A novel solution for anterior implant aesthetics
Implant placement combined with hard- and soft-tissue augmentation via the VISTA technique

For achieving an appearance similar to natural teeth, adequate hard- and soft-tissue support is a prerequisite to implant placement in the ideal position. From a prosthetic point of view, the ideal position for an implant usually requires the establishment of a significant amount of bone and soft-tissue volume using grafts in order to maintain aesthetics during the healing process and tissue remodelling. An aesthetic outcome therefore still remains challenging, even for an experienced clinician.

Since 2002, many articles focusing on immediate or early implant placement in extraction sockets have been published. Studies have shown that immediate placement can reduce treatment time. However, this involves different classifications and treatment recommendations. In 2005, for example, Dr Joseph Kan introduced a novel classification for immediate implant placement, in which buccal bone and histotype are carefully measured (Table 1). For Class I and 2, immediate implant placement is possible and predictable.

Table 1: The extraction defect sounding classification.

<table>
<thead>
<tr>
<th>Defect type</th>
<th>General assessment</th>
<th>No. of biotype affected</th>
<th>Bone</th>
<th>Hard tissue</th>
<th>Soft tissue</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pristine</td>
<td>0</td>
<td>Thick</td>
<td>0 mm</td>
<td>0–3 mm</td>
<td>Immediate placement (two stage)</td>
</tr>
<tr>
<td>2</td>
<td>Moderate damage</td>
<td>1–2</td>
<td>Thick</td>
<td>0–2 mm</td>
<td>3–5 mm</td>
<td>Achievable but site preservation or site development then implantation (three stage)</td>
</tr>
<tr>
<td>3</td>
<td>Severe damage</td>
<td>2–3</td>
<td>Thin</td>
<td>0–2 mm</td>
<td>3–5 mm</td>
<td>Compromised site preservation then implantation (one or two stage)</td>
</tr>
</tbody>
</table>

The VISTA technique reduces tissue remodelling and retains soft-tissue appearance, which results in a better clinical aesthetic outcome.

Clinical case report
A 48-year-old female patient of Asian ethnicity presented for treatment of tooth 21, which had been extracted the week before owing to trauma. She did not smoke, nor did she have any systemic disease. She also showed no signs of recreational drug abuse. No known drug allergy was reported. Generally, she was a healthy middle-aged woman (Figs. 1–8).

The clinical examination revealed a relatively healthy periodontium, with localised bone destruction visible on tooth 27. Previously, tooth 11 had been treated endodontically. She had a Class I interdental occlusal relationship, but denied bruxism and therefore the use of night-guard protection. There was no temporomandibular joint disorder and the head and neck examination was within normal limits.
In addition to its elegant and stylish design, its ease-of-use, its high image resolution and its reliability, the I-Max Touch 3D offers the ideal field of view (FOV) for use in dental imaging. With SimPlant® software pre-loaded, the I-Max Touch 3D is a MUST-HAVE for your implant planning procedure.
The extraction socket was healing with granulation tissue after one week. The CT image showed about 10 mm (mesiodistally), 7 mm (buccolingually) and 22 mm (corono-apically). According to Kan’s sagittal root classification, the sagittal root position was Class I.10

Local anaesthesia was administered (2 % lidocaine with 1:100,000 epinephrine). The granulation tissue was then removed and buccal bone thickness was measured. According to the periodontal probe measurement, the buccal bone was very thin, as we could feel the vibration of the buccal plate. Therefore, hard- and soft-tissue augmentation were indicated in this particular case (Figs. 9–13) and the VISTA technique was consequently performed.

A vertical incision was made first on the middle frenum, 2–3 mm apical from the papilla in order to achieve an ideal mucogingival position. In areas with a thin biotype to a thick biotype, preserving the labial bone and augmenting the bone graft was stable. A harvest of buccal hard and soft-tissue had been harvested, and connective tissue had been harvested, which achieved good initial stability (Figs. 16–23).

Drilling was performed in accordance with the recommendations of the manufacturers of the implant system. The ideal implant position was determined to 2.5 to 5 mm apical to the buccal gingival margin, with 1.5–2 mm between the implant and adjacent tooth and with 2–3 mm from the cervical height of contour to the buccal surface of the implant platform.11–13 After the osteotomy had been performed, a 4.2 x 14 mm platform-switching implant was placed, which achieved good initial stability (Figs. 24–28).

Two membranes were placed horizontally and vertically to augment the site via the vertical incision. Freeze-dried bone allograft mixed with bovine bone was used to maintain the volume. After that, the connective-tissue graft was sutured to the flap to cover the socket. The vertical incision was then closed and the graft was held in place (Figs. 29–36).

After four months of healing, a simple second-stage surgery was performed. Only a single incision was required to replace the healing abutment, which helped to push soft tissue buccally to improve appearance (Figs. 37–41). Two weeks later, after the soft tissue had healed, an open-tray impression technique was used to fabricate the final restorations on both teeth 11 and 21 (Figs. 43–45). Figures 33 to 46 show the seating of the crowns.

At the half-year follow-up appointment, a CT scan showed that the bone graft was stable. A harmonic result had been achieved (Figs. 47 & 48).

Discussion

Articles on immediate or early implant placement recommend preserving the labial bone and augmenting the soft tissue, changing a thin biotype to a thick biotype. The question is whether immediate implantation will be able to halt the labial bone resorption. Unfortunately, the answer is no. After a long-term follow-up, many anterior immediately placed implants without bone grafting showed extensive labial bone resorption. Considering this, it is not adequate to preserve labial bone only, it also needs to be augmented to be thicker than 1 mm. It should ideally be 2 mm thick.

In Asian populations, ideal candidates for anterior immediate implantation are rare unless the criteria stated above can be met by performing augmentation procedures. Combining immediate implantation with ala-laminar subepithelial connective-tissue graft can change soft tissue from a thin to a thick biotype and offer better resistance to long-term remodelling and physical trauma. However, hard-tissue augmentation remains almost impossible.

In order to perform a bone-grafting procedure, an open-flap and tension-free periosteal releasing incision is usually used in order to achieve adequate volume and primary closure. Inevitably, this ends with a large wound and incorrect mucogingival position. In areas demanding high aesthetics, it rarely achieves satisfactory results. Fortunately, the VISTA technique with hard- and soft-tissue augmentation can help clinicians without preparing the blood supply and more easily maintains an intact gingival margin. In this case report, hard- and soft-tissue augmentation was performed simultaneously with implant placement. By utilising the VISTA technique to regenerate damaged labial bone and to close the jumping gap of the extraction socket, blood supply is improved and soft-tissue stability is increased. The VISTA technique can offer great benefits to the patient and operator, and it can shorten treatment time in the aesthetic zone.

Editorial note: A complete list of references is available from the publisher.

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