MIS Implants Technologies has recently launched the new C1 implant system. This new C1 system brings a combination of proven and innovative design features to market, including a conical connection and abutments that utilize a platform-switching concept.

The 6-degree conical connection ensures a secure fit between the abutment and implant. By minimizing micro-movement at that junction, bone loss at the crestal level is reduced. There is a six-position cone index within the conical connection to help orient the implant during insertion and place the abutment into the proper position.

Implants, abutments and tools are color-coded according to platform size for easy identification. The standard platform refers to the 3.75 and 4.2 mm diameter implants, while the 5 mm diameter implant is the wide platform. Lengths for all of the diameters come in 8, 10, 11.5, 13 and 16 mm.

The C1 implant (as all of the MIS implants) is made from a titanium alloy that contains titanium, aluminum and vanadium known as Ti-6Al-4V-ELI (Grade 23). This alloy has high fatigue strength and is highly biocompatible. Similar to commercially pure titanium implants (Grades 1-4), the outer surface of these implants consists of a thin layer of pure titanium oxide (TiO2).

The unique geometry of the C1 implant encourages primary stability with mild bone compression at the upper 2/3 of the implant. The final drill, used during preparation of the osteotomy, is designed in such a way to allow less compression by the threads at the apical third of the implant, which will enable rapid bone growth in that area. These two characteristics have been put in place to minimize the period of time between initial mechanical stability and long-term biologic stability.

Platform switching is a restorative concept that has been shown to minimize crestal bone loss. It has been theorized that moving the junction of the implant/abutment connection away from the outer edge of the implant platform reduces the bacterial component that could lead to loss of vertical height. For those clinicians who prefer to utilize platform switching in the restorative phase, the C1 abutments have been designed to allow this.

As with other MIS products, the surface treatment consists of both large particle blasting and acid etching. This not only creates micro- and nano-surface morphology, but also ensures a high-quality, contaminant-free surface that has been shown to achieve superb osseointegration results, according to the company. The apex of the C1 implants is dome-shaped to help prevent damage to the mandibular nerve as well as to avoid perforation of the sinus membrane. Packaged with each C1 implant is a sterile, single-use final drill, a cover screw and a temporary PEEK abutment. Each implant (including these additional components) is sold for $249.

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From intraoral scan to final custom implant restoration

By Perry E. Jones, DDS, FAGD

This case demonstrates the optical scanning of Inclusive® Scanning Abutments (Glidewell Laboratories; Newport Beach, Calif.) utilizing the iTero® digital scanning system (Align Technology, San Jose, Calif.) with software version 4.0. Digital data was used with laboratory CAD/CAM planning to fabricate custom all-ceramic implant abutments and a four-unit fixed prosthesis. The abutments and fixed prostheses were fabricated using advanced computer-aided mill- ing technology.

Dental history

The patient was a 52-year-old healthy Hispanic male who sustained a traumatic avulsion and lost his maxillary incisors in an automobile accident. Following healing, a four-tooth transitional removable partial denture was constructed. He was seen by the oral and maxillofacial surgery service of Virginia Commonwealth University for dental implant therapy.

Treatment plan

The patient was informed of the alternatives, benefits and potential complications of various treatment options before deciding to pursue implant restoration of his missing teeth. The treatment plan included placement of two Replace® Select Straight RP 4.3 x 13 mm implants (Nobel Biocare; Yorba Linda, Calif.) with 5 mm healing abutments, followed by a six-month healing period and restoration with all-ceramic custom abutments and a four-unit, all-ceramic fixed prosthesis to restore the anterior incisors to form and function.

Surgical procedure

Using local anesthesia, two Replace Select Straight RP implant fixtures were placed in the area of teeth #7 and #10, using standard Nobel implant placement protocol. Placement angulation and depth were verified and deemed satisfactory. Standard RP 5 mm healing abutments were placed, and the fully reflected tissue flap was closed with interrupted sutures.

Restorative procedure

Following six months of healing post-implant placement, intraoral photos were taken to record and confirm the healthy remaining dentition. Osseous integration was confirmed with a panoramic X-ray; followed by resonance frequency analysis (RFA) using an Osstell® ISO implant stability meter with Smartpeg™ attachment (Ostell USA; Linthicum, Md.), which displayed an implant stability quotient (ISO) of 78 on a minimum-to-maximum scale of 1–100. Counter rotation with a torque wrench confirmed no rotation to 35 Ncm. The implant fixtures were considered acceptable for restoration.

The 5 mm healing abutments were removed, Inclusive Scanning Abutments were placed on the implants, and the accompanying titanium screws were tightened (Fig. 1).

Using the iTero scanner with updated software (version 4.0), a full maxillary arch scan, full mandibular arch scan and centric bite in maximum intercuspation were completed. A three-dimensional digital record of the patient’s anatomy was created from these scans and electronically submitted to Glidewell Laboratories to be used in the CAD/CAM restoration process.

At Glidewell Laboratories, the virtual scan was registered to the scanning abutments, providing the dental technicians with the implant system, size, axis, position relative to the adjacent anatomy and locking feature orientation. A virtual zirconia abutment was designed using 3Shape’s DentalDesigner software (3Shape Inc.; New Providence, N.J.), and the Glidewell Digital Abutment Library (Fig. 2).

From this, the corresponding physical Inclusive All-Zirconia Custom Abutments (Glidewell Laboratories) were milled. Similarly, a BruxZir® Solid Zirconia four-unit fixed bridge (Glidewell Laboratories) was designed and milled using state-of-the-art CAD/CAM technology. The custom zirconia abutments were trial-fitted in the patient’s mouth with slight tissue Blanching noted (Fig. 3).

In the same visit, the final four-unit all-ceramic milled BruxZir Solid Zirconia bridge was tried-in and examined for proper occlusion. There was “tight” anterior coupling for this case as evidenced by the history of previous denture occlusion. The occlusion was checked and presented as so precise that no adjustment was required.

The anterior view of the final prosthesis demonstrates optimal mesiodistal width proportion, incisal edge proportion, pontic–tissue contact and excellent shade/esthetics (Fig. 4). Further, the occlusal view demonstrates an optimal incisal edge arch form. The soft-tissue lip position and speech phonetics appeared to be optimal.

Following the trial seating, the fixed bridge was removed, the zirconia abutment retention screws torqued to 35 Ncm, the abutment screws covered with cotton/Cavit™ Temporary Filling Material (3M™ ESPE™; St. Paul, Minn.), and the prosthesis cemented with GC Fuji PLUS™ (GC America; Alsip, Ill.).

* Note: Cadent (Carlsbad, Calif.) was acquired by Align Technology (San Jose, Calif.) in May 2011.

References