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TREATMENT OF GINGIVAL RECESSION ASSOCIATED WITH NON-CARIOUS CERVICAL LESION USING CORONALLY POSITIONED FLAP WITH OR WITHOUT RESIN MODIFIED GLASS IONOMER RESTORATION – A CLINICAL STUDY

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ABSTRACT

The aim of this study was to clinically evaluate the treatment of Class I gingival recessions associated with non carious cervical lesion by Coronally positioned flap alone and in combination with Resin Modified Glass Ionomer cement restoration. Twelve patients (24 sites) with bilateral Miller Class I gingival recessions were selected. The defects were randomly assigned to one of the treatments: Coronally positioned flap alone (control site) or Coronally positioned flap along with Resin Modified Glass Ionomer cement restoration (test site). The clinical parameters included were Width of the defect (WD), Depth of the defect (DD), Relative clinical attachment level (RCAL), Relative Gingival Recession (RGR), Height of Keratinized Tissue (HKT), Thickness of Keratinized Tissue (TKT), Plaque Index (PII), Gingival Index (GI), Probing Depth (PD), Cervical lesion height in root surface (CLH R) and Dentin Sensitivity (DS). The measurements were taken before the surgery and first, third and sixth month after surgery. The treatment resulted in significant gain in relative clinical attachment level. There was a greater reduction in Dentin sensitivity in the test site when compared to control sites. It can be concluded that both techniques provide significant root coverage in Class I gingival recessions; however, a greater reduction in Dentin sensitivity was observed with Resin Modified Glass Ionomer Cement.

KEYWORDS: Gingival Recession, Resin Modified Glass Ionomer Cement, Coronally Positioned Flap

INTRODUCTION

Gingival recession is defined as the displacement of the marginal tissue apical to the cementoenamel junction1. It is a common finding in periodontally untreated patients with poor oral hygiene as well as those who maintain a high standard of oral hygiene, (Loe H
1992, Serino G 1994). Common factors that influence gingival recession are alveolar bone
dehiscence, high muscle attachment, frenal pull, iatrogenic factors, hard tooth brush,
traumatic tooth brushing habits, orthodontic tooth movements and periodontal disease.
Recession has been clinically related to a higher incidence of root caries, periodontal
attachment loss, hypersensitivity, unaesthetic gingival appearance and cervical wear.3

Reports of surgical root coverage procedures have shown conflicting rates of success
and predictability and have led to the development of number of surgical techniques from the
time, Grupe and Warren introduced lateral sliding flap for root coverage. Bjorn is frequently
quoted as having introduced the free soft tissue auto graft, but a detailed description of the
technique was published by Sullivan and Atkins. Use of acellular dermal matrix graft is an to
obtain root coverage in areas with localized or generalized soft tissue recessions, particularly
if the recessions create aesthetic concern or root sensitivity or shallow root caries lesions
Kavitha et al.3,4,5,6,7,8,9,20

Norberg (1926) introduced Coronally repositioned flap procedure.10 The Coronally
positioned flap is one of the valid surgical options in the treatment of Miller class I and II
gingival recession. Coronally positioned flap was more commonly used as a means of gaining
root coverage and has varying degree of success. The advantage is that it is not technique
sensitive and also discriminates the need to harvest donor tissue and minimize the morbidity
of donor areas.

Gingival recession is associated frequently with cervical wear. Sangnes and Gjermo
(1976) reported that gingival recession and a wedge-shaped defect in the cervical area often
were seen affecting the same tooth. It was mentioned in another report12 that, because of
cervical abrasion, no sign of the Cemento-enamel junction (CEJ) was observed in ; 50% of
the examined teeth showing gingival recession. Despite this close association between
gingival recession and non-carious cervical lesions, restorative procedures, such as composite
restoration, are selected frequently as the single therapy to treat this condition.13 However,
optimal functional and esthetic results may require the combined use of periodontal and
restorative procedures.14

Gingival recessions associated with Non Carious Cervical Lesions can be treated
successfully with a Glass Ionomer Restoration combined with a Coronally advanced flap,
with or without a connective tissue graft15. After the healing period, part of the restoration
must be covered by the soft tissue. Despite the subgingival location of the apical margins of
the restorations, a good esthetic outcome and gingival health with no signs of inflammation,
such as redness and bleeding on probing (BOP), were observed.
MATERIALS AND METHODS

The clinical trial was conducted on 12 patients, selected from those attending the outpatients unit of Rajah Muthiah Dental College and Hospital.

The patients were treated for bilateral Miller Class I gingival recessions associated with Non Carious Cervical Lesion (1 to 3 mm deep) in maxillary canines or premolars. Each patient served as their own control and assigned to one of the following treatments site.

I. Experimental Site: Combination of Resin Modified Cement Restoration with Coronally Positioned Flap alone

II. Control Site: Coronally Positioned Flap Alone

The patients were informed about the study and a written informed consent was obtained from them.

INCLUSION CRITERIA

- Age site: 21 to 49 years
- Bilateral Miller class I recession in canine and premolars.
- Probing sulcus depth of less than 3mm
- Absence of bleeding around the teeth selected for treating recession.
- Vital pulp in the teeth treated for recession as determined by thermal or electric stimulation.

EXCLUSION CRITERIA

- Medically compromised patient
- Smokers
- Tooth with pulpo-perio problems
- Aggressive periodontitis
- Refractive periodontitis
- Pregnant or lactating women
- Patients under drugs known to cause gingival enlargement
- Patients allergic to any medication to be used in the study.
- Any contraindications to periodontal surgery.

CLINICAL MEASUREMENTS

WIDTH OF THE DEFECT (WD): The width was recorded at a level of 1mm apical to the Cemento enamel junction. (WD)
DEPTH OF THE DEFECT (DD): Distance between Cemento enamel junction and gingival margin

WIDTH OF THE KERATINIZED TISSUE (WKT): Distance between gingival margin (GM) and Mucogingival junction (MGJ)

WIDTH OF ATTACHED GINGIVA: Distance from the free gingival groove to mucogingival junction

PROBING DEPTH (PD): Distance between gingival margin (GM) and bottom of the pocket.

RELATIVE CLINICAL ATTACHMENT LEVEL (RCAL): Calculated as Relative Recession + Probing depth (PD)

NON CARIOUS CERVICAL LESION IN CEMENTUM (CLH R): Cervical abrasion apical to Cemento enamel junction

NON CARIOUS CERVICAL LESION IN ENAMEL (CLH C): Cervical abrasion coronal to Cemento enamel junction

DENTIN SENSITIVITY: Sensitivity recorded by patient own words.

All datas were collected and recorded on a case history proforma and measurements were made using William’s Periodontal probe and using digital caliper.

PRE- SURGICAL PREPARATION

- Initial therapy consisting of scaling and root planning was carried out.
- Occlusal adjustment was done if necessary.

PROCEDURE:

- After obtaining adequate anesthesia (Lignocaine 1:80,000) the exposed root surface was scaled and planed using hand and ultra sonic instruments.
- In test site Non- Carious Cervical lesion was restored with Resin Modified Glass Ionomer cement.
- Surgical procedures were similar for both the sites.
- A horizontal intra crevicular incision was made at the recession and extended with two releasing vertical releasing incision in correspondence to the line angles, the interdental papilla was preserved as much as possible. Their facial portion was deepithelialized to create a connective tissue bed.
- Full thickness flap was elevated.
- Horizontal incision was placed at the base of the flap to ensure tension free coronal displacement of the flap.
The flap was then Coronally positioned to completely cover the defect and secured using continuous sling suture (No 5-0 bioabsorbable polyglactin material).

Vertical releasing incisions were approximated using interrupted suture technique.

**POST SURGICAL CARE**

Immediately following surgery, use of icepacks was recommended intermittently for three hours. [Pini Prato\textsuperscript{16}, Pagliaro, Baldi et al]. All patients were instructed to discontinue tooth brushing around the surgical site and advised to use 0.12% chlorhexidine gluconate mouth rinse for four weeks. Systemic antibiotics were prescribed (Amoxicillin-500 mg, three times daily for five days) along with analgesics. Patients were advised to avoid pull their lips and to avoid excessive muscle tractioning. Sutures were removed 2 weeks after surgery. Clinical measurements and photographic documentation were taken at baseline and 1\textsuperscript{st} month, 3\textsuperscript{rd} month and 6\textsuperscript{th} month post-operatively.

**STATISTICAL ANALYSIS**

The difference between the preoperative and follow up measurements of each parameter of the patient were computed.

The mean differences within the sites were tested for significance by Friedman test. The mean differences between the sites were tested for significance by Wilcoxon test.

**Armamentarium**

- Resin Modified Glass Ionomer Cement & Digital Caliper
Preoperative View of Recession (Control Site)

Sulcular Incision Placed (Control Site)

Vertical Incision Placed (Control Site)

Full and Partial Thickness Flap Reflection (Control Site)
Root Planing Done (Control Site)

Flap Coronally Advanced and Sutured (Control Site)

Preoperative View of Recession (Test Site)

Resin Modified Glass Ionomer Restoration Done (Test Site)
Non Carious Cervical Lesion Restored With Resin Modified Glass Ionomer Restoration

- Done (Test Site)

- Sulcular Incision Placed (Test Site)

- Vertical Incision Placed (Test Site)

- Full And Partial Thickness Flap Reflection (Test Site)
Flap Coronally Advanced And Sutured (Test Site)

Post – Operative 1st Month (Control Site)

Post – Operative 3rd Month (Control Site)

Post – Operative 6th Month (Control Site)
RESULT

This study was carried out in the Division of Periodontics, Rajah Muthiah Dental College to evaluate the effectiveness of using Coronally advanced flap with or without Resin Modified Glass Ionomer restoration in Millers class I gingival recession associated with non-carious cervical lesion. The clinical trial was performed on a sample of 12 patients (24 sites) aged between 21 to 49 years. All were male patients. A total of twelve recession sites were treated with Coronally advanced flap alone and twelve recession sites were treated with Coronally advanced flap over Resin Modified Glass Ionomer restoration. Healing was uneventful in all the patients with very minimal post operative pain.
### TABLE 1: MEAN AND STANDARD DEVIATION OF WIDTH OF DEFECT (WD) AT BASELINE, 1ST MONTH, 3RD MONTH AND 6TH MONTH (in mm)

<table>
<thead>
<tr>
<th>PERIOD(WD)</th>
<th>CONTROL</th>
<th>TEST</th>
<th>COMPARISON</th>
<th>p VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>BASELINE</td>
<td>2.833</td>
<td>0.718</td>
<td>2.833</td>
<td>0.718</td>
</tr>
<tr>
<td>1 MONTH</td>
<td>0.250</td>
<td>0.452</td>
<td>0.333</td>
<td>0.651</td>
</tr>
<tr>
<td>3 MONTH</td>
<td>0.500</td>
<td>0.522</td>
<td>0.500</td>
<td>0.674</td>
</tr>
<tr>
<td>6 MONTH</td>
<td>0.583</td>
<td>0.515</td>
<td>0.750</td>
<td>0.622</td>
</tr>
<tr>
<td></td>
<td>F=32.25</td>
<td>F=29</td>
<td></td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>

### TABLE 2: MEAN AND STANDARD DEVIATION OF DEPTH OF DEFECT (DD) AT BASELINE, 1ST MONTH, 3RD MONTH AND 6TH MONTH. (in mm)

<table>
<thead>
<tr>
<th>PERIOD (DD)</th>
<th>CONTROL</th>
<th>TEST</th>
<th>COMPARISON</th>
<th>p VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>BASELINE</td>
<td>3.417</td>
<td>1.084</td>
<td>3.417</td>
<td>1.084</td>
</tr>
<tr>
<td>1 MONTH</td>
<td>0.333</td>
<td>0.651</td>
<td>0.333</td>
<td>0.651</td>
</tr>
<tr>
<td>3 MONTH</td>
<td>0.583</td>
<td>0.669</td>
<td>0.500</td>
<td>0.674</td>
</tr>
<tr>
<td>6 MONTH</td>
<td>0.750</td>
<td>0.754</td>
<td>0.833</td>
<td>0.718</td>
</tr>
<tr>
<td></td>
<td>F=32.012</td>
<td>F=29.01</td>
<td></td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>

www.jiarm.com
### TABLE 3: MEAN AND STANDARD DEVIATION OF WIDTH OF ATTACHED GINGIVA (WAG) AT BASELINE, 1ST MONTH, 3RD MONTH AND 6TH MONTH (in mm)

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>CONTROL</th>
<th>TEST</th>
<th>COMPARISON</th>
<th>p VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>BASELINE</td>
<td>2.083</td>
<td>1.222</td>
<td>2.042</td>
<td>1.137</td>
</tr>
<tr>
<td>1 MONTH</td>
<td>5.208</td>
<td>0.988</td>
<td>5.208</td>
<td>0.722</td>
</tr>
<tr>
<td>3 MONTH</td>
<td>4.958</td>
<td>0.753</td>
<td>4.958</td>
<td>0.542</td>
</tr>
<tr>
<td>6 MONTH</td>
<td>4.792</td>
<td>0.722</td>
<td>4.625</td>
<td>0.772</td>
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<tr>
<td></td>
<td>F=32.01</td>
<td></td>
<td>F=31.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P&lt;0.001</td>
<td></td>
<td>P&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 4: MEAN AND STANDARD DEVIATION OF RELATIVE GINGIVAL RECESSION (RGR) AT BASELINE, 1ST MONTH, 3RD MONTH AND 6TH MONTH (in mm)

<table>
<thead>
<tr>
<th>PERIOD RGR</th>
<th>CONTROL</th>
<th>TEST</th>
<th>COMPARISON</th>
<th>p VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>BASELINE</td>
<td>10.417</td>
<td>1.165</td>
<td>10.417</td>
<td>1.165</td>
</tr>
<tr>
<td>1 MONTH</td>
<td>7.333</td>
<td>1.371</td>
<td>7.333</td>
<td>1.557</td>
</tr>
<tr>
<td>3 MONTH</td>
<td>7.583</td>
<td>1.240</td>
<td>7.500</td>
<td>1.446</td>
</tr>
<tr>
<td>6 MONTH</td>
<td>7.750</td>
<td>1.215</td>
<td>7.833</td>
<td>1.337</td>
</tr>
<tr>
<td></td>
<td>F=32.01</td>
<td></td>
<td>F=29.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P&lt;0.001</td>
<td></td>
<td>P&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 5 : COMPARISON OF DENTINAL SENSITIVITY AT BASELINE, 1ST MONTH, 3RD MONTH AND 6TH MONTH. (VIDE FIGURE 7)

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>CONTROL</th>
<th>TEST</th>
<th>COMPARISON</th>
<th>p VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASELINE</td>
<td>12</td>
<td>12</td>
<td>_</td>
<td>_</td>
</tr>
<tr>
<td>1 MONTH</td>
<td>0</td>
<td>0</td>
<td>_</td>
<td>_</td>
</tr>
<tr>
<td>3 MONTH</td>
<td>3</td>
<td>0</td>
<td>1.732</td>
<td>0.083</td>
</tr>
<tr>
<td>6 MONTH</td>
<td>8</td>
<td>0</td>
<td>2.828</td>
<td>0.005</td>
</tr>
</tbody>
</table>

(SIGNIFICANT)

COMPARISON OF DENTINAL SENSITIVITY AT BASELINE, 1ST MONTH, 3RD MONTH AND 6TH MONTH.

DISCUSSION

The present study aimed at treating Millers Class I recessions, with a mean initial recession height of 3-4mm associated with Non Carious cervical lesion using Coronally advanced flap alone (control site) and Coronally advanced flap with Resin Modified glass Ionomer restoration (test site).

This type of defect could be treated with many variations of three basic approaches: 1) pedicle soft tissue grafts; 2) free soft tissue grafts; or 3) combinations of the two. Among the pedicle grafts, the Coronally positioned flap is one of the valid surgical options to cover exposed root surfaces. It has many advantages over other surgical procedures used to treat gingival recessions: it does not require a separate surgical site to obtain a graft. When root
exposure is associated with non carious cervical lesion, the cosmetic component of the surgical or restorative procedure may not be successful, especially in apically extensive lesions. Therefore to solve problems of sensitivity and esthetics simultaneously, a combined restorative surgical therapy was proposed for the treatment of gingival recession associated with Non Carious Cervical Lesion.

However in this study Resin Modified Glass Ionomer restoration was placed over the root surface to fill an Non carious cervical lesion in the test site (Coronally positioned flap plus Resin Modified Glass Ionomer restoration). Thus the goal of this split mouth randomized controlled clinical trial was to compare the treatment of gingival recession associated with Non carious cervical lesion with Coronally positioned flap plus resin modified glass Ionomer restoration.

Alkan et al\textsuperscript{17} demonstrated that periodontal health was maintained when Resin Modified glass Ionomer restoration was used for sub gingival restorations.

Similar to the above finding, the present study also revealed that there was no significant difference in Relative gingival recession after 6 months in both the sites treated with Coronally advanced flap alone or Coronally advanced flap with Resin Modified glass Ionomer restoration.

Therefore the observed change in Relative Gingival Recession after 6 months was same in Coronally advanced flap with Resin Modified glass Ionomer restoration when compared with Coronally advanced flap alone. Therefore it can be assumed that the presence of restoration on cervical area may not prevent the amount of soft tissue coverage that can be achieved by Coronally advanced flap alone.

In the present study subjects were assessed for the presence of dentin sensitivity before and after treatment orally, without the application of thermal or tactile stimuli to detect the sensitivity. The success of the therapy was based on the subjective evaluation of this symptom.

While comparing Dentin sensitivity between test and control sites a statistically significant difference with better outcomes was observed in the test site (Coronally positioned flap with Resin Modified Glass Ionomer restoration). The above results was in accordance with the observation of the investigation carried out by Santamaria et al\textsuperscript{18}.

Dragoo\textsuperscript{19} demonstrated histological evidence that epithelium and connective tissue can adhere to Resin Modified Glass Ionomer restoration when placed in sub gingival environment.
On the contrary some studies reported that sub gingival restorations are harmful to gingival health. However present study revealed that the fillings did not produce gingival inflammation and plaque accumulation compared to the control site.

In the present study all the treated sites showed root coverage improvement without damage to periodontal tissues, supporting the use of Coronally positioned flap for treatment of root surfaces restored with Resin Modified Glass Ionomer as being effective over a 6 months period.

The true benefits for the patient are improved esthetics and the stability of the results overtime. Longitudinal studies with a longer duration and histological analysis have to be done for evaluating the success and stability of the surgical procedure.

CONCLUSION

To conclude, the findings of the present study indicated that acceptable root coverage can be achieved in class I gingival recessions when treated with Coronally positioned flap alone as well as Coronally positioned flap along with Resin Modified Glass Ionomer cement.

However, absence of Dentin sensitivity is significant in sites treated with Resin Modified Glass Ionomer Cement. Future clinical and histological investigations in large number of defects with longitudinal follow up should be conducted to assess the short and long term effectiveness of this technique.

REFERENCES