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FLORIDA ACADEMY of GENERAL DENTISTRY

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How to Reach Us:
Florida Academy of General Dentistry
5721 NW 84th Terr., Gainesville,
Florida, 32653
Phone: 866-620-0773
Email: Flagdinfo@gmail.com

President's Message

It is hard to believe that we are nearly halfway through 2023. I hope all our members are off to a great start as we head into the summer travel months. It was great seeing such an awesome turn out at this year's general assembly in Tampa. I hope everyone who was there this year will also join us for our 2024 GA in Orlando to welcome our new board and enjoy a different type of lecture series.

The FL AGD has some exciting CE ahead of it and we hope our members will take advantage of the amazing speakers we have lined up. Our CE committee and Executive Director have worked hard to line up some highly anticipated lectures and hands-on courses for the next three quarters ahead. Please be on the lookout for our email blasts that will give all the dates, course schedules, topics, and links to sign up.

If you plan to attend this year's Florida Dental Convention (FDC) in Orlando, please be sure to stop by our FLAGD booth and meet our Executive Director, Ms. Patricia Jenkins. She will be there to answer any questions as well as provide information on our membership and upcoming courses. This is a great time to meet one another and get involved. Many of our current board members started out by networking and eventually volunteering to help keep this great organization growing for its members.

I hope everyone has a wonderful summer and I look forward to seeing everyone in the months to come.

Best Regards,

Matthew Scarpitti, DDS
FLAGD President

Editor's Note

Welcome to the extended-play issue of the *Florida Focus*! Since printing and mailing each issue has previously taken up such a large portion of Florida AGD budget, the board voted in January to mail printed issues twice a year and to have all the quarterly issues available on our website, as usual. Of course, the additional benefit of this change is that this issue can contain more clinical and practice management information for our members. As always, we are grateful to our contributors for sharing their extensive knowledge of current advances in dentistry. Many of these authors will be lecturing at the Florida Dental Convention in Orlando in June, so if you would like to explore their topics further, please register for their courses. Also, we hope you're looking forward to attending the AGD Scientific Meeting in Las Vegas in July!

In addition to clinical topics, this issue includes the welcome return of our longtime Legislative Chair, Dr. Mel Kessler, updating us on recent Florida legislation which affects dentistry. For another example of sharing one's gifts with the world, please read the interview with Dr. Boris Bujila, who discusses his experience providing volunteer dental care in Ghana.

The variety of modern dental care was on display in a program I had the pleasure of attending in April at the Florida State College at Jacksonville. The graduating dental hygiene students gave a series of presentations on current dental topics, including the advantages and disadvantages of 3D printing *vs* conventional prosthodontics, the use of CAD/CAM in orthodontic retention, the accuracy of digitally guided implant placement, and possible links between oral health and dementia. In addition to their research requirement, the students received training in both nutritional and tobacco cessation counseling. Particularly during this time of shortage of dental hygienists, it is crucial to appreciate not only their clinical skills but also their knowledge of the various aspects of dentistry.

We would be delighted to feature more about our Florida AGD members in each issue. If you would like to share a clinical procedure, practice management recommendation, or an experience you've had providing dental care, please email me at flagdeditor@gmail.com. I hope to hear from many of our Florida AGD members. Thank you for the privilege of serving as your editor, and have a wonderful summer!

Warmest regards,

Millie K. Tannen, DDS, MAGD

FLAGD Editor

Legislative Report: Using the FDA GAO Capital Report as the Source of Information

by Dr. Mel Kessler

The FDA Government Affairs Office does an excellent job representing its membership. In the world of politics, one is always bombarded by innumerable special interest groups, all with their lobbyists, trying to influence the system. They have 90 days to accomplish their task, which this year ended on May 5th. Legislation must be approved by three separate committees in each branch of the legislature, must be passed by both the House and Senate, await the budget process, and then await the Governor's action to approve or not. Very few bills, considering the number proposed, are actually approved by this process. This year's budget is $117 billion, in a state with a population of ~ 22 million, with a breakdown cost of $5,318 / person. As a means of comparison, New York's budget is $229 billion, with a population of ~ 19.5 million, with a breakdown of $11,743 / person. We have no state income tax, we raise 75 – 80% of income from sales tax and growth; while NY has sales tax, it also has a state income tax ranging from 4 – 10.9%! I personally was very surprised by the difference in the budgets and the cost / person, especially since Florida has ~ 2.5 million more people.

I feel our greatest success this year, was, after 10 years of trying, we will finally have funding, $2 million (recurring), for the Student Dental Loan Repayment Program and the Donated Dental Services Program. The Loan Program will incentivize dentists to work as full-time Medicaid providers in rural and underserved areas, in county health departments or community health centers. In return, besides salary, one will be able to get $50,000 each year, for up to five years, applied to their student debt. This is like a program that one of our past-presidents, Larry Grayhills, worked with at the very start of his career. The Donated Dental Program will be able to hire two full-time coordinators, rather than only the one part-time employee. This will enable the coordinators to provide dental care to many more eligible patients who qualify for care. I personally worked with this program and found it very gratifying to help these patients in need. They had to have some form of medical handicap and had to be vetted to see that there was a true need.

The next FL Mission of Mercy, scheduled for 5/30 – 6/1/24, in Lakeland, was also approved for $500,000 as a nonrecurring expenditure. Nonrecurring means it must be reapproved annually in the budget, nice, but nothing like a recurring budget item. Once that is approved, it is automatically in the budget, unless specifically removed!

The legislature passed a $1.3 billion tax relief package that includes a permanent sales tax exemption on many products and services, including oral healthcare products. The list is extensive and to see it in detail, please go to the instructions above and download the Sine die report, dated 5/17/23.

While veterans do not qualify for dental care unless they are 100% disabled or have a direct service-connected injury impacting their oral health, the FDA supported bill CS/HB 635 (CS added to HB, House Bill, means it is a committee substitute bill). This bill creates a state-funded veterans dental grant program, administered by the FL Dept. of Veterans Affairs. Charitable organizations that provide this care at no cost will be able to apply for funding. While it is not funded yet, the FDA will seek funding in the next legislative session. While these issues were all approved, we must wait to see if they are approved by the Governor. The state is very solvent, and it seems these will be accepted this time.

Others dental items were proposed but we will have to see if they come back next year. These include a Direct-To-Consumer Patient Protection, pertaining to aligners and telehealth; an Expanded Kidcare Eligibility; Medical Conscience in Health Care; Protection from Discrimination Based on Health Care Choices; and Universal Occupational Licensing, to address workplace shortages.

And yes, I am back to serve as Legislative Chair and help to keep you abreast of the issues. I would ask you to try to become more active with advocacy in your career. I am retired and so nothing done affects me, but it does affect YOU. Most members are never engaged and just let someone else do the work. I have been to the Legislature more than thirty times over my career, was on the AGD Legislative and Governmental Affairs Council for six years and have been to Washington, DC (a sewer) six times. While at times we may feel it doesn't pay, that is totally incorrect. All you must do is ask the FDA GAO if it helps.

Just a little closing note of where we were and where we are going. From 1787 to 2008 the US debt accrued, over 221 years, was $10.3 trillion. From 2008 to 2023, over 15 years, the US debt is now $31.46 trillion, or $20.16 trillion increase in just 15 years, or $1.34 trillion additional debt each of those 15 years. Something is WRONG! Plato is credited with saying "The price good men pay for indifference to public affairs is to be ruled by evil men."

Mel Kessler, DDS, MAGD, FACD

May 24, 2023

To see the entire report, please go to AGD Advocacy -> publications -> Capital Report -> download.

"The AGD Senior Student Dental Awards were established to recognize senior dental students from each dental school in the United States, Canada, and Puerto Rico who exhibit potential for becoming outstanding general dentists. The award recipient[s...] receive a complimentary one-year membership in the AGD."* In addition, the Florida AGD presents the students with the Crystal Award.

Left: Dr. Harvey Gordon of NOVA Southeastern University presents the FLAGD Crystal Awards to Dr. Jennifer Capra Diaz and Dr. Carlos Yanes Gonzalez. Center and right: Dr. Arlety Mendez and Dr. Stephen Smiley received the Senior Student Dental Awards at the University of Florida. The AGD and FLAGD awards at LECOM School of Dental Medicine were presented to Dr. Irene Miriam Thomas Duck and Dr. Mayya Velitskaya. Congratulations to all the new dentists of the Class of 2023!

Dr. Amr Hassan, FLAGD's continuing education co-chair (left), with speaker Dr. Hussain Basma.

Florida AGD Continuing Education

On May 19 in Tampa, Florida, Dr. Hussain Basma presented a lecture/workshop entitled, "Dental Implants In the Esthetic Zone: Concepts and Techniques to Improve Outcomes Immediate Placement and Provisionalization." This was Dr. Basma's first time lecturing with the FLAGD, and the attendees submitted high marks on the course evaluation.

The course was designed to provide dental professionals with the knowledge and skills necessary to successfully plan and execute implant treatment in the esthetic zone. The course emphasized the importance of understanding biological concepts and digital workflows when planning and executing implant treatment. Participants had the opportunity to learn and engage in a hands-on workshop and case presentations to explore the latest advances in dental implant technology. The aim of this course was to show that utilization of evidenced-based periodontal treatment protocols coupled with the integration of digital technology is indispensable to achieve better results in the aesthetic zone.

FLAGD's next CE course is on Sat, Aug 26, in Orlando, Florida. "Pinhole Surgical Technique for Gingival Rejuvenation – Cadaver Surgery Demo" with Dr. John Chao, and registration is now open. Visit http://flagd.org/ for more details about registration.

***From https://www.agd.org/my-agd/access/member-center/career-stages/students-residents/senior-student-dental-award**

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Dental Erosion:

A Contemporary Clinical Review

Alex J. Delgado, DDS, MS.

Associate Professor of the Department of Restorative Dental Sciences

Director, Continuing Dental Education, University of Florida, College of Dentistry

Director, UF Comprehensive Dental Program, FLAGD Master Track

Figure 3. **Loss of anatomical features, such as cusp ridges and occlusal anatomy**

Dental Erosion is defined as the irreversible loss of tooth structure by a chemical process that does not involve bacteria.[1] Recently, the term biocorrosion has been suggested as more appropriate as the term embraces the chemical, biochemical, and electrochemical degradation of tooth substance caused by endogenous and exogenous acids, proteolytic agents, as well as the piezoelectric effects only on dentin.[2] Studies have shown a high prevalence of children having dental erosion signs. One study examined 17,061 children where in the 5-6 year age group, 25% of the primary dentition exhibited erosive tooth wear that involved dentin exposure.[3] In the same study, 25% of the 11+ year age group exhibited some signs of dental erosion. Diagnosis at an early stage may decrease the risk of wear reaching a pathological state, in which the wear requires restorative intervention.[4]

Enamel and root dentin begin to decalcify at pH values of 5.2-5.5 and 6.7 .[5-6] However, in an erosive process, decalcification is more complex since the ionic content (calcium, phosphate, and hydroxyl ions) of saliva and plaque fluid needs to be taken into account.[7] Depending on the salivary concentrations of calcium and phosphate, the critical pH of erosion may range from 5,5-6,5.[8]

Extrinsic and intrinsic are the two causes of dental erosion. The extrinsic type is mainly due to ingesting acidic foods and beverages. The intrinsic type results from gastric acids entering the oral cavity, most often due to gastroesophageal reflux disease (GERD) or vomiting from eating disorders. A thorough medical history is essential to identify the causative factors, and treatment should never be initiated until the factors at play are under control.

Extrinsic causes

Extrinsic erosion is due to acidic dietary habits. The erosive potential of beverages is not only related to their pH value; beverage composition and the titratable acidity can be even more important.[9] Non-cola beverages can therefore be far more aggressive than cola-based drinks.[9] Several common and popular beverages can be erosive such as commercially available teas with an erosive pH as low as orange juice (pH = 3.73).[10] Several white wines has been measured to be equally or more erosive than orange juice.[11] Designer›s drink may pose a considerable erosive problem.[12] Sports drinks and energy drinks have shown even lower pH values and higher titratable acidity than orange juice and carbonated sodas.[13,14] The consumptions of these drinks have increased tremendously in the last decade.

Figure 1. **Cupping**

Acidic food may also have erosive potential. A case report was presented on a patient who ate three apples a day, and her maxillary incisors suffered from considerable loss of tooth structure.[15] Several fruits and vegetables have acidic pH values. Acidic medications are also an extrinsic risk.[16] Furthermore, about 63% of the most commonly prescribed medications in the U.S. have the potential to cause dry mouth.[17] Saliva creates a protective pellicle on tooth surface which reduces the erosive potential of acidic agents.[18] As a result patients with reduced salivary flow rates are at an increased risk for erosion as well as caries.[19,20] The preferred treatment for dry mouth or xerostomia is the use of oral moisturizers several times a day to alleviate symptoms, but the moisturizers themselves can also be erosive, especially on exposed dentin.[21] Most of these products have been shown to have pH values

below the critical pH of enamel and dentin.[22] Another solution has been the use of oral rinses, but a recent study demonstrated that there is a significant association between acidic pH values of these rinses and higher titratable acidity, and some of these commercially available products presented erosive potential on dentin substrate.[23]

The erosive potential of an acidic diet depends on the habits of consumption. The method of drinking, the time to clear the erosive agents, the protective salivary capacity, and the amount of residual acids can reduce the erosive effect up to 50%.[18] The initial erosive effect occurs within the first 3 minutes of exposure. After that time, the salivary capacity reverses the effect. After swallowing and clearing, there will be a residual amount of acid in the mouth in limited contact with teeth, most likely in the sulcus, where crevicular fluid has a protective role.[25]

Figure 2. Restorations standing proud or alone (amalgam and resin-composite)

Upon diagnosis of extrinsic erosion, it is imperative to find the causes. Diet analysis is a very useful tool that should include at least four days, weekdays, and weekends. A one-to-one dietary intervention is an excellent way to show patients objectively what they are consuming, the frequency and advises some alternatives.[24,25]

Intrinsic causes

The intrinsic causes are mainly from gastric acids, which can reach a pH value of less than 1. The prevalence of GERD in the adult U.S. population has been found to be 6-10%.[26] Clinical symptoms of GERD are heartburn, non-cardiac chest pain, chronic cough and hoarseness, ulcers and laryngitis, and erosion is the primary oral clinical manifestation of patients who suffer from this condition.[26] Early diagnosis and suppression of refluxed acid through lifestyle changes and medications have been reported to prevent further damage and potential tooth loss. Systematic reviews have reported the prevalence of dental erosion among GERD-positive patients in the range of 32.5-48%. The severity is correlated with the presence of the GERD symptoms.[27,28] Patients receiving a GERD diagnosis should therefore be examined for dental erosion, and gastroenterologists should collaborate with dentists on treating these patients.[29]

Eating disorders, such as Anorexia Nervosa (AN) and/or Bulimia, may also cause dental erosion. Patients suffering from AN restrict food intake and may have episodes of binge eating and vomiting, leading to profound weight loss, amenorrhea, abnormalities in endocrine gland function, and a distorted concept of body image. Excessive vomiting leads to dehydration and low levels of salivary flow. Often, these patients consume acidic drinks to stimulate salivary flow levels and counteract the bad taste related to vomiting, sadly exacerbating the erosive effect.[30] The clinical manifestation of erosion coupled with eating disorders has been termed perimolysis: erosion primarily seen on lingual, palatal, and posterior occlusal surfaces, the erosive wear often being exacerbated by the movements of the tongue.[31] Patients who have Bulimia have periods of binge eating followed by forced vomiting to prevent weight gain. Periods of severe food restriction are also commonly seen.

No matter what the eating disorder the patient is suffering from, open communication between the patient and dentist must be established, using a nonjudgmental, understanding approach.[32] A multidisciplinary approach is imperative to treat these patients, and the role of the dentist is to assess the case and make the appropriate referral to a psychologist, nutritionist, and physician. Keep in mind that dentists are often the first health provider to identify these situations. The patient must admit the problem if the dental provider is to help them. Only minor and/or palliative treatment should be considered if the problem is not admitted. Definitive treatment should be postponed until the condition has been admitted and the patient actively participates in treatment.

Clinical Signs

The three main clinical signs of erosion are cupping of cusps, restorations standing proud or alone, and the absence of anatomical features with a smooth-glazed appearance (Figure 1-3). It is essential to determine the location of these clinical signs to understand the cause and plan the treatment accordingly. Intrinsic erosion usually occurs on the palatal surfaces of anterior maxillary teeth, the facial surfaces of mandibular anterior teeth, and the occlusal surfaces of mandibular molars, which is consistent with the pathway of gastric acids. Extrinsic erosion is generally seen on the labial, buccal, and occlusal surfaces. Often the cause can be multi-factorial, causing a more generalized appearance requiring a thorough health history and analysis of dietary, hygienic, and parafunctional habits to identify the causative factors at play.

Several indices and scoring systems exist to grade dental erosion. The most widely used is the Basic Erosive Wear Examination (BEWE).[34] In this system, surfaces are scored based on signs of dental erosion with either a «0» (no signs of erosive wear), «1» (initial loss of surface texture), «2» (distinct defect, hard tissue loss <50% of the surface area) or «3» (hard tissue loss ≥50% of the surface area). Only the most severely affected surface of each sextant is scored. The total scores of the sextants are then added, and the subject is graded as having «no» (<2), «low» (3-8), «medium» (9-13) or «high» (≥14) risk level, based on their total BEWE score. Suggestions for treatment focus mainly on prevention and preservation of tooth structure. However, special restorative intervention may be necessary for cases of severe progression.

Prevention and management of dental erosion

When a patient is diagnosed with dental erosion, one must identify whether it is intrinsic, extrinsic, or both. The causes need then to be identified and addressed. In any case, a thorough medical history should be taken, emphasizing medicine or conditions that can cause dry mouth. Alterations to less xerostomic medication can improve the patient's quality of life and oral health.

If the patient is diagnosed with intrinsic erosion, a referral to a gastroenterologist needs to be made to diagnose and treat the underlying condition. If a suspicion arises that the patient has an eating disorder, appropriate referrals need to be made as well. Definitive treatment should be undertaken once the underlying causes are under control. Until then, only palliative and necessary treatment should be performed.

A diet analysis should include at least two weekdays and a weekend in case of extrinsic erosion. The patient needs to be educated about the nature of the condition and encouraged to change his dietary habits to a less erosive pattern. Acidic consumption should be reduced with an emphasis on reducing the frequency of acidic attacks. Acidic beverages should ideally be substituted with water or milk, or the mouth at least

rinsed with water, fluoride, or bicarbonate after acidic drinks. If the patient has difficulty limiting the consumption of acidic beverages, drinking them with a straw can be helpful since it limits direct contact with the acid with teeth.

The acidity of the oral environment should be reduced. Several sugar-free antacids are readily available over the counter and can help alleviate symptoms and acidity in patients suffering from gastric reflux. Saliva, which dilutes, buffers, and clears acid from the oral cavity, should also be assessed. Hyposalivation is diagnosed when salivary production goes below 0.1 mL/min for unstimulated salivary flow or 0.7 mL/min for stimulated salivary flow.[5,35] If salivary production is low, Xylitol-containing chewing gum is a readily available adjunct to stimulate salivary flow rates. In addition to the gum stimulating saliva secretion, Xylitol effectively prevents root caries in adult patients.[36] Encouraging the patient to maintain adequate hydration is also essential. Mouthwashes and oral moisturizers can also benefit, alleviate symptoms, and even aid in remineralization. Care should be taken not to prescribe agents that can potentially be erosive.[28-30] Remineralization needs to be encouraged when tooth structure is compromised by wear and dentin exposure. 5000ppm toothpaste should be prescribed, especially if the patient presents active caries lesions. Fluoride varnishes remineralize the tooth structure, lower the critical pH for demineralization by substituting hydroxyapatite with fluorapatite, and can reduce sensitivity where dentin has been exposed.[37,38] an outstanding benefit of fluoride varnishes is that their efficacy does not rely on patient compliance. Fluoride rinses are readily available, and their use should also be encouraged.

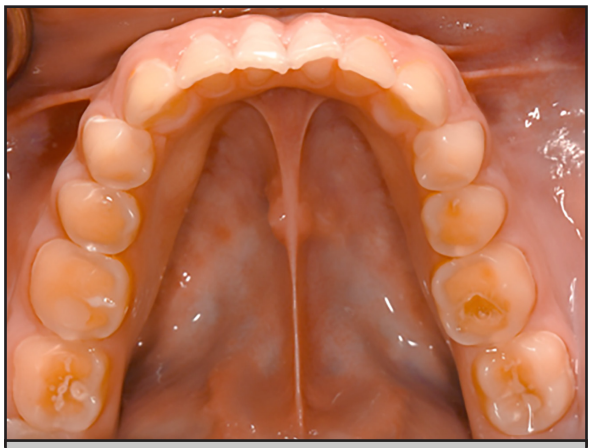

Figure 4. A 15-year-old male with severe erosion

Treatment

The primary focus of the restorative dentist should always be to preserve the remaining dentition. As Dr. Robert F. Barkley stated elegantly in his book "Successful Preventive Dental Practices," "The goal of dentistry is to make the patient worse at the slowest possible rate." If the patient does not have major esthetic or functional problems, sealing dentinal exposures on occlusal, facial, or palatal surfaces can go a long way in preserving the remaining dentition if other causative factors in erosive tooth wear are kept at bay.

If functional or esthetic problems are such that more significant restorative intervention is genuinely needed, modern conservative dentistry dictates that an additive approach should be employed whenever possible to preserve tooth structure.[40,41] Historical treatment of severe tooth wear was often by means of crowning affected teeth or even through full-mouth rehabilitation with crowns, a treatment modality often causing more massive tooth structure loss than the causative factors themselves had produced. This has been described as «a strange way to treat teeth which were already compromised by wear».[42] The authors proposed composite bonding resin to affected teeth to protect them from further wear while improving patient-perceived esthetics simultaneously. This "pragmatic esthetics" concept is advantageous and cost-effective for treating wear patients.

Wear patients often seek dental offices due to chipped, thin, and often short maxillary front teeth. There is often inadequate space to build up these teeth that have eroded and worn on the palatal surface. Two easy approaches can be made here: If the posterior teeth are relatively unaffected by erosion, the front teeth can be built up with either a free-hand composite resin or a wax-up and silicone stent. This will temporarily open up the occlusion posteriorly. Through a combination of supra-eruption of the posterior teeth and intrusion of the anterior teeth, the teeth will come into occlusion again, usually throughout 4-6 months.[43] This has been termed the Dahl Principle, which was first proposed to gain restorative space in cases with anterior attrition by placing a removable cast appliance on the palatal surfaces on the upper anterior teeth for a period of 4-6 months.[44] The same effect can be obtained today by using composite resin and doing the anterior build-ups directly. If the anterior surfaces of the upper maxillary teeth are also affected by erosion, either direct or indirect veneers (given that the teeth are relatively unrestored) are the most conservative method of restoring function and esthetics after the proper occlusal relationship has been restored.[45]

If the posterior teeth are affected by an erosive tooth, wear the vertical occlusal relationship can be raised with either direct composite resin or bonded onlays on the affected teeth, thus gaining space to restore the anterior dentition adhesively. Evidence is mounting up supporting the use of bonded ceramic onlays which defy traditional retention and resistance form, a very favorable treatment modality for eroded teeth since very little tooth structure needs to be reduced.[46] Long-term clinical evidence on this treatment modality is still being established, but short- to medium-term studies and reports have shown excellent results. Numerous case reports have been published where cases of erosive tooth wear have been successfully treated using bonded ceramic onlays, palatal and facial veneers, direct composite, and a mixture of these materials, which are all very conservative treatment modalities.

For more severe cases (Figure 4), full-coverage restorations may still be the most suitable treatment to offer, significantly if the teeth are extensively restored and/or damaged. Still, our goal should always be to delay such invasive treatment for as long as possible and, whenever possible, detect this condition early and employ preventive measures and minimally invasive treatment modalities to protect what is remaining.[47]

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Dr. Alex J. Delgado received his DDS degree from the Universidad Santa María, Caracas, Venezuela, in 2001. From 2001 through 2010, Dr. Delgado worked in a private practice and clinical settings in Venezuela and North Carolina. In 2011, he joined the University of North Carolina, School of Dentistry at Chapel Hill, where he earned his Master's in Operative Dentistry and a Clinical Certificate in Advanced Operative Dentistry. Dr. Delgado joined the University of Florida in 2014 as a Clinical Associate Professor and now serves as Director of the Dental Continuing Education. He is the past Division Director of Operative Dentistry in the Department of Restorative Dental Sciences and is the current director of the AGD MasterTrack Comprehensive Dentistry program.

Dr. Delgado is a member of several professional organizations, including the American Dental Association, the Academy of Operative Dentistry, the Academy of General Dentistry, and the International Association for Dental Research, and he has served as a manuscript reviewer for six peer-reviewed dental journals. In 2016, he was presented with the Judson C. Hickey Scientific Writing Award from the American Prosthodontic Society and was recognized as Teacher of the Year 2015-2016 and 2018-2019 at the University of Florida. Dr. Delgado also received the Sustained Exemplary Teaching Award for 2016-2017. In 2019, he was the recipient of the Rising Start Faculty award from the Academy of Operative Dentistry.

Dr. Delgado is involved in patient care devoted to prevention, restorative dentistry, and esthetics. He has actively maintained himself in research, particularly in the areas of dental erosion, biomaterials, and educational research. Dr. Delgado is a member of the National Practice-Based Research Network and serves on the communication and dissemination subcommittee of the network.

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ORAL MUCOSAL DISEASES: PUZZLING CONDITIONS IN COMPLICATED PATIENTS

by Jacqueline M. Plemons DDS, MS; Clinical Professor, Department of Periodontics, Texas A&M School of Dentistry

Ying S. Wang DDS, MS; Clinical Professor, Department of Periodontics, Texas A&M School of Dentistry

Elain Benton RDH, CTTS Instructor (Retired), Department of Public Health Sciences, Texas A&M School of Dentistry

Introduction

The mucosal surfaces of the oral cavity provide a canvas for a variety of common and some not-so-common oral lesions and conditions. Mucosal diseases vary greatly in appearance and can present as red, white and/or ulcerative areas affecting a single or multiple sites. They may be asymptomatic or cause discomfort that negatively affects quality of life.

Prevalence of oral mucosal lesions appears to vary with age affecting approximately 5% of people in their 20's and increasing to nearly 20% of individuals aged 70-80 years.[1] Numbers can be significantly higher in certain populations.

Figures 1 & 2: Lichen planus occurring on the gingiva (desquamative gingivitis) and tongue (plaque-like form).

The etiology of oral mucosal diseases and conditions includes infection, trauma, altered immune-response and neoplastic changes. A detailed patient history is often critical to establishing a definitive diagnosis. Patients most commonly seek care for oral mucosal pain from their general dentist.

This paper explores mucosal changes seen with dermatologic diseases such as lichen planus, mucous membrane pemphigoid and pemphigus vulgaris; recurrent aphthous and herpetic stomatitis; and oral contact or allergic reactions.

Dermatologic Conditions

Lichen Planus

Lichen planus is a chronic inflammatory disease resulting from an abnormal T-cell mediated immune response to a yet unknown lichen planus specific antigen. It can cause skin and/or mucosal lesions, affecting slightly more females than males. Symptoms vary from mucosal sensitivity to continuous debilitating pain, however, some patients are asymptomatic and unaware of their lesions prior to clinical examination.

Lichen planus affects 0.5-2% of the general population.[2] The buccal mucosa is the most affected site followed by the tongue and gingiva. Lesions may persist for years with periods of exacerbation and quiescence. Lichen planus is occasionally associated with diabetes and hypertension, and more recently with hepatitis C infection. Lichenoid changes are also seen with drug reactions, contact reactions and chronic graft-vs-host disease.

Lichen planus presents in various forms in the mouth including reticular, plaque-like, papular, atrophic, ulcerative, and bullous forms. Lesions range from asymptomatic, white lacy lines (Wickham's Striae) in the reticular form and dense thickening of the mucosa in the plaque-like form to erythema and ulceration in the atrophic and ulcerative forms. In the former, patients may complain of sensitivity to spicy, acidic and rough-textured foods as well as difficulty with oral hygiene.

A diagnosis based on clinical examination is often acceptable in patients with reticular lichen planus, however, histologic evaluation may be necessary to arrive at definitive diagnoses for the other forms. Direct immunofluorescence may be useful when distinguishing between lichen planus and other oral desquamative diseases.

The cornerstone of treatment of oral dermatologic diseases including lichen planus is the use of high potency topical steroids such as clobetasol and fluocinonide. With severe episodes, tapering doses of systemic steroids are often prescribed as well. Topical steroid therapy can be enhanced by using steroid delivery trays, and intralesional steroid injections may be considered for ulcerative lesions on movable mucosa. Other immune suppressants, both topical and systemic, are used in refractory cases where collaboration with a physician is warranted. Patients often benefit from avoiding products that may irritate the oral tissues including strong flavored toothpaste and mouth rinses as well as spicy, acidic, or rough-textured foods.

Figure 3-5: Mucous membrane pemphigoid (MMP) presenting as desquamative gingivitis; poor plaque control resulting from the inability to brush comfortably; patient responded well to topical steroids applied in delivery trays.

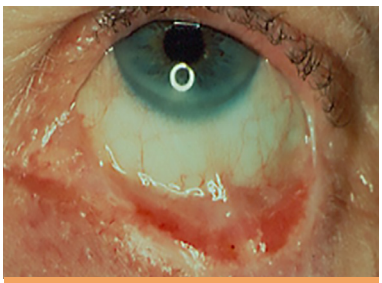

Figure 6: Symblepharon (scar) in a patient with MMP extending from the conjunctiva to the eyeball.

Mucous Membrane Pemphigoid

Mucous membrane pemphigoid (MMP) is an autoimmune blistering disorder that affects the oral &/or other mucosal surfaces. It affects women twice as often as men and occurs most frequently in the 5th to 7th decades of life.[2] Clinically, MMP presents as desquamative gingivitis (bright red gingiva) often showing a positive Nikolsky's sign (sloughing of the outer surface of the oral mucosa with slight rubbing).

Vesiculobullous lesions occasionally occur on other mucosal surfaces such as the conjunctiva, genitals, skin, nares, esophagus, urethra, and rectum. Symblepharon formation (scarring extending from the conjunctiva to the eyeball itself) can lead to blindness. It is wise to refer patients for an evaluation by an ophthalmologist following diagnosis. Biopsy for routine histology and direct immunofluorescence is often necessary for a definitive diagnosis. Specimens will show a clean, sub-basilar separation of the epithelium from the underlying connective tissue.

Treatment of MMP usually begins with medications and techniques previously described for oral lichen planus – topical and/or systemic steroids applied via various techniques. Systemic therapy with doxycycline or dapsone has shown value in the management of patients with MMP along with other medications which are prescribed by physicians due to their complex side-effects and monitoring demands. More recently, biologics have been used in patients who have not responded to more conventional therapy or have high risk side effects.

Pemphigus Vulgaris

Pemphigus vulgaris is another autoimmune blistering disorder affecting the skin and/or oral mucosa. Autoantibodies against proteins in the skin called desmogleins are produced causing a suprabasilar separation of epithelial cells from one another. Approximately 50-70% of patients with pemphigus vulgaris develop mucosal lesions.[3] Middle-aged and older adults are most often affected, males and females equally. A mortality rate of approximately 5-15% has been reported.

Oral manifestations of pemphigus vulgaris include bullous lesions, erosions with ragged borders, desquamative gingivitis and a positive Nikolsky's sign. Multiple large lesions on the skin can result in fluid loss, electrolyte imbalance, septicemia and death.

Diagnosis of pemphigus vulgaris is determined by routine histology and direct immunofluorescence following biopsy. Treatment of minor lesions confined to the oral mucosa may initially be managed with topical and/or systemic steroids, however, patients often require other systemic immunosuppressants or biologics. A team approach to treatment including both dentists and physicians is required.

Dr. Jacqueline Plemons is a periodontist from Dallas, TX where she has a small private practice and teaches part-time at Texas A&M School of Dentistry. She lectures both locally and nationally sharing her experience in providing dental care to patients with oral medicine diseases. Dr. Plemons is active in organized dentistry, serving in leadership positions on the state and national levels. Her passion in dentistry is providing care to patients with complicated and sometimes puzzling conditions in the oral cavity.

Recurrent Oral Ulcerations

Recurrent Aphthous Stomatitis

Aphthous ulcers (canker sores) are common oral lesions affecting mucosal surfaces (labial/buccal mucosa, tongue, soft palate and floor of the mouth) in approximately 20-30% of the population. Most patients experience lesions prior to the age of 30 (80%), and the problem often runs in families.[4] Patients may experience only an occasional aphthous ulcer; however, some suffer from multiple painful recurrent lesions that negatively affect quality of life. It is these patients who seek care from their dentist.

Minor aphthae occur as single, or multiple painful circular/ovoid ulcers with fibrinous coatings surrounded by erythematous borders. They range from 2-3 mm in diameter (<1cm) and typically persist for 7-10 days. Major aphthae are larger, deeper, and often last for weeks. Patients may experience systemic symptoms such as fever and malaise, and lesions are said to heal with scarring. Herpetiform aphthae are far less common and present as multiple very small ulcerations (clinically similar to herpesvirus lesions) which may coalesce forming larger areas of ulceration.

Factors associated with recurrent aphthous stomatitis include tissue trauma, psychological stress, gastrointestinal disease, blood dyscrasias, vitamin deficiencies, immunosuppression, food reactions, medications (NSIAD's) and oral hygiene products (sodium lauryl sulfate). A thorough medical and dental history is paramount to the successful management of patients with chronic oral ulcerations.

Treatment of aphthous stomatitis often begins with the use of topical agents such as chlorhexidine or steroids including triamcinolone, fluocinonide or clobetasol. Systemic steroids are considered in severe cases along with other immune modulating drugs prescribed and monitored by physicians. Intralesional steroid injections are useful for isolated refractory lesions. Vitamin supplementation and diet manipulation may be useful along with discontinuation of targeted medications. Several over-the-counter products are marketed for treatment of aphthous ulcers, and patients may benefit from laser therapy.

Recurrent Herpetic Stomatitis

Recurrent herpetic stomatitis represents the attenuated form of the primary infection with Herpes Simplex 1 virus, usually occurring in childhood. After initial exposure, the virus remains latent in the trigeminal ganglion and uses the axons of sensory neurons to move back and forth to the skin or mucosa. Recurrent (secondary) herpes infection occurs with reactivation of the virus.[5]

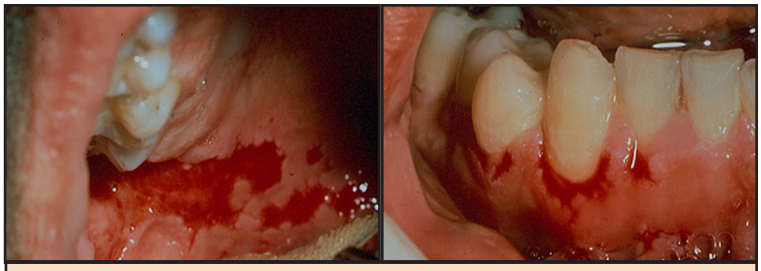

Figure 7 & 8: Erosions with ragged borders seen with pemphigus vulgaris.

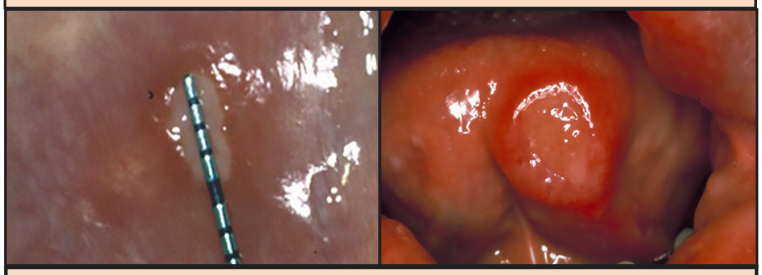

Figure 9 & 10: Minor aphthous ulcer presenting as a small painful lesion with a fibrinous coating and erythematous border inside the lower lip. Second picture shows a large painful ulcer consistent with major aphthous stomatitis which has been present for several weeks.

In contrast to recurrent aphthous stomatitis, recurrent herpetic lesions occur unilaterally on non-movable keratinized tissue that is attached to the underlying bone (hard palate and attached gingiva). Ulcerations are preceded by multiple small vesicles which quickly rupture forming ulcers that coalesce creating larger ones. Lesions are usually painful and last around two weeks during which time transmission may be possible. Patients often experience a prodrome or warning of an impending lesion characterized by tingling, itching, or burning. Herpes labialis occurs in the same manner but is not included in recurrent herpetic stomatitis because it affects the outer portion of the lips.

Reactivation of the virus is associated with stress, fatigue, fever, upper respiratory tract infections, trauma, sunlight, hormonal changes and foods. It is more commonly seen in immunocompromised patients. Information regarding reactivation or triggering of the virus should be explored during patients' health history.

Treatment of recurrent herpetic stomatitis includes prevention as well as topical and systemic medications. Lesions may be preempted by avoiding sunlight or using a protective sun blocking agent, avoiding triggering foods or drinks, and taking lysine. Once a lesion has occurred, there are several over-the-counter products such as 10% docosanol that provide symptomatic relief as do prescription topical medications including 1% penciclovir and 5% acyclovir. Systemic therapy with acyclovir and valacyclovir is the cornerstone of antiviral treatment.

Contact Reactions

Oral Contact Stomatitis

Oral contact stomatitis is an inflammatory condition caused by exposure of the mucosa to a variety of substances resulting in pain, burning, swelling, erythema (oral and perioral), peeling, and blisters/ulcerations. Reactions often begin within minutes to hours. The most common sites affected include the buccal/labial mucosa, lateral borders of the tongue, gingiva, and hard palate. Clinical changes can be localized, follow the shape of oral appliances, or can be more generalized such as that seen with exposure to mouth rinses or toothpastes.

Signs and symptoms of acute contact stomatitis usually develop shortly after exposure to irritants while the chronic form occurs in areas of long-term exposure to materials such as dental restorations and appliances.[6]

Contact stomatitis in the mouth occurs less frequently than contact dermatitis on the skin due to saliva, which constantly dilutes offending agents, and the relatively short time substances have in contact with mucosal surfaces as a result of the high degree of vascularization in the mouth.

Common causative agents associated with oral contact stomatitis include oral hygiene products; candy, gum, or mints; sodas; flavorings agents (cinnamon) and preservatives (benzoic acid); foods such as processed tomato products; and dental materials.

Diagnosis of oral contact stomatitis is based primarily on history of present illness and clinical examination. Treatment begins with changes in oral hygiene products and an elimination diet which should result in improvement or resolution within two to four weeks. Topical steroid therapy may be useful for more severe cases, and biopsy confirmation may be indicated to rule out systemic disease. Patch testing can be of benefit in identifying causative agents, and replacement of dental restorations may be considered if lesions are consistent in location.

Summary

Clinical evidence suggests that oral mucosal lesions and conditions may be more prevalent now than in the past. Diagnosis can be difficult as signs and symptoms of oral mucosal lesions are often similar, making diagnosis a challenge. Patients often seek care from multiple dental and medical providers before receiving a diagnosis and effective treatment. Knowledge of oral mucosal diseases will not only help patients but will also give dentists the tools to provide optimal care. §

References are on page 31. **The content of this paper was also published in the May 2023 issue of the *Texas Dental Journal*.**

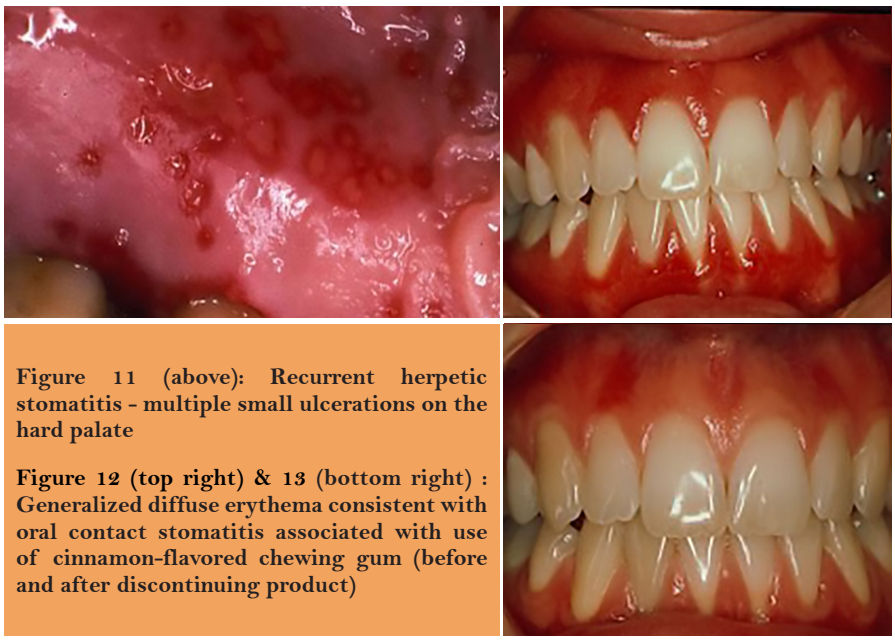

Figure 11 (above): Recurrent herpetic stomatitis - multiple small ulcerations on the hard palate

Figure 12 (top right) & 13 (bottom right) : Generalized diffuse erythema consistent with oral contact stomatitis associated with use of cinnamon-flavored chewing gum (before and after discontinuing product)

Answers to Questions That Keep You Up at Night

by Steve Carstensen, DDS

Have you laid awake wondering why your treatment didn't work? What was missing from your diagnosis? Why didn't your patient's chief complaints exactly line up with what you saw during your exam?

You may not yet be able to see clues about breathing problems and airway function that you need to complete the clinical puzzle that your patients present every day in your dental chair. Many dentists have been frustrated with applying what they learned in dental school about tooth erosion, bruxism, TMD, gingivitis, and tooth alignment to real-life patients. Things just don't add up, or treatments that 'should work,' don't. Dentists and dental hygienists are curious about the overall health of their patients but don't know how to relate other health concerns to what they focus on in their practices.

The airway connects everything. Think about the first action taken by a newborn: that first breath, filling the lungs and starting a process that continues without interruption for life. What's the human body's primary reflex? Breathing. Without gas exchange, nothing else matters. Disruptions to this vital process have consequences – some seemingly small, like snoring, and some definitely impactful, like hypoxemia leading to stroke.

In the late 1980's, physicians figured out how to keep hospital patients breathing by using a contrived pressure device to inflate a collapsing throat. Even then, some worked with dental colleagues to devise ways to pull the mandible forward, achieving a patent airway during sleep. With mechanical support for flexible tissues, the body was allowed to resume normal respiration, following that reflex drive. Unfortunately for population health, the medical profession concentrated on the downstream consequences of this collapsing airway – the cardiovascular effects of years of compromised respiration reduce life expectancy. Obstructive sleep apnea, a mechanical problem, was defined by its effects and designated a medical disease, ultimately the province of highly specialized physicians.

Gatekeeping sick people has produced a population of 29 million people in the United States with some form of poorly functioning upper airway with less than 20% of them formally diagnosed. The treatment developed by the sleep physicians, positive air pressure, is rejected by over half of the people prescribed it, with unknowable numbers of sufferers avoiding consultation because they don't want the machine. Don't get me wrong: CPAPs and mandibular advancement devices have saved millions of people and improved the lives of millions more. Poor airway function persists, costing the economy over $150 billion per year in direct and indirect costs.

What other part of medicine has expertise in the form and function of the upper airway? Dental professionals. Pediatric dentists, primary care dentists, orthodontists, and oral surgeons, as well as our dental hygiene colleagues, each have a role to play in this population health crisis. We dentists (I'll use this as an inclusive term for all dental professionals) see signs of poor airway function daily.

Why does your patient brux? Think about what

Steve Carstensen DDS

Fellow, Academy of General Dentistry

Fellow, American College of Dentistry

Fellow, International College of Dentistry

Diplomate, American Board of Dental Sleep Medicine

Steve Carstensen DDS has treated sleep apnea and snoring in Bellevue, WA since 1998. He's the Consultant to the ADA for sleep related breathing disorders and heads the ADA's Children's Airway Initiative. He trained at UCLA's Mini-Residency in Dental Sleep Medicine and is a Diplomate of the American Board of Dental Sleep Medicine. He lectures internationally, directs sleep education at Airway Technologies and the Pankey Institute and is a guest lecturer at Spear Education, Louisiana State Dental School, and University of the Pacific, in addition to advising several other sleep-related manufacturers. In 2014 he helped found Dental Sleep Practice Magazine and currently serves as Chief Dental Editor. In 2019, Quintessence published *A Clinician's Handbook for Dental Sleep Medicine*, written with a co-author. The American Academy of Dental Sleep Medicine awarded him the 2023 Distinguished Service Award.

you've been taught – did anyone mention frequent microarousals from sleep? What about periodontal inflammation? Did mouth breathing or increased circulating inflammatory cytokines from intermittent hypoxia appear on your etiology list? Your patients who refuse a rubber dam or other isolation device "because I can't breathe through my nose" – do your thoughts turn to nasal underuse syndrome? Are parents of young children in your practice agonizing over an adenotonsillectomy decision? Do you and your orthodontist still put off treatment until all the permanent teeth are erupted?

Dental responsibilities are changing with the evidence developing around breathing and airway support. Today's dentist must step into the void created by an increasingly fragmented medical system, where providers must meet many challenges upon their time, and patient coaching is often in short supply. Some people, who have been compensating for bad breathing for years or decades, have developed serious medical problems and need to be seen by physicians for proper management. For many others, dentists can interrupt the compensations earlier in life and allow the body to return to homeostasis, with expectations they will never face the dire risks of heart attack, stroke, or insulin resistance that develop directly from obstructive sleep apnea. Even those whose physiology has been overwhelmed need treatment. If they reject the positive air pressure mask, the remaining non-invasive therapy available, an oral device, must be provided by a trained, qualified dentist.

Dental schools do not yet, for the most part, include this training in curriculum – it's too new and disruptive for them. Fortunately, the culture of dentistry includes the commitment to ongoing education. Dentists worldwide have become curious about how they can help their patients breathe better. How they can continue to enjoy professional practice in the face of declining caries rates, reimbursement restrictions, and the routine of everyday dentistry. Breathing and airway support provides a path for active learning, professional growth, and ways to impact patient health and satisfaction unavailable anywhere else in our profession. Business owners must consider the bottom line – there's good news there, too, as this service can provide income uncontrolled by third parties.

How do dental professionals become qualified? As most questions are answered, "It depends." If you are a primary care dentist, you can sign up for intense CDE programs – but what if you are unsure, or want to get some clinical experience under your belt before that level of commitment? Do you take an online course? A two-hour lecture? Or do you seek out a short, intensive course that provides enough training you can put into practice on select patients, learning in a medically ethical and safe way?

Dental Hygienists, the stars of medicine's preventive capabilities, can learn to recognize problems, coach patients in treatment, and even provide remedies unique to their role by adding myofunctional therapy. This additional skillset builds on a dental hygienist's training in anatomy, physiology, and function of the upper airway to provide training in muscle control of every part in their scope.

Specialized dentists (or, as one colleague labels them: 'The Limiteds') have narrower but critical ways to help. Pediatric dentists are the only part of medicine who can recognize underdevelopment of the Craniofacial Respiratory Complex, a term created by a pediatric dentist Dr. Kevin Boyd to bring attention to every part of the upper airway. As we watch littles grow, we can see when their maxillae are being pinched from poor function, or their tongues are not allowed to work through a full range of motion. As we see, so shall we act. Orthodontists, trained to create beautiful smiles, a coordinated occlusion and smooth jaw joint function, can add 'developing excellent bone support for the airway' without compromising any of their other primary focus points. In fact, it's easier to create a beautiful smile when there is plenty of arch length and bone support for the person to breathe through a wide-open airway. Oral surgeons shift from occlusion or esthetic driven goals of maxillomandibular surgery to add breathing support.

Breathing during wakefulness is under our control, too, and learning better breathing habits from early life

yields less compromise and improved concentration. While anyone can learn to be a 'breathing coach,' when a dental team takes on some of the simple exercises as part of a whole-body wellness focus, the added service benefits the clinic brand as well, improving business.

Your patients present with clinical puzzles. They don't respond to treatments you had confidence in. You wonder how they developed the problems you see in the first place. If you ask them how they breathe at night and they look at you as part of their overall health, you've added value to your relationship in unexpected ways.

What's next for you, reader? Has your curiosity been raised to wonder how you can be part of this exciting health service? Have you taken classes already but haven't found the way to putting what you know into practice? Is now the time to step forward to declare you want to be part of the future?

At the Florida Dental Conference, June 30 – July 1st, I will be helping you see ways to add breathing and airway support to your practice. A dental hygienist colleague who is a leader in myofunctional therapy will bring her perspective. Our goal is to have you return to practice on Monday a changed dental professional, never able to see your patients the same way, and ready to gain the rewards that come from committing to health. You will have answers you've never thought of before. §

FLORIDA ACADEMY of GENERAL DENTISTRY

HANDS-ON WORKSHOP

Pinhole Surgical Technique for Gingival Rejuvenation - Cadaver Surgery Demo

WHEN: August 26, 2023

LOCATION: Springhill Suites Orlando Lake Buena Vista in the Marriott Village, 8601 Vineland Avenue, Orlando, FL

Overview: The Pinhole Surgical Technique® for Gingival Rejuvenation is a minimally invasive treatment to correct gingival recession in as little as one appointment. This course is designed to give you an introduction to this technique. Additional training will be required to become certified to use the Pinhole Technique.

Intro Hands-on Workshop: Attendees will have the opportunity to become familiar with all the instrumentation, theory, and therapy for providing the Pinhole gingival recession reversal treatment.

Cadaver Demonstration Surgery: After the hands-on portion, Dr. Chao will perform his innovative Pinhole technique on a cadaver. This will be followed by a question-and-answer session with Dr. Chao.

Course Objectives: To teach dentist attendees how to utilize the minimally invasive Pinhole Surgical Technique to treat gingival recession without the use of scalpels, sutures, or grafting.

About the Speaker: Dr. John Chao is the inventor of the Pinhole® Surgical Technique for the treatment of gingival recession. His involvement with the Post-Graduate Periodontics Program at the University of Buffalo, SUNY, speaks to the depth of his knowledge and experience in the scientific investigation of periodontal disease.

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TREATING INFLAMMATION:

The key to good oral and systemic health

by Carol A. Jahn, RDH, MS

Chronic inflammation. Over the last several years, research indicates it plays a major role in the development of numerous chronic conditions such as heart disease, stroke, cancer, diabetes, and neurogenerative disorders.[1] According to data from the Centers for Disease Control (CDC) six in ten US adults have at least one chronic condition, and four in ten have two or more. Chronic diseases are the leading causes of death and disability and cost the nation $4.1 trillion in annual health care costs.[2]

Chronic inflammation is also a key element in the development and progression of periodontal disease.[3] Over the last 25 or so years, numerous studies have demonstrated that people with chronic conditions often have periodontal disease.[4] Unfortunately, despite the volume of research and many inroads, there is not enough high-quality evidence to determine exactly what the links are between periodontitis and many life-threatening and limiting chronic conditions.[4]

Why have we not made more headway in establishing causality in the connection between periodontitis and systemic health conditions? The challenge is that unlike influenza or COVID, which can be linked directly to specific viruses, chronic conditions are often the result of multiple risk factors.[1] The three most common types are inherent factors like age, gender, or race, lifestyle/behavioral influences such as poor diet, physical inactivity, alcohol and tobacco use, and environmental considerations including exposure to air pollution or asbestos.[1] What most of these risks have in common is that they are drivers of inflammation. For example, as we age, we naturally product more inflammatory mediators. Diets high in processed foods or sugar drive inflammation as does excessive use of alcohol and tobacco.[1]

Complicating the situation further is that many people have more than one chronic condition. When people have two chronic conditions it is referred to as a comorbidity. If they have more than two, it is referred to as a multimorbidity.[5] One example of this is diabetes. Diabetes increases the risk of both heart disease and periodontitis. A 2019 study found that people who suffered a heart attack were also likely to have undiagnosed diabetes and periodontal disease.[6]

What does this mean for us as dental professionals? In 2018, an editorial in JADA stated that "promoting oral health care because of its possible effect on systemic disease is premature and may be misleading."[4] As painful as this statement is, it is correct. We simply do not have the high-quality evidence to tell someone that treating their periodontitis will improve their heart or brain health or prevent a premature birth. However, that does not mean what we do isn't important to overall health.

The most important thing that dental professionals do, especially dental hygienists, is combatting inflammation. Whether it's a prophy, treatment for gingivitis, or nonsurgical periodontal therapy, the goal is to prevent, reduce, or eliminate inflammation. The American Academy of Periodontology is in alignment with this as they define periodontal health as "a state free from inflammatory periodontal diseases."[3] Importantly, the science shows that the inflammatory agents products by periodontitis don't just affect the mouth but entire body.[7] And when periodontitis is treated, there is a reduction in these inflammatory mediators both orally and systemically.[8]

A 2019 perspective paper on inflammation written by scientists from across the globe recommend the early diagnosis, prevention, and treatment of severe chronic inflammation to reduce the risk of chronic disease and death worldwide.[1] They acknowledge the many factors that are at play in driving inflammation and chronic disease, and admit, no one has all the answer. Despite this, they conclude targeting inflammation can improve human health.[1]

We may not know, now or ever, what role periodontal disease plays in the development of chronic disease. It could be a risk factor or a comorbidity. Or a different risk factor might make someone more likely to development both chronic condition like heart disease and periodontitis. At this point, we don't know, and that's okay. Because what we do know is that we have be vigilant at treating inflammation.

Every day, you and your dental hygienist can be collaborative partners in the early diagnosis, prevention, and treatment of chronic inflammation. One person cannot do it alone. It takes a cohesive, supportive team. Every day a patient puts off scaling and root planning is a day they continue to have oral and systemic inflammation. Every time we continue to recommend string floss when we know the chance of them adopting this habit is a lost opportunity to find something they will use to keep inflammation at bay. §

References are on page 31.

Carol Jahn, RDH, MS has a BS in dental hygiene from the University of Iowa and an MS in Continuing Education from the University of St Francis. She has been a dental hygienist since 1982. She is an international speaker and author, and industry leader. Currently, she is the Director of Professional Relations & Education for Water Pik, Inc. Carol received the ADHA/J & J Award of Excellence in 2013 and served on the board of the American Dental Hygienists' Association and been a delegate to the International Federation of Dental Hygiene. **cjahn@waterpik.com | 708-899-1886**

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AGD is excited to introduce George Schmidt, DMD, FAGD, as our new AGD Podcast Series host. Schmidt is a New Jersey dentist and chair of the AGD Scientific Meetings Council.

Schmidt is passionate about dental education and is active with AGD. He has served on the Dental Education Council and also lectures nationally on dental implants, restorative dentistry and practice management. He is an adjunct clinical assistant professor in the CDE Implant Department at the New York University College of Dentistry and in the Department of Diagnostic Sciences at the Rutgers School of Dental Medicine.

Schmidt received his dental degree from the University of Medicine and Dentistry of New Jersey. He is a Fellow of AGD, the International Congress of Oral Implantologists and the American Dental Implant Association.

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Everyday Endo For Tomorrow

by Kevin Kuo, DDS, MMSc

Introduction

The future of endodontics is paramount and exciting.

Dentists and endodontists perform more than 41,000 root canals daily in the United States.[1] Root canal treatment will continue to be an essential dental procedure for patients for years as caries' prevalence continues to be high. A surveyed one in five adults in the United States had untreated caries between 2017 and 2020.[2] Many of these patients may require root canal treatment as caries disease progresses.

Currently, endodontic technology and materials have also made significant inroads. Lasers, multi-sonic irrigation, and 3D printing are technologies being actively researched and studied by endodontists and even applied by some clinicians. Advancements in microscope magnification, CBCT, nickel-titanium rotary files, and bioceramic materials also continue to be important. Artificial intelligence may be humanity's most significant technological advancement yet and has a role in endodontic diagnosis, treatment planning, and research analyses.

Despite its paramount importance to the public and compelling new technologies, the future of endodontics in the next couple of decades may exhibit more pragmatism in its growth than groundbreaking technologies. In other words, the primary advancement in endodontics may focus more on the mundane aspect of optimizing and utilizing existing materials and technologies rather than adopting new revolutionary ones. Even if monotonous in nature, endodontic developments in diagnoses, treatment planning, and outcomes may have an incredibly high impact on the specialty.

Historical Example

The history of nickel-titanium (NiTi) rotary files will be used to better demonstrate the future decades of optimization and utilization phase of endodontic development.

Engine-driven nickel-titanium files were first studied and used in the late 1980s, more than 30 years ago.[3] NiTi featured alloy characteristics that benefit root canal treatment efficiency and safety over prior stainless steel equivalent files. In 1959, William Buehler and Frederick Wang discovered NiTi while developing missile nose cones at the Naval Ordnance Laboratory. NiTi's shape memory ability was particularly interesting for its inventors as the material can keep shape after strain.[4]

For endodontics, NiTi's superelastic properties are more clinically significant, reducing rotary file cyclic fatigue, minimizing transportation, and improving the instrumentation of curved canals. Superelasticity also allows larger tapered NiTi files beyond the standard .02 in stainless steel, where greater tapers become too stiff for canal instrumentation.[5]

Despite its advantages over stainless steel, NiTi still suffers from cyclic and torsional fatigue that results in file separation. From the 1990s to the early 2000s, most early developments focused on different smooth, passive cutting designs, such as Profile developed by McSpadden and Johnson, to minimize file separation and other preparation errors. Minimizing procedural errors was the focus.[5]

The later 2000s introduced active cutting rotary files and intra-file variable tapers, like the introduction of ProTaper. Instead of smooth radial lands, sharp triangular cross-sections improved cutting efficiency. Multiple tapers along a single file also allow for asymmetrical cutting along the root canal, creating file systems that cut in different zones within the canal. Maximizing cutting efficiency was the focus.[5]

And most importantly, in the 2010s, heat-treating rotary files became the priority. NiTi demonstrates two different crystal configurations depending on temperature and/or applied strain. Rotary files prior to 2010 primarily worked in the austenitic phase at room and body temperature. Heat treatment biases the crystal lattice of NiTi files in the martensite, which is even more flexible than prior NiTis. In other words, heat-treated rotary NiTi files exhibit super-charged capability in minimizing procedure errors such as cyclic fatigue while maintaining cutting efficiency in complex curved canals--further advancing the focuses in the prior two decades.[6]

Large-scale improvement from the current rotary file design and metallurgy will unlikely occur in the coming decade.

Despite the considerable advancements in NiTi rotary file design and metallurgy, clinicians still revert to instrumentation techniques that revolve around stainless steel hand files.[7] Anecdotally, rather than maximizing the ability of current NiTi files, initiating instrumentation and creating a manual glide path with stainless steel hand files is still the default technique for many clinicians as they begin cleaning and shaping.

As such, NiTi rotary files are a great example of a technology and material that took an entire generation to develop that still needs time for optimization and utilization with clinicians, especially for general dentists.

Evidence-based dentistry

Even with mundane developments in endodontics, research-based decision-making and chair-side application are critical to developing endodontics for the future.

Dr. Kevin Kuo is the founder of KevinDental, PLLC. He primarily practices endodontics in Tampa, Florida. His practice focuses include evidence-based dentistry, clinical technology, practice innovation, and multi-disciplinary care - ideals and methods developed from his expansive training at the University of Michigan School of Dentistry (2014), Einstein Medical Center, Philadelphia (2015), and Harvard School of Dental Medicine (2018).

Due to his experience in digital media, he has been involved with multiple committees in the American Association of Endodontists and the *Journal of Endodontics* to develop and execute extensive digital products. He has also worked on smaller-scale projects with dental brands like SurgiTel, *Dentaltown*, Meta Biodmed, and Spear Education. KevinDental continues to produce dental-related media, courses, and other digital products.

The American Dental Association defines evidence-based dentistry "as an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating the patient's oral and medical condition and history, with the dentist's clinical expertise and the patient's treatment needs and preferences."[8]

Simply put, evidence-based dentistry involves a triad of elements from research to patient factors to doctors' abilities and preferences--not just research. However, research is the most challenging aspect of practicing evidence-based dentistry.

First, there is a great volume of studies to decipher. From treating patients and managing the office, time is a limiting factor in familiarizing with emerging research.

Second, despite progress in endodontic research, clinically significant and statistically significant research in endodontics and dentistry still needs improvement. There is little homogeneity and reproducibility in methodology and statistical analyses, which limits systematic reviews and meta-analyses--the most robust research data for clinicians to make chairside decisions with patients.9

The type of statistical analysis also needs adjusting. Most research in dentistry relies on a frequentist outlook, focusing on P-values, power, significance, and confidence intervals. Alternatively, endodontic research should balance frequentist statistical analyses with Bayesian modeling, focusing more on mathematical analyses that blend prior probabilities with current information, which is particularly helpful in early clinical trials.[10]

Without better standardization and rigorous methodology, even the use of artificial intelligence in data mining among the myriad of studies cannot improve clinical decision-making in evidence-based dentistry. This issue will likely continue in the coming years within dentistry, not just endodontics.

In the following sections, we will utilize the best available evidence in determining other means of optimization and utilization of available materials and technologies through the entire root canal treatment process, from diagnosis to treatment--an overview rather than a comprehensive discussion.

Diagnosis

Current endodontic diagnoses involve patient subjective findings and doctor objective factors based on phenotype, observable characteristics which are sometimes broad and imprecise. Eventually, the use of biomarkers will allow clinicians to make more precise pulpal diagnoses in a larger continuum.[11] The addition of genotype diagnostics will likely not be in the near future.

In the immediate future, better optimization and utilization of CBCTs will be the most essential aspect of endodontic diagnoses and development. From the 2010s to the present, most endodontic and many general dentists offices integrated CBCTs. However, numerous clinicians are still learning more about the nuanced findings in 3D digital imaging.

Initially, clinicians advocated for the adoption of CBCTs to recognize disease sooner due to better anatomical visualization in practically infinite 3D slices. Although this CBCT benefit is likely true, over-diagnosis may also just be as common at the present moment.

For example, Pope et al.[12] found that clinicians would over-diagnosis 20% of normal periapical findings as disease if the traditional PA imaging criteria of disease were utilized in CBCT. Previously, a diseased apical area was defined as twice the size of periodontal ligament space. Normal periapical in CBCT can present larger than what is considered normal in traditional imaging. Misdiagnosing CBCT artifacts as fractures is also possible.

Further optimization and utilization of CBCTs will likely occur in the coming decades.

Treatment planning

As bioactive and biocompatible materials improve in endodontics, treatment planning for a given diagnosis is changing.

Vital pulp therapy on permanent dentition--such as direct pulp caps, partial pulpotomies, and full pulpotomies--will be performed more often by clinicians in the immediate future.

Multiple studies found MTA and bioceramic materials used in vital pulp therapy resulted in 85-100% success in symptomatic or asymptomatic irreversible pulpitis at 1-2 years.[13] Simply put, vital pulp therapy can be an alternative to root canal treatment in teeth with pulpitis.

Even with some increase in frequency, endodontists performing regular vital pulp therapy will likely still be few and far between in traditional practice environments where definitive dental treatment is coordinated with general dentists.

It is unclear, for instance, how crown preparations affect clinical outcomes (i.e., pulpitis or necrosis) or patient-centered outcomes (i.e., increased dentine hypersensitivity). Many vital pulp therapy outcome studies involve shorter recall times and non-full coverage restorations, such as composite.[14]

Vital pulp therapy may be more frequent with general dentists in community health centers serving patients in lower socio-economic households where palliative dental treatment is more common.

Similarly, in the author's opinion, predictable, routine regenerative endodontics on permanent dentition is still a few more decades away. Regenerative endodontics is not currently a viable alternative treatment for necrotic pulps as there is still insufficient research on the materials, techniques, and outcomes involved in this approach.

Access and canal preparation and apical sizes

In the past decade, within a subset of endodontists, there has been a philosophical push for minimal access, canal preparation, and final apical sizes, termed minimal invasive endodontics (MIE).[15]

MIE's primary objective is to preserve tooth structure to minimize tooth susceptibility to fracture.

For access, the premise for MIE is somewhat weak. Often endodontic access size is pre-determined by the amount of caries. The typical caries size leading to irreversible pulpitis or pulp necrosis is often much larger than the usually presented "ninja" accesses as described by MIE. Many examples of "ninja" accesses are demonstrated on crowned teeth with no recurrent decay.

Root canal-treated teeth are also routinely restored with build-up and crown following root canal treatment. Currently, research does not validate the intuitive premise that smaller access sizes allow teeth to withstand more biomechanical forces following full-coverage restorations.[16]

Preserving cervical dentine within the pulp chamber may be more feasible and reasonable as straight-line access is no longer critically necessary with advancement and superelastic properties in heat-treated rotary NiTi files.[17]

MIE for canal preparation and apical sizes may have more merit. The actual biomechanical advantages, as in access size, will likely continue to be of debate from research. But with current advancements in active irrigation, complete cleaning and shaping with smaller canal preparation and apical sizes may be practical. In other words, smaller canal preparation and apical sizes with advanced active irrigation may be an alternative to traditional canal preparations requiring larger sizes for fluid disinfection.

"In the immediate future, better optimization and utilization of CBCTs will be the most essential aspect of endodontic diagnoses and development."

Instrumentation & Irrigation

In the future, the key to success in rotary instrumentation lies in adopting efficient techniques rather than any new materials or designs for rotary files.

The optimal technique for endodontic instrumentation depends on the specific anatomy of the root canal--which is a challenge to teach, learn, and perfect. Therefore, clinicians should ultimately adopt various techniques and files suited for various case types while adhering to foundational protocols to ensure consistency. However, as mentioned earlier, clinicians often use inefficient instrumentation protocols for all types of dentition, including more straightforward cases.

Over twenty years ago, Dr. John McSpadden, regarded as the pioneer of rotary files, often advocated a comprehensive understanding of file design and engineering for clinicians to better use rotary files proficiently in the clinic.[18]

General dentists, and even some endodontists, may not utilize the full benefits of current rotary file designs and materials due to limitations in file design knowledge. This could be attributed to manufacturers attempting to simplify protocols pertaining to their files in the interest of safety, which may not be necessarily safer and could impose artificial constraints on the actual effectiveness of the files.

For example, crown-down instrumentation in zones with a series of variable tapered rotary files is a more efficient and effective protocol than relying on manual glide paths with hand files during initial instrumentation. Further, each rotary file does not need to reach the apex. By dividing the root canal into two zones - coronal and apical - clinicians can better tackle simple and complex canals in a safe and efficient manner with the immediate use of rotary files during cleaning and shaping.

Hand files will always be essential for root canal treatment. They should be used for almost all dentition to assist in apex location, calcified and curved canal negotiation, and patency. Nevertheless, hand files do not have to be used in a manner that handicaps the effectiveness and efficiency of current advanced rotary files.

Additionally, active irrigation science and technology have necessitated the integration of irrigation protocols with instrumentation protocols. Therefore, including irrigation in the same section as instrumentation is essential. Active irrigation enhances the effectiveness and efficiency of rotary file instrumentation.

Sodium hypochlorite and EDTA will remain the core disinfection solutions in endodontics. However, introducing the activation of these solutions is expected to undergo significant adoption in the future. The intricate and irregular morphology of root canals renders the complete eradication of biofilm via instrumentation and passive manual syringe disinfection alone tricky.

Activation with sonic and passive ultrasonic irrigation (PUI) devices has been studied and used by many endodontists for a long time but more rarely for general dentists. Studies found that PUI effectively establishes acoustic streaming and cavitation to break up biofilm. The ability of sonic irrigation to perform better than simple syringe activation is more debated.[19]

More recently, large intricate endodontic irrigation apparatuses have been introduced. Multi-sonic and laser-activated irrigation devices attempt to dismantle biofilm with even greater efficiency than passive ultrasonic irrigation.[19]

Active irrigation assists in better disinfection and may accommodate easier or less instrumentation. Anecdotally, the use of passive ultrasonic irrigation and laser-activated irrigation help clinicians navigate files through calcified curved canals. Some endodontists also claim that multi-sonic irrigation reduces the need for canal instrumentation, especially larger file sizes.

At the present time, it is unclear if active irrigation actually improves clinical outcomes. Most outcome studies compare root canal treatment with and without active irrigation on dentition that already exhibits a high success rate with techniques and materials introduced decades ago. Research comparisons with and without active irrigation with more specific and intricate case selections will better demonstrate potential clinical significance, such as studies with narrow case selections like retreatments.

The author believes active irrigation may enhance apical healing outcomes in necrotic pulps and apical radiolucencies by approximately 5-10%. Moreover, in retreatment scenarios, this improvement could be even greater, potentially ranging between 10-20%--strictly a speculation.

Obturation

Clinicians often prioritize the obturation process in root canal treatment. The radio-opaque obturation material on a radiograph serves as the visual representation of a completed endodontic procedure. However, as described in the previous section, instrumentation, and irrigation carry greater significance than obturation in overall treatment efficacy.

Dr. Herbert Schilder's 3D-obturation technique involved the dense compaction of gutta-percha and a thin sealer layer. Gutta-percha is the primary core material in obturation, while the sealer is the supplemental layer to assist in adhesion to root canal walls. This technique was highly effective with earlier obturation materials.

However, the progression of bioceramics has enabled the advancement of endodontic obturation techniques toward greater simplicity. Bioceramic sealers offer biocompatibility, bioactivity, and effective filling in contrast to earlier sealers, such as zinc-oxide eugenol or resin which result in either leakage or inflammation.[20]

Bioceramics negate the need for dense compaction of gutta-percha to create a biocompatible seal. Instead, gutta-percha, in a way, just serves as a tool to apply bioceramic sealer and as a path for retreatment in the case of persistent bacteria. Bioceramic sealers are more of a filler that can act as core obturation material along with gutta-percha.

Similar to outcome studies on instrumentation and irrigation, the efficacy of bioceramic obturation in achieving better healing remains uncertain. From the author's viewpoint, the use of bioceramic sealer is unlikely to enhance the success rates of root canal therapy. Rather, instrumentation, active irrigation, and restoration are more significant factors in clinical success. Bioceramic sealers may only exhibit a potential improvement in outcomes on more rare and complex cases, such as resorption.

Outcomes

There are plenty of outcome studies within endodontics. The problem is not of volume but of quality. Improved future outcome studies will better guide treatment decisions for clinicians. As stated earlier, this would require improved, consistent research methodology in clinical trials that lead to conclusive systematic reviews and meta-analyses.

"By dividing the root canal into two zones - coronal and apical - clinicians can better tackle simple and complex canals in a safe and efficient manner with the immediate use of rotary files during cleaning and shaping."

Historically, the primary outcome measure in endodontics has been apical healing. However, recent outcomes studies have attempted to redefine endodontic success with patient-centered factors rather than traditional doctor-centered outcomes as viewed with radiographs. Instead, patient-centered outcomes focus on treatment's impact on the patient's overall well-being, including pain relief, quality of life, and patient satisfaction.[21]

This dogmatic shift reflects a growing emphasis on the patient's perspective when assessing the effectiveness of endodontic treatment. Apical healing may not always be necessary for endodontic treatment to be considered a success. And radiographic periapical radiolucencies may not always necessitate retreatment.

Ultimately, patient-centered outcomes in research and clinical-decision making might be the single most significant advancement in endodontics of the future. §

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Dental Humanitarian Care in Ghana

with Dr. Boris Bujila

Dr. Boris Bujila received the Florida AGD Humanitarian Award in 2022 for his volunteer work with Ghana Ministries, providing oral surgical treatment and oral hygiene instruction to the villagers in remote areas of the country. During his second mission in October 2022, the team consisted of fifteen Americans and 22 Ghanaians. In four days, they provided care to 2,387 patients, which included 457 extractions. In this interview, Dr. Bujila describes his volunteer experience and how he first learned about Ghana Ministries.

Could you please tell our members a little about your professional background, Dr. Bujila?

I was a dental student back home in Serbia. As soon as I finished my dental education, I decided to move to the U.S. in 2010. It took me a while to learn the language and pass all my exams to start applying to dental schools. In 2015, I got accepted to the University of Florida's two-year AGD program. It's a special small program located in Miami for international dentists. In 2017, I graduated, and then I moved to Naples, Florida, where I still reside, and joined Heartland Dental.

What was the Ghana Ministries program like, and how did you learn about it?

Ghana Ministries is a very nice organization located in Alabama. A few ladies from Alabama went to Ghana many years ago, trying to adopt some kids from that country. They found the kids that they wanted to bring to the U.S. and were finalizing all the paperwork. Suddenly, overnight, the law in Ghana changed, and it stated that they couldn't bring any kids to any country. They were already attached to those kids and were already calling each other "son and daughter" and "Mom and Dad," so they didn't want to give up on them. What they decided to do was create Ghana Ministries, which is a nonprofit organization, and try to build an orphanage in Ghana. They were raising donations for the orphanage, and they came up with an idea to organize a brigade or a mission, because they'd seen the immense medical and dental need.

Two years ago, they created the first mission trip. I work for Heartland, and all the doctors have this big platform where we communicate. One of the doctors posted, "If someone is interested in going on a mission in Ghana, please let us know; we are organizing." As soon as I saw that, I reached out, because that was one of the things on the bucket list that I always wanted to do. In two weeks, I was already boarding the plane. It was love at first sight. We clicked right away. It was maybe around 15 of us from the States joining the team in Ghana.

At that time, I was the only dentist. Dr. Elijah Asamoah is a maxillofacial surgeon in Ghana, and he organizes everything on his end: the villages where we're going, advertising, and talking to the village chiefs, promoting us and saying that "the U.S. brigade is coming to work with you, to help you guys."

We had a huge success in 2021, and that prompted us to do another brigade in 2022. We saw so many people. This time, I brought my sister with me, Dr. Ana Bujila. She's also a dentist from Serbia, and she's now doing a perio residency at UCLA. I sponsored her to come with me

because I knew that this trip would be way bigger than the year before. We targeted different villages in the same region. People had already heard about us from 2021, so there were a lot of people coming from all around that area to be treated by us.

In the photos, it didn't appear that you had any handpieces, suction, or any other equipment.

Or any electricity. The villages where we were stationed were very remote, deep in the jungle, and there was nothing sophisticated. I brought some elevators from my practice and from practices around me. My sister brought elevators and forceps from L.A.

What other medical professionals were there?

They were basically family practitioners, and we had a big pharmacy. The medical practitioners already had experience and a lot of connections here in the U.S., and they were able to raise a lot of medications. I believe we had three family doctors and two or three medical nurses with us. The rest were lay people, family members or neighbors who wanted to join.

Were there any incidents that made a deep impression on you?

I can remember one incident from 2021. This lady came who had a very severe infection, acute abscesses. There were five or six teeth to be extracted, all in the upper canine area, and her eye was very swollen. I knew I had to do something for her. It was very hard to numb her, and the pain was unbearable. She was grabbing her hair. I was able to extract three of the worst teeth, and then she rejected my doing anything else. I remember one of my coworkers was taking some pictures because I was helping her on the floor. She couldn't even sit on the chair because she was in excruciating pain. I felt so bad for her and later, I couldn't even sleep, thinking the whole night about her. I decided to ask the local people if they knew about her and showed them her pictures, and one of them was able to recognize her. I took my lunch and went on a motorcycle to that village, which was about 15 minutes away, and I was able to find her in her house.

She was very surprised to see me. I gave her my lunch and some money, and I checked her to make sure she was okay. Surprisingly, she was working in the field. They have rice in front of their houses, and she was working. I was blown away that after such tremendous pain, she didn't have time to lose, she had to work. She was super happy to see me. Even nowadays when I see the pictures, I remember vividly that incident.

One photo showed you instructing the children about how to brush their teeth. Could you please tell us a little about that?

I was working and extracting all these teeth. I was looking in people's mouths all day long, and it struck me how many infections they had, most of them. They never brushed their teeth in their life, so they don't have any type of preventative education and I was thinking, okay, we're coming here every year and we're treating the cause of the problem, but we should focus more on prevention. It just didn't give me peace. So, one day I left my sister to extract the teeth, and I decided to bring all the kids in front of the tent where we were working and just teach them how to brush their teeth. We gave all of them the brushes and toothpaste, and I showed them how to apply the toothpaste and showed them the motions up and down, left and right. That was very neat, to see how excited they were to learn how to brush. It doesn't make sense to just go over there, extract a tooth, and not teach them how to brush the teeth, because guess what? Next year we're going to be extracting the tooth next to it.

Thank you for sharing your moving experiences in Ghana with your fellow Florida AGD members, Dr. Bujila. Is there anything else you'd like us to know?

I would like to encourage other AGD members to reach out, because there is a big need. Maybe they would want to reach out directly to Ghana Ministries or maybe I can connect them, because I feel we are growing, and this is just beginning. We will become bigger and bigger, and we need a lot of help over there. *They* need a lot of help. I would greatly appreciate that.

Giving back was always my definition of being truly successful in life. I'm blessed to be in this country and finally be able to help. Often time we take things for granted, and traveling to countries like Ghana keeps me grounded.

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Comprehensive Dentistry Program Class 33

Description

For more than 40 years, the University of Florida has provided a unique **MasterTrack** program for dentists seeking an opportunity to **Earn 600 credits** applicable toward a Mastership in the Academy of General Dentistry. In fact, the University of Florida offers the only **MasterTrack** program that allows you to complete all your Mastership requirements in 25 months.

Completion of AGD **MasterTrack** program qualifies participant to seek Diplomate status with the American Board of General Dentists.

Objectives

This two-year postgraduate course in comprehensive dentistry provides the general practitioner an organized and structured educational program of dental sciences in a format that offers something for everyone. Classes meet one weekend per month on Friday, Saturday and Sunday (including lunch on Friday and Saturday, and breakfast on Sunday). Classes consist of lectures, discussion, in-office projects, literature review, and intensive hands-on participation utilizing the College of Dentistry's state-of-the-art Simulation Lab.

Faculty

Courses are presented by a variety of instructors including UF faculty, other nationally-recognized experts and private practitioners who are known for their standards of excellence.

FLORIDA ACADEMY of GENERAL DENTISTRY

The course curriculum parallels the requirements for the Mastership in the Academy of General Dentistry

Date and Location

June 2024 - June 2026
Fri & Sat: 8:00am - 5:00pm
Sun: 8:00am-12:00pm

University of Florida
College of Dentistry
1395 Center Drive
Gainesville, FL 32610

Credits

600 CEUs
Participation &
Hands-On Workshop

Tuition

$29,975
Payable with an initial deposit of $2,500 and $1,099 monthly attendance fee.

This program has been approved for tuition payment under the Post-911 GI bill

Contact

Continuing Dental Education
352-273-8480
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ADA C·E·R·P® | Continuing Education Recognition Program

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Service Starts With Each Other!

by Judy Kay Mausolf

Judy Kay Mausolf is a speaker, author, and dental culture specialist with expertise in helping others get happier and more successful! She coaches dentists and their teams how to become better leaders, communicate effectively, work together better and deliver service with more focus and passion which result in cultivating a happier, healthier and higher performing culture.

She is Past President of National Speakers Association (Minnesota Chapter), Director of Sponsoring Partners for the Speaking Consulting Network and a member of the National Speakers Association and Academy of Dental Management Consultants and recognized as a leader in consulting by Dentistry Today. She is author of three books; "TA-DAH, Delivering W.O.W. Service, and "Rise & Shine!", and a contributing author for many dental magazines. She also publishes a monthly newsletter entitled "Show Your Shine".

Judy Kay lives in MN with her awesome husband Steve who makes her special coffee every morning!

If you would like to receive a copy of the author's ABC's Sample Standards, please email her at JudyKay@PracticeSolutionsInc.net and write "ABC's Sample" in the subject line.

I often find there is a misconception about service. A belief that service starts with the patients and doesn't really pertain to the team. In other words, we must treat our patients exceptionally but not so much each other. It's as if there is an entirely different set of standards for patients than there is for the team pertaining to attitude, behavior and communication, which I refer to as the ABC Standards.

I have the privilege of working with dental teams nationwide to help them create a happier, healthier and higher performing service culture. I witness some team members (including doctors and managers) treating other team members poorly. That same poor behavior towards a patient would be grounds for dismissal.

We make excuses for our behavior. We use labels and say this is just how we are. For example, I am direct, which really means, I say whatever is on my mind without any regard of how I may make you feel. Or I am a non-morning person, which means because I am a non-morning person, others should just understand my moodiness.

What confounds me is watching the same direct or non-morning person flip a switch and turn it on for their patients. It is like watching a Jekyll and Hyde transformation.

We believe it is acceptable to turn the respect and kindness filters off for each other. After all, we wouldn't want to be fake, would we? We also know they will just accept or put up with our poor behavior. We frequently even turn it off for the people we love the most, like our family. I find it thought-provoking that we put filters of kindness and respect on for strangers and acquaintances and don't for the people we care about and love the most. Something seems a little backward with this behavior.

It's time to put the filters back on and start service with the team. I teach the Golden Standard; treat each other as well or better than you treat your patients. Now, that doesn't mean lessening the standard for patient service.

Creating ABC Standards for how the team will treat each other will help cultivate a service culture that is happier, healthier and higher performing! ABC Standards increase clarity, unity, congruency, level of service, and your business reputation; while preventing the chafing and disagreements from assumptions and opinions of who is right and wrong.

Have a team meeting with the entire team to discuss ABC Standards for your practice. Ask each team member to share what they feel they need from each other to be able to work together better. I find using a big easel pad with markers to write down the responses helps to generate more participation. Be specific and define what it means in words, actions, body language and tone of voice. Please see the box on the next page for some examples.

Create a document titled Team ABC's Standards Document with the team standards. Print it out, frame it and put it on display wherever one can see it daily. A lunch room or locker room often works

Examples of ABC Standards

Be Likeable

- Be courteous
  - Ask instead of tell
  - Say please and thank you
- Be nice
  - Be friendly
  - Be kind
  - Be pleasant
- Be happy
  - Smile and greet each other warmly
  - Be optimistic
    - Use positive words, tone, body language
  - Be cheerful

Believe in Positive Intent

- Give benefit of doubt
- Don't assume negatives – ASK

Be Honest

- Be specific
- Don't generalize
- Don't exaggerate
- Be considerate
  - Always ask yourself, "How can I be honest and say what I need to say, while respecting how it might make the other person feel?"

Be Compassionate

- Be understanding
- Be supportive
- Be sympathetic

Be Trustworthy

- Do what you said, when & how you said
- Only promise what you can deliver
- Don't gossip

Have an Ownership Mentality

- Be self-motivated
  - Be self-disciplined
  - Do the right thing
  - Own your mistakes
  - Be patient, practice- & team-focused, not personally focused
  - Be helpful
    - Ask before helping
      - What do they want help with completing?
      - How do they want it done?
    - Delegate clearly and specifically

Be Respectful

- Listen first
- Don't insult or put others down
- Don't judge & criticize
- Treat others how **they** want to be treated
- Address concerns only with the source
- Forgive each other
- No gossip
  - Don't spread gossip
  - Don't listen to gossip

Lead by Example

- Model the waddle you want to see
- No double standards

Be Reliable

- Be consistent
- Be on time
- Be accountable

Be Appreciative

- Thank others
- Be grateful and show gratitude

Be Fun

- Laugh a little
- Be lighthearted
- Be good-humored

well. Your daily huddle is a great opportunity to create accountability. Discuss on a daily basis how they did the previous day as an individual and as a team supporting the standards. Where did they rock it and where can they raise it? The more you discuss your standards on a daily basis the more real and alive they become.

It is crucial that the ABC Standards are adhered to by the *Leadership Team*. The team will look to leadership and mimic their behaviors. Never create something you are not comfortable supporting. Everything starts and stops with leadership. It's time to model the waddle to a happier, healthier and higher performing team culture! §

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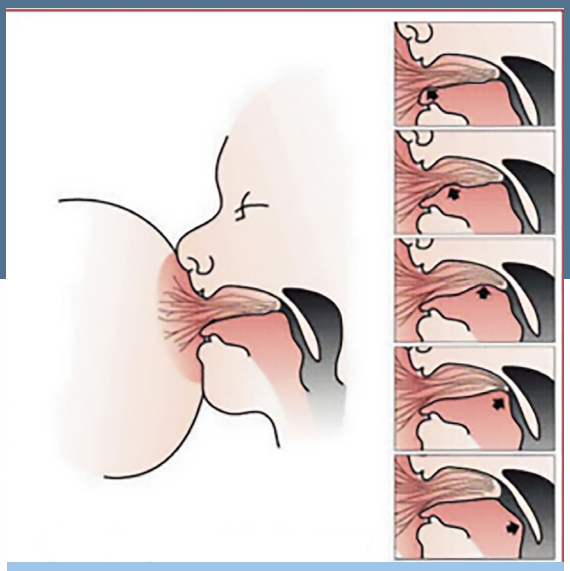
Tethered Oral Tissues: Impact on Speech-Language, Feeding, and Lactation

by Kristina Madden, MS, CCC/SLP, CLC
Co-authored by Andrea Valentin, MS, CCC-SLP
and Stephanie Hoppe, MS, CCC-SLP



Anatomy of infant suckling, from Michael Wooldridge in *Midwifery*[8]

Introduction

As medical professionals with regular access to the mouth and full visualization of the oral structures, dentists are key in identifying, treating, and referring to multi-disciplinary team members for collaborative care of tethered oral tissues and associated oromyofunctional disorders. This article provides information on the impacts of tethered oral tissues in the areas of speech, language, feeding, and lactation to promote collaboration between disciplines and aid in identification of symptoms requiring referral to a speech-language pathologist (SLP) and/or IBCLC/CLC. Partnerships between dentists and SLPs/lactation professionals are vital for quality care and treatment of these disorders and to coordinate the timing of release of tethered oral tissues with pre- and post-operative therapy.

As the systems for speech production, mastication, digestion, breathing, and the brain are interconnected, a more holistic understanding of the body and possible correlations between symptoms can help us readily assess the underlying cause. Symptoms pertaining to tethered oral tissues can be observed in early infancy and evolve as the person ages, making knowledge of the etiology imperative.

Impact on Speech and Language

An important differentiation to make is the one between speech and language. While articulation refers to the sounds of spoken language and includes the placement of oral structures, language refers to words, the way they are put together to convey meaning, and how this message is then conveyed to the listener.

As tethered oral tissues may often affect the strength, range of motion, and coordination of the tongue (and sometimes lips), certain sounds may become more difficult to produce based on severity of attachment. A more anterior attachment will affect sounds produced with the tip of the tongue (e.g., /t/, /d/, /n/, /l/, which are produced against the alveolar ridge). Patients with a posterior attachment may present with production difficulties for sounds produced in the mid-palatal and glottal areas (e.g., /dj/, /sh/, /k/, /g/, /r/, /s/).[1,2] Although less common, bilabial sounds (e.g., m, p, b) may also be impacted by labial tethers when these are severe. Dental providers may be able to identify children who have attended traditional speech therapy for extended periods of time with limited progress, a common red flag.

In regard to language, children who present with tethered oral tissues may present with symptoms in a variety of areas, including: executive functioning (e.g., attention to task[3], inhibition, following directions, working memory[4,5]), pragmatic skills (e.g., engagement with others[6,7]), as well as language delays which affect the way the message is provided to a communication partner. Clients with oromyofunctional disorders often experience difficulties in the aforementioned areas as a result of the tongue resting posteriorly or inferiorly in the mouth rather than against the palate, which in turn affects the growth and development of the hard palate and the establishment of the nasal cavity size/shape, and later may impact developing brain functions due to lack of sufficient oxygenation. When caught early in development, these effects may be mitigated; however, these consequences can become permanent when not addressed, and need to be subsequently managed by continuous treatment and compensatory efforts.

Impact on Feeding

Feeding involves a series of three phases: oral, pharyngeal, and esophageal. The oral phase of feeding involves sensory processing, behavioral interactions, and oral motor control and manipulation of food for mastication and preparation of the food bolus. This bolus is then propelled by the tongue's peristaltic wave motion into the pharynx where the nasopharynx is sealed off and larynx is elevated, enlarging the pharynx to receive food. Once the esophageal phase has begun, the epiglottis closes over the trachea to protect it, the upper esophageal sphincter opens, and food enters the esophagus. Tethered oral tissues can have a significant impact on these oral phase processes and the digestion of food, which may disrupt the developmental feeding process within the pediatric population. If left untreated, feeding issues can persist across the lifespan.

The oral preparatory phase of swallowing requires adequate strength, range of motion, and coordination of the tongue, lips, cheeks, and jaw to masticate and control the variety and range of textures that comprise a nutritionally adequate diet. This array of foods provide input to promote jaw growth, including thin liquids (ie. water), soft solids (ie. bananas), and hard, chewy solids (i.e. steak). Tethering of the lingual and/or labial and buccal tissues can decrease the range of motion of the oral structures and impinge the coordination of the mastication process, contributing to

Kristina Madden, MS, CCC/SLP, CLC is the owner and founder of Madden Therapy Solutions. She is a licensed pediatric speech-language pathologist and Certified Lactation Counselor. Kristina has 16 years of experience in both inpatient and outpatient settings in a variety of specialties, including infant and pediatric feeding, NICU, cardiac patients, tracheostomy/ventilator-dependent patients, brain injured patients, GI-related issues and complications, and feeding tube dependence and weaning. She worked and trained exclusively in the medical setting at facilities such as Johns Hopkins All Children's Hospital, Duke University Medical Center, Medical University of South Carolina, and Children's Hospital of Philadelphia prior to opening her practice in 2018. Madden Therapy Solutions is now regarded as a leader in premiere pediatric therapy in Tampa Bay, offering speech and feeding therapy, oral myofunctional therapy, occupational therapy, lactation counseling, and postpartum doula care. They are a team of 13 SLPs, OTs, and IBCLC/CLCs, offering the highest level of individualized care both in-person and throughout the state via teletherapy.

Because of Kristina's vast and comprehensive experience, she is well aware of how important the "big picture" is, and how crucial it is to offer a global and functional approach in order to produce the best outcomes. Kristina values providing impeccable quality of service and highly personal care in order to improve the collective quality of life of both her patients and their families.

immature or unsafe swallowing patterns, the inability to manage certain textures, and general picky eating.

Tethering of the lingual tissue can limit the ability of the tongue to lateralize food to the molars for chewing and impair the ability to collect chewed food into a cohesive bolus onto the center of the tongue prior to propulsion. Individuals with tethered tissues frequently develop atypical compensatory patterns in response to their impairments. Compensations may include:

- Demonstrating a preference for meltable solid textures (ie. chips, crackers) that are easy to manage
- Avoiding semi-solid textures or tough, chewy textures
- Limiting overall food intake to avoid fatigue
- Pocketing food within the buccal cavities
- Excessive bite size
- Grazing on food throughout the day, instead of full meals
- Holding food anteriorly within the oral cavity during mastication
- Excessive use of lips and cheeks to manage food within the oral cavity, frequently resulting in increased muscle tightness

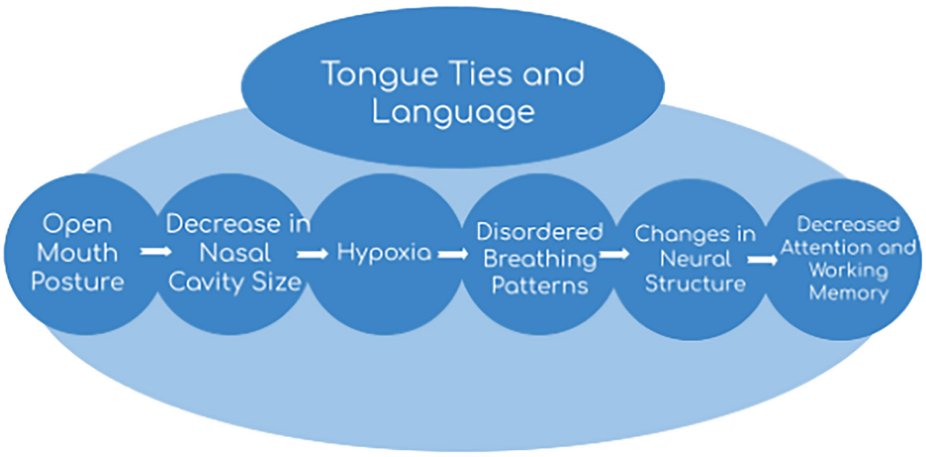
These difficulties and compensations can make eating feel like an effortful chore, and in the case of limited coordination, feel unsafe. Fatigue and fears of coughing or choking can result in avoidance of entire categories of food, food refusals, and decreased caloric intake, which can be extremely problematic for the pediatric population and place significant stress on the family unit.

Impact on Lactation[8]

One of the earliest impacts of tethered oral tissues is often on lactation and breastfeeding. Mothers often experience feelings of significant discomfort, pain, bleeding, cracked, and/or misshapen nipples after breastfeeding. This, understandably, affects not only maternal stress and, at times, her sense of maternal bonding with her baby, but can also impact baby's weight gain, concern for jaundice if not taking adequate milk, and overall turns breastfeeding into a negative and upsetting experience. If not addressed, mothers are then faced with a decision: continue while in significant, toe-clenching pain, or give up breastfeeding entirely despite the initial goal to experience that time with baby.

When breastfeeding a baby with tethered oral tissues, oftentimes mothers may demonstrate an impacted milk supply, as well as recurrent clogs and/or mastitis. This is due to inadequate latch, incomplete emptying of the breast, and atypical sucking pattern. Typically, though not always, in the case of a lip tie, mothers describe a "pinching" feeling and a shallow latch. If the baby is unable to successfully flange his/her lips out to encompass the entire nipple, and if the medial lip is bulky and inflexible, it can result in stronger compression and tension while breastfeeding. Additionally, babies with tethered oral tissues are often tense throughout the body, including the cheeks and jaw. This can affect jaw gape and subsequent shallow latch.

Lastly, and often the greatest impact on breastfeeding, is in the case of a tongue tie (whether anterior or posterior). When not restricted, the tongue should rest anteriorly in the mouth, and demonstrating lingual-palatal suction. When breastfeeding, the length of the tongue should cup around the nipple, with the nipple/areola/breast filling the oral cavity. The baby should then demonstrate a rhythmic anterior-posterior stripping wave with the tongue and use that closed system to demonstrate the negative pressure required to adequately express milk from the breast. When a baby has a restriction of the tongue, it often results in the tongue resting inferiorly behind the lower gumline with a restricted and bulky posterior tongue, minimal if any tongue cupping (tongue often appears flat), using only the anterior portion of the tongue to try and express milk. Little breast tissue is in the mouth, so the baby then attempts to create that needed negative pressure with the posterior portion of the tongue against the palate, thus the frequent report of tongue "clicking." This pattern typically results in "chomping" versus A-P stripping motion and further promotes limited jaw gape because of the compensatory habits required to express the milk. These babies are working harder than they should be, resulting in inability to sustain a full feed, fatigue, and inadequate emptying of the breast. The reason most of these babies perform better with the bottle (or that bottle-fed babies



may not be diagnosed as quickly), is that the bottle requires much less effort, and so the baby is able to "participate" in a much more passive way.

Of note, there are instances where a release isn't necessary, and these issues may be addressed through a combination of exercises and massage. This is another reason it is critical to work together and refer to a lactation professional experienced in oral ties as soon as possible, in order to determine if stretches alone are sufficient or if a release is indeed warranted, and to maximize the chance of maintaining the breastfeeding dyad.

Screening, Assessment, Diagnosis

Screeners are valuable tools for dentists and SLPs alike to inform further assessment of the airway, speech, language, and feeding skills, and direct the referral process. These can be easily adapted into routine checkups to identify possible disorders and increase the quality of patient care. Sleep questionnaires (for example, FAIREST[9], Pediatric Sleep Questionnaire[10]) in particular can be the first line of defense in identifying systemic health problems and may provide valuable information, along with basic questions about speech or feeding concerns (see free questionnaires available in image[11-15]).

Upon referral to an SLP, a comprehensive assessment may include inventory and analysis of disordered speech sounds, a functional exam of the oral structures, observation of chewing and swallowing a variety of textures and liquids, identification of utensils and methods used for eating and drinking, gastrointestinal screening, completion and analysis of food inventory, and measurements of strength, range of motion, and coordination of the cheeks, lips, jaw, and tongue. Analysis and interpretation of the assessment data will reveal the presence or absence of speech, language, feeding, and/or oromyofunctional disorder(s).

Pre-Release Therapy

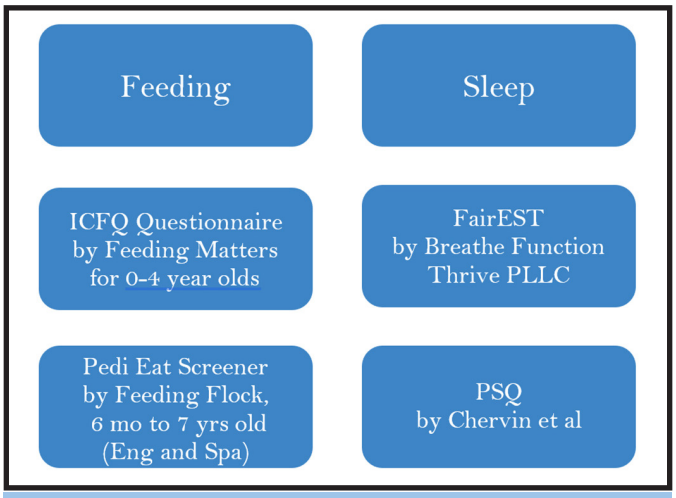
Therapy prior to release of tethered oral tissues is critical to the success and effectiveness of the procedure. Dentists, SLPs, and/or lactation professionals should consistently coordinate services to best complement the timing of the release with progress in the therapeutic care plan, as well as with consideration for individual factors. A team approach can ease patient fears, clarify expectations, and increase compliance across the entire process.

Pre-release therapy plans vary across the lifespan. For breastfeeding infants, pre-release consultations typically include a thorough assessment of the oral structures (focusing on function rather than appearance), observation of the feeding (breast and bottle, if applicable; ideally a weighted feed is performed in order to assess intake and efficiency at breast), and an individualized home program of stretches and exercises, as well as a review of any necessary positional and/or bottle/nipple changes, is implemented to maximize function and improve compensatory patterns until release occurs. It is also an opportunity for the lactation professional to reiterate the importance of post-operative stretching and care in order to minimize the chance of reattachment. Depending on the age of the infant, pre-release visits may be as few as 1-2 if prompt release is warranted and family is compliant, to a longer course of sessions if infant is older and the lactation professional has more flexibility with timing in order to begin the neuromuscular re-education process with specific exercises to maximize function post-release.

For children ages 0-4 who are too young to participate in a traditional oromyofunctional program, pre-release therapy will primarily focus on feeding skills applied through the lens of oral motor function. Therapy may include decreasing tension of the facial muscles and decreasing oral hypersensitivity. Skilled feeding therapy may also target increasing tongue lateralization, increasing variety of food textures accepted, and teaching appropriate bite size to ensure safety of the swallow. For children who are verbal but delayed in speech and/or language development, pre-release therapy may also target decreasing compensatory movements to increase the accuracy of articulation, as well as disassociation of the oral structures in order to produce developmentally appropriate speech sounds.

Children cognitively developed beyond the age of 4 typically have the skills to follow directions and conceptualize the targets to participate in structured oromyofunctional therapy in order to support progress towards any speech, language, and feeding goals. Prior to release, patients may be taught correct articulatory placement of speech sounds and learn pragmatic language skills. Feeding therapy prior to release may include learning functional chewing skills, increasing maturity of the swallow, and exploring new tastes and textures. Older children may also be able to participate in breathwork and respiration retraining activities. Older children are encouraged to take on an increased level of ownership over their therapeutic process and identify personal goals and desired outcomes from therapy and release of tethered oral tissues.

Adult patients benefit from a strong partnership in pre-release therapy to identify the personal factors most impeded by tethered oral tissues that they would like to prioritize. These factors may include: poor sleep quality, difficulty chewing and swallowing, and cascading effects of lifelong compensations. Quality therapy focuses on addressing these issues within the context of everyday life, and how to address the concerns through new skills that can be generalized in functional ways. Compensations and adaptations present in adult patients have been used over the course of the lifetime and can take significant time to undo and retrain.



Sleep and feeding questionnaires useful for identification of airway and oral motor difficulties. These documents are free online.

Ideally, patients achieve a plateau in their progress towards their speech, language, feeding, or oromyofunctional goals prior to release. This plateau ensures the oral structures have achieved maximum possible function and the patient has developed awareness of how the structures should optimally respond when no longer restricted. The best results are achieved when release providers and speech-language pathologists work together to determine the timing of the procedure.

Post-Release Therapy

Therapy after release of tethered oral tissues is also imperative to the long-term success of the treatment. Post-release care focuses on proper wound care to decrease the risk of reattachment of the tissues and promote healthy healing, including coaching and training caregivers to execute prescribed stretches and exercises. Quality of post-release care may also be influenced by family factors, including collaboration of care with the other members of the interdisciplinary team, family stressors, and finite resources. Understanding how a family may need to be supported or how to prioritize care is crucial to optimizing release outcomes.

Therapy following the procedure focuses on habilitation of the oral muscles and teaching oral motor skills with the increased range of motion. At a minimum, therapy will continue through the initial healing phases of the release, approximately three weeks. Therapy may continue for several more weeks or months, depending on individual patient needs, and addresses those previously identified goals that had been introduced prior to the release to maximize results. By increasing strength, coordination, and range of motion of the oral structures, in conjunction with evidence-based speech, language, feeding, and lactation interventions, patients are expected to make significant improvements in their individual areas of challenge.

Other goals of post-release therapy may address function related to oral health, including: closed mouth posture, nasal breathing, improved tolerance for tooth brushing, increasing range of motion, sensory awareness, and improving coordination of the tongue to clear residuals after meals and decrease the risk of dental caries.

Collaborative Care

Treatment of tethered oral tissues and associated speech, language, feeding, and oromyofunctional disorders are best treated through a multidisciplinary approach to address the unique needs of each patient. Team members may include: orthodontists, registered dental hygienists, lactation consultants, speech-language pathologists, bodyworkers, sleep physicians, allergists, otolaryngologists, gastroenterologists, occupational therapists, physical therapists, and/or any other dental or medical professional specializing in the orofacial complex and craniofacial development. Each team member brings a unique perspective to the table, and is important in identifying those symptoms or medical issues within their scope in order to treat each patient holistically and individually.

Quality collaboration can be fostered by professionals visiting each other's practices, learning each other's referral processes, and communicating standard procedures. This ensures a warm handoff between providers, continuity of care, unified communication with patients and families, and increased compliance and follow-through with recommendations. Patients benefit when all team members are on the same page and working together.

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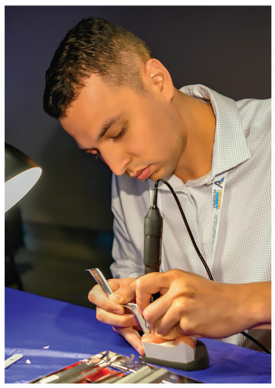

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