

INCREASING YOUR POTENTIAL WITH SMALL DIAMETER IMPLANTS

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The management of small restorative areas in the esthetic zone has posed significant problems for the implant and restorative team. The lack of bone available for the surgeon as well as the lack of restorative space available between the adjacent teeth make tooth replacement with implants challenging for both the restorative dentist and the laboratory technician.

Recently, manufacturers in the implant industry have offered a 3 mm diameter implant design to address these challenges. Most of the implants available in the 3 mm size have been one-piece or unibody implants, which often necessitate conventional tooth-preparation techniques by the restorative team as well as standard cord-impression techniques for indexing the restorative margins. With some systems, there is no need for preparation due to a cervical marginal collar that can be captured utilizing a snap-in impression transfer.

CASE PRESENTATION

A man in his early sixties presented to the practice with a temporary composite buildup on tooth No. 25 which had fractured off at the gum line a few weeks earlier (**Figure 1**). The patient claimed the coronal portion broke off when he bit into a sandwich and that the dentist had done a quick repair, so that he would not have to walk around toothless. He did not complain of any discomfort except for a little irritation in the gum tissue. Clinically, it was very evident that



FIG. 1 — Provisionally repaired tooth No. 25

the adjacent teeth (Nos. 23, 24, and 26) had cervical abfractions as well as cervical decay that would probably result in the same type of injury or fracture. Radiographically, the pulp chambers were calcified on all his anterior incisors with very little tooth structure remaining at the cervical areas for crown preparation. In addition, there was Class II mobility present in these teeth.

Based on the lack of mesial-distal and facial-lingual space for a traditional sized dental implant, it was apparent that only small-diameter implants would facilitate tooth replacement in this region. Due to the condition of the surrounding incisors (Nos. 23, 24, and 26), the patient decided that he would rather have all four incisors removed and restored with implants. All risks, benefits, and alternatives to this treatment were discussed with the patient.

Once the patient was fully anesthetized, the gingival tissue was slightly deflected with a mucoperiosteal elevator (Zoll Dental) to separate the attachment. Teeth Nos. 23-26 were atraumatically extracted utilizing the Physics Forceps (Golden Dental Solutions). Care was taken not to break the buccal plate

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when extracting these teeth. The extraction sites were debrided with a serrated curette (Zoll Dental) to remove any tissue and initiate bleeding. There was adequate width and height to place two small diameter implants (3 mm x 12 mm, OCO Biomedical) in the areas of Nos. 23 and 26 that would be restored with a fixed bridge. Having the ability to immediately “osseofixate” due to their proprietary design, I prefer OCO Biomedical’s thread design when considering progressive or immediate loading.

A 1.8 mm pilot drill was placed into the sites of Nos. 23 and 26 and advanced to a depth of 12 mm measuring from the bone surface using the AEU7000 (Aseptic) surgical motor and handpiece (Mont Blanc) with sterile irrigation. Paralleling pins were placed in the sites of the osteotomies and X-rays taken to check the angulations of the pins between the adjacent teeth within the jaw. Once confirmed, an osteotomy former was used to shape the final osteotomies. Once completed, two 3.0 mm x 12 mm I-Minis (OCO Biomedical) were placed in the osteotomies using the appropriate finger driver instrumentation.

The ratchet wrench was then connected to the driver adapter and the implants torqued to their final depths reaching a torque level of 65 Ncm. Bone grafting material (OraGraft, Salvin) was placed in the extraction sites of teeth Nos. 24 and 25, as well as any spaces between the implants and alveolar bone (Nos. 23 and 26) (**Figure 2**). A membrane (OraMem, Salvin) was then used

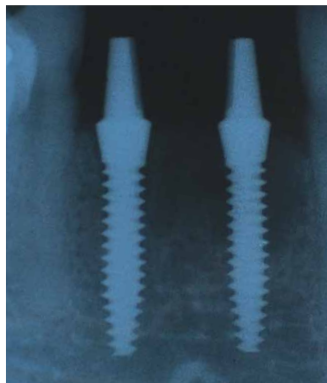


FIG. 2 — Radiograph of implants placed with grafting.

to cover the grafted area and stabilized with black silk sutures (Salvin). The surgical site was covered with a piece of dental dam (Hygenic) to prevent any temporary material (Protemp, 3M) from flowing into the site. Once fabricated and trimmed, the occlusion was verified to ensure there was very little to no contact with the opposing dentition.

Four months later, two TRIP transfers (Tissue Retraction Impression Pickup, OCO Biomedical) were used to take an impression of the implants. Suitable for a closed-tray method, there was no need to remove it or to reinsert the transfers as they remain in the impression throughout the process. A heavy and light bodied polyvinyl siloxane impression material (Dentsply Caulk Aquasil Ultra or 3M ESPE Imprint 3) was used in a full-arch impression tray. Once the impression material was set, it was removed from the mouth, picking up the TRIPs, and sent to the lab for a fixed bridge on Nos. 23-26.

When the patient desires strength and esthetics without metal, then my choice for the best material would be a zirconium-based restoration. Restorations such as LAVA (3M) afford clinicians the opportunity to confidently place cosmetic, metal-free alternatives that demonstrate exceptional strength, esthetics, color stability, and biocompatibility even in the anterior region.

The preparation design for this type of restoration is similar to conventional porcelain-fused-to-metal alternatives; however, I have found that the elimination of metal from the substructure makes these restorations even *more* esthetic. Some of the advantages of zirconium-based restorations include a natural translucency or fluorescence and the elimination of dark lines at the margin.

CEMENTATION

After the provisional restorations were removed, the final zirconium restorations were tried in to verify marginal fit, contour, contacts, shade, and accuracy. The patient was very satisfied with the look of his new restorations and approved them for final cementation. The

crown restorations were seated using Re-lyX Luting Plus (3M). Excess cement was easily removed from the margins and accomplished within a short amount of time. No finishing of the cement was necessary along the margins. The overall health and structure of the soft tissue and restorations was very good (**Figures 3, 4**). The patient was extremely satisfied with the definitive results.

FIG. 3 — Final bridge restoration on I-Mini Implants.



FIG. 4 — Radiograph of integrated implants with FPD restoration.

CONCLUSION

Having the ability to provide a variety of services such as extractions, grafting, and implants under one roof gives you the opportunity to not only provide proper form and function to your patients, but also increases office profitability with fewer appointments. When we look at the successful business plan of most retail stores (e.g., Target), we find that people would rather shop at one location for a variety of services where they are familiar with the type of services and products available. To them, this means not having to

race around to multiple locations, especially in today's fast-paced lifestyle. Applying this type of model to your dental office will definitely increase your patient population as well as your productivity. Other services to consider offering in your dental practice in addition to small diameter implants might include one-visit endodontics, Six Months Braces, and atraumatic extractions. **DE**



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