ON THE CUSP
Trends, Tips and Technology

Tips & Trends: Creative Solutions

Cementation Procedures for Dental Implants
Permanent & Retrievable Options for Cementation

Upcoming Innovations in Digital Dentistry
from DENTSPLY Implants

Permanent Game Changers
Opportunities for New Dentists

Compliments of Town & Country Dental Studios
The big buzz is screw-retained. It usually goes like this: “I attended a seminar and was advised to do screw-retained implant restorations and not to use cement. Excess cement is a leading cause of implant failure.”

The question is: Why is excess cement left in the sulcus area, endangering the life of the implant? Should we be tossing cementable restorations out with the...irrigation water?

Of course not! Careful cementation technique, such as the use of a cement die jig to express excess cement outside the mouth, and placing just the right amount of cement in the restoration, should eliminate excess cement or minimize cleanup. But poorly designed restorations or improperly chosen stock abutments will not provide the emergence profile or margin depth that is needed to prevent cement from creeping into the sulcus. And once cement is set several millimeters below the gingival margin, it may be there to stay.

Don’t despair—help is on the way! With Town & Country’s SIMPL system, we custom design and mill an abutment with the proper emergence profile and natural contour of the tooth being replaced, and the correct marginal depth and width for the crown that is desired. We know that not every implant can be restored with a screw-retained restoration. Implants cannot always be placed where the access hole for the screw is favorable, or may be angled too severely to provide the necessary path of insertion or contact area. Cementable restorations are often necessary and desired by patients and dentists.

Then there’s the need for retrievability. “What if the screw loosens?” is a common concern. Why does the screw loosen? Is it due to insufficient torque? Too much torque? Occlusal interferences? Improper seating of the abutment? The million dollar question.

And if the screw loosens with a cementable restoration, must the crown or bridge be sacrificed to get at that nasty loose screw creating all these problems? Maybe not. With the use of a temporary cement you may not need to destroy the crown, and possibly the abutment, in search of the elusive screw hole. Joe Apap, CDT and General Manager at Town & Country, is the author of an article in this issue addressing cementation issues and offers suggestions for choosing the right type of cement.

Screw-retained options continue to grow as materials and components have been developed and used successfully. While a PFM utilizing a UCLA abutment is the most common and often practical way to restore single or multiple implants, our offerings have expanded to include screw-retained zirconia restorations such as Zirlux, Zirlux-Plus and Zircad, and our very popular Emax crown. When occlusal clearance is limited and may require metal occlusion or a bite stop, a screw-retained ceramic restoration may be possible for a more aesthetic result. The interface with the implant is titanium and has a substantial base that is bonded to the ceramic crown. The titanium may be gold-shaded to enhance the shade of the ceramic material.
If you want the retrievability of a screw-retained restoration, but the ease of insertion of a cementable one, we have just the thing. It’s screw-retained. It’s cementable. It’s screw-mentable. A SIMPL custom abutment combined with a crown of your choice is fabricated, but the crown will have a screw access hole in the same position as in the abutment. You can seat the abutment and then the crown, allowing you to make adjustments to the crown if needed without having to unscrew the restoration as you would with a one-piece screw-retained crown. Cementation of the crown to the abutment may be done outside the mouth, so no worries about excess cement in the sulcus. Each case is unique and deserves thoughtful planning and a creative solution. We recently fabricated a restoration for a young patient following mandibular resection. Implants were placed where bone was available, significantly facial and buccal to ideal positions. The anterior implants were close to the vermilion border of the lip. And the distance between the lower ridge and upper teeth was excessive. The patient desired a fixed prosthesis. With a hybrid prosthesis, the potential problems were visibility of screw holes on the facial surfaces of the teeth, and screw access holes so deep that a driver would bottom out before the screws reached the implants. A double structure had advantages in that the screw holes of the bar would be hidden by the overdenture, but the overdenture would need to be secured directly to the bar with screws in order to be “fixed.” However, even with the superstructure kept to a minimal thickness, it likely would cause the lower lip to protrude unnaturally.

Designing the right restoration can be a challenge when confronted with limited occlusal vertical dimension, particularly when an entire arch is being restored. Increasing the OVD is not always possible or may be insufficient to allow the necessary clearance for the restoration of choice. A screw-retained restoration on multiple implants may be the only viable option, and ideal implant placement is critical to avoid unfavorable positioning of screw access holes, such as on the facial or buccal surfaces of the teeth. After diagnostic records were completed and the trial setup was approved, we were able to visualize the access hole positions and select the best option. The final design was a Montreal style hybrid bar. The screw holes were placed in the pink Ivobase acrylic with the exception of the two most anterior implants. That segment of the bar was left highly polished to allow the lip to rest comfortably. Pink composite will be used to fill the holes in the base material. An implant placed in the #19 position was restored as a single screw-retained Emax crown.

When implant placement does not allow favorable access hole positions for a hybrid bar, a double structure may be the only option. The interocclusal space then becomes even more critical as every fraction of a millimeter has to be allocated to the various restorative materials. A milled CAD/CAM bar can be designed with various attachments depending on the space available for each individual tooth. For example, there may be room for a Locator or Equator attachment in the molar area, but only enough room for a gold clip in the anterior region. Whether you are restoring a single implant crown or an entire arch, there are many options to consider. Let us help you determine the best option to realize your treatment goals and your patient’s expectations. To discuss an existing or future case, please contact Jerilyn at 1.800.925.8696 ext. 213 or jsapoznick@ncidental.com.

Jerilyn Sapoznick
Implant Department Director
Town & Country Dental Studios
The success of implant restorations depends not only on the sound osseointegration of the implant fixtures, but also on the integrity of the connection of the prosthetic superstructure to these fixtures. In screw-retained designs, loosening or breakage of the screws may lead to failure or replacement of the whole implant. For cement-retained designs, dissolution of cement may lead to loss of the bond between the final prosthesis and implant abutment, thus requiring recementation.\(^1\)

Although the use of cemented superstructures limits the retrievability of the prosthesis, it has been successful in simplifying the restorative phase of treatment. An advantage of cemented superstructures is that conventional prosthodontic procedures may be used during the clinical and laboratory phases of restorative treatment. Moreover, the cement-metal interface allows for small discrepancies which are not acceptable in a screw-retained restoration, and may even act as a shock absorber.\(^2\) One more advantage of a cemented superstructure is that a minor divergence of implants can be easily corrected during abutment design which makes it easier to accomplish aesthetic restorations, as the abutment bulk can be more favorably managed.\(^3\)

On the other hand, permanent cementation of implant-supported restorations should only be considered when future retrievability of the prosthesis for repair or modification is not desired or when surgical correction of peri-implant tissue problems is not anticipated.\(^4\) Permanent cementation may become a great disadvantage in cases of loosening of the abutment screw, porcelain fracture or even if framework fracture occurred.\(^5\),\(^6\)

Sometimes, conventional cast fixed prostheses are recommended to be provisionally cemented to abutment teeth in order to evaluate occlusion and tissue reactions and has been advocated for up to two months.\(^7\) This also applies to implant-supported and implant-tooth-supported prostheses which are sometimes provisionally cemented to evaluate occlusion and occlusal loading of the implant fixture. Provisional cements may also be used as final cements in cases of implant supported restorations.\(^8\)

The type of provisional cements selected for a given clinical situation controls the amount of retention obtained.\(^1\),\(^2\),\(^9\) However, provisional cementation is unpredictable to some extent, due to the many different factors that influence the retentiveness of a restoration and can result in difficult retrieval or premature loosening.\(^10\),\(^11\)

For implant systems in which the abutments are cemented to the fixtures, the provisional cement must be strong enough to resist functional forces, but weak enough to allow easy removal of the superstructure when necessary without harm to the abutment and implant fixture.\(^2\),\(^12\),\(^13\)

Implant supported fixed restorations may be cemented to abutments with a provisional luting agent to enable removal of the restorations. The tensile bond strength of the cement must be great enough to resist lateral and vertical forces during function. The taper, surface area and texture of preparations affect the retention of the casting.\(^14\) With regard to potential retrievability of cement-retained implant restorations, the retentive strength of the luting agents is critical. Nejatidanesh\(^2\) evaluated the retention values of implant-supported metal copings using different luting agents. He concluded that the dual cure resin modified glass ionomer; zinc phosphate, zinc polycarboxylate, and Panavia F had statistically the same retentive quality and are recommended for final, definitive cementation of single implant-supported restorations. The provisional cements and glass ionomer may allow retrievability of these restorations.

In an in vivo study, Singer and Serfaty\(^1\) reported success when implant-supported cast restorations were retained with provisional luting agents. Retrievability of the cast restoration is desirable if intervention therapy is required and for the maintenance of the supporting tissues and implants. The use of either a provisional luting agent or screw should allow retrievability; however, a provisional cement should eliminate problems noted with screw-retained prostheses. When a cemented superstructure is in use, conventional prosthodontic procedures may be completed in both the laboratory and clinical phases of restorative treatment.

Tensile bond strength of permanent dental cements, such as zinc phosphate and glass ionomer, has been reported with both natural abutments and implant abutments. However, published bond strength data for provisional luting agents used with cast restorations cemented to implant abutments is limited. The tensile strength of the luting agent should allow retrievability when required, yet be sufficient to retain the prostheses during function.

The results of the study showed that thermo-cycling caused a significant reduction in the retentive values of all provisional luting agents investigated. This is in agreement with the results obtained by Michalakis\(^16\) and Kokubo.\(^17\) Michalakis\(^16\) concluded that thermal cycling had a detrimental effect on the retentive properties of all cements investigated. Also Kokubo\(^17\) stated that the retentive force of Temp Bond decreased significantly after thermal cycling.

They concluded that TempBond NE may not be appropriate for the retention of single-tooth zirconia abutments and coping restorations. This is in agreement with our results as TempBond and TempBond NE had the lowest retentive load. Also Ramp\(^18\) found that Temp Bond and Prorlink temporary cement exhibited the lowest mean tensile bond strengths, while Neo Temp cement exhibited tensile bond strength more than three times that of Temp Bond.

Nejatidanesh\(^2\) evaluated the retention value of implant-supported zirconium oxide ceramic copings using different temporary cements and concluded that the retention of zirconia ceramic restorations over ITI solid abutments may be influenced by the type of cement. Michalakis\(^22\) evaluated the failure loads of four provisional luting agents used for the cementation of FPDs supported by 2 implants or 4 implants.

Nogenol luting agent exhibited the lowest retentive values in both types of FPD while ImProv (polyurethane) was the most retentive of all cements tested, possibly related to its higher compressive strength. They found also that Temp Bond NE and Temp Bond presented significantly different values (P<.05) for the 2-implant prostheses but not for the 4-implant model.\(^23\)

The demand for long term provisional cementation of implant supported restorations has resulted in some stand-out solutions by dental materials manufacturers:

\- GC FujiTemp from GC America
\- Telio CS CEM Implant from IvoclarVivadent
\- ImplanteLink from Pret
Part II: Permanent & Retrievable Options for Cementation

**GC FUJITEMP**

**Features and Benefits:**
- Easy and accurate placement and seating due to thin film thickness and moisture tolerance
- After 1 minute seating, easy removal of excess cement while still rubbery
- Final 3 minute set to complete provisional luting of the fixed prosthesis
- Great handling with no runny consistency in a moist environment
- Ability to continually recharge fluoride
- Biocompatible material that is non-irritating to the tooth structure or soft tissue making it an ideal choice to help prevent peri-implantitis
- Excellent insulation (helps prevents thermal sensitivity)
- Ionic bonding to tooth structures and metals to optimize marginal seal
- Tooth-like coefficient of thermal expansion to maintain marginal seal
- Easy to clean-up with no adverse residual effect on final cementation which is common with eugenol cements
- Low film thickness (6 microns)
- High bond strength and mechanical properties for cases needing high retention

**TELIO CS CEM IMPLANT**

Telio Cs Cem Implant is a self-curing luting composite cement with a light-curing option for the aesthetic temporary / semi-permanent cementation of metal-supported long term provisionals (e.g. Telio Lab), metal-free long term provisionals (e.g. Telio Cs C&B) and temporary and definite crowns & bridges

**Features and Benefits:**
- Available in two different shades, transparent and opaque
- Eugenol-free so suitable for use in conjunction with all-ceramic restorations or lab-fabricated composite restorations which are permanently cemented in the adhesive technique
- High cross-link density of the cement preserves marginal gap seal, preventing penetration of bacteria and swelling or detachment of the cement
- Excellent esthetics, even where cement margins are visible
- Extremely low film thickness (8 μm) allowing for reliable and precise positioning of the restoration
- Secure adhesion, high compressive strength
- High cross-link density of the cement preserves marginal gap seal, preventing penetration of bacteria and swelling or detachment of the cement

**IMPLANTLINK FROM PRET**

**Features and Benefits:**
- Long term provisional cement specifically engineered for implant restorations
- Damage free removal of implant restorations using common standard aids (e.g. Crown Butler, Corona Flex)
- Thin (8 micron) film thickness for great fit
- Dual cure for easy removal of excess cement
- Flexible processing times with the dual curing system allow for a controlled gel phase and easy removal of excess cement (large pieces, no crumbling!)

**Indications:** Semi-permanent / temporary cementation on implant abutments made of titanium, gold, or zirconium oxide

**REFERENCES**

Upcoming Innovations in Digital Dentistry

Enhanced connectivity with intraoral scanning

DENTSPLY Implants provides technologies that make it easier for all members of the treatment team to connect and achieve the restorative results they expect every time. In addition to the existing lab-based scanning options, the introduction of intraoral scanning capability allows for increased versatility.

**Intraoral scanning with iTero**—the first intraoral scanning service for ordering ATLANTIS Abutments:

- Clinician captures a digital impression and transmits it to the dental laboratory
- Dental laboratory reviews the case and orders the ATLANTIS Abutment

**Expanded versatility with solutions for edentulous patients**

With ATLANTIS, DENTSPLY Implants offers outstanding freedom of choice in cement-, screw- and attachment-retained restorations, fulfilling every patient’s requirements for esthetics and functionality. An additional solution for partial or completely edentulous patients now includes:

**ATLANTIS™ Conus Abutment**—two options for removable prosthetics:

- ATLANTIS Conus Abutment – overdenture. A solution for removable overdentures attached using ANKYLOS SynCone caps
- ATLANTIS Conus Abutment – custom. A solution for removable bridges/overdentures with more individual design options

**Extended compatibility with new implant interfaces**

Incorporating ATLANTIS for all major implant systems into your portfolio offering is now even easier with expanded compatibility for the following implants:

- **ASTRA TECH Implant System™ EV**
- **Zimmer Dental Tapered Screw-Vent friction fit™**

**Introducing Immediate Smile featuring ATLANTIS Abutment**

for immediate individualized temporization in one single visit through a fully digital workflow. The Immediate Smile concept combines the proven benefits of SIMPLANT guided surgery and ATLANTIS patient-specific abutments into a solution that delivers considerable clinical and patient value.
INTRODUCTION

Levin Group has identified 8 Permanent Game Changers that are having—and will continue to have—a profound impact on the careers of dentists and specialists across the country:

1. The Great Recession and Uninspiring Recovery
2. Changes in Consumer Purchasing Habits
3. Opening of New Dental Schools
4. Decrease in Insurance Reimbursements
5. Expansion of Dental Service Organizations (DSOs)
6. Higher Dental School Student Loan Debt
7. Fewer Associateship Opportunities for New Dentists and Specialists
8. Dentists and Specialists Practicing 8–10 Years Longer

Dr. Roger Levin is a third-generation dentist and the Chairman and CEO of Levin Group, Inc., the largest OMS practice consulting firm in North America. Levin Group was founded in 1985 when Dr. Levin recognized a vital missing link that was preventing oral surgeons from increasing practice production. As a leading authority on OMS practice management and marketing, he has developed the scientific, systems-based consulting method that will increase practice production and profitability, while lowering stress.

He has authored 65 books and more than 3,200 articles. Dr. Levin sits on the editorial boards of five prominent dental publications, serves as the practice management editor of Compendium and is the managing editor of Dental Business Review for Surgical Practices. He is a regular contributor to the Journal of the American Dental Association.

Permanent Game Changers

2. Share Ideas

Once dentists have developed their vision statement, they must let others know about it. They’ve worked hard to create it, so they should share it with the team. Read it out loud at monthly meetings. Hang it in the break room. The vision statement helps the team see their future in the practice.

3. Implement Systems Early

Many doctors think they have systems when what they actually have are merely habits—many of which are bad habits—developed over time. Younger dentists have an opportunity to establish strong systems for long-term success. Once systems have been put in place, the team should be trained to use them properly.

4. Communicate with the Team

Dentists will spend many hours each day with their team. They must be informed about what’s going on with the practice. The doctor should ask for suggestions and listen to their concerns. Too many dentists fail to communicate effectively with staff, and then wonder why confusion and conflict have taken over the office. Good communication keeps everyone on the same page.

5. Start off the Day Right

Begin the day with a morning meeting. This meeting will encourage an open dialogue and allow the team to discuss keys to maintain and improve patient care. Dentists will also have an opportunity to uncover additional items such as how to:

- Prepare for the day—are emergencies or complex cases scheduled?
- Increase efficiency and reduce stress

6. Let Go

With step-by-step systems in place, dentists can hand off non-clinical responsibilities without worry. When team members are given proper training and allowed appropriate decision-making authority, they will feel a sense of self-confidence and connection to the practice.

7. Develop Clear Job Descriptions

Dentists should be sure team members know what is expected of them. Write job descriptions and keep them updated. Doctors can also use job descriptions to improve performance and better train the team.

CONCLUSION

The 8 Permanent Game Changers are transforming dentistry. Many younger dentists who had hoped to “learn the ropes” as an associate have instead been thrust into practice ownership sooner than they expected. As newer dentists settle into their careers, they must decide how they want the next few years to unfold. Strong leadership creates a framework for future success. These seven action steps can help younger dentists reach their leadership potential and grow their practices quickly—even in a difficult economy.

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2 The Levin Group Data Center houses proprietary data collected annually from thousands of dental practices, including clients and other dentists worldwide.
3 American Dental Education Association’s Survey of Dental School Seniors, for the Graduating Class of 2011
The Right Fit

It’s not just the precise fit of our implant restorations, it’s how well our dental laboratory fits you and your practice.

“With SIMPL and Town & Country, I have the confidence and the ability to restore any implant case.”
—Dr. Jones

“SIMPL restorations from Town & Country fit so well, I can seat a case in just 15 minutes.”
—Dr. Glassman

Give us a try, you won’t be disappointed. Call 800.925.8696 to learn more or visit www.townandcountrydental.com.

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