Abstract

Objectives: This retrospective study evaluated the influence of Laser-Lok microtextured surface (LMS) implants on changes in marginal bone level after immediate implant placement, in maxillary and mandibular posterior fresh sockets with hydroxyapatite agarose gel.

Material and Methods: This study was designed as a retrospective study with a 3-year follow-up. Seventy patients (21 men, 49 women) were included, with a mean age of 52.8 years (range 28–79 years). Within these patients, 40 patients were treated in the maxillary and 30 patients in the mandibular posterior region. The socket was covered with HA/agarose gel without primary closure. Soft tissue healing was excellent at 2 months after implant placement. The final restoration was completed between 12 and 20 weeks after implant insertion.

Results:

- The surgical protocol was used for all subjects.
- Soft tissue healing was excellent at 2 months after implant placement.
- The final restoration was completed between 12 and 20 weeks after implant insertion.

- Immediate implant placement in the posterior region has several advantages. Some strategies have been developed to improve hard and soft tissue integration and prevent marginal bone loss. One such strategy is the use of Laser-Lok microtextured surfaces (LMS) for immediate implant placement in posterior fresh sockets with missing bony plate, where bony defect height was > 5 mm. Initially, the gap was filled with synthetic bone substitute hydroxyapatite/agarose (HA/agarose) gel and the site was left open. Clinical and radiographic evaluations were performed immediately after implantation and 3 years thereafter.

Methods and Materials

This study was conducted in compliance with the Declaration of Helsinki, and was approved by the ethical committee of Miyakonojo National Hospital. This study was registered at the University Hospital Medical Information Network (UMIN000027172).

Patient selection

Patients enrolled in the present retrospective study were identified through the customized records of Miyakonojo National Hospital. Only patients treated with immediate implant in the posterior (premolar and molar) region in either the maxilla or mandible between January 2011 and December 2014, with successful single-tooth restoration and complete 3-year follow-up were included.

Exclusion criteria were:
- Good systemic and oral health
- Age > 40
- History of radiation therapy
- History of any medical condition that may affect oral health
- Smoking (more than 10 cigarettes/day)
- Uncontrolled diabetes
- Heavy smoking (>10 cigarettes/day)
- Bacterial infection
- Uncontrolled HIV
- Uncontrollable bleeding disorder
- Use of anticoagulants
- Use of non-steroidal anti-inflammatory drugs
- Use of systemic corticosteroids

A total of 40 patients (12 men, 28 women) were included, with a mean age of 63 years (range 49–83 years). Within these patients, 20 patients were treated with a LMS implant (Tapered Internal TLX Laser Lok, BioHorizons, Birmingham, AL, USA) and 20 patients with a MC implant (XiVE plus, Dentsply) was packed into the bone defect. HA/agarose gel was densely packed into the bone defect. Asch et al., 2003. J Biomed Mater Res B Appl Biomater 2003; 67: 680–688.

Table 1. Mean Average of Proximal Bone Defect Range (mm) at 3 years

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Proximal Bone Defect Depth (mm)</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS (N=20)</td>
<td>5.30±2.25</td>
<td>0.65±1.12</td>
</tr>
<tr>
<td>MC (N=20)</td>
<td>12.1±3.25</td>
<td>4.11±1.57</td>
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</tbody>
</table>

Table 2. % Reduction of Depth at the Proximal Bone Defect Over Time

<table>
<thead>
<tr>
<th>Group</th>
<th>Reduction of Depth (%)</th>
<th>Time (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS (N=20)</td>
<td>78.6%</td>
<td>3</td>
</tr>
<tr>
<td>MC (N=20)</td>
<td>47.4%</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 3. Probing Depth Measurement in Both Groups after 3 years

<table>
<thead>
<tr>
<th>Group</th>
<th>Probing Depth Range (mm)</th>
<th>MeansSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS (N=20)</td>
<td>1.17</td>
<td>0.51</td>
</tr>
<tr>
<td>MC (N=20)</td>
<td>4.11</td>
<td>1.19</td>
</tr>
</tbody>
</table>

Conclusions

Within the limitations of this research, the flapless surgery with no primary closure used for immediate implant placement in posterior fresh sockets with missing bony plate and a >2 mm gap was predictable results using LMS implants combined with HA/agarose gel. Conversely, the procedure is not recommended to MC implants.

References

