Challenging multi-disciplinary approach to a damaged tooth in the maxilla

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This case required a precise evaluation of the different alternative approaches and clinical decision making before deciding on the final treatment.

A surgical approach would have involved extraction of teeth 11, 12, and 21, and enucleation of the significant cyst seen in the pre-surgical CBCT scan, followed by bone grafting to fill the cavity. This would have required placement of an additional one or two implants and restoration with either three single implant-retained crowns or an implant-supported three-unit bridge.

It was determined that the surgical approach was too traumatic and would cause extensive loss of vital tissues, making it difficult to establish a good aesthetic result later on. It also would have required the patient to lose three of his four front teeth, which would have been psychologically traumatic. Endodontic therapy was chosen instead in order to decompress the cyst and thereby save the teeth, retain the ridge form and preserve the interdental papillary tissue and architecture.

The initial view of the linked crowns at the 11 and 21 sites showed the dangerous appearance with poor soft tissue health and colour (Fig. 1). A pre-surgical radiograph revealed root of tooth 21 to be resorbing, with apical radiolucency at 11 (Figs. 2a & b). After extraction of tooth 21, resorption of the socket wall was evident (Fig. 3). Therefore, a graft with bone substitute material and coverage with a membrane was performed (Fig. 4) to prevent collapse of the buccal plate. The wound was sutured and a laboratory-made four-unit temporary restoration was delivered (Fig. 5).

One year was allowed for post-graft healing, as well as to allow for compression of the radicular cyst. At the one-year follow-up, the soft tissue appeared healthy (Fig. 6). Figure 7 shows the virtual placement of a 4.8 mm x 13 mm OsseoSpeed EV implant, as viewed in a cone-beam computerised tomography (CBCT) scan using the SIMPLANT software.

The implant was placed utilising a flapless approach and a 4.8 Ø 6.5 mm HealDesign EV abutment was placed to support transmucosal healing (Fig. 8). After an impression was taken, the Implant Replica EV was connected to the Implant Pick-Up EV (Fig. 9). A plaster model was created and scanned.

These data were transferred into the ATLANTIS IAD software. Figure 10 shows the virtual design of an ATLANTIS abutment in gold-shaded titanium. This abutment was placed in the model with gingiva mask, and final individual full ceramic lithium disilicate crowns (IPS e.max) were created (Figs. 11 & 12).

The ATLANTIS abutment in gold-shaded titanium was installed using an abutment screw tightened to 25 Ncm (Fig. 13). Figures 14 & 15 show the facial and occlusal view of the final restorations at delivery, with full ceramic crowns at teeth 12, 11, 21, and 22. Radiographic image taken when the final crowns were inserted demonstrates an excellent restorative fit with stable marginal bone levels (Fig. 16). Six months after the crowns were inserted, a follow-up examination of the patient revealed excellent peri-implant tissue health (Fig. 17).