Predictable Long-term Aesthetics in Single-tooth Implant Restorations

by David Little, DDS

In order to achieve maximum aesthetics and function for single-implant tooth restorations, the following points must be carefully considered. Every case must be precisely diagnosed and the treatment procedures planned. The implant must be inserted in the correct position to allow the fabrication of an aesthetic and functional single-tooth implant restoration. The implant components must be mechanically stable and biocompatible, and the abutment must be anatomically shaped to allow for each specific clinical situation so that a natural emergence profile for the crown can be formed within the peri-implant soft tissue.

Diagnostic models, digital radiography and CT scans should be incorporated to plan implant placement, ensuring that sufficient, stable bone exists and that where the implant is placed will promote optimal retention. CBCTs allow dentists to view cross-sections with zero distortion, enabling them to measure the exact width and depth of hard tissues.

Case: The implant was placed (ANKYLOS, DENTSPLY Tulsa Dental Specialties) using a surgical guide and a provisional abutment and crown. After osseointegration, a fixture level impression allowed fabrication of a zirconia abutment and zirconia crown. The all-ceramic zirconia restoration and zirconia abutment Cercon (DENTSPLY Ceramco) provides great biocompatibility and aesthetics. The clinical photo and radiograph show results three years post-op. (Figs. 1, 2). It is nearly impossible to differentiate natural teeth from the implant restoration. By visualizing the end result first and using advanced diagnostic technologies, predictable aesthetics were accomplished with hard and soft tissue stability including a gain in papilla height.

All oral implant systems rely on the abutment part of the implant to provide stability for the dental prosthetic. The TissueCare connection of the ANKYLOS implant offers precisely machined, tapered-cone abutment (Morse taper) connection. This tapered abutment connection provides high resistance to bending and rotational torque during clinical function, which significantly reduces the possibilities of screw fracture or loosening. This increased stability of the abutment/implant interface is critical in the stability of the hard and soft tissues and thereby providing predictability with aesthetics. The extremely accurate ANKYLOS TissueCare connection has no micro-movement.

The ANKYLOS system was developed with the clinician’s biological and mechanical concerns and the patient’s aesthetic concerns in mind - with the conical cone connection being the cornerstone of this philosophically different implant system. The implant system has a unique transition from the implant body to the prosthetic abutment. The tapered tissue care connection transfers the transition between implant and abutment to the center of the implant and prevents mechanical influences on it and microbial attack on the peri-implant tissue. It provides additional space on the implant shoulder for soft tissue support for the surrounding tissue (platform switching).

Experience with the TissueCare connection and the ANKYLOS system with single-tooth replacement indications may be considered positive with regard to the aesthetic and functional results of the treatment. Because of the lack of mechanical complications and problems with the hard and soft tissue in the loading phase of the implants, healthy and stable implant restorations can be achieved.

References:

David Little, DDS, received his dental training at the UTHSCSA and now maintains a multi-disciplinary practice in San Antonio, Texas.
Simple Implant Placement and Restoration Courses

OCO Biomedical implant placement and restoration courses are affordable, comprehensive one-day training seminars that focus on the essentials of implant dentistry. OCO courses are held each month in locations all over the United States and are taught by some of the most experienced clinicians in the world. OCO Biomedical courses are no-nonsense implant education. They cover the full spectrum of implant case possibilities and procedures and give dentists the tools to successfully incorporate dental implants into their practices.

Course Content

**Historical overview of implantology:** brief lecture on early implant patents, sub-periosteal implant systems, blade-type implants and endosseous, root form implants and how they affected the development of current generations of dental implants.

**Treatment planning and case selection:** new and classic techniques on the fundamentals of case selection and treatment planning, including model/ridge mapping, CBCT/pano evaluation and traditional modalities for correct implant diameter, length and types for all placement scenarios.

**Selective loading:** immediate loading, one-stage and two-stage protocols - when, where and how implant loading should be employed. Logically progress from our I-Micro to our larger diameter implants with a few easy steps.

**Placement and restoration lectures:** placement drilling protocol for conventional and mini implants using the latest techniques for flapless surgery with less drilling steps; instruction on the fundamentals of placing and restoring implants and the basics of initial stabilization for enhanced osseointegration. The lecture also includes techniques for giving your patients superior aesthetic results.

**Case studies:** well-documented case examples (both photo and video) of denture stabilization, simple single and multiple tooth placements.

**Hands-on workshop:** includes a two-hour hands-on workshop on models that cover implant placement with conventional and mini implants, restorative options that include prosthetic abutment selection and direct and indirect impression taking.

Visit [www.ocobiomedical.com/courses](http://www.ocobiomedical.com/courses) for schedules and booking information. Call (800) 228-0477 to enroll.
Advanced Implant Courses (AIC) is a surgical-based implant continuing education institution which provides realistic and necessary implant training to dentists.

AIC’s basic implant course provides understanding of implants through anatomy, patient diagnosis, treatment, surgical plans and patient management in real clinical situations. One of the main characteristic of AIC is its six days (36 hours) of comprehensive training via lectures and hands-on sessions. Hands-on sessions contain X-ray tracing, block bone drilling, gum model drilling, prosthetic selection, impression and live surgery. Courses are taught by experienced clinicians who provide assistance and understanding regarding dental implants.

Live surgery is directed by a faculty doctor, an assisting doctor and a surgical doctor. The group offers knowledge and support to the enrollees during their first live surgery. This structure creates a safe atmosphere for the training doctors. Live surgery candidates are carefully selected and chosen by the course director and the faculty members to create a safe and optimal surgical atmosphere.

HiOSSEN implants are provided for the live surgery and afterward, impression-taking on the clear model, abutment selection and understanding of prosthesis are practiced.

Advanced Implant Courses are where doctors can learn about real and practical clinical situations using implants.

I took Osstem AIC implant training from September to November 2007. It was a great platform for me to start placing implants. The live placement is what puts AIC over the top.

After my training, I started slow and wanted to place one implant every month for the first year. It’s now 16 months later and I have placed 19 implants (just did five in the last two weeks, including a three-implant case of 4, 5, 6). I have placed about two dozen bone grafts/socket preservations and currently have six to 10 cases going (from one to four implants at a time). This course was what helped me get to the advanced-novice stage of implant practice.

Gregg Fink, DDS; Newark, Delaware
With more and more patients making the decision to move forward with a treatment plan for dental implants, the concept of socket preservation takes on an even more important role. This simple procedure can give the practitioner more predictable bone height and width to accept these implants than allowing the site to heal on its own.

Calcium sulfate has been used as a bone augmentation material for more than a century. It has advantages that make it an excellent material for socket preservation. Among these are its biocompatibility, osteoconductive qualities and its resorption rate which is comparable to normal bone formation.

MIS Implants Technologies, Inc., offers a calcium sulfate product that can be used for socket preservation as well as other procedures. BondBone is biphasic calcium sulfate in a granulated powder form. This material has been developed to combine the best qualities of the hemihydrate and dihydrate phases of calcium sulfate into one simple-to-use product. It has the advantages of the hemihydrate phase (being moldable and cementable) along with the advantages of calcium sulfate in the dihydrate phase (having high strength, a resorption rate equivalent to bone growth, and the ability to set in the presence of blood and saliva). Another positive feature is the way it is packaged. BondBone comes in a “driver” in which the product can be mixed and delivered directly to the intended site. The procedure time, from the beginning of the mixing phase to the completion of the placement, can be accomplished in two to five minutes.

Small Defects

In areas that are less than 10mm in width and have at least three-wall bony support, BondBone can be used on its own. Sterile saline is injected into the driver's head until the BondBone is completely saturated. Excess liquid is expelled, the driver's head removed, and any remaining excess liquid should be absorbed using sterile gauze. That's all there is to the preparation step.

The BondBone is then expressed into the defect, being sure to have good bone-to-product contact and to fill the defect completely. The BondBone can then be shaped and should be condensed with gauze for three to five seconds. The final step in the placement of the product is to wet a sterile gauze pad with sterile saline and place it on the graft for approximately 30 seconds. The BondBone is now set and you will not experience the particle migration that is seen with traditional particulate materials. The stability of the BondBone will keep it from collapsing as the area is filled with new bone. Primary closure can now take place.

Larger Defects

When a defect does not meet the criteria mentioned above, BondBone can be mixed with other granular bone augmentation products to create a cementable composite graft material. To achieve this composite, the recommended ratio of BondBone to your chosen particulate graft material is 2:1. The two dry materials should be mixed completely in a sterile bowl, sufficiently saturated with sterile saline and mixed thoroughly. Excess liquid should be absorbed gently with sterile gauze. The newly mixed composite can be placed in the driver, using a technique similar to loading amalgam into a carrier. Application of the composite is identical to that of using BondBone alone. The defect needs to be filled completely, compressed with dry gauze and then with sterile saline soaked gauze.

BondBone is a bone graft material that should be considered for socket preservation procedures as well as other procedures needing bone graft products. Because of its ability to be combined with other graft materials, it is very versatile. It is available in 0.5cc and 1.0cc drivers. For more information, please visit www.misimplants.com or call 866-797-1333.