Case study: Straumann SLActive and immediate loading

ROBERT LEVINE, ZOLA MAKRAUER AND ROBERT BURNS

Initial situation

A 49 year old female (MP) presented with generalized advanced aggressive periodontitis with dental esthetic and periodontal concerns after losing tooth #15 recently (Figs. 1–5). She had noticed her teeth had become loose for some time. Her periodontal risk factors included diet controlled diabetes, a history of periodontal disease since childhood as with both parents, a half a pack/day smoking habit, and erratic to poor compliance to prevention. Clinical exam revealed generalized deep periodontal probing depths with severe mobility of maxillary posterior and mandibular anterior teeth (class 3).

Treatment plan and proceeding

After discussing treatment options as part of the team approach, the following treatment plan was developed and completed for a patient-desired fixed prosthesis for both jaws:

1. CT scans were taken for both the maxillae and mandible to evaluate bone quality and quantity and sinus health for bilateral sinus augmentation procedures. Mounted study models were taken to fabricate a maxillary FUD and surgical guide templates. A medical clearance was completed pre-surgery with discussions for smoking reduction/cessation.

2. Procedures in the maxillary jaw: surgical extractions of teeth #2-14 was completed with socket preservation (DFDBA and calcium sulfate covered with collagen membranes on #4-13) In addition, bilateral lateral wall sinus augmentations were completed (DFDBA mixed 50:50 with anorganic bovine bone and calcium sulfate. The FUD was delivered and adjusted and the patient was seen by the restorative dentist the following day for further denture adjustment.

3. Procedures in the mandibular jaw: 3 weeks later the mandibular jaw was treated with full extractions and immediate Straumann® SLActive implant placement sites #19, 21, 22, 27, 28, 30 (Figure 6).

Socket preservation was completed for sites #20, 23, 24, 25, 26, 29. Excellent primary stability was achieved (35 Ncm or greater initial torque delivered) at insertion of all implants. The surgical date was coordinated with the dental lab technician (R. Burns) for a screw-retained metal reinforced laboratory processed provisional with insertion 3 days post-surgery. During the procedure the final impression and bite registration was accomplished prior to any bone grafting using an open tray technique in which the restorative dentist was present (Figs. 7–10).

Over the next three days the laboratory mounted the case (Figure 11) and fabricated the screw-retained provisional prosthesis with a casted metal bar to provide strength (Figure 12).

On day three post-surgery the provisional was inserted in

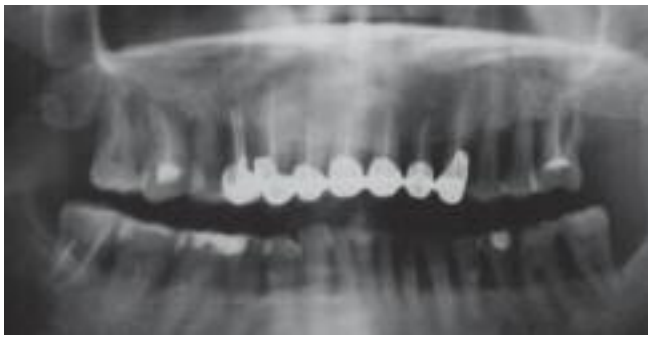

Figure 1: CMX Pretreatment. Diagnosis: generalized advanced aggressive periodontitis.

Figure 2: Initial smile at presentation.

Robert A. Levine DDS
Private practice in dental implants and periodontics, Philadelphia, USA
Clinical Associate Professor in postgraduate periodontics, perio-prosthesis and implantology University of Pennsylvania, School of Dental Medicine

Zola A. Makrauer DMD/FAGD
Private practice in advanced restorative dentistry, Huntington Valley, USA

Robert Burns CDT
Benchmark Dental Studio in Southampton,USA

Figure 3:Initial full intraoral view.

Figure 4: Initial buccal mirror view, right side.

Figure 5: Initial buccal mirror view, left side.

Figure 6: Mandibular surgical visit: installation of 6 implants with Straumann® SLActive surface (with aid of surgical guide template).

Figure 7: Initial suturing with 4-0 silk sutures around the Straumann RN/WN synOcta® Copings.

Figure 8: Medium body impression material was used with a combination of closed tray Straumann WN synOcta® snap-on Impression Copings and positioning cylinders (#19 and 30) and Straumann synOcta® open tray Impression Coping for #21,22,27,28 sites.

the restorative office without anesthesia being needed (Figure 13). The patient had very little swelling at this time and was advised to eat a soft diet for 4 weeks. Radiographs were taken to verify that the prosthesis is fully seated and the occlusion is checked in centric and lateral excursions (Figure 14). Group function is utilized in this case because of occluding against a full upper denture. Once the occlusion is verified all screws are placed and torqued to 15Ncm. Cotton pellets and composite resin are then placed to seal the access holes.

4. 6 weeks later bone healing was tested with a successful 35Ncm reverse torque delivered to all implants to confirm secondary bone stability and commencement of final restorative phase. Final impressions were then taken to create a new master model along with a bite registration. As the implants were in ideal positions, three bridges 2(36–34/33–43/44–46) were fabricated on Straumann® Solid abutments (Figure 15). The fit of the metal framework was verified with radiographs and the porcelain shade was selected and added.

The lower teeth were returned and inserted, the abutments placed and torqued to 35 Ncm and the access holes of the abutments sealed. The final bridge work was cemented with non-eugenol temporary cement. Immediate

Figure 9: Surgical guide template in place in MIP and luted with fast setting acrylic to two Straumann RN synOcta® Temporary Abutments (screw-retained).

Figure 10: Final suturing after impressions with placement of tall healing caps lined with triple action antibiotic ointment.

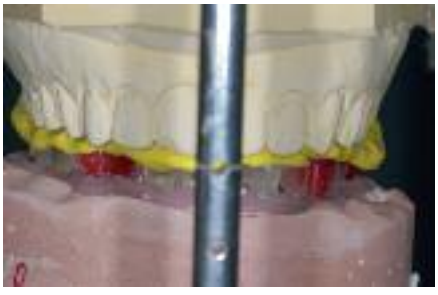

Figure 11: Lower case lab mounted with surgical guide template attached to laboratory model's analogs.

Figure 12: Lab model of mandibular case with casted bar in place.

Figure 13: 3 day post-surgical insertion with immediately loaded, metal-reinforced, screw-retained provisional.

Figure 14: Panorex taken at provisional insertion appointment 3 days post-surgery confirming complete seating of the provisional.

Figure 15: Lab model of mandibular case with final stock abutments for all sites.

Figure 16: Maxillary implant surgical placement of 8 implants with Straumann SLActive surface using converted radiographic guide template as the surgical guide template.

Figure 17: Final suturing of maxillary case. A cover screw was placed for site #3 for a two-stage approach due to very poor bone quality and to avoid loading by her FUD during healing phase 1.

loading allowed us to provide a service to the patient that avoided her wearing a lower denture for any period of time when restoring the lower arch with implants. The Straumann® SLActive implant surface allowed us to significantly reduce the total treatment time in the lower jaw to 12 weeks.

5. A second maxillary CT scan was taken at 7 months post-augmentation using a radiographic guide template which was customized for maxillary implant surgery. This second CT was used for final treatment planning for proposed implant site position and to evaluate bone healing in grafted sinuses and socket preservation sites (#4-13).

6. 8 months after maxillary extractions and lateral wall sinus elevations: 8 implants with Straumann® SLActive surface were placed in maxillary anticipated sites (#3, 4, 6, 8, 9, 12, 13, 15) with the aid of the converted radiographic template used as surgical guide template (Figs. 16, 17). Her FUD was relieved and worn as a temporary prosthesis.

Final restoration

7. Final restorative completion commenced at 3 months post-surgery. This was based on initial insertion torque values delivered at maxillary implant placement as site #3 had very soft Type 4 bone with only hand tightening of the cover screw providing any primary stability. The reverse torque was successful for all sites at 3 months for each implant and final impressions were taken. The final impression technique employed a mix of open and closed impression techniques.

Figure 18: Lab model of maxillary case with 3 Straumann® Solid Abutments and 5 custom-made abutments in place.

Figure 19: Final maxillary porcelain fused to metal case which was broken up in 4 sections.

Figure 20: Final case in place, full buccal view. Compare with Figure 3.

Figure 21: Final maxillary case in place.

Figure 22: Final mandibular case in place.

Figure 23: Final case, right buccal mirror view (compare with Figure 4).

Figure 24: Final case, left buccal mirror view (compare with Figure 5).

Figure 25: Final smile (note midline correction in final case).

An open impression cylinder was used for the final impression for site #3 because of tissue depth. Other sites were impressed with a closed technique.

The master model was then fabricated along with a bite rim. The vertical dimension and bite relationship was then determined in the same manner as when fabricating a full denture. Esthetics and phonetics were checked at this time. The maxillary case was completed in four segments (Figs. 18, 19). Custom-made abutments were fabricated for site #3, 6, 8, 9 and 12, and Straumann® Solid Abutments were placed in sites 4, 13 and 15. The metal under castings were then tried in to verify fit. After this, the metal was sent back to the laboratory to solder the bridgework together and then sent back to the restorative office for final try in. There, the fit was verified and the shade selected. Afterwards, the case was returned to the lab for the application of porcelain. Her midline was deviated slightly to the right. Given that the implants were in the number 8 and 9 positions, we had a hard time shifting the midline significantly. If the midline is finished with a cant or deviated to one side it can destroy the esthetics of the case. The lab technician managed to get the midline very close to an ideal location. The access holes in the custom abutments were sealed, and the final case was cemented with non-eugenol temporary cement. A follow up appointment was scheduled for one week (Figs. 20–26). An impression was taken at this time to fabricate an upper hard acrylic night guard.

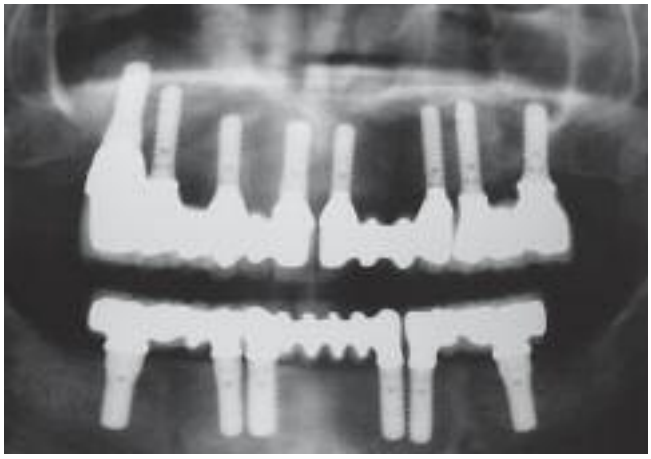

Figure 26: Final panorex. Note position of #3 which is in a more apical position than #4 site due to initial severe vertical bone loss noted at presentation.

8. Upon completion the maintenance phase was commenced at 3 months frequency.

Reprinted with permission from Institut Straumann AG. Starget 01/2008