

Management of Aberrant Frenum: A Case Report

Dr. Rajesh Kashyap.S¹, Dr. Zareena², Dr. Shashikanth Hegde³

Dr. Arun Kumar M.S⁴

¹(Professor, Dept. of Periodontics, Yenepoya dental College & Hospital, Mangalore, India)

²(Post Graduate student, Dept. of Periodontics, Yenepoya dental College & Hospital, Mangalore, India)

³(Prof & Head, Dept. of Periodontics, Yenepoya dental College & Hospital, Mangalore, India)

⁴(Professor, Dept. of Periodontics, Yenepoya dental College & Hospital, Mangalore, India)

Abstract: The frenum is a normal anatomical landmark in the oral cavity which attaches the lip and the cheek to the alveolar mucosa, gingiva and the underlying periosteum. The aberrations or abnormalities in the frenal attachment at times, may pose problems to gingival and periodontal health either due to an interference in the plaque control or due to a muscle pull. In addition to this, an abnormal frenum attachment can cause aesthetic and functional problems such as a midline diastema, localized gingival recession and loss of sulcus depth. Therefore management of aberrant frenum is important. In the present case report the sequelae and management of aberrant frenum has been discussed.

Keywords: Aberrant frenum, Frenectomy, Labial frenum.

I. Introduction

Frenum is a fold of mucous membrane, usually with enclosed muscle fibers, that attaches the lips and cheeks to the alveolar mucosa and/or gingiva and underlying periosteum.¹ There are several frena that are usually present in a normal oral cavity, most commonly seen are maxillary labial frenum, the mandibular labial frenum, and the lingual frenum.² Their primary function is to provide stability of the upper and lower lip and the tongue.³ Superior labial frenum extends over the alveolar process in infants and forms a raphe that reaches the palatal papilla. Through the growth of alveolar process as the teeth erupt, this attachment generally changes to assume the adult configuration.⁴ But in some instances the infantile arrangement is retained and this high coronal attachment is generally associated with a hypertrophy of the frenum.⁵ Placek et al (1974)⁶ has classified frenum depending upon the extension of attachment of fibres,

1. Mucosal – when the frenal fibres are attached up to mucogingival junction.
2. Gingival – when fibres are inserted within attached gingiva.
3. Papillary – when fibres are extending into interdental papilla; and
4. Papilla penetrating – when the frenal fibres cross the alveolar process and extend up to palatine papilla.

Abnormal or aberrant frena are detected visually, by applying tension over it to see the movement of papillary tip or blanch produced due to ischemia of the region. According to Millar the frenum should be characterized as pathogenic when it is unusually wide or there is no apparent zone of attached gingiva along the midline, or the interdental papilla shifts when the frenum is extended.⁷ Frenum may jeopardize the gingival health when they are attached too closely to the gingival margin, either due to an interference in the plaque control or due to a muscle pull.⁸ Clinically, papillary and papilla penetrating frena are considered as pathological and have been found to be associated with loss of papilla, recession, diastema, difficulty in brushing, malalignment of teeth and it may also prejudice the denture fit or retention leading to psychological disturbances to the individual.⁵

According to Olivi et al⁹, clinical indications for frenum removal include:

- i. Anomalous frenum associated with inflamed gingiva, resulting from poor oral hygiene.
- ii. Anomalous frenum associated with gingival recession.
- iii. Maxillary frenum associated with a diastema after complete eruption of the permanent canines.
- iv. Abnormal and/or anomalous maxillary frenum (Class III or IV), resulting in the presence of a diastema during mixed dentition
- v. Anomalous mandibular frenum with high insertion, causing the onset of gingival recession.

Management of aberrant frenum is usually carried out with frenectomy and frenotomy procedures. Frenectomy is the complete removal of the frenum, including its attachment to the underlying bone, while frenotomy is the incision and the relocation of the frenal attachment.¹

II. Case Report

A 45 year old patient reported to department of Periodontics, Yenepoya dental college, Mangalore with the chief complaint of loose upper front tooth since 2 months. Past dental history revealed root canal treatment done 8 months back. Patient's medical history revealed that he is diabetic and hypertensive since 6 years and is under medication. On clinical examination, a probing pocket depth and clinical attachment loss of >9mm with grade III mobility in relation to 21 and a probing depth of 7mm and clinical attachment loss of 9mm with grade I mobility was noticed. On examination it was also noticed that patient had papilla penetrating type of labial frenum and midline diastema in relation to upper anterior teeth and Tension test was found to be positive. Radiological and blood investigation were carried out. Fasting blood sugar and blood pressure was under normal level. IOPA showed bone loss up to apical 1/3 of the root in relation to 21. Following treatment plan was proposed. Scaling and root planning as phase I therapy was carried out. It was decided to subject the patient for surgical procedures including frenectomy and open flap debridement. Patient was explained about the procedure and consent was obtained.

Procedure:

2ml of local anesthesia containing lignocaine hydrochloride with 1:80,000 adrenaline was infiltrated labially and incisive nerve block was administered. Technique used was V-Rhomboidoplasty. A hemostat was placed to engage the frenum. Then incision was placed along the upper surface of the hemostat, simultaneously a similar incision was made along the under surface of the hemostat. Triangular portion of frenum resected along with hemostat. Horizontal incision was placed to dissect and separate the fibers attached to the bone. Crevicular incision was given and full thickness mucoperiosteal flap reflected from 12 to 22. Debridement was carried out along with the extraction of 21. Surgical area was thoroughly irrigated with normal saline and flap was approximated and sutures were placed. Frenectomy area was approximated with sutures, immediate denture was given in relation to 21. Post-operative instructions were given. Analgesic and antibiotics were prescribed. After 1 week sutures removed, healing was uneventful and no post-operative complications were noticed.



Fig: 1 Papilla penetrating type of frenum Between 11 and 21



Fig: 2 Probing pocket depth of 9mm i.r.t 21



Fig: 3 Probing depth of 8mm i.r.t 11

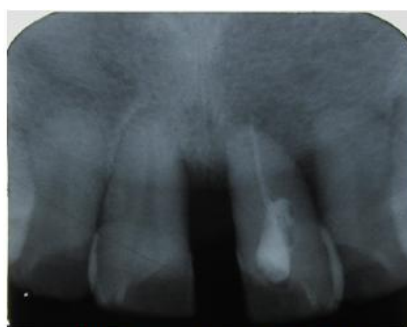


Fig: 4 Pre-operative radiograph



Fig 5: Frenectomy with conventional technique



Fig 6: Rhomboidal incision



Fig 7: Crevicular incision for flap reflection



Fig 8: Extraction of 21



Fig 9: Sutures placed



Fig 10: Immediate denture



Fig 11: Post-operative healing after 2 weeks



Fig 12: Final denture

III. Discussion

The prevalence of different types of the labial frenum attachment and its significance in periodontal health is an important aspect of treatment plan. The mucosal type of the labial frenum attachment is found to be the most common, with a percentage of 46.6% in maxillary and 92.1% in mandibular arch. The second most frequent type of the labial frenum attachment is the gingival one which is 34.4% in the maxillary and 6.5% in the mandibular arch. The papillary type of the labial frenum attachment-3.1% in the upper and 0.2% in the lower jaw, always causes the pull syndrome and is associated with the appearance of pathologically changed midline interdental papillae. The papillary penetrating type of labial frenum attachment, is 16.1% in the maxillary and 1.2% the mandibular arch.⁴

Abnormal frenum and muscle pull has been considered detrimental to periodontal health by pulling away the gingival margin from the tooth and thus contributing to accumulation of plaque and calculus, leading

to inflammation and pocket formation.¹⁰ Hirschfeld (1939) is pioneer as he was the first one, who called upon the attention to the marginal attachment of the frenum, as an etiologic factor in periodontal disease and recommended its excision.¹¹ A high frenal attachment may hinder the performance of adequate oral hygiene.¹²

The conventional technique was introduced by Archer (1961) and Kruger (1964). This technique involves excision of frenum by using scalpel which includes interdental tissues and palatine papilla along with the frenulum. Presence of muscle fibers in frenum could play a co-destructive role by exerting forces along with elastic and collagenous components of the gingiva. Excisional surgery of aberrant labial frenum with conventional technique ensures removal of the muscle fibers which were supposedly connecting the orbicularis oris with the palatine papilla along with dense connective tissue up to the level of the alveolar bone in order to prevent its recurrence and eventual pathological sequelae. Also, it is a safe surgical procedure with minimal complications.¹³ A number of modifications of the various surgical techniques including Miller's technique, V-Y plasty and Z-plasty have been introduced to manage problems associated with an aberrant labial frenum.²

The use of electrosurgery in the management of aberrant frenum has an advantage over the conventional technique such as minimal time consumption, mild bleeding and the minimal postoperative complications. However, its disadvantages include burns, the risk of an explosion if combustible gases are used, interference with pacemakers and the production of surgical smoke.¹⁴

The recently introduced technique in the management of aberrant frenum is lasers. Some of the lasers used are diode, carbon dioxide, Nd:YAG, Er:YAG and Er,Cr:YSGG.¹⁵⁻¹⁹ According to the studies done by Haytac et al¹⁸ and Kara¹⁹, using CO2 laser and Nd:YAG laser, have shown that there was an improved patient perception in terms of postoperative pain and function than that obtained by the scalpel technique. However, the main disadvantages are high cost, requirement of sophisticated equipment, and reduced surgical precision resulting in an inadvertent laser-induced thermal necrosis and/or a photo acoustic injury.^{15,17}

IV. Conclusion

The aberrant frenum can interfere with normal oral hygiene maintenance and can result in other mucogingival problems. The present case report suggests that early detection and correction of aberrant frenum by the clinician can positively affect the periodontal health and prevent further progression of periodontal disease.

References

- [1]. Newman, Takei, Klokkevold, Carranza, Periodontal Plastic And Esthetic surgery, In F.A. Carranza (Ed), Carranza's Clinical Periodontology, 10 (Missouri: Saunders: An Imprint Of Elsevier Science 2006) 1023-1024.
- [2]. M. Priyanka, R. Sruthi, T. Ramkrishnan, P. Emmadi, N. Ambalavanan N. An Overview Of Frenal Attachments. J Indian Soc Periodontol 2013; 17: 12-15.
- [3]. S.M. Mintz, M.A. Siegel, P.J. Seider. An Overview Of Oral Frena And Their Association With Multiple Syndromes And Nonsyndromic Conditions. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005; 99: 321-324.
- [4]. SW Henry, MP Levin, Tsaknis PJ. Histological Features Of Superior Labial Frenum. J Periodontol 1976; 47: 25-28
- [5]. Anubha N, Chaubey KK, Aroravk, Narula IS. Frenectomy Combined With A Laterally Displaced Pedicle Graft. Indian J Dentsci 2010; 2: 47-51.
- [6]. Placek M, Miroslavs, Mrklas L. Significance Of The Labial Frenal Attachment In Periodontal Disease In Man. Part I; Classification And Epidemiology Of The Labial Frenum Attachment. J Periodontol 1974; 45: 891-894.
- [7]. Miller P D Jr. The Frenectomy Combined With A Laterally Positioned Pedicle Graft; Functional And Aesthetic Consideration. J Periodontol 1985; 56: 102-106
- [8]. Millar PD. The Aberrant Frenum, Handbook Of PD Millar. 2006. P. 29-34 .
- [9]. Olivi G, Chaumanet G, Genovese MD, Beneduce C, Andreana S. The Er,Cr:YSGG Laser Labial Frenectomy: A Clinical Retrospective Evaluation Of 156 Consecutive Cases. Gen Dent 2010; 58: 126-133.
- [10]. Bhaskar N, Garg A K, Gupta V. Review Article. Periodontics As An Adjunct To Clinical. Orthodontics: An Update. Indian Journal Of Multidisciplinary Dentistry 2013; 3: 756-761.
- [11]. Kesselerm., Interrelationships Between Orthodontic And Periodontics; Am J Orthod; 1976; 70: 154-172.
- [12]. Bmistin E, Machtei E, Becker. The Attached Gingiva In Children : Diagnostic Developmental And Orthodontic Considerations For Its Treatment. ASDC J Dent Child 1998; 55: 351-356.
- [13]. Devishree, Gujjari SK, Shubhashini PV. Frenectomy: A Review With The Reports Of Surgical Techniques. J Clin Diag Res 2012; 6(9): 1587-1592.
- [14]. Cunha RF, Silva JZ, Faria MD. A Clinical Approach Of Ankyloglossia In Babies: A Report Of Two Cases. J Clin Pediatr Dent 2008; 32: 277-282.
- [15]. Epstein SR. The Frenectomy: A Comparison Of Classic Versus Laser Technique. Pract Periodontics Aesthet Dent 1991; 3: 27-30.
- [16]. Gontijo I, Navarro RS, Naypek P, Ciamponi AL, Haddad AE. The Application Of Diode And Er:YAG Lasers In Labial Frenectomies In Infants. J Dent Child 2005; 72(1): 10-15.
- [17]. Pie-Sanchez J, Espana-Tost AJ, Arnabat-Dominguez J, Gay-Escoda C. Comparative Study Of Upper Lip Frenectomy With CO2 Laser Versus The Er,Cr:YSGG Laser. Med Oral Patol Oral Cir Bucal 2010; 17(2): E228-232.
- [18]. Haytac MC, Ozcelik O. Evaluation Of Patient Perceptions After Frenectomy Operations: A Comparison Of Carbon Dioxide Laser And Scalpel Techniques. J Periodontol 2006; 77(11): 1815-9.
- [19]. Kara C. Evaluation Of Patient Perceptions Of Frenectomy: A Comparison Of Nd:YAG Laser And Conventional Techniques. Photomed Laser Surg 2008; 26(2): 147-152.