Button-assisted Coronally Advanced Flap: An Innovative Ortho-perio Amalgamation

ABSTRACT

Introduction: Esthetics has become an essential criterion of the overall treatment plan in dentistry that comprises of a healthy and beautiful smile at any age. Multidisciplinary approach involving orthodontics and periodontics results in the maintenance of a beautiful smile and a healthy periodontium. The continuous endeavor for innovation of newer interdisciplinary treatment modalities has resulted in the use of a passive object like the orthodontic button being used to provide the initial stabilization in cases of root coverage using a Coronally advanced flap (CAF).

Objective: The objective of this case report is to evaluate the effectiveness of a new treatment approach which consists of coronally advanced flap (CAF) procedure combined with orthodontic button application for the treatment of Miller’s class III recession defects.

Methodology: After the application of orthodontic buttons in middle third of tooth surface, a split-full split flap was raised from tooth #22 to #24 and the flap was sutured 3 to 4 mm coronal to cementoenamel junction and the central part of flap was suspended with sutures to the orthodontic button to maximize the stabilization of the immediate postoperative flap location. Clinical parameters were recorded at 1 and 3 months postoperatively.

Results: Complete root coverage was achieved when evaluated from baseline to 3 months along with gain in clinical attachment level and keratinized tissue. The final esthetics, both color match and tissue contours, were highly acceptable.

Conclusion: Three months postoperative results showed that the CAF combined with orthodontic button is a very effective approach even in the treatment of Miller’s Class III recession defects.

Keywords: Gingival recession, Coronally advanced flap, Orthodontic button.

INTRODUCTION

The changing face of dentistry has ushered in a new era where the present day aim is to have a healthy and esthetically pleasing dentition. Thus, esthetics has become an essential criterion of the overall treatment plan in dentistry, which comprises of a healthy and beautiful smile at any age. The various specialties in dentistry—conservative dentistry, prosthodontics, orthodontics, and periodontics all strive to achieve this visually satisfying result either solitarily or in tandem with each other. Multidisciplinary approach involving orthodontics and periodontics often involves maintaining a healthy periodontium and treatment of modalities like correction of midline diastema due to high frenal attachment, supracrestal fiberotomy after completion of orthodontic treatment to prevent relapse, and soon. But the continuous endeavor for innovation of newer interdisciplinary treatment modalities has resulted in the use of a passive object like the orthodontic button being used in cases of root coverage to provide the initial stabilization for coronally advanced flap (CAF) surgeries as presented in our case report.

CASE REPORT

A 40-year-old male patient reported to the outpatient department of SGT Dental College, Hospital and Research Institute, Gurgaon with a chief complaint of sensitivity to hot and cold fluids in upper left front teeth region since 2 months along with a concern for his receding gums. Patient was a nonsmoker, systemically healthy, and had not been on any medications.

On clinical (Figs 1 and 2) and radiographic examination (Fig. 3)-Miller’s Class III gingival recession along with tooth abrasion was diagnosed in relation to 23, 24, and 25. The gingival biotype of the patient was thick. The patient underwent a session of oral prophylaxis along with instruction for maintenance of oral hygiene. Glass ionomer cement restorations were done in relation to the above-mentioned teeth.
The following clinical measurements were taken to the nearest millimeter for the above-mentioned teeth at baseline (before surgery after initial periodontal therapy) 1 and 3 months after surgery (Table 1).

1. Gingival recession depth (GRD), measured as the distance between the most apical point of the CEJ and the gingival margin (GM).

2. Gingival recession width (GRW), measured as the distance between the mesial GM and the distal GM of the tooth (measurement was recorded on a horizontal line tangential at the CEJ).

3. Probing depth (PD), measured as the distance from the GM to the bottom of the gingival sulcus.

4. Clinical attachment level (CAL), measured as the distance from the CEJ to the bottom of the sulcus.

5. Apicocoronal width of keratinized tissue (KTW), measured as the distance from the mucogingival junction (MGJ) to the GM, with MGJ location determined using a visual method.

6. Recession depth reduction.

7. Complete/Partial Root Coverage.

GRD, PD, CAL, and KTW measurements were performed at the midbuccal point of the involved teeth. A Hu-Friedy periodontal probe (UNC-15 periodontal probe) was used for all clinical measurements.

Before the surgery, orthodontic buttons were applied on each of the above-mentioned teeth with flowable composite on the middle 1/3rd of the facial aspect of the tooth after etching and bonding (Fig. 4).

**Surgical Procedure**

After administration of local anesthesia (Xylocaine with 0.2% adrenaline), a horizontal incision was given starting from tooth 22 to 24 (Fig. 5). The papillae were elevated as split thickness flap, followed by full thickness flap apical

**Table 1:** Clinical parameters at baseline, 1 and 3 months postsurgery

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>1 month</th>
<th>3 months</th>
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<tbody>
<tr>
<td>GRD (mm)</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>GRW (mm)</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PD (mm)</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CAL (mm)</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>APW (mm)</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Recession depth reduction</td>
<td>—</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Root coverage (%)</td>
<td>—</td>
<td>100%</td>
<td>100%</td>
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(23 represents the tooth number according to FDI. APW: apicocoronal width of keratinized tissue; CAL: Clinical attachment level; GRD: Gingival recession depth; GRW: Gingival recession width; PD: Pocket depth)
to the root exposures terminating till 3 to 4 mm apical to the bone dehiscence exposing denuded bone. The apical most portion of the flap was undermined to convert it to a split thickness flap, facilitating coronal displacement of the flap. The anatomic interdental papillae were deepithelialized (Fig. 6). The central area of the CAF was stabilized using suspensory sling sutures [with 5-0 Ethicon-(NW-3316)] on the buttons. The surgical papilla was stabilized using loop sutures (with 5-0 Ethicon-(NW-3316) over the interdental connective tissue bed. The final position of the flap was overcorrected to be at least 3 to 4 mm coronal to the CEJ of all teeth at the end of the surgery to compensate for the expected postsurgical wound contracture (Fig. 7). A periodontal dressing was applied to prevent any mechanical trauma (Fig. 8).

**Postoperative Treatment and Follow-up**

Postoperative instructions were given. The patient was instructed to avoid brushing and flossing in the area of surgery and to consume only soft food during the first week. Amoxicillin 500 mg TDS and Ibuprofen 400 mg TDS for 5 days were prescribed to the patient. A 0.2% chlorhexidine digluconate mouth rinse was prescribed 4 times (60 seconds) daily for the first 15 days. Only soft food diet for the first week was advised. The sutures, buttons, and periodontal dressing were removed 14 days after surgery (Fig. 9). The patients were instructed to resume mechanical tooth cleaning of the treated areas using a soft toothbrush and a careful roll technique after 3 weeks of surgery was recalled for prophylaxis 2 and 4 weeks after suture removal. The patient was evaluated at 1 month (Fig. 10) and 3 months.

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*Fig. 4: Orthodontic buttons fixed on the teeth*

*Fig. 5: Horizontal incisions were given from #22 to #24*

*Fig. 6: The flap extending from #22 to #24 elevated with a split-full-split technique*

*Fig. 7: Flap positioned coronally and held in place with suspended sutures around the orthodontic buttons*

*Fig. 8: Coe-Pak placed to protect sutures and surgical site*
surgical time and forces blood clot stabilization. So in order to avoid these adverse effects VRI was eliminated and orthodontic buttons were used.

Orthodontic buttons are routinely used by the orthodontists as an inactive component to provide strong bond for attachment of accessories such as elastics. In this case, these have been used as a passive component for holding sutures so as to provide maximum stability to the flap in the coronally displaced position during 2 weeks of wound healing.

The split-thickness elevation at the level of the surgical papilla guarantees anchorage and blood supply in the interproximal areas mesial and distal to the root exposure; the full-thickness portion, by including the periosteum, confers more thickness, and thus better opportunity to achieve root coverage, to that portion of the flap residing over the previously exposed avascular root surface; the more apical split-thickness flap elevation facilitates the coronal displacement of the flap. Therefore, optimum root coverage results, good color blending of the treated area with respect to adjacent soft tissues and complete recovery of the original (presurgical) soft tissue marginal morphology can be predictably accomplished by means of this surgical approach.

**DISCUSSION**

It has been demonstrated that the initial adhesion of the clot to the root surface is of critical importance in the healing process. A thin clot promotes tensile strength and stability of the wound. The surgical technique and the early postoperative period are the keystones to achieving successful root coverage.

In conventional root coverage procedure, as proposed by Sanctis and Zuchelli in 2007, a split-full-split flap is raised along with vertical-releasing incisions (VRIs) extending beyond mucogingival junctions. These VRIs provide stability to the flap, but it has disadvantages which includes damage to lateral blood supply, unesthetic visible white scars. It has also been reported that there is less increase in apicocoronal width on keratinized tissue because VRI delays or disturbs realignment of mucogingival junction. Absence of VRI limits bleeding during surgery which decreases surgical time and forces blood clot stabilization. So in order to avoid these adverse effects VRI was eliminated and orthodontic buttons were used.

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The presence of the restoration on the cervical area does not prevent soft tissue coverage by the CAF. Instead, it eliminates excessive convexity of the root surface and flap is better adapted and sutured without tension.

According to Pini-Prato only partial root coverage (70% to 75%) can be accomplished in Class III defects. Using this method, a 100% root coverage was obtained in a Miller’s Class III recession. Furthermore, the postoperative course was less troublesome for the patient as no other surgical sites was involved. Besides, the costs of mucogingival operations may increase when other biomaterials materials such as acellular dermal matrix, enamel matrix derivative, and bioabsorbable membrane are included. Orthodontic buttons on the contrary provide a cost-effective alternate and application of these buttons on the teeth was convenient and easily acceptable.

CONCLUSION

Interdisciplinary approach helps the specialists of contributing disciplines immensely in diagnosis, treatment planning, execution of planned treatment, and problem solving for any untoward complication. Orthodontic treatment may be adjunctive to periodontal therapy or vice versa. The results showed that the usage of the orthodontic buttons and suspended sutures with CAF technique was effective in gingival recessions. The 3 months results of this case report were very promising in terms of both clinical (root coverage, esthetics, keratinized tissue height) and patient-centered (esthetics) parameters.

REFERENCES