, sloughing of the flap caused by high wound tension, and the trapdoor effect (elevation of central tissue resulting from a downward contraction of a surrounding scar). Most complications may be prevented by meticulous attention to technique[6,7,8]. Millers technique[9,10] is indicated for the post-orthodontic diastema cases. In third case, Miller's technique that combined frenectomy with a laterally positioned pedicle graft was performed. This technique offers two distinct advantages. First, on healing there is a continuous band of gingiva across the midline rather than unaesthetic scar. The second advantage is that trans-septal fibres are not disrupted surgically, to avoid any trauma to interdental papilla. This prevents loss of interdental papilla. Diode laser with wavelength of 810 nm was selected for the procedure in fourth case. Advantages of Laser over Conventional technique: It's a painless procedure. As a result there is less patient apprehension. Bloodless operative field, thus better visibility. No need of periodontal dressing, therefore no patient discomfort as a result of irritation from the dressing. Better healing and less scarring. Less time consuming.

5. Conclusion

In the present case series, Midline diastema with high frenal attachment was treated with classical frenectomy, For thick and broad frenum with shallow vestibule Z plasty was performed and for postorthodontic cases Millers technique was performed. Based on the type of the frenal attachment, frenectomy technique was selected which achieved functional and esthetic outcome.

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