Efficiently delivering full-mouth reconstructions

By Dr Ara Nazarian, USA

Having the ability to take a patient from point A to point Z in fewer appointments within one’s practice allows one to position oneself as a provider that can fulfill patient’s surgical and restorative needs. With the proper training, a dental provider may provide extraction, grafting and implant placement within one appointment at one location. Not only does this allow the reduction of the number of visits for the patient, but this type of service also helps the patient stay within his or her budget. Most importantly, this enables the dental provider full control of the surgical and prosthetic outcome.

Depending on the patient’s desires, the clinical conditions of the oral environment and the skills of the dentist, the dentist may choose to extract teeth, level bone, and graft with simultaneous implant placement. In this case, a patient in his mid-sixties presented to the office with discomfort owing to multiple rampant caries and generalised advanced periodontal disease (Figs. 1 & 2). Having already visited multiple providers for a consultation, he was very frustrated with the treatment options offered with varying treatment plans that were segmented into different disciplines. Since many of these options did not complement the other, the patient decided to come to us for full treatment after being referred by one of our patients who had undergone a Total Dental Solutions Reconstruction.

Before the surgical appointment, a CBCT scan was taken to accurately plan treatment for this case to make certain that no complications would arise from completing all of the procedures (extract, graft and implant placement) in the Total Dental Solutions Reconstruction protocol. CoDiagnostiX software (Dental Wings) was used through 3D Diagnostix virtual assistance to precisely plan the placement of six Engage (SOX Biomedical) dental implants in the maxillary arch as well as seven Engage dental implants in the mandibular arch using CT-based surgical pilot guides (3D Diagnostix; Figs. 3 & 4).

The final treatment plan was fixed bridges on implants in the maxillary and mandibular arches. Engage implants were selected (Fig. 5) because I have personally experienced their high implant stability at placement, which is a critical success factor during the early healing process of osseointegration with these types of cases. With the combination of its patent-pending Bull Nose Auger tip and Mini Cortic-O Thread, this implant system offers practitioners a bone-level implant with high initial stability for selective implant options. In fact, the Engage implant body creates a tapping pattern when threaded for an enhanced mechanical lock in the bone. Other dental implant systems with aggressive threading may include, but are not limited to, Nobel-Active (Nobel Biocare), SEVEN (MIS Implants Technologies), ET III (Hiossen), I5 (AB Dental) and AnyBridge (Megagen).

For effectiveness and greater proficiency during the Total Dental Solutions Reconstruction procedures, intravenous sedation should be performed. Not only does it make the appointment easier, but patients also prefer to have the treatment completed in one visit. Since the patient is sedated, a mouth prop is needed to keep his or her mouth open. Because of this, teeth are extracted in quadrants, starting from the upper left to the upper right and then down to the lower right and lower left. This allows great time-savings, as it is easier to keep the patient’s mouth open and be able to proceed around the arches safely. Once the teeth have been extracted, the tissue has to be reflected in order to seat the bone-level surgical guides and fix them with their respective retention pins. Using these pilot surgical guides, the osteotomies for the implants were begun with a 1.95 mm pilot drill utilising the Mont Blanc surgical handpiece (Anthogyr) and Aseptico surgical motor (ANU 2000) at a speed of 1,200 rpm with copious amounts of sterile saline (Figs. 6 & 7).

Paralleling pins were placed in the sites of the osteotomies to confirm the accuracy of the surgical guide and radiographs were taken to check the angulations of the pins within the maxilla and the mandible. Once the osteotomies were complete, an
implant finger driver was used to place the dental implants until increased torque was necessary. The ratchet wrench was then connected to the adapter and the implants torqued to final depths, reaching a torque level of approximately 40–50 Ncm.

Adequate implant fixation was further verified using an Osstell ISQ (implant stability quotient) meter, which uses resonance frequency analysis as a method of measurement (Fig. 8). Several studies have been conducted based on resonance frequency analysis measurements and the ISQ scale. They provide valid indications that the acceptable stability range lies above 55 ISQ.

Extended healing caps were hand tightened to the implants. A postoperative radiograph was taken of the implants and the healing caps to ensure complete seating. The immediate dentures were soft relined with a silicone-based soft denture relining material (Ufi Gel SC, VOCO). Some of the advantages I have personally experienced with this material are that it is biocompatible, tasteless and odourless. By using the extended healing caps with the soft relines, the immediate dentures were much more retentive. The soft tissue and implants were evaluated clinically after one week. The patient stated that he had had very little postoperative discomfort or swelling.

Within ten days, the patient returned to the practice. The soft tissue around the extended healing caps had healed very nicely with a healthy pink colour. Using impression posts, full-arch impressions were taken with Instant Custom (Kerr) tray (Good Fit). These custom trays can be adapted and fitted in minutes, eliminating the need for models, light-cured materials, monomers and extra laboratory time for custom impression tray fabrication because they are made of a material (PMMA) that becomes mouldable when heated (Fig. 9) and maintains its shape while cooling.

Once the trays had been moulded for the patient, full-arch impressions were taken using a polyvinyl siloxane impression material (Take 1 Advanced, Kerr; Fig. 10). Bite relations, as well as instructions for size, shape and colour of the full-arch provisionals, were forwarder to the dental laboratory. With only a five-day turnaround, the custom abutments and provisionals were forwarded to the dental office and inserted. The patient was very pleased with the aesthetics and function of these provisional restorations. He was instructed about their care and use in eating, speaking and biting.

Approximately four months after the initial placement of the dental implants, the patient returned for the definitive porcelain-fused-to-metal restorations. The provisional restorations were removed using the Easy Pneumatic Crown and Bridge Remover (Dent Corp). Any temporary cement was removed and the abutments inspected. If there was any settling or re-creation of the gingival tissue, the abutments were modified using a carbide bur with copious amounts of water not to overheat the abutments. This way, the margins could be brought right to or to slightly below the free gingival margin. A full-arch impression was taken in a similar fashion for the abutments and the provisionals. In addition, the relations between maxillary and mandibular arches were captured. Within three weeks, the porcelain-fused-to-metal restorations were inserted and a panoramic radiograph taken (Figs. 11 & 12).

In conclusion, an increasing number of patients are presenting to dental practices who seem to require this type of reconstruction. By providing multiple services in a shorter number of visits with the use of CBCT and other technologies, the dental provider will find that more patients will accept treatment. In doing so, not only are you helping your patients regain proper form and function, but you are also helping them achieve a Total Dental Solutions Reconstruction in fewer appointments.