BACKGROUND

Collagen plug has been a popular and practical choice by many practitioners to cover bone graft material for ridge preservation procedures; however, very limited studies had focused on the specific use and efficacy of collagen plug as an exposed barrier membrane.

Additionally, current clinical studies on ridge preservation had mainly focused on the bone dimensional changes (Van de Weijden et al. 2009; Avila-Ortiz et al. 2014), but little is known about the soft tissue healing events and the factors related to the initial wound healing, which could be highly associated with the final outcomes.

One of the main concerns from using collagen plug is the integrity during the healing phase if it will contain the bone graft or wound healing time course and optimize the application of collagen plug not. Given the popularity, there is a need to conduct clinical studies to understand the socket.

**Aim:** Qualitatively and quantitatively evaluate the secondary soft tissue healing over collagen plug as a barrier membrane over allograft.

**Methods**

- **Patient selection:** A total of 22 consecutive cases required extractions and socket grafting were included.
- **Socket grafting:** Allograft (cancellous) with Collaplug
  - Modified cross-cut suture
- **Analysis:**
  - 0, 2, 4 week follow up
  - Quantitative evaluation (Mean % area)
  - Qualitative evaluation by blinded examiner

**RESULTS**

<table>
<thead>
<tr>
<th>Average % Wound Closure</th>
<th>Average Wound healing quality score</th>
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</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>73.9 ± 0.23</td>
</tr>
<tr>
<td>Diabetes (Well controlled)</td>
<td>81.1 ± 0.32</td>
</tr>
<tr>
<td>Compromised (Chemo/radiation)</td>
<td>71.7 ± 0.71</td>
</tr>
<tr>
<td>Current smokers</td>
<td>5.40 ± 0.28</td>
</tr>
</tbody>
</table>

- After two-week healing, an average of 47.09% of soft tissue wound closure was achieved, minimal additional wound shrinkage (14.77%) occurred between the two to four week post-extraction.

- Current smokers exhibited both the least quantitative and qualitative soft tissue wound closure at both time points.

**DISCUSSION**

- Why minimal shrinkage occurs between 2-4 weeks? Reached the maximum contractile forces of myofibroblasts resulted in partial wound closure at around 2 weeks. And the secondary healing/granulation tissue filled in the rest of the wound on ward.

- Why current smokers showed compromised healing? Smoking alterations the host immune response and suppress vasculature. Majority of the smoker subjects reported to resume smoking after 2 days post-extraction.

**SUMMARY**

- The majority of soft tissue wound closure (around 50%) occurred within two weeks post-extraction and the remaining area potentially convert into the formation of keratinized tissue.

- Current smoker negatively impact the soft tissue healing despite patient self-reported reduction of the cigarette.

- Caution should be taken and closely monitor the smokers during the early stage of socket graft healing.