Reconstruction and rehabilitation of a compromised single-tooth gap in the anterior maxilla with a moderately high smile line

Pocket depths of 11 to 12 mm were recorded for the distal aspects of tooth #13 with initial signs of pulpal involvement. In addition, the tooth presented with a mobility of Class II. The tooth was deemed unsalvageable and indicated for extraction (Fig. 1). Radiographic examination revealed a localised, severe vertical (through-and-through) defect on the distal of the tooth (Fig. 2).

Three months after extraction, the missing gap site healed uneventfully but demonstrated a severe horizontal ridge defect (Figs. 3–4). A staged guided bone regeneration (GBR) approach utilising an autogenous block graft was indicated to augment the loss of horizontal alveolar ridge prior to the placement of a dental implant.

An autogenous block graft (12 x 6 x 5 mm) was harvested from the patient’s lower right ramus region, and subsequently positioned and secured using a fixation mini-screw at the tooth #13 recipient site (Fig. 7).

This was followed by placement of additional autogenous bone chips and a demineralised bovine bone substitute for appropriate contour bone adaptation around the secured block graft (Fig. 8). Thereafter, a resorbable collagen membrane was placed over the newly augmented site (Fig. 9).

Prior to flap closure, a periosteal incision was made to ensure a tension-free flap. Wound margins were then re-approximated and closed with interrupted resorbable 5-0 and 6-0 Vicryl sutures (Fig. 10).

Six months after the GBR procedure, healing was without incident. The missing gap site at tooth #13 demonstrated favourable buccolingual ridge widths with good plaque control and healthy soft tissue (Fig. 11). Once anaesthesia was achieved, a mid-crestal incision was performed with only a vertical relieving incision made at the distal line angle of tooth #15 (Fig. 12).
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Upon the removal of the fixation miniscrew, the implant site preparation was performed with the aid of a surgical stent (Fig. 13). The implant bed was appropriately scalloped and subsequent drills were utilised (Fig. 14).

A Straumann Bone Level implant (Ø: 4.1 mm, L: 12 mm, SLActive) was selected and placed in the prepared implant osteotomy site. Correct 3-D positioning and primary stability were achieved (Figs. 15–17).

Primary closure of flaps was achieved using interrupted resorbable 5-0 Vicryl sutures (Fig. 17).

Following eight weeks of healing, a Stage II re-entry procedure was performed and a healing abutment replaced (Ø: 6 mm, H: 4 mm; Figs. 19–20). A provisional screw-retained crown was placed to allow appropriate healing of the peri-implant soft tissue for a period of three months (Figs. 21–22).

Stable and healthy peri-implant tissues were observed following peri-implant soft tissue conditioning using a provisional crown restoration over the course of three months (Fig. 23). Thereafter, connection of the cast-gold customised abutment was performed (Fig. 24).

The final restoration, consisting of a customised cast-metal screw-retained abutment and a metal ceramic crown, was cemented. Favourable peri-implant soft tissue contours of the implant and the adjacent teeth were observed six months post-restoration (Figs. 25–26).

The periapical radiographs at six months post-restoration demonstrated stable bone levels around the bone level implant (Fig. 27). Despite the challenging, moderately high smile line, we were able to achieve a pleasing aesthetic result. Overall, the patient was most satisfied with the outcome (Fig. 28).