INTRODUCTION

A 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. Frenum problem most often occurs on the labial surface between the maxillary and mandibular surfaces of the teeth. They occur less often on the lingual surface of the teeth. They occur less often on the lingual surface of the teeth. Depending upon the extension of attachment of the frenum, frena have been classified as:3

- Mucosal: When the frenal fibers are attached up to mucogingival junction
- Gingival: When fibers are inserted within attached gingiva
- Papillary: When fibers are extending into interdental papilla
- Papilla penetrating: When the frenal fibers cross the alveolar process and extend up to the palatine papilla.

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, alignment of teeth and psychological disturbances to individual.[3,4]

Frenectomy is the complete removal of the frenum, including its attachment to the underlying bone. There are two techniques for frenectomy. One of these is the conventional technique with scalpels and periodontal knives, and the other is using the soft tissue laser.[5,6] Both of the techniques has certain disadvantages; in addition to that high frenal also hinders oral hygiene maintenance. This study aims to evaluate patient's response to two different frenectomy technique, and oral hygiene maintenance before and after frenectomy. Materials and Methods: Twenty patients with high labial frenum were randomly selected from the outpatient department. Patients were divided into two groups according to the technique used. Each group contained ten patients. One group was treated by "conventional scalpel technique" and other group by "new paralleling technique". To evaluate patients response, visual analogue scale for pain and speech were taken at first postoperative day, 1-week and 1-month. In other part of the study the oral hygiene maintenance was evaluated by using plaque and gingival bleeding index at baseline before frenectomy, 1-week and 1-month after frenectomy. Results: Results showed that new paralleling technique for frenectomy causes less postoperative discomfort and also there was significant improvement in the oral hygiene maintenance by the patient after frenectomy. Conclusion: High maxillary frenum causes hindrance in oral hygiene maintenance. Paralleling technique for frenectomy causes less discomfort to the patient during healing phase when compared with the conventional technique.

Key words: Conventional scalpel technique, frenectomy, high frenal, oral hygiene, paralleling technique.

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conventional scalpel technique on the degree of postoperative pain, discomfort, and functional complication like speech problem which is experienced by the patient after frenectomy.

MATERIALS AND METHODS

Subjects and study design
The study sample was selected from patients who had been visited to the Department of Periodontology M. G. V Dental College and Hospital Nasik. Twenty patients requiring frenectomy were randomly assigned to have treatment either with conventional surgical or with paralleling technique. Informed written consent was obtained from all patients. All subjects were systemically healthy, did not use medications, with gingivitis and had good oral hygiene at the time of surgery. Only maxillary frena extending to the interdental papilla were considered in the study. Twelve male and eight female patients aged between 20 and 35 years were included in the study.

For the conventional technique, the frenum was held with a pair of hemostats [Figure 1], and the whole band of the tissue together with its alveolar attachment was excised with a number 15 blade [Figure 2]. After dissecting the fibrous attachment to the underlying periosteum, the wound was closed with suture [Figure 3].

For paralleling technique, the frenum was retracted and two paralleling incisions were placed on the side of ridge of the frenum with a number 11 blade. After initial incision, deep dissection of the muscle fibers was done to eliminate all the attachments [Figure 4]. Incised frenum was removed by giving releasing incision on the top and bottom of the frenum [Figure 5]. After frenum excision the wound was closed with suture to attain primary closure [Figure 6].

Evaluation of oral hygiene was done by using Plaque index [8] [Figures 7 and 8] and gingival bleeding index. Both the index was recorded preoperatively 1-week and 1-month postoperatively to assess the improvement in the oral hygiene after frenectomy.

Both groups received postoperative instructions, and they were told to use an analgesic if needed.

Method of scoring
The patients were asked to rate the degree of postoperative pain and speech complication on a 10 cm horizontal visual analogue scale (VAS) by placing a vertical mark to assess position between the two endpoints. The left endpoint of the pain scale was designated as “no pain,” and the right end point was designated as “worst pain imaginable.” The patients were asked to mark the position between the two endpoints that best describe their personal perception of the degree of pain and discomfort during speech on postoperative days 1, 7 and 30.

The score for pain and functional complication degree were between 0 and 10. A single operator recorded these scores at postoperative days 1, 7 and 30. After completion, all recordings were analyzed, which included comparison of postoperative pain and the degree of functional complication after the two techniques.

The score for Plaque and Gingival bleeding index for the upper anterior teeth were recorded at 1, 7 and 30 days. Calculation was done to obtain the mean value of the respective index.

Statistical method
Nonparametric Wilcoxon signed rank test was used for intra-group comparison for oral hygiene maintenance. Wilcoxon rank sum test was used for Inter-group comparison for different frenectomy technique. Results were interpreted as mean ± standard deviation a P < 0.05 was considered significant. Statistical analysis was performed using a statistical program.

RESULTS

Results of the study are summarized in Tables 1-3. 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 speaking 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.

DISCUSSION

The aim of this study was to compare the postoperative subjective effects of paralleling and conventional techniques after frenectomy. In the era of periodontal plastic surgery, more conservative and precise techniques are being adopted to create more functional and aesthetic results.

Table 1: Comparison of gingival bleeding and plaque index before and after frenectomy

<table>
<thead>
<tr>
<th>Time interval</th>
<th>Gingival bleeding</th>
<th>Dental plaque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative</td>
<td>1.28±0.23</td>
<td>1.74±0.32</td>
</tr>
<tr>
<td>1-week</td>
<td>1.42±0.25</td>
<td>1.79±0.34</td>
</tr>
<tr>
<td>1-month</td>
<td>0.68±0.12</td>
<td>0.85±0.11</td>
</tr>
</tbody>
</table>

SD – Standard deviation

Table 2: Comparison of the VAS score of postoperative pain after conventional and paralleling technique

<table>
<thead>
<tr>
<th>Time interval</th>
<th>Conventional Mean±SD</th>
<th>Paralleling Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain 1 day</td>
<td>2.92±0.42</td>
<td>1.71±0.23</td>
</tr>
<tr>
<td>1-week</td>
<td>2.07±0.39</td>
<td>1.07±0.19</td>
</tr>
<tr>
<td>1-month</td>
<td>1.07±0.19</td>
<td>±±0.13</td>
</tr>
</tbody>
</table>

SD – Standard deviation

Table 3: Comparison of VAS score of speech after conventional and paralleling technique

<table>
<thead>
<tr>
<th>Time interval</th>
<th>Conventional Mean±SD</th>
<th>Paralleling Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech 1st day</td>
<td>2.25±0.43</td>
<td>1.81±0.26</td>
</tr>
<tr>
<td>1-week</td>
<td>1.62±0.24</td>
<td>1.00±0.16</td>
</tr>
<tr>
<td>1-month</td>
<td>1.07±0.29</td>
<td>±±0.13</td>
</tr>
</tbody>
</table>

SD – Standard deviation; VAS – Visual analogue scale
Abullais, et al.: Paralleling technique for frenectomy

Figure 1: Maxillary frenum held with hemostat in conventional technique

Figure 2: Wide wound surface area after excision of the frenum

Figure 3: Inability to get primary closure by suturing

Figure 4: Two paralleling incision placed on sides of frenum in paralleling technique

Figure 5: Narrow wound area after excision of the tissue

Figure 6: Primary closure obtained by suturing

Figure 7: Visualization of plaque after 1-week in conventional technique

Figure 8: Visualization of plaque after 1-week in paralleling technique
The management of aberrant frenum has travelled a long journey from Archer’s\(^6\) and Kruger’s\(^9\) “classical techniques” of total frenectomy to Edward’s\(^10\) more conservative approach. Recent techniques added frenal relocation by Z-plasty,\(^{11}\) frenectomy with soft-tissue graft and laser\(^{14,15}\) applications to avoid typical diamond-shaped scar and facilitate healing. Each method has its own advantages and disadvantages.

In our study patient treated by paralleling technique had significantly less postoperative pain and functional complication when compared with the conventional technique. Conventionally, a frenectomy procedure involve holding of frenum with the hemostat, incising above and below the hemostat, creating a large diamond shape wound, often with copious bleeding. Patient often experience postsurgical bleeding and pain mainly because of the open area at the base of the frenectomy site [Figure 3], where primary closure is not possible because large part of mucosa has been removed. To overcome these problems a new paralleling technical is used in this study for frenectomy.

In case of paralleling technique two paralleling incisions are made on the side of ridge of the frenum this will reduce the removal of excess mucosal tissue [Figure 4]. After that deep dissection for the muscle fibers are done to remove the attachment. This will decrease the chances of recurrence. Then the thin incised tissue is removed by making sharp cut above and below frenum. Primary closure is possible in this case throughout the length of frenum because of close approximation of margin produced by thin paralleling incision [Figure 5]. Primary closure and less removal of gingival and mucosal tissues could be the reason for less postoperative pain and speech discomfort [Figure 6].

Oral hygiene evaluation was done after 1, 7 and 30 days. Both the technique showed improvement in the oral hygiene in upper anterior region at the end of 30 days [Figures 7 and 8]. Oral hygiene was not improved at 7 days of evaluation, which might be because of sutures or pain that makes it difficult.

CONCLUSION

Paralleling technique provides better patient perception in terms of postoperative pain and speech when compared with conventional technique. High frenum causes hindrance in oral hygiene maintenance and the measures for oral hygiene improves after frenectomy.

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Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES