

“Comparative Evaluation of Frenectomy By Conventional Technique Versus Paralleling Technique”

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Abstract:

Background: The frenum may jeopardize the gingival health causing gingival recession, midline diastema when they are attached too closely to the gingival margin, either because of an interference with the proper placement of a toothbrush, either due to interference in the plaque control or through the opening of the gingival crevice because of a muscle pull. The management of such an aberrant frenum is accomplished by performing a frenectomy procedure. The conventional technique has certain disadvantages, namely large rhomboidal wound area where primary closure is not possible in the lower part and healing takes place by secondary intention. A new technique (paralleling technique) has been introduced for frenectomy procedure. The purpose of this clinical study was to compare the postoperative subjective effects of paralleling technique versus conventional technique after frenectomy procedure.

Materials and methods: Twenty subjects with abnormal labial frenum were selected and randomly divided into two groups, group A (conventional scalpel technique n=10) and group B (paralleling technique n=10) based on the technique used. Group A was treated by “conventional scalpel technique” and Group B by “paralleling technique” of frenectomy procedure. Patient's response was evaluated using visual analogue scale (VAS) for pain and speech at first postoperative day, 1-week and 1-month. Oral hygiene maintenance was evaluated using plaque index and gingival bleeding index at baseline (before frenectomy), 1-week and 1-month after frenectomy.

Result: Paralleling technique had significantly less postoperative pain and functional complication when compared with the conventional technique. ($p < 0.05$)

Conclusion: Paralleling technique provided better patient perception in terms of minimal postoperative pain and functional complication when compared with conventional technique.

Keywords: frenum, conventional technique, paralleling technique

I. Introduction

A frenum is a fold of mucous membrane, generally through enclosed muscle fibers, that attaches the lips and cheeks to the alveolar mucosa and/or gingiva and underlying periosteum.¹ A frenum that is closely attached to the gingival margin would compromise the health of the gingiva either by not permitting proper placement of a tooth brush resulting in poor oral hygiene practice and by muscle pull leading to opening of the gingival sulcus eventually leading to gingival recession and midline diastema, which may be of high esthetic concern and sometimes leading to speech difficulties. The facial surface between the maxillary and mandibular central incisors along with canine and premolar areas is the area that is most prone to frenal problems. Removal of the abnormal frenum is facilitated by either frenotomy or frenectomy. Frenotomy is the incision and relocation of the frenal attachment, whereas frenectomy is the complete excision of the frenum along with its attachment to the underlying bone.¹ Frenectomy can be done by conventional technique, electrosurgery or soft tissue lasers. The conventional technique with scalpel has certain disadvantages, namely large rhomboidal wound area where primary closure is not possible in the lower part and healing takes place by secondary intention.³ A new technique (paralleling technique) has been advocated for frenectomy procedure. When compared to the conventional technique, paralleling technique has certain advantages, namely wound area where primary closure is possible and healing takes place by primary intention.⁴ Hence a study was conducted

to compare the postoperative subjective effects of paralleling technique and conventional technique after frenectomy procedure.

II. Materials And Methods

Study design:

Twenty subjects diagnosed with abnormal frenal attachment were selected from Out Patient Department, Department of Periodontology. The selected subjects were randomly assigned to have treatment either with conventional technique (Group A, n=10) or with paralleling technique (Group B, n= 10). Subjects in the age range of 18-35 years, of either sex, systemically healthy and cooperative, with maxillary papillary or papillary penetrating type of frenal attachment showing good oral hygiene at the time of surgery were included. Smokers and tobacco chewers, subjects on antibiotics or anti-inflammatory drugs in past 3 months, those with history of any gingival and/ or periodontal surgical treatment in past 6 months and pregnant or lactating women or women taking oral contraceptive pills were excluded. A detailed case history of the subjects participating in the study was recorded. Signed informed consent was taken prior to the start of study. Oral hygiene instructions were given and scaling and root planning was completed for all the subjects.

Assessment Of Clinical Parameters

Plaque index (maxillary anteriors) [Loe 1967] and Gingival bleeding index (maxillary anteriors) [Carter H.G and Barnes, 1970] were recorded at baseline (before frenectomy), 1-week and 1-month after frenectomy. Using a visual analog scale (VAS), ratings for pain and speech were recorded at day-1, 1-week and 1-month post-operatively.

Surgical Procedure

Conventional frenectomy technique

The area was anesthetized with 2 % lignocaine (with 1:80,000 adrenaline). The frenum was held with the mosquito haemostat to its full depth. With the No. 15 blade mounted on a Bard-Parker handle, an incision was made along the upper surface of the haemostat till the entire depth of the frenum extending into the vestibule. A similar incision was repeated on the under-surface of the haemostat so that the haemostat is detached along with the frenal tissue. Once this was achieved, a rhomboid area exposing the deeper connective tissue fibers was visible. With the help of fine scissors, the deeper fibers were detached from the underlying periosteum. Periosteal scoring was done with the help of surgical blade so as to prevent the reattachment of fibers. The bleeding was controlled by applying pressure packs. The diamond shaped wound was sutured using a 3-0 silk suture in simple interrupted fashion. Proper approximation of the margins was ensured.¹ [figure1]

Paralleling frenectomy technique

For paralleling technique, after anesthesia was achieved the frenum was retracted and two paralleling incisions were placed on the side of ridge of the frenum with a number 11 blade mounted on a Bard-Parker handle. After initial incision, deep dissection of the muscle fibers was done to eliminate all the attachments. Incised frenum was removed by giving releasing incision on the apex and base of the frenum. After frenum excision, the wound was sutured using 3-0 silk suture in simple interrupted fashion to attain primary closure [figure-2].⁴ Postoperative instructions were given and analgesics were prescribed if needed.

III. Statistical Analysis

Data obtained was compiled on a MS Office Excel Sheet (v 2010) and subjected to statistical analysis using Statistical package for social sciences (SPSS v 22.0, IBM). Intergroup comparison of variables like Plaque index, bleeding index, VAS score for pain & VAS score for speech was done using 't' test. Intra group comparison of these variables in each of the 2 groups at baseline to 1 month was done using paired 't' test. For all the statistical tests, $p < 0.05$ was considered to be statistically significant, keeping α error at 5% and β error at 20%, thus giving a power to the study as 80%.

IV. Results

Results of the study are summarized in Tables 1-4. The VAS scores of pain on day 1 and 7 were significantly lower in the paralleling technique as compared to the conventional technique. In addition postoperative functional complication assessed by the speech VAS scores were also significantly lower in the paralleling technique group. While considering oral hygiene after frenectomy both the technique showed significant improvement in oral hygiene of upper anterior region after 1-month.

Table 1: Comparison of plaque index score before (on the day of surgery) and after Conventional and Paralleling frenectomy technique (at 1 week and 1 month)

Plaque index score	At DAY-1 (Mean ± SD)	At Day-7 (Mean ± SD)	At 1 month (Mean ± SD)
Conventional	0.85	1.14	0.53
Paralleling	0.76	1.04	0.42
p value of t test	0.635 [#]	0.477 [#]	0.512 [#]

* (p<0.05) Statistically significant difference

Table 2: Comparison of bleeding index score before (on the day of surgery) and after conventional and paralleling frenectomy technique (at 1 week and 1 month)

Bleeding index score	At DAY-1 (Mean ± SD)	At Day-7 (Mean ± SD)	At 1 month (Mean ± SD)
Conventional	0.65	0.98	0.46
Paralleling	0.66	1.00	0.31
p value of t test	0.919 [#]	0.908 [#]	0.297 [#]

* (p<0.05) Statistically significant difference

Table 3: VAS score for pain at day-1 , at 1 week and at 1 month post-operatively

VAS score for pain	At DAY-1 (Mean ± SD)	At Day-7 (Mean ± SD)	At 1 month (Mean ± SD)
Conventional	1.75	0.29	0.00
Paralleling	0.86	0.13	0.00
p value of t test	0.042	0.045	0.00

* (p<0.05) Statistically significant difference

Table 4: VAS score for speech at day-1 , at 1 week and at 1 month post-operatively

VAS score for speech	At DAY-1 (Mean ± SD)	At Day-7 (Mean ± SD)	At 1 month (Mean ± SD)
Conventional	1.50	0.14	0.00
Paralleling	0.57	0.00	0.00
p value of t test	0.038	0.024	0.00

* (p<0.05) Statistically significant difference

V. Discussion

The widely followed procedure which remains is the conventional (classical) technique. The classical technique leaves a longitudinal surgical incision and scarring, which may lead to periodontal problems and an unaesthetic appearance, thereby necessitating other modifications.⁵ In the era of periodontal plastic surgery, more conservative and precise techniques are being adopted to create more functional and aesthetic results. Recent techniques added frenal relocation by Z-plasty, frenectomy with soft-tissue graft and laser applications to avoid typical diamond-shaped scar and facilitate healing. Each method has its own advantages and disadvantages.⁴

In the present study, subjects treated by paralleling technique had significantly less postoperative pain and functional complication when compared with the conventional technique. In conventional technique at the base of the frenectomy site [Figure 1], primary closure is not possible because large part of mucosa has been removed. In case of paralleling technique less removal of mucosal tissue [Figure 2]. Primary closure is possible in this case throughout the length of frenum because of close approximation of margin produced by thin paralleling incision [Figure2]. Primary closure and less removal of gingival and mucosal tissues could be the reason for less postoperative pain and speech discomfort. These results are in accordance with the study of Abullais SS, Dani N, Ningappa P et al (2016)⁴ who reported less postoperative pain and discomfort in

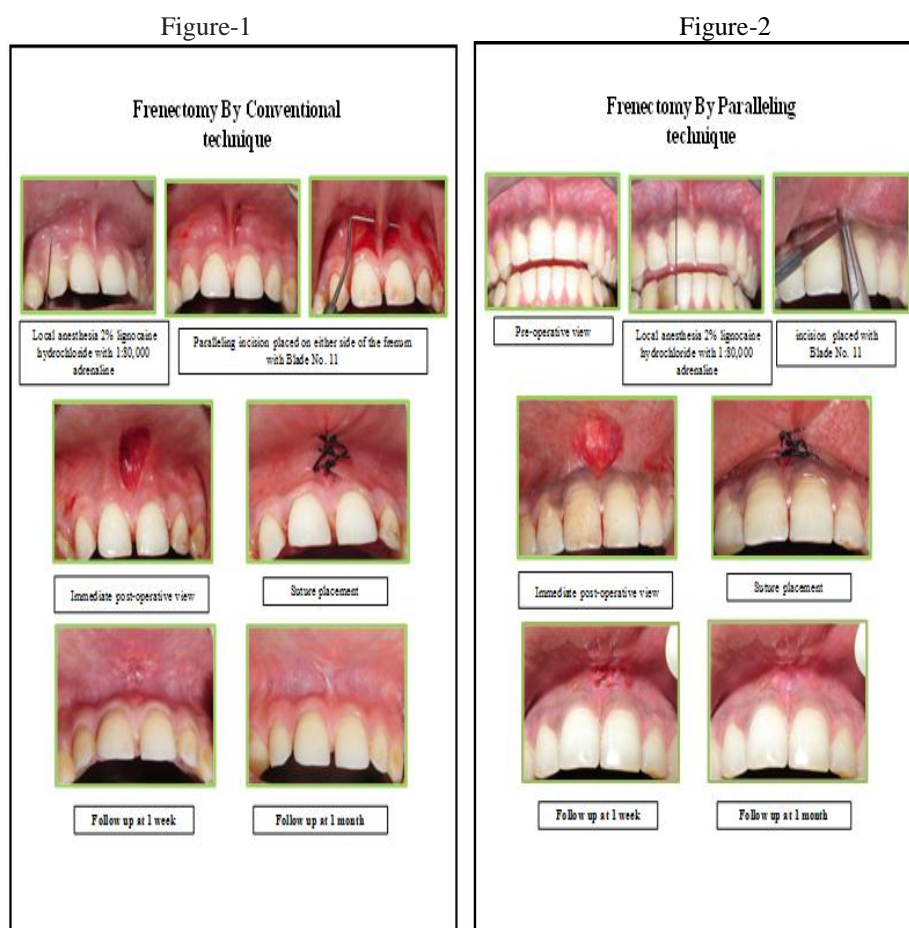
paralleling technique as compared to conventional technique. Plaque index and bleeding index scores were assessed pre and post-operatively. A statistically significant increase in both the indices was observed in both the techniques at 1 week. At the end of 1 month, there was improvement in maxillary anterior region in both techniques. However, on intergroup comparison, there was no significant improvement in plaque index and bleeding index scores.

VI. Conclusion

The Paralleling frenectomy technique proved to be a better alternative to the conventional frenectomy technique in terms of minimal postoperative pain and discomfort (speech).

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