

Straumann® SLActive and immediate loading: decreasing time while increasing confidence

by Dr Robert Levine, Dr Zola Makrauer and Robert Burns, CDT

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



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



Fig. 2:
Initial smile at presentation.



Fig. 3:
Initial full intraoral view.



Fig. 4:
Initial buccal mirror view, right side.



Fig. 5:
Initial buccal mirror view, left side.

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 (Dr Makrauer) 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 (Fig. 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 (Fig. 11) and fabricated the screw-retained provisional prosthesis with a casted metal bar to provide strength (Fig. 12).

On day three post-surgery the provisional was inserted in the restorative office without anesthesia being needed (Fig. 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 (Fig. 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 15 Ncm. Cotton pellets and composite resin are then placed to seal the access holes.

4. 6 weeks later bone healing was tested with a successful 35 Ncm 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 (Fig. 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

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

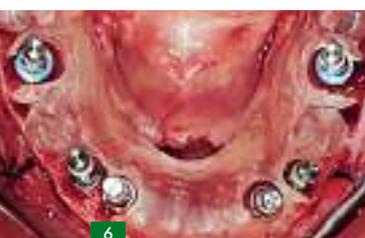


Fig. 7:
Initial suturing with 4-0 silk sutures around the Straumann RN/WN synOcta® Copings.



Fig. 8:
Medium body impression material was used with 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.



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





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

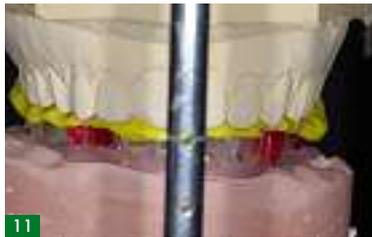


Fig. 11:
Lower case lab mounted with surgical guide template attached to laboratory model's analogs.



Fig. 12:
Lab model of mandibular case with casted guide template and laboratory bar in place.



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

torqued to 35 Ncm and the access holes of the abutments sealed. The final bridge work was cemented with non-eugenol temporary cement.

Immediate 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. An open impression cylinder was used for the final impression for site #3 because of tissue depth. Other sites

¹Implant placement was dictated by esthetic surgical principles in 3 dimensions, as noted by Buser, Martin and Belser in: IJOMI 2004, Special Issue 3rd ITI Consensus Conference Proceedings.

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



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



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

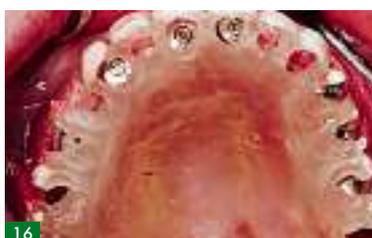


Fig. 17:
Final suturing of maxillary case. A cover screw was placed for site #3 for a two-stage approach due to very poor bone quality and to avoid loading by her FUD during healing phase¹.





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



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



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

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.

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

Background

The advantages offered by the Straumann® SLActive implant surface

A multi-center clinical study is presently testing the Straumann® SLActive implant surface in the area of greatest occlusal forces, posterior maxillae and mandible single tooth sites (R. Levine, C. Auty, W. Keller et al). The clinical 5 year study is passing the 1.5 year time point where in posterior single tooth applications a 35 Ncm torque is applied at implant insertion, final impressions are taken day of surgery and the final restoration is inserted in occlusion at 3 weeks (mandible) and 4 weeks (maxillae). To date over 80 single tooth cases are completed and the initial results were recently presented by the primary author at the 2007 American Academy of Periodontology Annual Meeting (R. Levine, DDS).

Fig. 21:
Final maxillary case in place.

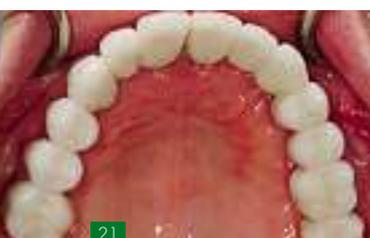


Fig. 22:
Final mandibular case in place.



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



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





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



Fig. 26:
Final panorex².

²Note position of #3 which is in a more apical position than #4 site due to initial severe vertical bone loss noted at presentation.

Survival to date is 98.7% with one early failure and no bone loss noted on surviving implants. Thus we are proving in our daily practices that in posterior applications the Straumann® SLActive implant surface can convert implant dentistry into conventional dentistry regarding time needed for final restoration insertion. This shift of the “stability dip” is indeed occurring. We confirm secondary implant stability at 3 weeks (mandible) and 4 weeks (maxillae) when a successful reverse torque at 35Ncm is completed the same day as the final restoration insertion. Only one “spinner” (78 year old female, borderline osteoporosis) has been noted which was retested successfully 6 weeks later. A spinner is a bone-bone phenomenon, not a bone-implant problem, and we have seen all of these cases heal successfully by giving additional bone-to-bone healing time (M. Rocuzzo and T. Wilson; personal communication)³.

Our clinical experience with Straumann® SLActive has been close to two years and based on the promising research to date this translates to increased confidence and treatment predictability with shortening treatment times in especially difficult cases. The advantages we have seen are in cases where we have “stretched the envelope” in type 4 bone (posterior maxillae/

posterior mandible) and where the “stability dip” will be a factor (especially under a functioning FD/PD) – as in site #3 in the present case or in immediate loaded cases where Straumann® SLA distal abutment implants have been shown in Straumann SLA® cases as most at risk of failure due to occlusal forces or patient “interference” (R. Jaffin, A. Kumar, C. Berman IJOMI 2004). Due to a strong correlation now shown clinically of good primary stability (initial torque insertion values of at least 35Ncm torque) and its translation into excellent secondary stability at 3–4 weeks by our present multi-center study, for every Straumann implant with Straumann® SLActive surface placed the final insertion torque is measured with the Straumann® Torque Control Device and this value is recorded routinely. This helps us in determining when final reverse torque can be applied to test secondary bone stability/healing and when final impressions can be taken to commence restorative completion.

As immediate loading has become part of our daily routines in case-specific situations, Straumann® SLActive should help us in critically important poor bone areas (posterior maxilla) – as shown in the present case report. As type 4 bone is seen most frequently in the posterior maxillary jaw, three clinical periodontal

offices (R. Jaffin/A. Kumar; R. Levine; J. Ganeles/F. Norkin; as of Oct. 2007) have pooled Straumann® SLActive data for full arch and partial arch immediate loaded cases (in full function within 3–5 days) – with only one early failure being recorded out of 265 maxillary implants placed for a survival of 99.99%. This is a definite improvement over immediately loaded maxillary cases with SLA® implants.

³Note: At the 2007 ITI World Symposium, Dr Jim Ruskin’s conclusion contraindicated an early loading protocol in patients with a history of osteoporosis and recommended to adhere to a conventional healing period of 6–12 weeks.

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