‘Oral tissue contains a kind of powerful stem cell’

Tissue engineering is based on the concept that the human body, or parts of it, can be regenerated using stem cells. Since the 1980s, several types of tissue and organs have been generated worldwide using cultured living cells.

Dental Tribune Asia Pacific, in cooperation with FDI’s Worldental Daily, spoke with Dr. Minoru Ueda from Nagoya University in Japan about key tissue-engineering strategies and their potential for dentistry.

Dr. Ueda, tissue engineering is a relatively new approach in regenerative medicine. How did it find its way into dentistry?

The basic concepts and strategies for tissue regeneration are general. To regenerate any tissue, we need stem cells, growth factors and a scaffold.

In the field of dentistry, we have made much scientific progress in terms of materials, which gives us an advantage over other fields of medicine. We began with developing high-quality materials and then expanded to using stem cells.

What are the key tissue-engineering strategies that are currently being developed for dentistry and how do they work?

The most important tissue for dentistry is bone. We are establishing technologies for bone tissue engineering and apply these clinically to implant surgery. Secondly, we are focusing on stem cell science.

Oral tissue contains a kind of powerful stem cell that can be used to treat systemic diseases, such as brain infarction or heart infarction. The dental pulp stem cell is one of the most important cells derived from oral tissue.

Which dental conditions will be the first to be treated or cured by tissue engineering?

Atrophied alveolar bone and severe periodontitis.

‘You’ve taken implant training; what do you do next?’

By Lynn Mortilla, RDH

Integrating implants into a practice is a job for the whole team as much as it is for the dentist. It is critically important to focus on the “other” skills necessary after clinical competencies are learned. A necessary step is to be sure not only the clinician but the entire team is trained for implant dentistry. Everyone in the practice plays an integral role for successful incorporation of systems, strategies and techniques to enhance the success of implant dentistry. These techniques should be built into daily protocols. Standardized forms and tools can also aid the implant-focused practice.

‘Oral tissue contains a kind of powerful stem cell’

Complete maxillary implant prosthodontic rehabilitation with a CAD/CAM-fixed prosthesis

The authors explain the use of high-strength zirconium oxide restorations in the prosthodontic management of an edentulous maxilla with a failing implant.

‘You’ve taken implant training; what do you do next?’

‘Oral tissue contains a kind of powerful stem cell’
‘Tissue engineering could provide a new treatment method for diseases that have not been treatable thus far.’

To assist with the next steps as a team, I published “Incorporating Implants Into Your Practice — Team Strategies for Success.” The resource guide helps practices learn how to get the most out of implant training and start booking more treatments through staff education, identification of implant candidates, documentation forms, case presentation techniques, patient financial forms and more. The resource guide was printed as a courtesy of ChaseHealthAdvance financing options.

I was working as a surgical assistant and dental hygienist in a practice that was starting to become involved in implant dentistry almost 20 years ago. I had no idea of how the procedures were performed, how to educate patients about implants. Through some research, I found the ADIA (Association of Dental Implant Auxiliaries) and attended their symposium. The ADIA enhanced my overall knowledge of implant dentistry, and in 1996 I accepted the responsibility of becoming the executive director of the ADIA.

It is of great interest to the ADIA to educate each member of the team in the clinical techniques and communication skills necessary to provide excellence in patient care and to educate the team as a whole to enhance the practice and each team member’s career. We focus on the coordination and management responsibilities related to implant dentistry.

As the number of implant practices in the world grows and develops, there is a need for auxiliaries to do the same. Our society is dedicated solely to the purposes of educating dental team members about implants and associated procedures. The ADIA’s main purpose is to establish educational criteria and training for certification, and provide an organized vehicle for auxiliaries to contribute to the field of oral implantology/implant dentistry.

Implant dentistry can be a dynamic and productive part of your practice. If you have completed clinical implant training, how are you going to continue to evolve with current trends, techniques and technology in implant dentistry? Have you developed the systems, strategies and techniques to incorporate implants successfully into your practice? Have you included educating your team in your professional development? The ADIA is committed to constant development of our programs to keep current with the evolving realm of implant dentistry.

I encourage you and your team to look into membership with the IAD and ICOI at www.ICOI.org and www.adaonline.org. I hope the resource guide will give you tips and tools to simplify incorporating implant dentistry into practices for the entire team.

Tell us what you think!

Do you have general comments or criticism you would like to share? Is there a particular topic you would like to see more articles about? Let us know by e-mailing us at feedback@dental-tribune.com. If you would like to make any change to your subscription (name, address or to opt out) please send us an e-mail at database@dental-tribune.com and be sure to include which publication you are referring to. Also, please note that subscription changes can take up to 6 weeks to process.

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Dental Tribune | January 2010

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‘Your Spitting Image’ Web site

Interactive program explores forensics, saliva and bioengineering through dentistry

Did you know that a person could be identified from the DNA in saliva left behind on a postage stamp? Or that the average person creates enough saliva each day to fill a soft-drink bottle? That teeth can survive fires reaching 2012 degrees Fahrenheit?


Find out how forensic dentists use tooth records and DNA你是要牙科，牙医和口腔卫生学作为它

relates to science, dentistry and oral health.

Key scientific topics include DNA, genetics, the mouth/body connection and stem cells.

Parents and middle and high school teachers looking for engaging topics in scientific exploration for use at home or in the classroom will find plenty of lessons to choose from on this site.

The lessons can also be used in conjunction with a field trip to see the Your Spitting Image companion exhibit at the National Museum of Dentistry in Baltimore or at one of the venues across the country hosting the traveling version of the exhibit (currently on view at the Impression 5 Science Center in Lansing, Mich.).

The Web site features three sections that explore the science of dentistry and oral health. In “Forensics: Solving Mysteries,” learn how forensic dentists help law enforcement identify missing persons using X-rays, bitmarks and DNA testing.

Learn how saliva protects our teeth and how our mouth is connected to the health of the rest of our body in “Saliva: A Remarkable Fluid.” The section “Biome- ing: Making a New You” explores how stem cells and genes are being used to grow replacement teeth and cure disease.

Interactive activities include:

• An exploration into how a few drops of saliva can be used to deter mines genetic makeup, diagnose infections and identify illegal drug use.

• A step-by-step illustration of how forensic dentists can extract DNA from a tooth to learn the identity of an unknown victim.

• An animated cartoon that shows how brushing, flossing and rinsing lead to a healthy mouth.

• A visual timeline of the various ways humankind has sought to replace missing teeth for thousands of years, from the ancient Egyptians to the future of tooth replacement.

Teacher guides included on the Web site provide easy-to-understand, illustrated, age-appropriate lessons for middle and high school students that can be used in the classroom.

The educational Web site ‘Your Spitting Image’ is a part of the National Museum of Dentistry’s online offerings.

The Your Spitting Image Web site was made possible by a generous grant from the Patterson Dental Foundation.

The National Museum of Dentistry

The Dr. Samuel D. Harris National Museum of Dentistry, an affiliate of the Smithsonian Institution, is a lively national center where visitors discover the power of a healthy smile and the rich history of dentistry.

Designated by Congress as the official museum of the dental profession in the United States, the museum’s collection of 40,000 objects tells the story of dentistry through changing and traveling exhibits, school tours and family days.

Highlights include George Washington’s lower denture, Queen Victoria’s personal dental instruments and an extraordinary collection of toothbrushes ranging from the 1800s to the present.

The National Museum of Dentistry is located at 51 S. Greene St. in Baltimore. Admission is $7 for adults, $5 for seniors and students with ID, $3 for children ages 3–19; and free for age 2 and under.

Open Wednesday to Saturday 10 a.m. to 4 p.m. and Sunday 1–4 p.m. Closed Mondays, Tuesdays and major holidays. Call (410) 706-0600 or visit www.smile-experience.org for more information.

About the author

Lynn D. Mortilla, RDH, is executive director of the Association of Dental Implant Auxil iaries (ADIA), a fellow of the ICOI’s Board of Directors.

She is also an adjunct clinical instructor at Temple University, Department of Periodontics and Implants and is on the faculty for the implant preceptorship at the University of Texas Health Science Center, San Antonio.

Mortilla is a contributing author to “Dental Implants: The Art and Science” (Rabbiush: Saunders) and to “Contemporary Implant Dentistry 3rd Edi tion” (Misch; Mosby).
NYU shares $1.63 million NIH award

Although the destructive effects of oral bacteria in producing dental caries (cavities), periodontal disease and other infectious conditions are well known, the identities of many of the microbes responsible for these conditions, as well as their physical characteristics and ability to grow and sustain themselves, remain a mystery. In fact, only half of the bacteria residing in the human oral cavity have been identified.

Now, a NYU College of Dentistry microbiologist and an engineer at Sandia National Laboratories, part of the U.S. Department of Energy, are partnering to develop a technology that will facilitate bacterial identification. Their study was recently funded with a three-year, $1.63 million grant from the National Institute of Dental and Craniofacial Research (NIDCR) of the NIH.

The study's principal investigator, Dr. Anup Singh, director of biosynthesis research at Sandia, uses a method for spotting unknown microbes in saliva dubbed “FISH n’ CHIPS” because it combines fluorescent in situ hybridization (FISH) with a glass chip less than four centimeters wide.

NYUCD, a subcontractor on the grant, received a $264,000 award to acquire saliva samples from NYUCD’s patient population, prepare the samples for Dr. Singh, and analyze Dr. Singh’s findings. Dr. Deepak Saxena, an assistant professor of basic science and craniofacial biology, is leading the NYUCD study in collaboration with Dr. Daniel Malamud, a professor of basic science and craniofacial biology and director of NYUCD’s HIV/AIDS Research Program.

In their study, Saxena and Singh take advantage of recent advances in gene sequencing that enable microbial analysis without lab cultivation. Using probes composed of small, incomplete oral bacteria nucleic acid sequences, the researchers will locate, or “fish out,” bacterial cells with matching DNA sequences from dozens of saliva samples that have been arrayed on a glass chip. Probes that bind to complementary sequences will be marked with a fluorescent dye so that investigators can examine them under a microscope to confirm that they have been properly matched.

The researchers plan to locate cells from a dozen unknown oral bacterial species and establish a bank of cells that can be manipulated in subsequent sequencing studies designed to fully decode a microbes’ genome.

“I anticipate that our ‘FISH n’ CHIPS’ model will ultimately also be used to locate unknown bacteria in the gastrointestinal and nasal tracts and in other parts of the body,” said Saxena. “This will help in the development of genetic tests to identify those at risk for a variety of infectious diseases.”

(Source: New York University)

Long-term cavity protection from tooth-binding micelles?

A new study suggests that tooth-binding micelles (or particles) may provide long-term cavity protection by adhering to tooth surfaces and gradually releasing encapsulated antimicrobials.

A formulation of a mouthwash-based delivery system is anticipated, ultimately simplifying application and increasing at-home patient compliance.

The researchers, from the University of Nebraska Medical Center, Omaha, and the University of Florida, Gainesville, reported their findings in the November 2009 issue of the journal Antimicrobial Agents and Chemotherapy.

One of the main contributing factors to dental cavities is overpopulation of acid-producing bacteria in the oral cavity that causes localized destruction of compromised dental hard tissue. Due to the episodic nature of cavities, long-term benefits of periodic treatments administered during routine office visits are minimal. Other delivery systems developed to maintain drug concentrations, including bioadhesive tablets, patches, films and gels, aren’t very effective on the tooth surface and often cause irritation resulting in poor patient compliance.

Emphasis on the need for therapeutic strategies that target the bacterial aspect of the disease and a delivery platform that would maintain the drug concentration on the tooth surface is warranted.

In the study, tooth-binding micelles (molecular particles) were developed and encapsulated with farnesol, an antimicrobial recently found to be effective against the cavity causing bacterium Streptococcus mutans. The researchers suggest that the micelles provide long-term cavity protection by adhering to tooth surfaces and gradually releasing the encapsulated antimicrobial.

Formulation of a mouthwash-based delivery system is anticipated, ultimately simplifying application and increasing at-home patient compliance.

(Source: New York University)
Cosmetic dentist holds video contest

By Fred Michmershuisen, Online Editor

A cosmetic dentist in Austin, Texas, has thought of an interesting idea to drum up interest in his practice, Austin Dental Spa.

Dr. Mark Sweeney is conducting a contest inviting participants to describe — on video — why they think they are “the most interesting dental patient in the world.”

The winner will be chosen by an online vote and will be treated to a smile makeover worth up to $15,000, including a variety of treatments designed to fix dental issues and improve the appearance of his or her teeth.

Contestants are asked to create a video that shows why they are the most interesting dental patient and why they deserve a smile makeover. Submissions will be judged by staff members of Austin Dental Spa for creativity and entertainment value, and the top three finalists will be uploaded to the practice’s Facebook and YouTube pages.

Anyone can view the videos and vote on the contestant he or she believes best represents the most interesting dental patient in the world.

Although only the winning submission will earn the smile makeover prize, Sweeney says everyone who submits a video will receive from the practice a teeth whitening treatment valued up to $600.

Sweeney is asking contestants to keep video submissions shorter than five minutes — and also G-rated.

Contestants aiming for a smile makeover, which can include teeth whitening, dental crowns, porcelain dental veneers and dental implants in Austin, are encouraged to check out the contest rules and details on Austin Dental Spa’s Web site, located at www.austindentalspa.com.

Videos were submitted through Dec. 31. Online voting began Jan. 6 and ends on Jan. 22. The winner will be announced Jan. 27.

Dentists honor Mingledorff

By Fred Michmershuisen, Online Editor

Fort Washington, Pa., prosthodontist Dr. Tom Balshi and his wife, Joanne, recently gathered dental specialists born of Philadelphia’s only graduate program in prosthodontics to honor its renowned former chair, mentor and Bryn Mawr resident Ernest Beckwith Mingledorff.

Beloved by all for his wisdom, gentle manner and flowing good humor, “Ernie” drew a crowd of 80 professionals from the greater Philadelphia and New York area.

In a late summer poolside setting with the vibrant music of live steel drums keeping beat, dental collegiality was at its best graced by the presence of Temple University President Ann Weaver Hart and newly appointed Dean Amid Ismail of Temple’s Kornberg School of Dentistry.

Both Hart and Ismail spoke of their commitment to reinvigorate prosthodontic education in the Philadelphia area.

Balshi was the first graduate of the Temple Dental School program in prosthodontics to become certified as a Diplomat of the American Board of Prosthodontists. His Fort Washington, Pa., practice boasts a 100 percent success rate in prosthodontic restorations on dental implants.

“IT is anticipated that the tooth-binding micelles have the potential to be formulated into mouth rinses that may have the merits of simple application, cultural acceptance and improved patient compliance.”

If you would like to download a copy of the journal article, please visit www.asm.org.

(Source: American Society for Microbiology)

coccus mutans UA159. When tested on a model tooth surface, the micelles were able to swiftly bind and gradually release the encapsulated farnesol.

Additionally, biofilm inhibition studies of the farnesol-containing tooth-binding micelles demonstrated that they were able to inhibit S. mutans UA159 at much higher levels than untreated blank control micelles.

“A tooth-binding micelle delivery platform for the prevention and treatment of dental caries has been designed and prepared in this study,” the researchers said.
Weak economy increases employee theft

By Sally McKenzie, CMC

The stories read like popular fiction. Unfortunately, they are true. The outwardly stable, unquestionably loyal employee commits a crime that no one would have expected, least of all her/his employer. More puzzling is the fact that often this member of the staff doesn’t have a criminal record.

In fact, according to the 2008 report of the Association of Certified Fraud Examiners (ACFE), only 7 percent of those committing fraud have prior convictions and a mere 12 percent have been fired by a former employer as a result of fraud related conduct.

However, what is perhaps most disconcerting is that many of the characteristics that make up this person’s profile would also be the sketch for your “ideal” team member. “Dedicated, takes very little time off, first in the office and last to leave, will even take work home, is very particular about how things get done.” Someone may say she/he is controlling while others contend it’s a commitment to doing a job well. Working her/his fingers to the bone, this devoted employee is quietly slipping thousands of dollars under the table and into her/his pocket.

According to the ACFE’s most recent report, U.S. businesses lose an estimated $949 billion in annual revenues to fraud despite increased emphasis on anti-fraud controls and recent legislation to combat it. If that weren’t troubling enough, the U.S. Chamber of Commerce estimates that 75 percent of all employees steal at least once, and that half of these steal repeatedly.

Who are the thieves?

Fraudsters are represented by all occupations — CEOs, bank tellers, firefighters, payroll clerks, senators, even Catholic priests. And, in some cases, they are shamelessly brazen.

One reported case involved an employee who routinely crossed out the employer’s name on checks written from customers and inserted his own. No Wite-Out®, no fancy chemical concoction to erase the ink, he just struck through the name on the check and made it payable to himself.

And you probably thought the bank would catch something so blatant, right? However, banks process literally tens of thousands of checks per minute so they cannot catch every suspicious-looking one.

In the case of a parish priest, he embezzled more than $1 million from two churches. The crime wasn’t exposed until a donor requested a receipt for tax purposes from the church dioceses, which had no record of the donation. However, the contributor had his canceled check. This led to the arrest and conviction of the priest.

No organization or business is immune to employee theft, and health care businesses, such as dental offices, are among the top three businesses to be victimized by dishonest employees.

With the average loss per fraud case among small businesses at $200,000, that kind of financial hit can be huge for small dental practices, many of which operate very close to the margin.

In this economy, any increase in expenses or reduction in revenue could be catastrophic. Even more problematic is the fact that lenders are less likely to extend additional credit these days to cover such a shortfall.

How do they steal?

Dishonest employees are fraudulently writing company checks, skimming revenue and engaging in fraudulent billing. In small operations, such as dental practices, internal controls tend to be lax and accountability slim, thus providing the ideal environment for employee theft.

Checks, in particular, present a veritable smorgasbord of opportunities for the small business embezzler. As another thief discovered, it was a relatively simple exercise to alter company checks to herself and then destroy the canceled checks.

Countless fraudsters have discovered the ease of ordering new checks in the business’ name and making them out to themselves. They can steal insurance checks or sign checks using a signature stamp.

In a multitude of other cases, the trusted employee accepts payment from the patient or customer, deletes the transaction on the computer and keeps the payment. Many patients never notice. Whatever form the rationalization takes, often, in the employee’s mind, she/he is simply correcting a perceived wrong.

Who’s most likely to be pilfering from your practice? Fraud experts refer to it as the 10-10-80 rule: 10 percent of people will never steal, another 10 percent will steal at any opportunity, and the other 80 percent will go either way depending on how they rationalize a particular opportunity.

The good news is that for those in the 80 percent category, if they believe they will be caught, they won’t take the chance.

Don’t be an easy target

Small businesses such as dental practices are prime targets for fraud and embezzlement. Why? Practice owners can be very naïve and far too trusting, giving almost total financial control to an employee. In some cases, dentists don’t even know how or where to access their financial reports.

In addition, there is often a close relationship between clinicians/owners and employees. They...
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become trusted friends, and this, sadly, encourages dishonest employees to take advantage of their “dentist friends.”

As the ACFE reports, the most common small business scheme is check tampering. It frequently occurs when one individual has access to the company’s checkbook and also has responsibility for recording payments and/or reconciling the company bank statement.

Therefore, the first order of business in protecting practice finances is to divvy up the financial duties.

The practitioner may only want to do the dentistry, but this attitude is inviting disaster.

As one Wisconsin dentist discovered not long ago, his trusted employee of 28 years who had “total run of the practice’s financial operations” was accused of stealing at least $41,000, and that was believed to be just the tip of the iceberg.

Separating billing, collections and delinquent account responsibilities is critical. The employee making the bank deposit should not be the same employee responsible for checking the deposit slip that is returned from the bank.

Consider rotating the responsibility for making bank deposits among employees, and monitor deposits for unexplained increases or decreases.

Checks received should be immediately stamped on the back with the practice’s bank deposit endorsement stamp. Periodically check the account number to ensure it is the practice account. Do not use signature stamps.

All employees should be required to take at least one week’s vacation every year, particularly those in charge of practice finances.

And, most importantly, don’t let the work pile up. During that time, someone else should carry out the vacationing employee’s duties.

Checks received should be immediately stamped on the back with the practice’s bank deposit endorsement stamp. Periodically check the account number to ensure it is the practice account. Do not use signature stamps.

Pay attention to key red flags. According to the ACFE report, “Fraud perpetrators often display behavioral traits that serve as indicators of possible illegal behavior. The most commonly cited behavioral red flags were perpetrators living beyond their apparent means (39 percent of cases) or experiencing financial difficulties at the time of the frauds (34 percent).”

Finally, take complaints seriously. If patients claim that they’ve paid but didn’t receive credit, investigate it. If an employee tips you off that something isn’t right, check it out.

If you sense that things just aren’t adding up, don’t dismiss it. Ignorance could cost you thousands, if not millions, of dollars.

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When It's Time to Buy, Sell, or Merge Your Practice
You Need A Partner On Your Side

ALABAMA
Birmingham—3 Ops, 2 Hygiene Rooms, GR $675K #1018
Birmingham Suburbs—3 Ops, 3 Hygiene Rooms #10106
CONTACT: Dr. Jim Cole @ 205-513-1573

ARIZONA
Arizona—Doctor seeking to purchase general dental practice #2110
Shaw Law—2 Ops, 2 Hygiene Rooms, GR in 2007 $645,995
Phoenix—General Dentist seeking Practice Purchase
Plano—4 Ops, 3 Equipped, GR $515K+, 5 Working Days #12113
North Scottsdale—General Dentist seeking Practice Purchase
Opportunity #2109
Urbana—5 Ops, 4 Equipped, 1 Hygiene, GR $990K #21122
Tucson—1,800 active patients, GR $850K, Asking $600K #12116
CONTACT: Tom Kimbel @ 602-516-3219

CALIFORNIA
Altamont—3 Ops, GR $611K, 3 1/2 day work week #14279
Antioch—2 Ops, 1,080 sq. ft., GR $147K #14367
Bakersfield—2 Ops, 2,000 sq. ft., GR $1,516,000 #14200
El Cerrito—3 Ops, 3 Equipped, 1,000 sq. ft., GR $550K #14132
Fresno—5 Ops, 1,500 sq. ft., GR $1,064,500 #14290
Fresno—3 Ops, 1,000 sq. ft., GR $86K. Some loco 24 yrs #14298
Great Areal Area—1 Ops, 1,000 sq. ft., GR $765K #14301
Madera—7 Ops, GR $1,921K #14283
Modesto—12 Ops, GR $980,000, Some location for 10 yrs #14309
Northern California Wine Country—2 Ops, 1,500 sq. ft., GR $950K #14290
Ponterull—6 Ops, 2,000 sq. ft., GR $2,800,000 #14291
Red Bluff—4 Ops, 2008 GR $1,605,966, 10 days hygiene #14272
San Francisco—4 Ops, GR $875K, 1,000 sq. ft. #14288
San Jose—4 Ops #14297
South Lake Tahoe—3 Ops, 647 sq. ft., 2007 GR $515K #14277
Los Gatos & Saratopoly—4 Ops, 1,150 sq. ft. GR $81 MILL #14265
CONTACT: Dr. Dennis Hooper @ 608-519-3458
Dinse—1,000 sq. ft., GR $122K #14265
Grass Valley—3 Ops, 1,000 sq. ft., GR $714K #14272
Redding—2 Ops, 2,200 sq. ft., GR $711K #14293
Yuba City—5 Ops, 4 days hyg, 1,200 sq. ft. #14275
CONTACT: Dr. Thomas Wagner @ 916-712-3235
San Jose—1,200 sq. ft., 10 days over lease #14301
Thom till Tn @ 913-593-3808

CONNECTICUT
Fairfield Area—General practice using 8000 #16102
Scotch Plains—2 Ops, GR $25K #16111
Wallingford—2 Ops, GR $600K #16113
CONTACT: Dr. Peter Goldberg @ 617-660-2930

FLORIDA
Miami—5 Ops, Fall Lah, GR $859K #18117
Jacksonville—GR $1.5 Million, 3000 sq. ft., 7 Ops, 8 days hygiene #18118
CONTACT: Deena Wright @ 800-730-8883

GEORGIA
AtlantaSuburb—3 Ops, 2 Hygiene Rooms, GR $863K #19125
Atlanta Suburb—2 Ops, 2 Hygiene Rooms, GR $675K #19128
Atlanta Suburb—3 Ops, 1,270 sq. ft., GR $438,563 #19131
Atlanta Suburb—Pediatric Office, 1 Op, GR $426K #19134
Duluth—GR $1 MILL, Asking $482K #19107
Macon—3 Ops, 1,625 sq. ft., State-of-the-art equipment #19103
North Atlanta—4 Ops, 3 Hygiene, GR $678K #19132
Northeast Atlanta—4 Ops, GR $607K #19129
Northern Georgia—1 Op, GR #19110
South Georgia—2 Ops, 3 Hygiene Rooms, GR $722K #19113
CONTACT: Dr. Jim Cole @ 404-513-1573

ILLINOIS
Chicago—4 Ops, GR $709K, Sale Price $461K #22126
1 1/2 Mi South of Chicago—2 Ops, GR 2007 $464K, 28 yrs old #22123
Chicago—3 Ops, GR $190K, 3-day work week #22119
Western Suburbs—3 Ops, 2-200 sq. ft. GR Appx $1.5MM #22152
CONTACT: Al Brown @ 610-781-2176

MARYLAND
Southern—11 Ops, 3,500 sq. ft., GR $1,840,628 #29101
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Complete maxillary implant prosthetic rehabilitation with a CAD/CAM-fixed prosthesis

By Neo Tee-Khin, Ansgar C. Cheng, Helena Lee and Ben Lim, Specialist Dental Group, Singapore

Endosseous implant treatment has been widely reported as a highly predictable treatment modality with a low percentage of clinical complications. Current clinical judgement and careful consideration of the risks and benefits of various treatment options are essential for the treatment planning and long-term success of prosthetic treatment.

Traditional implant prostheses are commonly fabricated using acrylic resin teeth supported by a metal framework. Significant space is designed at the tissue surface of the prosthesis to enhance oral hygiene maintenance. However, application of this prosthetic design in the maxillary arch is occasionally esthetically inadequate and speech may be compromised.

Conventional porcelain-fused-to-metal restorations require the placement of labial restoration margins below the free gingival margin in order to mask the hue and value transition between the sub-gingival implant sub-structures and the supra-gingival crown restorations.

From a periodontal point of view, sub-gingival placement of restoration margins is related to adverse periodontal tissue response. As a result, restoration margins are best placed coronally from the free gingival margin. Porcelain-fused-to-metal restorations are commonly used in the posterior teeth because of their well-documented long-term clinical track record. CAD/CAM ceramic-based materials are prescribed nowadays, owing to their demonstrated promising physical properties and clinical longevity.

This article describes the clinical application of high-strength zirconium oxide restorations in the prosthodontic management of an edentulous maxilla with a failing implant prosthesis.

Clinical report

A 62-year-old female with an implant-supported maxillary prosthesis was evaluated at the Specialist Dental Group in Singapore. She presented clinically with a maxillary fixed complete denture supported by six endosseous implants (NobelReplace, Tapered Groovy, Nobel Biocare).

The prosthesis had acrylic resin teeth supported by a gold alloy metal framework. The implant at the patient’s maxillary right canine area was exposed. The patient reported no symptoms (Fig. 1).

An occlusal examination revealed a stable maximum inter-cuspation position with insignificant centric relation to maximal inter-cuspation slide at the teeth level. A canine-guided occlusal scheme was noted. No para-functional habits were reported. Sub-optimal maxillary lip support was noted.

A significant amount of dead space was identified between the intaglio surface of the prosthesis and the maxillary soft tissue. Upon removal of the maxillary prosthesis, all the maxillary implants were found to be osseointegrated. The patient desired to correct the failing implant, restore lip support, masticatory function and facial esthetics.

The overall treatment plan included removal of the implant at the maxillary right canine area, replacement of a new implant at the maxillary right canine region and fabrication of a full-arch, zirconium oxide-based ceramic restoration in the maxilla.

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The overall treatment plan included removal of the implant at the maxillary right canine area, replacement of a new implant at the maxillary right canine region and fabrication of a full-arch, zirconium oxide-based ceramic restoration in the maxilla.

Under local anaesthesia, the implant at the maxillary right canine area was removed surgically (Fig. 2) and a new 15 mm-long regular platform implant was placed (NobelReplace, Tapered Groovy). The new implant was sub-

Fig. 2: Full-thickness flap revealed the advanced bone loss on the labial surface of the implant. In spite of the tissue damage, this implant was clinically firm.

Fig. 3: Maxillary prosthesis before the application of tooth-colored porcelain; excessive crown length was noted at this stage.
merged and primary wound closure achieved. The existing prosthesis was re-inserted during the healing period to serve as a provisional prosthesis.

Once osseointegration was achieved a few months later, the new implant was exposed and the maxilla was ready for prosthodontic rehabilitation after a few weeks of soft-tissue healing.

Six implant-level impression copings (NobelReplace) were placed onto the maxillary implants. High-viscosity vinyl polysiloxane material (Aquasil Ultra Heavy, DENTSPLY DeTrey) was carefully injected around all the impression copings.

A stock tray loaded with putty material (Aquasil Putty, DENTSPLY DeTrey) was seated over the entire maxillary arch to make the definitive impression.

A jaw-relation record at the treatment vertical dimension was made with a vinyl polysiloxane material (Regisil PB, DENTSPLY DeTrey).

The maxillary and mandibular definitive casts were mounted arbitrarily in the center of a semi-adjustable articulator (Hanau Widevue, Teledyne Waterpik) using average settings.17,18

The custom zirconium oxide abutments with gold-alloy fitting surface (Procera, Nobel Biocare) were CAD/CAM fabricated according to the prosthesis design.

The development of the planned definitive maxillary restoration was carried out using a CAD/CAM process. The maxillary definitive cast with the custom full-ceramic abutments were scanned (Zeno Scan, Wieland Dental+Technik), and the prosthesis framework was designed using a software program (D700, 3Shape).

The framework was milled in zirconium-base material (Zeno Zr Bridge, Wieland Dental+Technik) with a milling machine (Zeno 4050 M1, Wieland Dental+Technik). The prosthesis framework was sintered according to the manufacturer’s recommendations.

Subsequently, overlaying low-fusing, tooth-colored porcelain
material (IPS e.max, Ivoclar Vivadent) was manually applied onto the exterior to create proper anatomic form (Fig. 5). Low-fusing, gingival-colored porcelain material (IPS e.max) was applied to create proper lip support (Fig. 4).

During the delivery clinical session, the old prosthesis was removed and the new custom abutments were torqued to 52 Ncm (Fig. 5).

The new prosthesis was tried in to verify color, occlusion, lip support, teeth form and comfort. Upon confirmation of the patient's acceptance, the implant abutments were sealed in gutta-percha (Fig. 6) and the prosthesis was cemented in resin-modified glass-ionomer luting agent (Relly X Unicem, 3M ESPE).

The patient was evaluated two weeks postoperatively. Anterior guided occlusal schemes were verified intra-orally before and after prosthesis cementation (Fig. 7).

The patient reported no discomfort and she had been functioning well with the new restorations. No abnormal clinical signs were noted.

Discussion
Osseointegration is a well-documented and predictable clinical treatment option. On the other hand, management of implant failure is also a clinical reality.

In this clinical report, the failure of one implant at a crucial location indicated the need for re-fabrication of the entire implant prosthesis.

As the patient desired a high level of esthetics, full-ceramic restorations were selected. By prescribing tooth-colored ceramic abutments and full-ceramic restorations, prosthesis margins were made at the gingival level and gingival retraction procedures were eliminated during impression and prosthesis insertion.

Full-arch prosthodontic rehabilitation using fixed prostheses usually requires longer-term provisional restoration in order to facilitate a predictable treatment outcome.

In this patient, the existing maxillary prosthesis served as a long-term provisional restoration for verifying her adaptability, and multiple professional clinical adjustments of provisional restorations were not required.

This treatment sequence increased the margin of safety in the execution of the definitive full-ceramic restoration.

Intra-oral verification of the new treatment occlusal scheme and detailed in situ clinical adjustment of the restorations on the day of prostheses insertion still formed the essential foundation for proper treatment execution.

In any major prosthodontic treatment, the patient should be informed of the potential financial and time implications should the need for re-fabrication of the restorations arise.

Conclusion
The functional management of an edentulous maxilla using a full-ceramic implant-supported maxillary prosthesis has been reported. New CAD/CAM-based restorative materials were used in treating this case.

The use of high-strength full-ceramic restorations enhances overall esthetic predictability and long-term functional outcome. A complete list of references is available from the publisher.

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‘Sunshine and Sweet Romance’ at the Miami meeting

The 2010 Miami Winter Meeting promises to deliver an excellent program for all attendees. Headlining the program are Drs. Markus Blatz and Alan Atlas on esthetic dentistry from adhesion to zirconia.

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Dr. Scott Benjamin will present a lecture on laser dentistry sponsored by the Academy of Laser Dentistry.

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The Miami Winter Meeting is a boutique meeting that is all-inclusive. When you purchase your ticket to any of the lectures or for the expo only, your food, beverage and parking are included.

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Fig. 6: Occlusal view of the maxillary arch before insertion of the maxillary prosthesis; favorable anterior-posterior spread allowed the replacement of posterior teeth with distal cantilevering.

Fig. 7: Completed maxillary implant-supported prosthesis; note the placement of the supra-gingival margins.
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Placing a matrix band to attain a good contact point and avoiding interproximal overhang after preparation for Class II fillings can be a time-consuming and laborious procedure. Directa’s new FenderMate® offers a unique, fast and easy solution by combining a separating plastic wedge and stainless-steel matrix in its innovative design.

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FenderMate is available in two wedge widths, regular and narrow, and for left or right application. They are color-coded for ease of identification. The new, innovative design accommodates most approximate spaces.

FenderMate aids fast and efficient restorations and is the fastest matrix to apply on the market.

The combined use of Directa’s new FenderMate and Fender-Wedge® sets a new standard with a tissue-friendly approach for the preparation and filling of Class II restorations.
Levin Group partners with pharmaceutical company

Levin Group announced on Dec. 16, 2009, that it has been engaged by Novalar Pharmaceuticals, based in San Diego. As the leading international dental practice management consulting firm, Levin Group works with numerous dental corporations to help them successfully market their products and technologies and integrate them into dental practices.

The company will partner with Novalar to develop a program to demonstrate to dental professionals the value of OraVerse as an effective routine treatment in cases where anesthesia reversal is appropriate. OraVerse is used after restorative dental procedures where lingering numbness is problematic. It is the first and only anesthesia reversal agent that restores normal sensation twice as fast and accelerates return to normal function so patients can speak, smile and drink normally.

A leader in consulting with dentists and dental companies on practice management systems, Levin Group has partnered with multiple companies to develop materials to assist in the implementation of unique and innovative products.

Levin Group, an international consulting firm for dentists, specialists and dental corporations with 24 years of experience, is based in Owings Mills, Md., with a second office in Phoenix. Levin Group provides practice management and marketing consulting programs to thousands of practitioners every year. For more information about Levin Group, please visit www.levingroup.com.

New Zealand prime minister salutes Triodent at project launch

New Zealand Prime Minister John Key gave dental manufacturer Triodent his seal of approval at an unveiling ceremony on Nov. 21, 2009, to launch the company’s major expansion project.

Key had been invited to open the Triodent Innovation Center, the first stage of the company’s plan to build a new headquarters in Katikati, New Zealand, about two hours’ drive southeast of Auckland.

The prime minister unveiled a sculpture to commemorate the event. Appropriately, it was made using the company’s new titanium laser sintering machine, which will be used to manufacture core Triodent products.

The new headquarters will bring all of Triodent’s New Zealand operations, including manufacturing, administration and an international call center, onto one site for the first time since early 2007.

A new factory is scheduled to open there in late 2010, with the administration wing to follow.

Speaking to invited guests at a garden party on the planned site, Key said achieving success in the world market was “ultimately about doing things a lot smarter.”

“I want to encourage New Zealand companies to do the things that Triodent is doing, and that is blazing a trail in international markets, being creative and investing in science and research and development, because that is the future of New Zealand,” Key said.

Triodent founder Dr. Simon McDonald was delighted to welcome Key to the opening. “This is a special day for me personally and it is a great honor to host the prime minister in this wonderful country I am privileged to live in.”

McDonald said 2009 had been a memorable year for Triodent, not only for the numerous awards won but also in the way the company had consolidated its position and set out the path for a strong future.

“It has been a hard year for worldwide business, but we have weathered the storm better than many and we will be the better for it. We have greatly improved many of our systems this year and made some big decisions that will bring huge benefits as we mature.”
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Immediate restoration of single implants replacing central incisors compromised by internal resorption

By Susan McMahon Petruska, DMD, and Jessica Forestier

Central incisors with a history of past trauma are a common finding in dentistry today. Many of these conditions may present as asymptomatic and is discovered shortly post trauma. However, failure of these teeth can occur at a later time as a result of fracture, internal resorption, external resorption, decay and other factors. Sources of trauma often include sports or automobile related accidents.

Once it has been determined that an internally resorbed tooth is failing, the appropriate restorative treatment plan that is both functionally and esthetically acceptable must be determined and implemented. The following is a case study involving maxillary right central incisors that had sustained trauma, were endodontically treated and functioned for a number of years. Approximately 15 to 20 years later, the teeth in each case failed due to internal resorption.

Internal resorption

Dental root resorption involves the loss of hard tissues that compose the teeth (dentin, cementum and enamel) as a result of trauma that occurs primarily by osteoclasts, large multinucleated cells that originate from the bone marrow. Osteoclasts aid in the process of bone loss by releasing demineralizing agents and degrading enzymes that function in the breakdown of a tooth’s hard tissues. Resorption of the teeth is often difficult to prognosticate, diagnose and care for.

In most cases, tooth resorption is the result of trauma or irritation to the periodontal ligament and/or tooth pulp. These conditions may occur because of injury, inflammation or chronic infection of the pulp, periodontal conditions, orthodontic tooth motility or tooth eruption. Internal inflammatory resorption, the type of resorption identified in the following cases, is characterized by progressive loss of hard tissue in the tooth root. This degeneration is typically found in the cervical region, but has been observed in all areas of the root canal system. Internal resorption is generally asymptomatic and is discovered most frequently through radiographic examination. The loss of hard tissue is detected radiographically as uniform radiolucent expansion of the tooth canal. If internal resorption is left to progress untreated, it may result in extension to the periodontal ligament through a crown or root perforation.

Immediately placed implants/immediate provisionalization

The clinician faces a great esthetic challenge in the replacement of single anterior teeth. In the following cases of internally resorbed incisors with a poor prognosis, extraction followed by immediate placement of an implant is a desirable restorative option. The failing tooth is located in the esthetic zone, and therefore an immediate and esthetic replacement is necessary following extraction.

In the past, the non-restorable tooth was extracted and a removable partial denture (or flipper) was fabricated and placed for use during healing. After an adequate healing period, an implant was placed and buried under the gingiva and the patient continued to wear the flipper until the implant had osseointegrated and was ready to be uncovered and restored. The patient would therefore wear the removable partial denture for upwards of six to eight months.

This course of treatment often results in a less than desirable gingival architecture surrounding the final restoration. There are also clear indications that partial removable dentures are an important causative factor in the alveolar bone resorption process.

Major cosmetic concerns in the fabrication of the immediately placed provisional are the retention of the interdental papilla and prevention of alveolar bone collapse. Research has suggested that immediate provisionalization following implantation allows for greater clinical control over the regeneration of tissue surrounding the site of extraction. This benefit offers an esthetic advantage of immediate loading of an implant with immediate provisionalization over alternative-staged therapy treatment options.

Unfavorable alterations to the alveolar bone structure must be avoided using ridge preservation techniques and precautions in terms of osseous exposure. Immediate placement of the implant into fresh extraction sockets prevents the post-extraction resorption that occurs commonly with alternate forms of treatment, preserving the integrity of the alveolar ridge.

Case study No. 1

The patient is a 50-year-old healthy male who was examined in our office for a failing maxillary right central incisor. His history involves a soccer accident in 1995 that resulted in an elbow to the face with trauma to the right maxillary central incisor. Approximately one week subsequent to the accident, the patient’s tooth was treated endodontically. It eventually became discolored and grew increasingly out of alignment (Fig. 1).

Clinically, all other maxillary and mandibular teeth were in good condition. Periapical examination revealed healthy gingival tissue. The patient was concerned that his anterior tooth would fracture unexpectedly and desired an immediate replacement.

Treatment options

Several treatment options were considered. The first was extraction of the maxillary right central incisor and fabrication and placement of a conventional fixed bridge of porcelain fused to metal or an all-ceramic system.

The second option was extraction of the tooth followed by placement of a removable partial denture. The next option was extraction, provisionalization with a removable partial denture (flipper) followed by implant placement while wearing the flipper and, finally, restoration of the implant.

The best alternative was extraction and immediate replacement of the extracted tooth with an implant, followed by immediate loading with a nonfunctioning provisional. After adequate osseointegration, a final restoration would be fabricated.

Advantages and disadvantages of all options were explained to the patient, who decided to undergo immediate treatment with an immediate implant restoration. The patient was then referred to a periodontist for further evaluation and implant consultation.

Implant evaluation

Implant examination revealed adequate bone height and width for implant placement immediately following extraction of the failing tooth. A surgical date was scheduled with the periodontist for extraction of the tooth and placement of the implant. An appointment was coordinated with our office for the patient directly following the surgical procedure for provisionalization of the implant.

Surgical protocol

The right central incisor was removed and a Nobel Replace Tapered Groovy (internal connection) 5.0 x 15 mm implant was placed.

An osseous graft of demineralized freeze-dried bone and a collagen membrane were utilized to augment the surgical site. The fixture received an emergence profile-healing abutment. See the radiograph with implant in place (Fig. 2).

Provisionalization

The patient presented in our office after the implant placement with a healing abutment in place. The healing abutment was removed. A Nobel Biocare immediate temporary abutment was placed and a provisional was fabricated.

Care was taken to contour the emergence of the provisional as to best support the gingival architecture. The plastic coping for the immediate temporary abutment was...
roughened with a 56 carbide bur to enhance adherence of the integrity provisional material used.

The provisional was polished and placed on the immediate temporary abutment with a small amount of flowable composite to enhance retention. The provisional crown was fabricated to be completely out of occlusion and non-functional to insure the implant adequate osseointegration time undisturbed by occlusal and forces.

The provisional restoration was observed periodically during the six-month healing process to monitor gingival adaptation (Fig. 5).

**Final restoration**

Six-months post surgery, the patient was scheduled for placement of the final restoration. After removing the provisional crown and the immediate temporary abutment, an implant impression post was placed, radiographic verification was made to assure complete seating and a final impression was taken with a polyether system.

Complex shade mapping was carefully performed to match the existing contralateral natural teeth. The provisional was then reinserted.

A Procera zirconia custom implant abutment was chosen. Zirconium implant abutments have not only been noted for their toothlike color and esthetic appeal, but for their tissue tolerability, high load strength and intrasulcular design enhancement.2

The extraordinary load strength of the oxide ceramics is not compromised by high bending and tensile strength, and fracture and chemical resistance.7 Zirconium abutments are mechanically equivalent to their metal counterparts, but boast greater biological compatibility.

Results of a recent study provide evidence that ceramic oxide abutments can be safely utilized in the incisor region of both the maxilla and mandible as determined by maximal bite forces in the esthetic zone.6

Due to excellent restorative properties in terms of strength and color conformity, the zirconium implant abutment is becoming increasingly favored by clinicians for esthetically pleasing anterior implant restorations.4 A Procera zirconia crown was fabricated for this patient with Noritake CZR porcelain (Fig. 4).

At the time of insert, the provisional crown and immediate temporary abutment were removed. The Procera zirconia custom abutment was seated, the screw was hand tightened and the screw torque to 55 Ncm with the manual torque wrench.

The access was filled with a small cotton pellet and topped with a thin layer of flowable composite. The Procera zirconia crown was then seated; margins, contacts and occlusion were confirmed; and the crown was cemented in place with 3M ESPE RelyX luting cement (Fig. 5).

**Case study No. 2**

This patient, a healthy male in his late 50s, was examined in my office for a fractured maxillary right central incisor. The patient had full-mouth porcelain restorations on his upper central and upper lateral incisors that were placed several years ago.

He had a history of trauma to the anterior teeth from a sports injury and subsequent endodontic treatment. Recent periapical radiographs showed internal resorption in the upper incisors (Fig. 6).

The patient sustained additional trauma to the maxillary right central incisor through a fall that resulted in complete fracture of the crown (Fig. 7). The tooth was non-restorable. After reviewing the different treatment options, the patient decided on an immediate implant restoration.

Although the maxillary left central incisor also exhibited signs of internal resorption, it was decided that treatment of that tooth would be performed later. Consideration was given to the poor gingival architecture that results from placing adjacent implants in the esthetic zone.

He was then evaluated by the periodontist for the surgical placement of the immediate implant for the maxillary right central incisor.

The patient’s treatment was similar to that of the patient in case study No. 1. The right central incisor was removed and a NobelReplace Tapered Groovy (internal connection) 5 x 15 mm implant was placed. An osseous graft of demineralized freeze-dried bone was utilized to augment the surgical site. The fixture received an emergence profile, reinforcing alveolar bone loss in the extraction site.

**Final restoration**

After the six-month healing period, the final restoration was fabricated. In this case, a one-piece screw-through abutment made from a Nobel Biocare GoldAdapt Engaging NobelReplace (Fig. 8) was fabricated in order to obtain the correct emergence profile of the restoration due to the slightly lingual placement of the implant (Fig. 9).

The restoration was seated, the screw was hand tightened and then torqued to 55 Ncm with the manual torque wrench. The lingual screw access was filled with a cotton pellet and composite restoration (Fig. 10).

**Conclusion**

As esthetic expectations of patients and the desire for a convenient and timely treatment continue to increase, instantaneous replacement of failing teeth is becoming more routine.8

In the cases cited above, both patients had sustained juries to their anterior teeth as young adults while engaging in sports. Each of the patients had been treated endodontically and experienced internal resorption of the traumatized teeth approximately 15 years later. Both of the patients’ careers and lifestyles demanded immediate replacements that were non-removable and esthetically pleasing. The failing teeth were extracted and implants were inserted immediately and restored the same day with a non-functional loaded provisional.

Immediate placement and restoration of a single implant offers a highly esthetic and timely treatment option in the case of internal resorption and tooth failure in the maxillary central incisors.

Furthermore, this treatment eliminates the need for a removable partial denture while maintaining the gingival architecture and preventing alveolar bone loss in the extraction site.

**Acknowledgements**

Custom abutments and porcelain crowns by Charles Moreno CDT, Excel Dental Studios.

Implant placement performed by Dr. Garry Bloch.

A list of references is available from the publisher.

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