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FLORIDA ACADEMY of GENERAL DENTISTRY

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It's All About the Tongue. How Dentists Can Lead the Fight Against Sleep-Disordered Breathing, by Dr. Jenna Katz Schwibner

Help Your Patients Reduce Oral Pathogens With Probiotics, by Linda Rhoades, CRDH The Carolina Bridge: The Most Conservative Porcelain Bonded Fixed Prosthesis, by Dr. Alex J. Delgado and Dr. Vilhelm G. Olafsson



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The Florida AGD Legislative Chair, Dr. Mel Kessler, encourages our members to support our profession by participating in the Florida Dental Association's **Dentists' Day on the** Hill on January 30, 2024. Please join your fellow dentists for this event! Special alert

Aug. 11, 2023

fda

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The room block is open for the 2024 *Dentists' Day on the Hill (DDOH)*! The 2024 *DDOH* will take place **Tuesday, Jan. 30, 2024**, with a legislative briefing **Monday, Jan. 29, at 6 p.m.** at Hotel Duval. <u>Help support the FDA's legislative agenda and register to attend this annual grassroots advocacy event</u>!

The Florida Dental Association (FDA) has a room block at Hotel Duval for \$249. <u>To make your room</u> <u>reservations click here</u>. You may also call Hotel Duval at 850.224.6000 and reference the "Florida Dental Association" to book your room. Rooms for this event fill up quickly, so reserve your room today! *Please note: Room reservations should only be made for yourself/parties staying in the same room. Multiple rooms reserved under one name for any affiliate or district may be subject to cancellation by the FDA. Thank you for your cooperation.*

During this event, the FDA will host a complimentary buffet dinner after the legislative briefing on Jan. 29 at Hotel Duval. If you plan on attending the briefing and dinner, please add both items during your registration.

Information regarding *DDOH* will be sent periodically to registrants throughout the year and until the event. Register as soon as possible to receive timely information! If you have any questions, please contact Governmental Affairs Liaison Alexandra Abboud at <u>aabboud@floridadental.org</u> or 850.224.1089.

Atraumatic Extraction and Grafting Technique

by Stephanie Tilley, DMD

traumatic extraction and grafting techniques as site development for dental implants creates a proper foundation for esthetic smile design and emergence profile of the final implant retained prosthesis. Patients are anesthetized to perform an extraction that is minimally traumatic to the patient and dentist on teeth that are deemed non-restorable for any number of reasons, including severe decay, periodontal breakdown or fractures. The Physics forceps (Golden Dent) allows removal of teeth without placing excessive stress and pressure on the tooth that would normally occur using conventional extraction techniques. Maintaining the facial bone is important, whenever possible, during extraction procedures. Being atraumatic to the bone makes grafting and implant placement that much easier. Finally, because there is no squeezing of the handles of the instrument, and thus no forearm, bicep, or shoulder forces, the procedure is relatively "atraumatic" to the clinician as well. The instrument consists of two components, a beak and a bumper. The beak is a shovel shaped, flat-edged component that will engage the lingual or palatal aspect of the tooth 1-3mm subgingival. The clinician must have a solid purchase point to use this instrument effectively. If that does not exist, a purchase area is created using a 557-surgical bur, flattening the lingual or palatal aspect of the root until the purchase point is established. This is the working end of the instrument. The bumper is placed as high up (or as low into) the vestibule as possible. This is not the working end of the instrument, but rather, it serves as a fulcrum or center of rotation. It allows the clinician to rotate the instrument with wrist motion only (no squeezing) and to create tension on the lingual or palatal aspect. This creates a physiologic response that breaks down the periodontal ligament (PDL), allowing the tooth to come up and out of the socket using little pressure. The tool is not intended to remove the tooth in total, rather to luxate it up and out of the socket slightly. Then, to finish the extraction, a more conventional pair of anterior forceps with beaks is used to grab hold of the tooth root and simply extrude it from the socket.1



Fig. 1, above: Nonrestorable maxillary molar tooth with horizontal fracture at post line requires immediate attention and extraction.

Fig. 2, right: The Physics Foceps (Golden-Dent) consists of two components. The beak is the working end of the instrument and is engaged 1-3mm subgingival on the palatal aspect of the tooth. The bumper with green silicone covering, is positioned as high into the vestibule as possible and serves as a center or rotation or fulcum that allows tension to be created with simple constant wrist motion along the arch or rotation created by the unique design of the instrument. Maintaining bone height and width following any extraction simplifies any grafting protocol. Bone will physiologically shrink following any tooth removal. The available hard tissue is valuable



Fig. 3: With no squeezing and tension created on the palatal aspect of the root structure, a physiologic release of an enzyme breaks down the periodontal ligament (PDL) allowing the tooth to release up and out of the socket without damage to the facial plate of bone. This occurs is a matter of seconds.

for successful placement of dental implants, so grafting can be and is often an essential technique to learn and master. Unpredictable results following extraction are unacceptable, so it is important that materials and procedures be used to ensure bone formation following grafting. Bone grafting is possible because bone, unlike other tissues in the body, can regenerate completely, if provided the space into which to grow.^{2,3} As native bone grows, it will generally replace the graft material completely, resulting in a fully integrated region of new bone. Consequences of unwanted bone loss include; a decrease in the width and height of supporting bone, muscle attachments can move to near the crest of the ridge and thus there can be elevation of any removable prosthesis with contraction of the mylohyoid and buccinators muscles, the can be resulting paresthesia from the reduced height of the edentulous ridge. With significant bone loss, there may be diminished esthetics of the face and a potential increase in mandibular fracture.

There are many grafting products in the marketplace available to the dental practitioner. These include allografts, xenografts and alloplastic or synthetic materials. Corti-cancellous blends of allografts are osteoconductive and provide a matrix for rapid revascularization and structural integrity. Dental implants can normally be placed in 4 to 6 months. Demineralization means that inorganic materials are removed, leaving an organic collagen matrix, which exposes more bone morphogenic protein (BMP), allowing for osteoinduction. Removal of the bone mineral exposes more biologically active BMPs. These growth



Figures 4-7, from the top:

Fig. 4: The tooth is removed with minimal trauma (ataumatically) without the need for sectioning.

Fig. 5: The sockets are thoroughly curetted eliminating any granulation tissue from the sockets.

Fig. 6: The OsteoGen Plug (large size) was contoured with scissors to the shape of the extracted tooth and condensed firmly into the sockets.

Fig. 7: Compression is firm to the crest or slightly above the crest.



factors control the differentiation of progenitor cells into osteoprogenitor cells and are responsible for bone and cartilage formation. The demineralized bone matrix is thus more biologically active than mineralized bone grafts. Allograft particulate materials are hydrated with sterile water, saline, whole blood or Platelet Rich Plasma (PRP) or Platelet Rich Fibrin (PRF).⁴

Osteogenisis is the ability to create viable bone cell development. Osteoinduction is the ability to stimulate those cells capable of formulating bone cells, BMPS and PDGF (Platelet derived growth factors). Osteoconduction is a structure that is created to support or scaffold bone development.⁵

Collagen plugs are normally derived from bovine dermis, but resorb rather quickly, in anywhere from a few days to 30 days, depending on the formulation. Collagen plugs make good clotting materials but are not ideal for bone growth in preparation for dental implants and are not referred to as grafting products. It is imperative to realize that when grafting, the graft material must be protected from invagination of epithelium. A membrane is used to insulate the graft and must remain stable for approximately 6 weeks. This will allow for predictable replacement of the graft material with viable living bone. If not protected, the grafting procedure becomes unpredictable. Membranes are made from a variety of sites, including porcine peritoneum tissue. The resorbable membranes have high mechanical strength, are soft and drapable and can last from 3-6 months. Membranes maintain the space for graft material, prevent invagination of epithelial tissue, protect the clot from early contraction and assist in wound closure when primary closure is not possible.

An alloplastic material such as the OsteoGen Plug (Impladent, Ltd) has made the procedure of socket grafting simpler, predictable and cost effective for the dentist and the patient. OsteoGen is a bioactive

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with the latest in dentistry by attending continuing education seminars on topics such as oral surgery, implants, veneers, periodontal disease, cosmetic procedures, and much more. Dr. Tilley has also done extensive training at the Las Vegas Institute for Advanced Dental Studies and the Engel Institute with Drs. Timothy Kosinski and Todd Engel. Her lectures discuss bone grafting procedures and surgical and prosthetic aspects of implant dentistry. She is a Fellow of the International College of Dentists and most recently was inducted into the American College of Dentists, the Pierre Fauchard Academy and the Academy of Dentistry International. Dr. Tilley is a member of the AGD, the ADA, the Florida Dental Association, the Alabama Dental Association the Academy of Laser Dentistry, and the Academy of American Facial Esthetics. Dr. Tilley is also a Fellow with the International Congress of Oral Implantologists. She has been featured in several national dental publications and has published extensively on implant dentistry techniques, lasers, and Botox/ fillers. She can be reached via email at stephflynntilley@cox. net.

resorbable calcium apatite crystal cluster in a bovine Achilles tendon matrix. It is not a bettricalcium phosphate and not a dense ceramic hydroxy apatite. It is bioactive, controls invagination of soft tissue and forms a strong bone with bone as it resorbs. The clusters are packed and intertwined and form a hydrophilic matrix that absorbs blood. It is also radiolucent on the day of placement, becoming radiopaque once the bone has turned over and the material has been replaced by the host's bone. The graft and collagen combination fulfills 2 primary purposes of a membrane in socket preservation. It contains the graft material and restrict migration of connective tissue through both a physical and chemical barrier. The OsteoGen is a calcium deficient apatite, like the mineral in human bone.⁶

Osteogeny Plug contains graft material, but it also controls connective tissue migration through physical and chemical barriers. The physical barrier is created as you compress the plug down into the socket site, firmly, but not like amalgam. The compression gives the epithelial cells choices. Do they fight down through the condensed plug or simply go over the top? Nature provides that they will chose the path of least resistance and go over the top, so there is no need to use a membrane when using this product for socket preservation. The chemical barrier is created through the incorporation of the graft material. As the plug condenses into a socket that is bleeding, the crystals hydrate with blood and the resorption process begins, releasing calcium ions and creating an environment that is preferentially favorable to bone, not soft tissue.

Grafting at the time of extraction minimizes bone loss, supports the soft tissue structures, prevents periodontal pathology and provides an adequate site for implants in 12 to 16 weeks. The failure to graft following extraction can result in soft tissue infiltration into the socket, loss of ridge height and width which may results in 30-60% bone loss in a three- year period. Therefore, if

grafting is not completed at the time of extraction, the patient may require more invasive and expensive grafting procedures in the future.§



Fig. 8, above: Vicryl sutures are used to reposition the attached tissue and prevent the material from being dislodged. Sutures are normally removed in 7-10 days. Epithelium grows at a rate of 0.5-1mm per day. No primary closure is necessary with this specialized alloplastic graft material.

Fig. 9: Initially the graft has radiolucency, but after a certain time frame (usually 3-4 months depending on the size of the defect) integration occurs from the apical portion to the crest. The material thus becomes radiopaque and integration can be evaluated objectively with conventional digital radiography.

Fig. 10: After approximately 4 months of integration, a reflection is made prior to implant osteotomy. The viable bone turnover has occurred and the implant procedure intiated.



Unpredictable results following extraction are unacceptable, so it is important that materials and procedures be used to ensure bone formation following grafting.

Fig. 11: Histologic evaluation of the socket determines viable bone formation from the apex to the crest of the ridge.



Fig. 12: Following dental implant placement, CBCT analysis illustrates adequate viable bone to support and stabilize the dental implant. The implant will be allowed to integrate for another 4 months prior to restoration with an implant retained crown.

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Guided Surgery and Ultra-Narrow Diameter Implants For the Treatment of Narrow Edentulous Spaces by Paul S. Mozer, DDS, MSc, DICOI

Introduction

There are many clinical situations that challenge our ability to both meet the functional and esthetic expectations of the patient as well as the longevity, predictability and conservative nature we as clinicians desire for our patients. Historically, the intersection of these wants and needs had proven somewhat elusive. The advancement of material science that has allowed the implant industry to produce both narrow and short implants has opened the door to predictable and longterm treatment options that were not possible just several years ago.

Patients that present with narrow spaces and diminished mesiodistal or bucco-lingual dimensions have been traditionally treated with removable partial dentures, fixed prosthodontics or advanced and at times unpredictable bone block or bone plate grafting with implant placement.^{1,2} Although more time consuming orthodontic intervention can expand the arch in multiple dimensions and can lead to more ideal

space requirements, the ability of the opposing arch to tolerate the expansion for appropriate post-treatment occlusion can at times be problematic.

Narrow diameter implants have historically been used as single-piece integrated-abutment implants for the purpose of denture retention. The field of material science has advanced with subsequent generations of implant materials that have allowed engineers to both shorten implant lengths and reduce implant diameters. Two-piece narrow (3.0 mm) and ultra-narrow (2.75 mm) diameter implants have provided clinicians with more options to treat smaller edentulous spaces without more involved and costly bone augmentations and surgical interventions. There have been systematic reviews performed that demonstrated the success of ultra-narrow diameter 2.75 mm implants to be between 94.7-97.6%, a measurement equivalent to non-narrow implant therapy.3,

The accuracy of implant placement and its resultant implant prosthetics have a direct impact on the success of long-term implant therapy.^{5,6} Poor implant positioning leads to less

than ideal implant prosthetic position and design and increases the forces being transmitted from occlusal table to the implant and ultimately to bone. These increased forces have been shown by seminal studies to lead to overload forces that result in prosthetic complications, bone loss and implant loss.⁷

Implant treatment planning had previously consisted of evaluation of panoramic radiography coupled with clinical measurements to assess height, width and bone density prior to implant placement. These methods, combined or separately were inefficient and lead to deficiencies in data with tangible potential clinical implications.^{8,9,10} Freehand implant surgery can be challenging under normal clinical circumstances. When attempting to perform more technique sensitive and precise implant placements, small deviations in implant positions can have potentially significant detrimental effects during implant placements.¹¹





Cone beam imaging has allowed the clinician to visualize the critical anatomy, plan ideal implant positioning and then transfer the ideal plan to the surgical field with predictable accuracy and precision using stereolithographic static surgical guides.^{9,10,11,12} Implant manufacturers provide guided surgery drilling kits that compensate for the thickness of the surgical guides and allow for drilling only in the desired location.13 A clinician can plan their own implant cases using implant planning software or utilize the services of a guided surgery digital laboratory that can

assist doctors by planning cases together with clinicians.

Numerous studies have articulated the clinically significant improvements in implant placements accuracy as a result of static guided implant surgery as compared to freehand surgery. In complex clinical cases such ultranarrow diameter implant placements, guided surgery can level the playing field and create a successful outcome with less stress and less chance for error.^{11,14}



Clinical Case

This 81 year old patient presents with clinically relevant friable, erythematous tissue with tooth mobility 24, 25, 26 in the anterior mandible. (Fig. 1, 2) Periapical radiographs demonstrate greater than 50% bone loss in this area. Options were reviewed with the patient including Periodontal Surgery with likely low predictability for success due to proximity of adjacent roots and lack of current bone support. Discussed with patient extraction therapy and subsequent treatment options of removable partial denture, fixed partial denture and implant therapy. The patient declined more traditional prosthetics with non-surgical treatment modalities and ultimately opted for implant placements. A cone beam image was taken using the Icat Flx (Imaging Sciences, Hatfield PA) which indicated a narrow ridge in the affected site. Reviewed with patient options for a narrow ridge after extractions which included bloc grafting, ridge splitting and orthodontics and detailed co-morbidities, healing times, chances for success and treatment duration. For this clinical case ultra-narrow diameter 2.75 mm Adin Touareg Closefit (Adin Implants Afula, Israel) implants were selected and guided implant surgical treatment was planned using Atomica. ai implant planning software (Atomica. ai Atlanta, Georgia, USA) and the 3Sixty (3Sixty Atlanta, Georgia, USA) digital treatment planning service. (Fig. 3-6)

The consultation appointment included a cone beam three dimensional image and an intraoral scan taken with the Cerec Omnicam (Dentsply Sirona Salzburg, Germany) to be used for guided implant planning. The information was transmitted to 3Sixty utilizing their HIPAA compliant 360Courier software (3Sixty Atlanta, Georgia, USA) and treatment planning was executed cooperatively between the surgeon and the Dentist-Treatment planner from 3Sixty using the online program Zoom

(Zoom San Jose, California). The 3Sixty Dentist-Treatment Planner used the Atomica.ai implant planning software to digitally extract the offending teeth and plan the implants in their ideal positions with this surgeon. Once the treatment plan was set, the static resin surgical guide was designed automatically utilizing artificial intelligence from the Atomica.ai software and reviewed together before it was fabricated and delivered.

On the day of surgery, the procedure was reviewed with the patient including day of procedure steps, follow-up appointments required, prosthetic steps and relative time frames for healing. Consents were signed, the patient was given Clindcamyin 600 mg prior to the surgery and 2.5 carpules 4% Articaine 1:100k Epinephrine was administered (Septodont Lancasater, PA, USA). Teeth 24,25,26 were extracted using



forceps (Fig. 7), the adjacent teeth were scaled and irrigated and the surgical guide was seated clinically to verify precise seating. (Fig. 8) Adin Touareg Closefit 2.75 mm x 11.5 mm ultra-narrow diameter implants were placed utilizing the 3Sixty static surgical guide and Adin Implants ultra-narrow implant keyless guided surgery kit with copious irrigation. (Fig. 9) Bio-Oss xenograft bone graft (Geistlich Wolhusen Switzerland) and Bio-Gide collagen membrane (Géistlich Wolhusen Switzerland) were placed (Fig. 10-13, 15) and subsequently, healing abutments were placed and torqued to 20 Ncm. The surgical site was closed utilizing PGA (polyglycolic acid) sutures and hemostasis was achieved. (Fig. 14)

After the surgery, the patient was given Amoxicillin 500 mg three times daily for 7 days and given instructions to use Ibuprofen 800 mg every four hours for the first 24 hours

and as needed thereafter, .12% Chlorhexidine rinses twice daily for 1 week and warm salt water rinses 5-6 times per day for 7 days. A post-surgical follow up at 10 days facilitated suture removal and review of oral hygiene instructions.

Conclusion

In a very narrow ridge clinical situation, placing implants freehand can be very challenging yet with Atomica.ai implant planning software, 3Sixty digital treatment planning service and the Adin Touareg Closefit keyless guided surgery kit, placing 2.75 mm ultra-narrow diameter implants can be as predictable, accurate and stress-free as placing a traditional implant in a healed molar site.§

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Dr. Paul Mozer graduated from Buffalo School of Dental Medicine where he received academic distinction and clinical commendations. He conducted oral cancer research at Roswell Park Cancer Institute and completed a residency at New York Medical College.

Dr. Mozer has a Master of Science Degree in Oral Implantology from the University of Frankfurt Goethe Dental School, where he is now on faculty lecturing on guided implant surgery and serves as a Clinical Supervisor and Advisor to Master Thesis candidates.

Dr. Mozer is also on the faculty of the AAID Maxicourse in Boston, The Implant Institute of Australia, St. Peter's Hospital in Albany, and the VA Hospital in Buffalo. He has conducted clinical research in 3D static and robotic

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It's all about the tongue.

How Dentists Can Lead the Fight Against Sleep Disordered Breathing.

by Jenna Katz Schwibner, DMD, FAGD

s dentists we are experts at evaluating the tongue during our oral cancer exams. At every hygiene visit, we are accustomed to lifting the tongue with a 2 x 2, pulling it out and looking side to side. This important screening during all periodic and comprehensive visits is crucial, even though a cancer diagnosis is exceedingly unlikely. Only around 54,000 cases each year are diagnosed in the United States' representing approximately 0.01% of the population. Yet, however rare, we would never skip this part of the exam.

As it turns out, the tongue examination is useful for another oftenoverlooked condition that affects a much larger portion of our patients: Sleep Disordered Breathing (SDB). An estimated 30% of our adult population suffers from some form of SDB², which includes the more commonly publicized end-stage disease of Obstructive Sleep Apnea (OSA). However, many dentists are overlooking the warning signs evident during the tongue examination.

Estimates put OSA affecting between 3 and 7% of adults³, however the true number remains unknown as most suffering will never be properly evaluated. Of those who do complete a sleep study, 37% of men and 50% of women receive an OSA diagnosis⁴ with an even larger percentage outside the ranges of OSA suffering from Upper Airway Resistance Syndrome (UARS) and other milder SDB conditions. SDB, including OSA, is no longer a disease exclusive to older, overweight males. In my practice we are identifying these conditions daily across the entire population regardless of age, weight, or sex.

The impact that SDB and OSA is having on our society and medical system is staggering. 6 million Americans visit the Emergency Room annually with undiagnosed sleep apnea comorbidities, with the National Commission of Sleep Disordered Research estimating that approximately 38,000 deaths linked to cardiovascular issues each year are related to sleep apnea. And an OSA diagnosis under the age of 70 increases one's risk of early death due to cardiovascular disease and stroke.⁵

In 2017 the American Dental Association released a statement on the dentist's role in the treatment of SDB, including snoring, UARS and OSA.⁶ They encouraged dentists to screen for SDB, identify signs and symptoms of deficient growth and development in children and consider oral appliance therapy as appropriate treatment for adults who received a positive diagnosis for mild or moderate sleep apnea.⁶

Dentists have the advantage of seeing adult patients a minimum of twice a year which is typically more frequent than any other medical provider, and patients are



Figure 2: Before and after CBCT of an adult who underwent expansive orthodontic treatment in my office.



Figure 1: Scalloped Tongue that was identified in my office at a hygiene exam, which led to a sleep study that diagnosed this patient with severe OSA.

increasingly looking for dentists that offer a holistic approach to wellness. To make good on the ADA's ask, and to join the fight in this serious medical issue, it's important to recognize that we as dentists are truly the first line of defense against SDB... and it all starts with the tongue.

Therefore, after completing an oral cancer screening go on to evaluate the patient's tongue position and shape. A scalloped tongue is highly predictive of sleep pathology⁷ as it shows us that there is not enough room in the dental arches for the tongue to fit comfortably (**Figure 1**). When the tongue does not fit between the teeth, up at the roof of the mouth, there is an increased chance that the tongue will end up in the back of the throat obstructing the airway while sleeping. Also ensure there are no tongue ties, and the tongue is wide and can make a "pancake" instead of being long and straight. If you are doing orthodontics such as Invisalign on your adult patients, you want to be aware of the tongue shape and how it can work for or against you, as palatal growth and width always follows tongue shape and position. As an example, if you close an anterior open bite that is due to a tongue thrust habit and anterior tongue positioning without widening the posterior arch form, you are setting the patient up for potential relapse. To make things worse, by closing an anterior open bite without widening the posterior narrow arch form you are now constricting the tongue even more and increasing the likelihood that your patient will become airway restricted. If tongue position is erratic, team up with an Oral Myofunctional Therapist (OMT) to ensure better success in orthodontic treatment.

Other best practices in addition to the tongue evaluation include:

Ask the patient how they are sleeping and if they feel well rested when they wake up in the morning. The quality of one's sleep can be highly indicative of SDB issues.

Evaluate their teeth for signs of acid erosion. There is a significant link between Gastroesophageal reflux disease (GERD) and OSA and hypopnea syndrome.⁸ We can correct the damage with a filling or a crown but should also work to identify the root cause to prevent reoccurrence. Consider a referral to an Ear, Nose & Throat (ENT) physician and the completion of a sleep study. Stopping the GERD will not only improve the patient's quality of life, but also increase the longevity of your dental work.

Take blood pressure readings. High blood pressure is a common sign of sleep disorders and OSA.⁹ Many patients do not regularly take their own blood pressure. By screening them during their re-care visit we can identify cardiac changes that might otherwise be missed.

If you have a CBCT in the office, evaluate airway size and risk for collapse (**Figure 2**).



Figure 3: Enlarged Tonsils and Adenoids as well as low tongue posture shown on a CT scan of a 7-year-old taken in my office.

SDB and OSA in adults might be a relatively new focus within medicine. However, it has been documented and studied for almost 60 years¹⁰ and we know that the majority of non-obese OSA adults would have presented with milder forms of SDB as children. It is estimated that 25% of children snore while sleeping,10 and in my practice, most also express one of the many other symptoms of SDB, which include mouth breathing, behavioral and attention issues, daytime drowsiness, bedwetting, and chronic illness and/or allergies. We see patients of all ages and therefore place an emphasis on screening children for SDB so that we can intervene and prevent the development of more complex issues as they age, including end-stage OSA. When examining children with a more holistic approach, centered around jaw and airway development, we can greatly improve their growth trajectory and quality of life.

Between school germs and environmental pollutants, our children are constantly sick and congested. This congestion causes tonsil, adenoid, and nasal swelling, making it difficult to breathe through the nose, and thus promotes habitual mouth breathing. Mouth breathing can lead to forward head posture as the body attempts to compensate for a narrow and underdeveloped airway, thus contributing to improper growth and head and neck discomfort.¹¹ Chronic mouth breathing also leads to improper tongue position low at the floor of the mouth instead of high up on the palate, which is associated with snoring and OSA in children. There is further evidence that mouth breathing alone is associated with a lower quality of life, independent of polysomnographic evidence.18

Correction of mouth breathing can be accomplished through a team approach of OMTs, ENTs and an airway trained dentist. And just like our adult screenings... it all starts with the tongue.

In children, the position, shape, and strength of the tongue plays an important role in the development of the face and pediatric OSA in non-obese children is a disorder of oral-facial growth.¹² Evaluating tongue placement issues and educating the parents on the consequences of improper orofacial habits is the foundation of our pediatric appointments. We look for anterior and posterior tongue restrictions and refer to an OMT whenever we suspect a tongue restriction. Without the proper pressure from the tongue, the maxillary arch becomes constricted, causes narrowing, and then mandibular underdevelopment follows. In addition, tongue thrust habits can lead to breathing and speech difficulties, open bites, protruded anterior teeth, and narrow dental arches.¹³ A lingual frenuloplasty combined with proper myofunctional therapy has been shown to be beneficial in decreasing mouth breathing, snoring and clenching.1

As a dentist and owner of Dental Partners of Vero Beach, Jenna Katz Schwibner, DMD, FAGD has always strived to provide what she refers to as "Complete Dental Care" by adapting treatments and techniques that align with the latest breakthroughs in medicine and technology.

Her areas of expertise center around the relationship between oral and total-body health through Airway Health-Focused Dentistry. This forms the foundation of her general, cosmetic, implant and orthodontic treatments. Known by her patients as "Dr. Jenna," she provides sleep disordered breathing management for patients of all ages. Her passion lies in helping individuals with obstructive airways, preventing long term illnesses, and making a difference through life-changing treatments.



Her commitment to education is reflected in the completion of more than 800 hours of continuing education within just her first 10 years

of professional practice and obtaining the prestigious Fellow of the Academy of General Dentistry (FAGD) designation. She continuously attends advanced seminars, conferences and academic programs and has had the honor of studying under the late Dr. Peter Dawson. She continues to participate as a graduate and current Ambassador for the Dawson Academy, where she then met and was inspired by Dr. Ben Miraglia, founder of Airway Health Solutions. Dr. Miraglia's mentorship is what transformed her overall approach to adult dentistry, and a nonsurgical orthodontic philosophy clinically proven to further children's growth and development led to the opening of Dental Buddies of Vero Beach for her pediatric patients.

Dr. Schwibner has worked extensively with her patients, educating and providing solutions to correct airway and sleep disordered breathing issues which often result in additional health ailments in adults and a wide range of developmental delays in children. She has spoken and presented on this topic to colleagues and healthcare professionals locally, nationwide and abroad.

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Other best practices for pediatric evaluations include:

Observe and evaluate mouth breathing while the child is in the examination chair. Ask the parents if they sleep with their mouth open

needs to be unrestricted and sealed to the roof of the mouth with the lips closed day and night unless the child is eating, drinking,

or speaking. Evaluate for swollen tonsils and if possible, through a digital CBCT, swollen adenoids (Figure 3). Adenoid swelling makes nasal breathing challenging causing children to resort to breathing through their mouths. Chronic mouth breathing leads to enlarged tonsils, and now a child already struggling to breathe through their nose could also be struggling to breathe through their mouth. Enlarged tonsils and adenoids are a sign of improper breathing and function. In addition, once a patient has developed a mouth breathing habit, even after anatomical constrictions are removed, it often will not completely resolve on its own. Myofunctional therapy can assist in repositioning the tongue and improving nasal breathing making lifelong changes.¹⁵ Develop a relationship with an ENT and OMT and refer when appropriate.



Figure 6: After one phase of expansive othodontic treatment, the tension in this child's face is greatly improved.

Evaluate for teeth crowding and narrow arches. Having crowded teeth, narrow dental arches, excessive overjet or overbite, are all signs that the jaws are underdeveloped.16 Airway trained dentists feel that it is no longer acceptable to pull teeth to accommodate an underdeveloped jaw. Extracting teeth will make a small mouth even smaller therefore limiting the space for the tongue. If you are not trained in expansive orthodontics, team up with an airway focused orthodontist or general dentist with a non-extraction philosophy (Figures 4,5).

Look for tension in a child's face. Face tension including lip strain, mentalis strain, and tightness around the eyes making the white sclera visible under the iris is a common sign observed in my practice that a patient is suffering from SDB (**Figure 6**). Evaluate for sleep bruxism. There is a strong

correlation between snoring and sleep bruxism in children.17 Identifying evidence of bruxism in your chair may be easier than relying on parent observation of snoring at home as most children sleep in their own room with the door closed. The parent may not even know that their child is snoring or grinding their teeth at night. By identifying tooth wear on a child, you may uncover a sleep disordered breathing issue that the parent didn't even know existed.

Whether treating adults or children, it's important to be an advocate and be proactive. Consider adding

a sleep questionnaire whenever a patient is due to update their medical history. For adults, the "STOP-BANG" or the "Epworth Sleepiness Scale" are commonly used scoring systems, readily available for free on the internet. For children, "The Healthy Start" and "Myobrace" websites offer forms for download.

Treating forms of SDB undoubtedly requires a team approach. Dental treatments designed to alleviate SDB symptoms almost always involve collaboration with the OMT, who provides long term dental stability and maxillofacial health for both adult and pediatric patients. The OMT plays a positive role in the improvement of swallowing, the proper tongue posture and position, overall muscle function and reduces relapse of previous and active orthodontic treatment.12 In addition, OMT treatments alone have been shown to significantly decreased the Hypopnea Index Apnea (AHI) in **Ö**SA patients of all ages, as well as make a patient more tolerant to the sleep apnea appliances that the dentist fabricates, increasing compliance and success. Current



Figures 4 (above) and 5 (below): Arch development with expansive orthodontics in my office.

warning signs more proactively and then take action to alleviate future issues. By doing so, we can help our patients breathe better, sleep better and live healthier lives.§

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literature demonstrates that myofunctional therapy decreases AHI by approximately 50% in adults and 62% in children.¹⁸ It is also common for patients to need treatment from the ENT, as underlying anatomical limitations to breathing may not resolve through orthodontics alone, hence why proper imaging should be completed for all patients suspected of having SDB. And combining OMT with ENT procedures, specifically adenotonsillectomy, has been shown to prevent residual OSA in the pediatric population as well as increases CPAP compliance in the adult population.

Our patients deserve more and expect more from the modern dentist. Simply filling cavities and treating periodontal disease is no longer enough. As dentists we have a unique role and ability to screen and identify risk factors for SDB and OSA as stated by the ADA. I challenge you to advocate for your adult patients' overall health by taking one extra step when examining the tongue, and if you see children, to look for

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6/2022 to 4/2023, less than 10 months of treatment



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Help Your Patients Reduce Oral Pathogens With Probiotics

by Linda Rhoades, CRDH

it as a Chihuahua or a Great Dane.³ Some probiotics contain only two strains of bacteria, while others have many.

With multiple companies now promoting their oral probiotics to dental professionals, it is important to note that the more potent the strain, the less is needed to achieve symbiosis in the oral microbiome. Some brands also include a separate probiotic to achieve gut health as well, as it has been widely established that the oral and gastrointestinal microbiomes must be balanced at the same time to achieve health in both. For example, halitosis can sometimes occur in a healthy mouth because it originates from the stomach and intestines.⁴ Throughout life, bacteria tighten the lining of the gut to improve immune response. Furthermore, they promote healthy and diverse microbiota and prevent the growth of pathogens. The gut microbiota needs to be supported, especially as we age, since the diversity of bacteria decreases when we get older.⁵ Your mouth is the gateway to your body, from what you eat to what you drink... even what you breathe. If your mouth isn't healthy, you won't be healthy. Dual probiotics have a role in maintaining oral health

antibiotics have restricted their use in many people. New strategies have been developed to prevent oral diseases based on manipulating oral microbiota, which is provided by probiotics.1

What exactly are probiotics? According to the World Health Organization, "Probiotics are live organisms, that when administered in adequate amounts, confer a health benefit to the host."2 Dental probiotics focus on promoting the growth of good bacteria in the oral cavity and curtailing the growth of pathogenic bacteria. There are normally more than 700 different bacterial species found in the human mouth, most commensals, but a small portion are pathological.3 Also, not all bacteria are probiotics and not all probiotics are the same. Different strains of probiotics can have



professionals

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consumers alike are currently

ental

bombarded

common questions dentists and hygienists

are asked is "What about probiotics?"

Are you prepared to give a scientifically

sound answer? If you are confused, you

are not alone. While probiotics have been

used for gut health for many decades,

oral probiotics have more recently been

brought to the forefront. Although they

have been researched for the past 30 years,

they are still not a mainstream treatment

modality. However, the emergence of drug

resistance and the side effects of available

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different effects. For example, one strain may help with digestion while another may help to boost the immune system. A probiotic supplement's effectiveness is not determined by the number of strains or bacteria it contains. It depends on which strains are present in the product.

Some strains are more potent, and a smaller number of bacteria cells are required for effect. Most multi-strain products are not clinically tested to determine which strains work in conjunction with one another. How then can we judge whether the product is effective? The proof is contained in scientific evidence. A probiotic product's health benefits need to be proven in human trials. How do we prove which bacteria will be beneficial? Through extensive studies on the saliva of patients who had healthy mouths despite not having good oral hygiene, strains of good bacteria can be isolated and reproduced in the lab for manufacturing. When consumed in adequate amounts, these beneficial bacteria "choke out" the bad by overtaking their food supply and space. Today's lifestyles and diets often result in larger populations of pathologic bacteria. Probiotics must be taken daily to replace those which are washed out of the G.I. tract. Most formulas are an affordable, palatable lozenge. Within two weeks, improvements in tissue health and halitosis are evident, and by 6 weeks, studies show decreased bleeding and pocket depth. Pedodontists are strong proponents of probiotics for their ability to inhibit caries, even in an acidic environment. Each dental probiotic has different bacteria and strains which colonize and reduce the number of pathological bacteria such as a.actinomycetes, p. gingivalis, and streptococcus mutans. Companies manufacturing probiotics must provide this evidence of these bacteria's ability to promote health as well as the particular strain (number) of the bacteria. When reading the label, simply seeing "lactobacillus reuteri" is not enough. A strain number must follow. Otherwise, it is like saying you own a canine, and not identifying

polyols in inhibiting cariogenic and periodontal pathogens because they cannot digest the polyols.⁵ Without a good food source, the pathogens are then reduced in number. Fortunately, xylitol is available in many forms, making incorporation into preventatives relatively achievable. Xylitol toothpaste, mouth rinse, lollipops, candy, nasal spray, and gum are commercially available and very well accepted by patients. Most other prebiotics are found in a healthy diet of fruits, vegetables, and resistant starches, such as oats, beans, and legumes.

What to look for when choosing a probiotic:

- The product is backed by science (many clinical studies on real
- patients). • It provides an effective dose.
- It's safe to use.
- It's labeled properly, including the names and strains of the microbes, suggested dose, storage conditions, and how many live microorganisms are in each dose.
- It provides the benefits you are seeking.3

In summary, not all bacteria are probiotics, and not all probiotics are equal. Strain specificity is important. Additionally, probiotic strains should be tested in clinical studies to ensure their safety and effectiveness. It would be prudent to provide information on probiotics to your patients who suffer from periodontitis, high caries rates, fungal infections, or mucositis. Our patients look to us to be educated about the current thinking in preventative dentistry.§

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by contributing to healthy microbial equilibrium in the gut as well.

Some oral probiotics include a separate "prebiotic" in their kit. What is a prebiotic? Prebiotics function as a food source for your gut's microorganisms - and they need to bypass digestion and make it all the way to your colon. There, the microorganisms metabolize and ferment the prebiotics to survive. This metabolism and fermentation process is beneficial to your gut health because it creates a variety of other byproducts that help you in several ways. Some prebiotics are polyols, such as xylitol and erythritol. Numerous studies have demonstrated the effectiveness of



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hen prioritizing esthetics, dental ceramics emerge as the optimal choice, as they adeptly replicate the natural characteristics of tooth structure, ensuring a visually harmonious outcome. The use of all ceramics restorations has increased in recent years due to their esthetics, strength and adhesive possibilities.¹ However, an extensive array of ceramic materials and systems is currently accessible within the field of dentistry, with vastly different strengths and optical properties.

The introduction of Maryland bridges brought with it the incorporation of metal retaining wings. While Maryland bridges have proven effective when executed correctly, the dental field has transitioned towards resin-bonded fixed partial dentures (RBFPD) due to their increasing esthetics benefits.

A debate has arisen regarding the comparative survival rates of the single-wing versus double-wing approach, that is, if the pontic in question is placed on one or two abutment teeth. Kern's findings suggest

Figure 4. Seating #7 with the aid of a lingual matrix

that single-wing designs exhibit improved performance due to reduced tension during tooth movement.² Consequently, the risk of dislodgement in one of the abutments increases, potentially leading to a debonded restoration.

In 2006, Heymann published a novel approach to address edentulous cases using a wingless bonded prosthesis.³ Referred to as the "Carolina Bridge," this name was introduced by Drake Precision Dental Laboratory located in Charlotte, North Carolina, USA. These RBFPD are comprised of a custom-made all-porcelain pontic featuring etched proximal surfaces, which bonds with the adjacent abutment teeth with composite resin connectors.

In 1952, DeVan elucidated that our role as dental care providers should be "the preservation of what remains rather than the meticulous restoration of what is missing". Over the past decade, very conservative alternatives for anterior restorations and ceramics have emerged. Among these, the Carolina Bridge stands out as the most conservative choice, as it necessitates no tooth preparation.

The Carolina Bridge presents distinct benefits in comparison to other esthetic approaches, including effortless placement, simplified connector repair, and last but not least being a completely reversible procedure.

As with all other RBFPD, achieving success hinges on essential factors such as having a sufficient surface area available for bonding, favorable occlusion, and abutment teeth that are both periodontally and clinically stable and sound. A study reported at 5-year, the clinical performance of RBFPDs is similar to the performance of conventional fixed partial dentures (FPDs) and implant-supported crowns.⁴



From left: Fig. 1. Patient in her mid 30's with an implant placed in the position of #7 when she was 16 years-old. **Figure 2.** Modified ridge lap wingless pontics for tooth #7 and #10 (lingual view). **Figure 3.** Modified ridge lap wingless pontics for tooth #7 and #10 (lingual view).

Indications

The Carolina Bridge originally aimed to address a specific demographic - young adults with congenital absence of maxillary lateral incisors who faced difficulties with traditional options like the Hawley retainer, commonly referred to as the "Flipper," or Essix retainers. These patients felt socially uncomfortable and embarrassed, needing to remove the appliance for eating. For such cases, the Carolina Bridge emerged as a superior fixed alternative, offering remarkable aesthetics. This solution allowed young patients to wait until they were of an appropriate age for implant restorations, but can last much longer (Figure 1). Also, this technique can be considered as a temporary restoration during implant osseointegration, or a long-term temporary solution for mandibular

incisors that are lost due to periodontal disease or trauma. This novel restoration has become in some cases a permanent solution because of its success and esthetics. Cases of missing maxillary central incisors or mandibular anterior teeth have been reported.

The clinical prerequisites are:

- An occlusal relationship with minimal vertical overlap.
- Periodontally stable abutment teeth.
- Abutment teeth should ideally be free of proximal restorations, although small class III restorations can be incorporated into the connector.
- A minimum of 5 mm of occluso-gingival height is needed for the resin-boded connector.
- The clinical contraindications are:
- Replacement of posterior teeth or canines.
- Patients with deep bite or malocclusion.
- Patients with parafunctional habits such as clenching or bruxism.
- Short teeth inciso-gingivally.
- Spans greater than three units.

As previously mentioned, one of the significant advantages of this procedure lies in the option to revert it and thus maintain the integrity of the abutment teeth. Therefore, the clinical technique is notably straightforward and reliable. Upon meeting all the specified prerequisites, the initial step involves selecting the shade before the teeth undergo dehydration. The necessary records for fabricating the restoration can be obtained through elastomeric impressions or digital scanning.

Ideally, pontics should be fabricated from Feldspathic Porcelain due to its superior esthetics. However, considering the limited familiarity of many technicians with this material and its demanding and laborintensive technique, lithium disilicate has been successfully employed. The pontic's design should adopt a modified ridge lap approach, chosen for its aesthetic appeal and ease of cleaning (Figure 2 and 3).

Upon receiving or milling the restoration, it is advisable to secure it in the cast and stabilize it with a flowable resin composite, or any suitable alternative. This enables the clinician to create a lingual putty matrix that aids in positioning the restoration intra-orally due to the absence of retention features. Preceding the application of the restoration, the proximal porcelain surface requires etching with Hydrofluoric acid,



Figure 5a (left): Adding warmed resinbased composite to the proximal surface of prepared pontic. **Figure 5b. (right):** Adding flowable resin composite to the proximal surface of the prepared pontic. followed by silane-application. Please note that different types of porcelain require different etching times, so take care to follow the manufacturer's instructions. Prior to beginning the procedure on the teeth, it's crucial to ensure the thorough removal of any biofilm or debris. Employing a rubber dam is strongly recommended to attain absolute isolation, preventing against contamination by crevicular fluid and preventing the aspiration of the pontic in case of mishandling.

To optimize the bond strength, lightly roughening the proximal surfaces using a fine flame diamond is suggested, effectively removing any outer fluoride-rich layer or aprismatic enamel. The interproximal surfaces should then be etched with phosphoric acid for 15-20 seconds, carrying the etchant beyond the expected connector area.

This will prevent staining of margins that are placed on un-etched enamel in the future. Following etching the surface should be thoroughly rinsed for an equal duration that the acid was applied to ensure complete acid removal. Maintaining dry and clean conditions is essential to ensure optimal bonding.

With the pontic prepared, delivery can proceed. The lingual matrix is positioned to ascertain the correct path of insertion, and the bonding procedure is initiated (Figure 4). This entails applying the bonding agent alongside a small quantity of resin-based composite for the connectors. Warm resin-based composite can be employed to enhance viscosity. Either flowable resin composite or veneer resin cement are also viable options (Figure 5a and 5b). Prudent removal of excess material, particularly in the embrasures, is recommended before polymerization.

Depending on the patient's occlusion, the lingual surface can be reinforced with resin to strengthen retention. Extending the connector slightly beyond the proximal line angles, occlusion permitting, can greatly enhance retention since retention is directly related to the surface area available for bonding. Following the initial polymerization, the lingual matrix is removed, and the restoration is inspected for voids or undercontoured resin. If necessary, additional resin can be applied

at this stage. Applying glycerin or similar agents that inhibit the formation of an oxygen inhibited layer is advised to ensure total surface polymerization.

Should any adjustments or contouring be required, appropriate finishing burs or abrasive points can be utilized. The patient should be educated on how to maintain and clean the restoration, including using floss threaders to enable access beneath the pontic. Post-operative instructions should be provided, emphasizing the avoidance of hard foods and regular follow-up appointments. Resin connectors may periodically need surfacing, repairing, polishing to maintain the restoration in place and the esthetic aspect.

In the early 2000s, the Carolina Bridge emerged as a novel approach. Echoing Dr. Harald Heyman's perspective, "Although these bridges possess a somewhat interim nature, they have achieved considerable success in replacing absent incisors among patients for whom a permanent prosthesis is neither feasible nor financially viable." The authors contend that this approach embodies conservatism, presenting patients with an avenue of choice, and enhancing clinicians' treatment options.

Clinicians should consider using RBFPDs more often since their clinical performance has been shown to be similar to the performance of conventional FPDs and implant-supported crowns. The Carolina Bridge in particular stands out among these options due to its ultra-conservative, esthetic and completely reversible nature. (Figures 6-8). **§ References, p. 9**



Figure 6. Pre-treatment. Figure 7. After treatment, teeth #6 and #11 were treated with facial resin based composite, teeth #7 and #10 were treated with Carolina Bridges and teeth #8 and #9 were treated with resin-based composite. Figure 8. The same patient with Carolina Bridges replacing teeth #7 and #10 after 42 months (3.5 years) of service.

UF Continuing Dental Education COLLEGE of DENTISTRY

FL AGD MASTERTRACK COURSE

Comprehensive Dentistry Program Class 33

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