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Free the Frenum: A Review with Case Reports of Three Different Surgical Techniques

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ABSTRACT:
Frenum refers to a small mucosal fold that contains muscle fibres and connects the lip with the mucosa, attached gingiva or the underlying periosteum. Frenum can be aberrant and can result in periodontal disease progression by making the routine oral hygiene inefficient and may pose an unesthetic appearance. Management of the aberrant frenum is accomplished by frenectomy. Frenectomy is the procedure by which the frenum is completely excised. This article states about three different surgical approaches for removal of the frenum done through conventional scalpel, miller's technique and by assistance of electrocautery and emphasizes on indications, contraindications and complications of the three techniques.The post operative pain among the three techniques was assessed to get an idea about patient compliance with each technique.

I. INTRODUCTION:

Frenum or Frenulum is a mucosal fold made of muscle fibres that connects the upper and lower lip to the attached gingiva, alveolar mucosa or to the underlying periosteum. The aberrant frenum can make the routine oral hygiene difficult and also may result in gingival recession which ultimately leads to an unesthetic appearance. Since, the esthetics in the modern trends is evolving and gaining attention, the need for the elimination of the underlying etiology becomes essential. Sometimes, the abnormal hyperactive muscle pull can create diastema and failure to removal after orthodontic treatment may end up in relapse.(1)The frenulum was histologically examined by Knox and Young, who found both elastic and muscle fibers. (Orbicularis oris - horizontal bands and oblique fibres) but, Henry, Levin, and Tsakani's identified no muscle fibers in the frenulum, only exceptionally dense collagenous tissue.(2) The aberrant frenum must be addressed since it can lead to multiple undesirable consequences.

TERMINOLOGIES:
Frenectomy refers to the complete surgical removal of the entire frenum including its attachment from the underlying sound bone.
Frenotomy refers to the incision and repositioning of the frenum.

DEVELOPMENT OF ABERRENT FRENUM:

The ecto-labial bands connecting the upper lip's tubercle to the palatine papilla develop into the maxillary labial frenum as a post-eruptive remnant. No bone is deposited beneath the frenum when the two central incisors emerge widely separated from one another. Between the two central incisors, there is a V-shaped bony cleft which leads to an abnormal frenal development**.**(3)

CLASSIFICATION OF FRENUM
The frenum has been majorly classified as, (Placek etal 1974)(4)
Mucosal – The fibres of the frenum attaches to the mucogingival junction
Gingival – The fibres of the frenum attaches to the attached gingiva
Papillary – The fibres of the frenum attaches to the interdental papilla
Papilla penetrating – The fibres of the frenum attached to interdental papilla and traverses the alveolar bone and connects with the palatine papilla.
Sewerin's in the year 1971 have classified frenum as(4)
Simple frenum
Persistent labial frenum
Simple frenum with an appendix
Simple frenum with a nodule
Double frenum
Frenum with niche
Bifid frenum
Frenum with two or more variations at the same time.

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Sewerin's typology was modified by Ranjana mohan et al (2014)(5)
Simple frenum
Single
Double
Triple
Simple with nodule
At labial third
At middle third
At alveolar third
Simple with appendix
At labial third
At middle third
At alveolar third
Persistent tecto-labial
Simple
With nodule
With appendix
Simple with nichum
Inverted 'Y'
Bifid
Trifid
Two or more variations
Absent

DIAGNOSIS OF ABERRANT FRENUM:
Tension/ Blanch test:

By applying tension to a Frenal attachment and observed for the movement of the papillary tip or the blanching brought on by local ischemia, abnormal Frenal attachments can be clearly identified.(4)

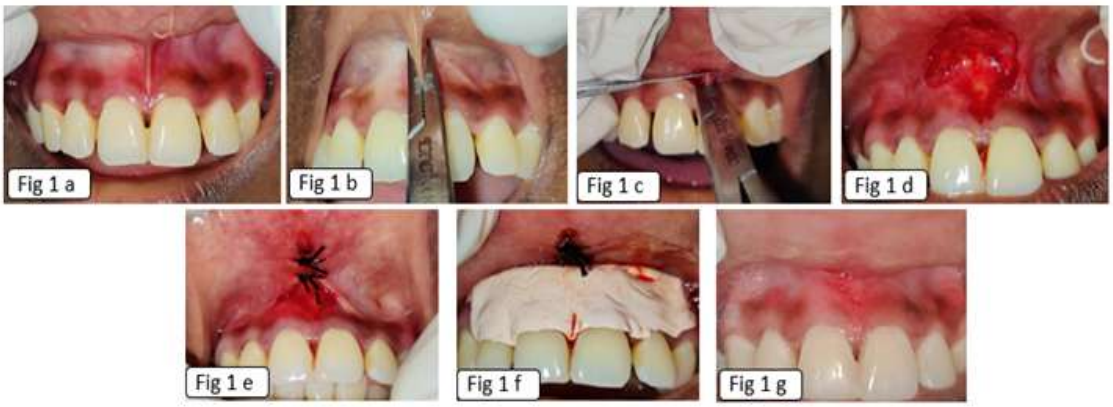
SYNDROMES ASSOCIATED WITH ABERRANT FRENUM:(6)

1. Ehlers- Danlos syndrome
2. Infantile hypertrophic pyloric stenosis,
3. Holoprosencephaly,
4. Ellis- van Creveld syndrome, and
5. Oro- facial- digital syndrome.

INDICATIONS OF FRENECTOMY:

1. Abnormal muscle pull leading to gingival recession and contributing to further progression of periodontal disease.(7)
2. Compromised aesthetics
3. A flattened frenum that compromises the ability to maintain routine oral hygiene measures(8)
4. Frenum with inadequate attached gingiva and an obliterated or shallow vestibule(8)
5. Midline diastema due to thick hypertrophic frenum(9)
6. If force from lip movement pulls the free gingival margin away from the teeth.(6)

SURGICAL TECHINIQUE – I (CLASSICAL FRENECTOMY):



TheClassical frenectomy was proposed by Archer in 1961 and Kruger 1964.(3) It is also called as Conventional technique.
A 35-Year-old Female patient reported to department od periodontics with a chief complaint of receding gums in her upper front teeth region for the past 6 months. Intra oral examination revealed presence of Gingival type of frenum with positive tension test and presence of black triangle in relation to 11,21. Hence, after thorough Phase -I therapy Frenectomy was planned.

Infiltration anaesthesia is administered using 1:80,000 Lignocaine without ballooning the tissues. The frenum is held with a help of a hemostat at its entire depth in the vestibule. Incision is given both superior and inferior to the hemostat using no 15 BP blade and the frenum is excised. Hemostasis must be achieved and the mucosa is approximated without any tension and suturing is done using 3-0 braided black silk. Periodontal dressing given using coe-pak. Sutures are removed at 1 week. (Fig 1a-g)

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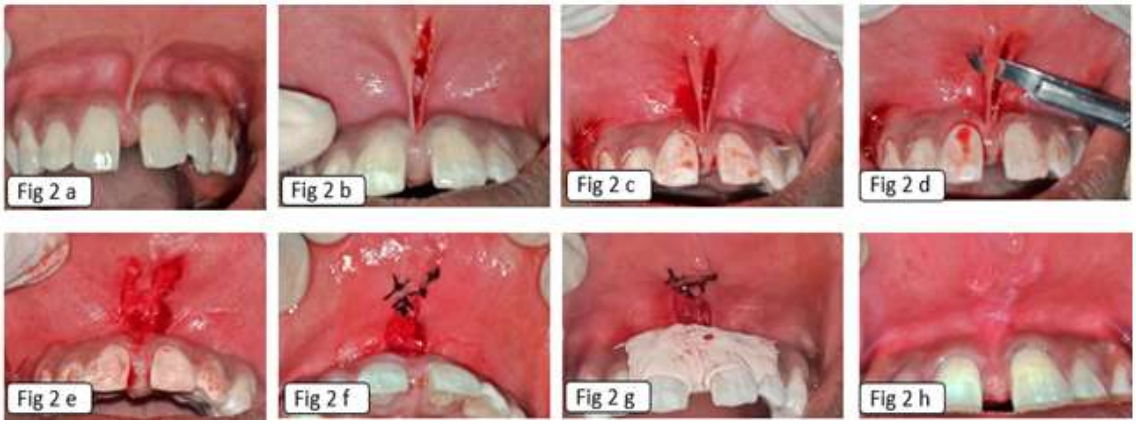
SURGICAL TECHNIQUE – II: (MILLER'S TECHNIQUE)



The technique was proposed by PD Miller in 1984. (9) The technique is majorly indicated for post orthodontic diastema cases where the thick hypertrophic frenum can result in relapse. The major advantage of this technique includes minimal scar formation, better esthetics as the transeptal fibres are not disrupted surgically and the orthodontic stability is better without any esthetic sacrifice.(9)

A 21 Year Male patient was referred to department of periodontics for management of high frenal attachment from department of orthodontics. Intraoral examination revealed midline diastema with papillary type of maxillary labial frenum. Infiltration anesthesia is administered using 1:80,000 Lignocaine without ballooning the tissues. After anesthesia, a single vertical incision is given through the frenum to its entire length (Fig 2 b) and a parallel vertical incision is given lateral to the primary incision 5-6mm apart till the same length as the primary incision. (Fig 2 c) An undermining incision is given connecting the primary and secondary incisions (Fig 2 d) and then a horizontal incision is given at the base of the frenum to obtain a lateral pedicle. (Fig 2 e) The pedicle is then mobilised and sutured to the mucosa using 3-0 black braided silk sutures. (Fig 2 f) Periodontal dressing is given and sutures are removed at 1 week(Fig 2 g-h).

SURGICAL TECHINIQUE – III: (ELECTROCAUTERY)

The use of electrocautery in dentistry was introduced by William Cameron in 1928 for the purpose of coagulation. One of the major advantages of using electrocautery is bloodless clear field. A 26 Years old Male patient was referred from department of orthodontics to department of periodontics for correction of aberrant frenum. Intra oral examination revealed presence of papilla penetrating type of frenum with

midline diastema. Frenectomy was performed using RF Electrocautery.

The patient must be grounded with grounding pad and then under anesthesia needle electrode (Bi-polar) is used to dissect the frenum by holding the lip taut using RF electrocautery unit.(Fig 3 b- c) Care must be taken to avoid contact with bone and remove the charred tissues from the electrode tip. Muscle fibres are relieved. The margins of the incision are approximated and simple interrupted sutures are placed using 3-0 braided black silk. Periodontal dressing is given and sutures are removed at 1 week.(Fig 3 d- f).

II. DISCUSSION:

The present article is about the review of different techniques (Conventional, Millers and Electrocautery) for management of aberrant frenum. The frenum considered to be pathologic, is removed so as to maintain proper oral health.Removal of such a pathogenic frenum with the appropriate technique selection is necessary to achieve the intended result.

The traditional method put forth by Archer and Kruger continues to be the method that is most commonly used. This procedure completely removes the frenum, interdental tissue, and palatine papilla while also exposing the alveolar bone beneath. However, it resulted in scar formation and unesthetic outcomes. In order to prevent this, Miller had put forth frenectomy with laterally displaced flap technique where the interdental papilla is not touched surgically and the scar formation is minimal.(9,10)

The Post operative pain were assessed through visual analog scale in patients on 3rd and 7th day. Patient treated with electrocautery showed minimal post operative pain at 3rd as well as 7th day with a score of 5 on third day and 1 on 7th day.Patient treated with conventional frenectomy reported a score of 7 on 3rd day and 2 on 7th day. Patient treated with miller's technique reported a score of 5 on 3rd day and 1 on 7th day.(11)Devishree etal in her case series also stated that the post operative pain was minimal in patients treated with electrocautery which was concurrent with our reports.(3)However, this result cannot be generalized as the visual analog scale has its own demerits since the pain tolerance varies in each individual.

Various modifications of conventional frenectomy have been proposed since the conventional frenectomy leaves a large wound area followed by scar formation which includes bi-pedicle approach, papilla preservation and repositioning technique, z plasty, v-y plasty.(12–14). Recent trends with lasers have been evolving. Use of lasers has advantages ofless patient apprehension, bloodless operative field improving visibility, better healing, minimal scarring and less time consuming.(15)

III. CONCLUSION:

Even though an aberrant frenum can be removed using any of the modification methods that have been suggested, a functional and aesthetically pleasing result can be obtained by choosing the right technique based on the type of frenal attachment.

REFERENCES:

[1]. Suvra Bagchi S, Sarkar P, Bandyopadhyay P. Management of Aberrant Frenum: Series of Cases Case Report. Ann ApplBiosci [Internet]. 2016;3(2). Available from: http://www.pacificejournals.com/aabs

[2]. Henry SW, Levin MP, Tsaknis PJ. Histologic Features of the Supe¬rior Labial Frenum. J Periodontol. 1976 Jan;

[3]. Devishree, Gujjari SK, Shubhashini P V. Frenectomy: A review with the reports of surgical techniques. Journal of Clinical and Diagnostic Research. 2012 Nov 15;6(9):1587–92.

[4]. Bamel Jan Nayak Ch Devi Lal Vidyapeeth N, Mehta S, Vats N, Thind S, Jindal S. An Overview of frenectomy: A Review. International Journal of Medical and Health Research [Internet]. Available from: www.medicalsciencejournal.com

[5]. Mohan R, Soni PK, Krishna MK, Gundappa M. Proposed classification of medial maxillary labial frenum based on morphology. Dent Hypotheses. 2014;5(1):16–20.

[6]. Priyanka M, Sruthi R, Ramakrishnan T, Emmadi P, Ambalavanan N. An overview of frenal attachments. Vol. 17, Journal of Indian Society of Periodontology. 2013. p. 12–5.

[7]. Dr. PD Miller the father of periodontal plastic surgery. The Aberrant Frenum.In. Jhaveri H. r.

Hiral Jhaveri (ed), editor. 2006. 29–34 p.

[8]. Miller PD, Allen EP. The development of periodontal plastic surgery. 1996;11:7–8.

[9]. Miller PD. The Frenectomy Combined with a Laterally Positioned Pedicle Graft* Functional and Esthetic Considerations. J Periodontol. 1985 Aug 21;56(2):102–6.

[10]. Janarthanan S, Arun R, Srinivasan S, Kumar Ss. Frenectomy with laterally displaced flap: A case series. Indian Journal of Dental Sciences. 2019;11(2):112.

[11]. Patel R, Varma S, Suragimath G, Abbayya K, Zope S, Kale V. Comparison of labial frenectomy procedure with conventional surgical technique and diode laser. Journal of Dental Lasers. 2015;9(2):94.

[12]. Desai A, Bedi S, Gowda T, Thomas R, Mehta D. Bilateral pedicle approach for esthetic management of upper labial frenum. Journal of Interdisciplinary Dentistry. 2015;5(1):27.

[13]. Damasceno EL, Silva MS, Paes KS, Dias A. Z PLASTY-AN ESTHETIC APPROACH TO FRENECTOMY: CASE REPORT. 2020; Available from: https://doi.org/10.37118/ijdr.19399.07.2020

[14]. Baiju CS, Joshi K, Virmani R, Gupta G, Kaur P. Surgical Techniques for Correcting Aberrant Frenal Attachment: A Clinical Review. Dental Journal of Advance Studies. 2021 Dec;09(03):111–5.

[15]. Dr M.L.V. Prabhuji PDSSMPDAGMI. Frenectomy Review: Comparison of conventional techniques with diode laser. Lasers. 2010;14–8.