A COMPARATIVE STUDY OF CONVENTIONAL AND MIROSURGICAL FRENECTOMY - A RANDOMIZED CLINICAL TRIAL


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ABSTRACT

Aim & Objective: To compare the clinical and patient related outcomes of conventional and microsurgical frenectomy. **Materials and Methods:** Eight patients (14-50 years) with aberrant frenal attachment were selected for frenectomy. Subjects were randomly assigned to two groups, Group A - Conventional group & Group B - Microsurgical group. Microsurgical approach was performed using magnification loupes (Galilean 2.5X46 cm) and microsurgical instruments. **Results:** Postoperatively clinical and patient related outcomes were evaluated using early healing index (7th day) and visual analog scale (1st & 7th day) respectively. Microsurgical group showed a statistically significant difference (P=0.008*) postoperatively when compared to conventional group in terms of early healing index. **Conclusion:** In frenectomy procedure, microsurgical approach can substantially improve the early healing index and induce less postoperative pain when compared to conventional macroscopic approach.

INTRODUCTION

Nowadays, aesthetics has gained importance in seeking dental treatment inorder to achieve perfect smile. The frenum is a mucous membrane fold that attaches the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum. Maxillary labial frenum, the mandibular labial frenum, and the lingual frenum are the different types of frenum present in the oral cavity. **[1]** Midline diastema between the maxillary central incisors has often been considered as an aesthetic problem in adults. Aberrant frenal attachment is considered as one of the aetiological factors for the development of diastema. **[2]**

Based on the extension of attachment of fibres, frenal attachments are classified as (Placek et al 1974)

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

Aberrant frenal attachment if left untreated, could interfere with oral hygiene maintenance which inturn jeopardize the gingival health. The treatment of aberrant frenal attachment involves complete excision of the frenum i.e. frenectomy. In this article we focused on microsurgical frenectomy since it offers several advantages over the conventional procedure which includes increased visual acuity, improved manual dexterity, minimal postoperative pain, passive and primary wound closure. **[3]**

Microsurgery is defined as surgery performed under magnification of 10x or more using a surgical microscope. **[4]** The three important components of microsurgery are magnification, illumination, and instruments. **[5]** The main aim of the present study is to compare the clinical and patient related outcomes of conventional and microsurgical frenectomy.

**MATERIALS AND METHODS**

A total of eight subjects between 14-50 years with aberrant frenal attachment were recruited from the outpatients visiting the Department of Periodontics, K.S.R Institute of Dental Science and Research, Tiruchengode, Tamil Nadu for frenectomy. Abnormal or aberrant frenum are detected visually by applying tension over it to see the movement of papillary tip.

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or blanching produced due to muscular pull induced ischemia of the region.[6] Pregnant & lactating women, smokers, patients with history of systemic diseases and patients who had taken antibiotics for the last 3 months were excluded from the study. A written informed consent was obtained from all the subjects. Subjects were divided randomly into two groups for frenectomy procedure:

1. Group A: Comprised of four subjects selected for conventional frenectomy
2. Group B: Comprised of four subjects selected for microsurgical frenectomy

Conventional frenectomy (Archer 1961 and Kruger 1964)[7]. The area was anesthetized with 2% lignocaine with 1:80,000 adrenaline. The frenum was held with hemostat, and the whole band of tissue together with its alveolar attachment was excised with a conventional scalpel [Fig 3]. The wound was closed with 3-0 silk interrupted sutures [Fig 4]. The treated area was covered with non-eugenol periodontal dressing (Coe-pack®). Sutures were removed after one week [Fig 5].

Microsurgical frenectomy

Followed by local anaesthesia, the frenum was held with hemostat and complete excision of frenum was done using microsurgical scalpel [Fig 6] under × 2.5 optical magnification dental loupes. Wound closure was obtained using 4-0 vicryl interrupted sutures [Fig 7] and covered with periodontal dressing.

Clinical and patient related outcomes were evaluated using early healing index[8] – seventh day & visual analog scale (100mm pain scale) – first and seventh day postoperatively.

Group A: Conventional frenectomy

Followed by local anaesthesia, the frenum was held with hemostat and complete excision of frenum was done using microsurgical scalpel [Fig 6] under × 2.5 optical magnification dental loupes. Wound closure was obtained using 4-0 vicryl interrupted sutures [Fig 7] and covered with periodontal dressing.

Clinical and patient related outcomes were evaluated using early healing index[8] – seventh day & visual analog scale (100mm pain scale) – first and seventh day postoperatively.
FIG 5 One week post-op

**Group B: Microsurgical frenectomy**

FIG 6 Frenectomy by microsurgical scalpel

FIG 7 Sutures placed

FIG 8 One week post-op

Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA, Version 17.0 for Windows). Unpaired t test was used to compare mean VAS score between two groups. Paired t-test was used to compare means on the same groups at different intervals. The chi square test was used to analyse frequencies of EHI scores between groups.

**RESULTS**

Postoperatively at first and seventh day, the mean pain scale scores were 0.5mm and 0mm respectively in microsurgical group whereas in conventional group the scores were 6mm and 0.5mm respectively. And at seventh day of post-op, early healing index scores of 1, 2, 4 showed 100%, 0%, 0% respectively in microsurgical group whereas conventional group showed 0%, 75%, 25% respectively.

Visual analog scale: Group B showed a statistically significant difference (P=0.008*) at first day postoperatively when compared to group A. No significant difference was found between the two groups at seventh day of post-op.

Early healing index: Group B showed a statistically significant difference (P=0.018*) at seventh day postoperatively when compared to group A.

**DISCUSSION**

Abnormal frenal attachment may hamper the oral hygiene maintenance leading to more plaque accumulation, gingival recession, midline diastema which in turn results in esthetic issue. In the field of periodontal plastic surgery, more conservative and precise techniques are being introduced, one among them is microsurgery. Apotheker and Jako...
introduced the microscope in the field of dentistry in 1978. Shanelec and Tibbetts in 1993 presented a continuing education course on periodontal microsurgery at the annual meeting by AAP. [9]

Frenectomy is commonly done using conventional scalpel and it is found to be associated with postoperative pain, discomfort and less patient acceptance. Microsurgery incorporates the use of microsurgical instruments, specifically designed to minimize the tissue trauma and to create clean incisions that prepare wounds to heal by primary intention. So, the patient acceptance is higher when compared to conventional methods. [10]

The present study was aimed to compare the clinical and patient related outcomes of conventional and microsurgical frenectomy. This is the first study in the literature to compare the conventional and microsurgical frenectomy. Two parameters namely visual analog scale (VAS) and early healing index (EHI) were chosen in the present study, to evaluate the clinical as well as patient related outcomes. VAS was evaluated at 1st and 7th day of post-op whereas EHI was evaluated at 7th day of post-op. Group B showed statistically significant difference in terms of VAS at 1st day and EHI at 7th day postoperatively when compared to group A. Results showed less postoperative pain and discomfort leading to increased patient acceptance in microsurgical group.

Present study results were consistent with the study conducted by Perumal et al. [11] They compared microsurgical and conventional open flap debridement, concluded that microsurgical approach resulted in early healing and minimal postoperative pain than conventional approach.

Patel et al and Yadav et al compared frenectomy with conventional surgical technique and laser, they used diode and Nd:YAG lasers for frenectomy respectively. Laser group patients experienced less pain intraoperatively and postoperatively than the conventional group patients. From the results, the authors found that lasers provide better patient perception and an efficient alternative to conventional frenectomy. [7,12]

A previous case report by Bhullar et al compared conventional and electrocautery frenectomy techniques. They concluded that both the techniques showed equivalent results in terms of visual analog scale and postoperative healing. [1] The limitation of the present study was minimal sample size.

CONCLUSION

Microsurgical approach can substantially improve the early healing index and induce less postoperative pain when compared to conventional macroscopic approach in frenectomy procedure. Studies with larger sample size has to be conducted in future to establish the efficacy of microsurgery over conventional approach for frenectomy procedure.

References


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