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INTERNATIONAL ASSOCIATION of OROFACIAL MYOLOGY

2023 IAOM Convention

October 13-15, 2023

Chandler, Arizona

Rounding up a Collaborative Team for the Orofacial Myofunctional Community

Friday, October 13

Identifying Early Childhood Malocclusion (ECM), Orofacial Myofunctional Disorder (OMD) and SDB/OSA Comorbidities: Why It Matters, What to Do About It

Kevin Boyd, *MSc, DDS*
Airway Health Solutions, Northport, NY, U.S.

Abstract: Deciduous malocclusion (DM), defined by poorly developing jaws and misaligned teeth in preschool-age children (under the age of 6 years) is a highly prevalent public health problem within industrialized societies. DM will seldom, if ever, self-correct and will usually persist and worsen into later adolescence and adulthood if left untreated; also, DM is frequently associated with sleep and respiratory problems. This presentation developed the argument that orthodontic/dentofacial orthopedic expansion of poorly developing jaws in young children can often coincide with optimization of sleep-related respiratory health in pediatric patients, which can not only improve the quality of life of affected children, but also might likely increase their longevity/life-spans, slow down the rate of aging, and accordingly, increase their health-spans during their senior years.

Airway Orthodontics

Kevin Adair, DDS, MSD
GV Smiles, Fairfield, CA, U.S.

Abstract: This presentation was outlined as follows: 1) Define Airway Orthodontics as I perceive it; 2) Increase awareness of sleep disturbed breathing and obstructive sleep apnea as well as advance knowledge of their signs and symptoms; 3) Cite research in both medical and dental journals as well as books and other publications to support my position that arch development, dental growth, and orthodontic treatments could have an effect on the airway and thus possibly on sleep; and 4) Show treated patients of different ages with different techniques that experienced dental and medical benefits.

Summary

The primary goal in airway orthodontic treatment is to prioritize and protect the airway. There are several principles and concepts that can assist with treatment planning to support this goal and having an understanding of the airway is critical. Snoring is often the first sign that this tube is not functioning correctly. From medical research we know that the intensity[1] and the frequency[2] of snoring are associated with Obstructive Sleep Apnea (OSA). The size of the smallest part on the tube, otherwise

known as a starling resistor, contributes to negative pressure.[3] Myofunctional therapy can help to reduce OSA[4,5] and is a powerful treatment option to help patients. In addition, an orthodontic technique referred to as Orthotropics has been shown to increase the posterior airway space.[6] Dr. John Mew published multiple articles as well as a couple of excellent books on the subject of Orthotropics.[7,8] There are additional publications that support the Orthotropics Theory.[9,10] There is supporting research from Dr. Christina Guilleminault on the associated risks of undersized cranial development[11] and the benefits of palatal expansion.[12]

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Understanding Reflex Integration for Greater Outcomes

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Abstract: Reflexes are involuntary obligatory actions performed in response to a stimulus without conscious thought. In utero and in the first months of life, developmental reflexes protect infants by helping to create a neurological foundation, which underpins all aspects of development. This includes nursing and feeding, sensory processing, regulation and bonding, social emotional skills, communication, gross and fine motor skills, as well as focus, attention, memory, and learning. Reflexes emerge early in development and peak near birth. These reflexes integrate or transform around 12 months of age. The strength and maturity of one's neurological system is determined by how successfully these reflexes have integrated. If reflexes haven't emerged and been transformed into higher neurological processes, then immaturities will remain. Many of these early reflexes are of acute interest to the orofacial myologist as they impact head, mouth, and tongue posture as well as feeding and speech skills. Early reflexes include rooting, sucking, palmar grasp, plantar grasp, Babkin, Babinski, asymmetric tonic neck, and tonic labyrinthine. Moro and fear paralysis were also reviewed. Techniques used to foster reflex integration were discussed. By using suggested screening methods, myofunctional therapists can develop best practices for referral to physical therapy and other body work professions.

Airway Mouth Consultant: Expanded Role of Myofunctional Therapist in Whole Body Health

Dr. Felix Liao, DDS
Whole Health Dental Center, Falls Church, VA, U.S.

Abstract: Orofacial myologists can become catalysts to upgrade whole body health as 'Airway Mouth Consultants' by: 1) recognizing Impaired Mouth Syndrome (IMS); 2) connecting the Mouth-Airway-Sleep (MAS) Axis with physiology; 3) understanding clinical epigenetics as a new natural solution; 4) screening impaired mouth structures in a whole-health context; and 5) offering a roadmap to those who are unaware of these issues, including dentists and dental patients.

Summary

Clinical epigenetics is the next paradigm shift from "Old World" mechanical dentistry to painless gene-expression toward fuller oral-facial growth and optimal airway development. Orofacial myologists can become catalysts for overall health upgrades through the MAS Axis in the 2020s, much like dentistry's historical turn in 1950s from extraction to prevention.

The starting point is the recognition of IMS, a term coined by this presenter in 2017: a vast set of medical, dental, and mood symptoms stemming from a structurally impaired mouth. Common symptoms include crowded teeth, bruxing, TMJ, sleep apnea, chronic fatigue, anxiety, depression, brain fog, and persistent pain in, around and far beyond the mouth. The presenter newly coined the term Impaired Mouth-Airway-Sleep Axis (2023) to highlight the mouth's global impact on many treatment resistant symptoms.

Orofacial myologists can figure prominently in bringing on children's 'best face' and adult's renewed vitality when they are trained as Airway Mouth Consultants. Best Face is defined as sufficient jaw growth for all teeth to erupt with sufficient bone volume to line up in an un-disrupted flowing arch form for optimal airway and postural alignment. Documented clinical cases, as shared in this presentation, show the importance of screening and diagnosing IMS as the root cause of 80% of patients' chief complaints. The first case illustrated how a presenting complaint of a ground-through night guard was turned into a root-cause solution that resolved teeth grinding with an airway growth of 3.1x in volume and 2.3 x in minimal cross-section. Facial glow was restored in the process. This pattern holds true in numerous cases presented.

Seventy to 90% of IMS symptoms resolve without reliance on drills, shots, surgery, and medication. This outcome is achieved using the new science-based Clinical Epigenetics method to bring on sufficient growth of the maxilla and mandible to support the airway and sleep in combination with a bone-building diet. Epigenetics is defined by the Centers for Disease Control as the study of how behavior and environment can affect how genes work. Clinical Epigenetics is delivered by patients in their lifestyle, and by airway dentists and OMTs in their offices. It is a natural "unfolding" from the patient's double-helix DNA genes. This can avoid/reduce relapse in contra-distinction from the traditional mechanical treatment. Clinical Epigenetics work in both children and adults. Sound natural teeth is the first criteria, while age is barely a factor.

Clinical Epigenetics as practiced by the presenter consists of 1) Documented diagnosis of impaired MAS; 2) 3D Jaw Diagnostics® method to reveal which of the three dimensions of oral space framed by maxillary and mandibular arch is deficient or excessive; and 3) Epigenetic oral appliances in combination with the following to grow/regrow jaws: (a) orofacial myofunctional therapists to change soft tissue environment and behavior; (b) patient implementation of bone-building diet and sleep hygiene, and (c) whole-health collaboration with other healthcare professionals as needed.

When trained as Airway Mouth Consultants, orofacial myologists are qualified to guide patients from initial screening to patient education to soft-tissue repatterning in teamwork with dentists similarly trained in Clinical Epigenetics to restore the MAS axis.

Saturday, October 14

The Ripple Effect: Early Referrals and Collaborative Approaches in Infant and Toddler Myofunctional Health

Joy Lantz, RDH, PHDH, COM®, IBCLC
Inspire Dental Wellness, Orland Park, IL, U.S.

Abstract: Improving outcomes for children relies on early intervention and collaborative efforts among healthcare professionals. This presentation outlined myofunctional issues in infants and toddlers and their impact on oral development. The use of tools to identify myofunctional issues in young patients highlight the power of early identification and teamwork for treatment.

Summary

A comprehensive understanding of myofunctional concerns in infants and toddlers can have an important impact on craniofacial, stomatognathic and overall development. One of the key goals for healthcare professionals is to be able to identify common myofunctional issues that can arise in infants and toddlers. The Academy of General Dentistry, the American Dental Association (ADA), the American Academy of Pediatric Dentistry (AAPD) all have recommended that children should see a dentist by age 1 year (or when the first tooth erupts).[1,2] Infants and parents will benefit from an early infant oral health visit and the establishment of a dental home.[1] There are many screening points that can be reviewed by dental professionals, including strategies incorporated within anticipatory guidelines. These guidelines are set by the AAPD and supported by the ADA.[2] By recognizing these issues, healthcare professionals can intervene early and prevent potential complications that may affect a child's overall development, such as mouth breathing on craniofacial development.[3] Anticipatory guidance during dental office screenings include many factors that could contribute to myofunctional issues, including nutrition and feeding, oral hygiene, habits, and language and motor skills.[4]

Collaboration among healthcare professionals is a crucial aspect of addressing myofunctional issues in this population. Coordination with other health professionals regarding the timing of OMT and other treatment modalities should be based on an individualized needs assessment and diagnostic evaluation. (5) There are key benefits to a collective approach, where healthcare providers combine their expertise to provide comprehensive screenings, targeted interventions, and ongoing support. By working together, these professionals can optimize functional outcomes for children with myofunctional concerns.

This presentation included practical information about tools used to assess, refer, and address potential issues in infants and toddlers. Collaborative approaches to screen and address myofunctional issues, including functional and developmental considerations at an early age emphasized, ensuring that children are identified and receive the necessary support and interventions. (6) Early intervention and teamwork can have a transformative impact on the lives of young patients. By screening, utilizing collaborative approaches, and intervening early, healthcare professionals can make a significant difference in the outcomes and wellbeing of infants and toddlers.

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The Tongue: More than just a simple muscle

Dr. Larry Kotlow, DDS, PC
Dr. Larry Kotlow, LLC, Albany, NY, U.S.

Abstract: The overall health of my patients is often driven by the health of the oral cavity. A critical challenge to infant and toddler oral cavity health is understanding and properly identifying restrictive tethered oral tissues (RTOTs), which have important short- and long-term effects on infant growth and development as well as overall health. The surgical release of these RTOTS is not just a simple "snip". Treatment can be safely completed in the dental office without the need for general anesthesia; in toddlers, I use a combination of topical and low-level lasers under minimal topical anesthesia. Since 1998, I have used dental soft tissue lasers without any complications. In my 52-year practice, I have released 10s of thousands of lingual frena and have many, many testimonials of their success.

Summary

The tongue plays a significant role in an infant's ability to efficiently suckle, swallow, and breathe. Tongue assessment using the Kotlow protocol is a simple, uncomplicated part of the differential diagnosis. Forms and information for assessment are available at my website: https://www.kiddsteeth.com. After I examine the infant, the parents watch a 15-minute video to review the importance of releasing the tongue tie. If ankyloglossia isn't treated, the child may develop lower dental crowding, periodontal problems, constricted mandible, pseudo-macroglossia, and more. The maxillary lip frenum also may require treatment to allow a good seal from the nursing infant to the breast or bottle.

The tethered oral tissues are formed by layers of mucosa and fascia. Body fascia is a continuous uninterrupted band of web-like connective tissue that extends from our head to our toes surrounding every organ, bone, nerve fiber and muscles in their proper positions. Fascial restrictions inhibit growth. Myofunctional therapists work on the fascial system to mitigate restrictions.

No child should have to compensate to nurse, eat, speak, breathe, or function due to restrictions of the RTOTS. Data supporting the safety and effectiveness of the release of RTOTS as well as the vast amount of clinical evidence for safe surgical correction and the known benefits of orofacial myofunctional therapy for the management of ankyloglossia and other restrictive tethered oral should encourage the medical community and other members of the team to work together to assist these families.

Integrating Myofunctional Therapy into Physical Functional Medicine (PFM)

Jesse Ham, PT, PRC, AIA Fellow
About You PT, Rapid City, SD, U.S.

Abstract: Physical therapy and myofunctional therapy are both professions that operate in the Physical Functional Medicine (PFM) realm. A case presentation illustrated the interplay between 'body work' where physical therapy is among the professions in play and 'oral myofunctional work' where myofunctional therapy is among the professions in play.

Summary

Rationale: Presently, there is little research available showcasing the integration of physical therapy intervention with myofunctional therapy intervention and dental intervention. Further, there are few articles available providing tangible, applicable ways for myofunctional therapists to assess if a physical therapist might be helpful to integrate into a particular case.

Methods: This case presentation integrated physical therapy, myofunctional therapy, and dental intervention, utilizing the Applied Integration Academy (AIA) Spectrum of Patterns (SoP) to objectively assess the patient's outcomes following

said interventions. A 15-year-old high school athlete was struggling with shoulder dysfunction and weakness.

Six observable assessment issues were checked to help myofunctional therapists determine if their patients might have a full-body pattern that is affecting their myofunctional program without the need to put hands on the patient:

1. Diminished glute mass compared to their lean body mass grossly.
2. Dropped shoulder unilaterally at rest.
3. Accentuated vertical chest/posteriorly tilted sternum at rest.
4. Asymmetrical single leg stance time.
5. Inability to attain full squat without discomfort or loss of balance.
6. Asymmetrical single leg squat to chair.

Results: With physical therapy intervention alone, the patient could not maintain objective physical findings, as measured in the AIA SoP. The physical therapist performed a myofunctional screening and believed a myofunctional therapy consultation was needed. Once the patient had been treated by a myofunctional therapist and had plateau findings, the myofunctional therapist recommended dental assessment for functional frenectomy. The dentist involved in the case would only perform a frenectomy with myofunctional therapy prior to and following the frenectomy procedure secondary to contemporary research and personal, positive case experiences with this practice pattern. In this case study, neither physical therapy, myofunctional therapy, nor dental integration alone achieved the objective outcomes this patient achieved.

Three weeks following the culmination of integrated physical functional medical combination of physical therapy, myofunctional therapy and dental functional frenectomy, the patient in question had no more subjective symptoms of shoulder and back tightness or pain. The patient also changed the speed of volleyball serve from 25 mph to 40 mph, a 60% improvement in velocity of volleyball serve with no change in lifestyle and no other treatment.

Conclusions: Myofunctional therapists can assess if physical therapy might be warranted using a brief six-item full-body screening checklist. Many variables played into the efficacy of the treatment for this patient. The significant improvements in pain and function for the individual in this case report may have broader implications for creating best practice for combining physical therapy, myofunctional therapy and dental practices in the multidisciplinary PFM realm. This case study warrants further research in higher echelon scientific platforms for this and many other multidisciplinary approaches like this one.

Legal Protections for Licensed Practitioners

Lisa Fraley, JD, CHHC, AADP
Lisa Fraley Legal Coach LLC, Columbus, Ohio, U.S.

Abstract: What do you need to know to legally protect your practice? What corporate entity do you need? How do you protect your website? What should you know to take your practice across state lines? This presentation provided legal clarity to reduce legal risks for licensed medical practitioners.

Summary

The purpose of this session was to help licensed medical practitioners get legally clear so they can feel safe, secure, confident, and empowered while working in person or expanding their reach online. The presenter reviewed key legal protections they would need as a licensed practitioner when it comes to business entities, website protection, licensure, telehealth, HIPAA and more. Specifically, she presented different types of corporate entities and when they're needed for one's practice, including LLCs, S-Corps, PLLCs and PCs. There are three legal documents needed for website protection, each with a specific purpose to reduce one's liability, protect intellectual property, and legally comply with website privacy laws, including the Website Disclaimer, Website Terms and Conditions, and Privacy Policy. Medical practitioners need to comply with telehealth laws and HIPAA and learn the differences between when working in person and through telehealth. The presenter reviewed the type of insurance and which legal documents are needed to operate an in-person medical practice and an online virtual practice, because the type of

insurance protection and legal documents used for each type of business are not the same. Attendees learned to recognize the legal issues and risks presented when wanting to operate a virtual practice and cross state lines to work with patients, and what steps to take to expand their reach in a legal way without violating licensure laws. We reviewed three virtual models for expanding one's practice across state lines in ways that can reduce the risk of investigations for the unlicensed practice of medicine in other states. This comprehensive presentation aimed to help attendees know how to keep themselves legally safe while expanding their practice, income, and reach.

Sunday, October 15

Integration of Cranial Nerves to Improve Treatment Options

Lois Laynee, LMT MBA
Restorative Breathing, PLLC, Phoenix, Arizona, U.S.

Abstract: Body mechanics, including those associated with respiration, can be viewed as a mechanical correlation of the skeletal, muscular, and visceral and neurological systems. Starting *in utero,* the sensory map develops based upon individual experience, perception, and proprioception. Normal development of cranial nerve connections may be interrupted or altered by injury, trauma, and surgery. Cranial nerve dysfunction can contribute to the symptoms associated with the following: autism, anxiety, depression, trauma, migraines, asthma, poor digestion, irritability, difficulty sleeping, poor social engagement and withdrawal. A patient-specific sensory map of normal and limiting (hyper or hypo) function may be revealed through careful in-depth examination using readily available clinical tools. The theoretical background behind the presenter's Dynamic Functional Cranial Nerve Assessment Tool (DFCNAT)™ was presented. The motor and sensory functions of each cranial nerve were reviewed, and precipitants were provided with an overview of DFCNAT testing principles and procedures. Once a patient's sensory system has been mapped, s/he may be treated via Cranial Neurosequencing™, in which gentle structured movement patterns can activate and help foster the optimal integration of the cranial nerves. Once cranial nerves are properly activated and integrated, sleep is restored, pain and anxiety can be reduced, and movement is easy, effective, and effortless. Case examples were provided.

Brain-Body Connection: Let's Connect the Dots: How the TMJ Influences Posture and Cognition

Dr. Karen Gordon, DC, RDH
Keiser University of Chiropractic Medicine, West Palm Beach, Florida, U.S.

Abstract: Temporomandibular joint disorder (TMD) is the second most common musculoskeletal pain following back pain. This presentation provided an introduction to basic screening and treatment techniques of the temporomandibular joint (TMJ), with an emphasis on a holistic patient-centered treatment-model approach.

Summary

TMD is a silent disease that influences many body systems. It is estimated that approximately 33% of the population has at least one TMD symptom. TMD affects posture in a descending approach from the temporomandibular joint to the cervical spine and even down to the pelvic girdle. This presentation reviewed the function and anatomy of key components associated with temporomandibular joint disorder, including bones, soft tissue and nerve conduction pathways associated with the head, neck, and temporomandibular joints (TMJ). It also considered how the temporomandibular joint's connection influences posture and cognition and described common musculoskeletal disorders of the head, neck, and TMJ. The craniofacial pain complex with its nociceptive input from craniofacial structures and cervical muscles activates the trigeminovascular system.

Birth, Airway, TMD and Cranial Osteopathy

Dr. Tasha Turzo, DO
Santa Cruz Osteopathy, Santa Cruz, CA, U.S.

Abstract: Integrative tongue function is critical to optimize facial growth and development. The growth of the face in an anterior/inferior direction from the cranial base creates a space, called *Airway* between the posterior margins of the tongue and the anterior cervical fascia. This space is surrounded by collapsible soft tissues that are dependent on the muscle and tone of the tongue and soft palate. Birth injuries can compromise the innervation and motor function of the tongue and muscles of the soft palate, which can affect the development of the face. Birth injuries, such as torticollis, often create temporal-mandibular dysfunction as the face grows. The stability of this joint is a crucial component of optimizing airway space during sleep. The presentation reviewed the questions to ask and a physical exam to screen for patients who are at risk for a suboptimal and compromised airway. It included *early interventions* to help redirect facial growth and development and discussed diagnostic methods and the basics of treatments for temporomandibular joint disorder. Cranial Osteopathy and manual medicine can help optimize facial growth and development.

Craniosacral Therapy: A Whole-Body Approach for Treatment of Orofacial Dysfunction

Dr. Lisa Desrochers, MS, PT, DPT, ATC, CST-D
The Upledger Institute, Palm Beach Gardens, FL, U.S.

Abstract: This presentation explored connections between the craniosacral system and orofacial dysfunction, including cranial nerve issues that may cause or contribute to dysfunction of the face, palate, and pharynx. The relationships between embryological fascial layers and orofacial function were discussed, and basic craniosacral therapy techniques were introduced.

Summary

Craniosacral therapy is a gentle manual therapy which focuses on the craniosacral system but can affect every system in the body. The craniosacral system includes the central nervous system and the fascia, fluid, and bony container that houses it. Through direct neural stimulus or indirectly through fascial connections, bony or membranous restriction within this system has the potential to disrupt normal function anywhere in the body, including facial, lingual, or pharyngeal structures.[1] With the understanding that the body is a unit, and that the reductionist approach to diagnosis and treatment might miss the bigger picture, craniosacral therapy utilizes a whole-body approach to treat a person, not a disease.[2,3]

Central to the craniosacral system is a physiologic, rhythmic motion which is expressed throughout the body.[2,5] Foundational work in the field of cranial osteopathy by Willam G. Sutherland, DO, in the early 1900's demonstrated that dysfunction resulted when cranial bones were immobilized.[6] Preliminary studies conducted by a research team led by John E. Upledger, DO, at the College of Osteopathic Medicine at Michigan State University between 1975 and 1983 demonstrated spontaneous motion of the cranial bones in living primates.[2] Modern research has precisely measured the amplitude and rate of the craniosacral rhythm in humans.[5] The craniosacral rhythm is autonomically driven and closely related to heart rate and respiration.[5,7] Like the cardiac and respiratory rhythms, the craniosacral rhythm is essential for optimal health.[5,8,9] Evaluation of this rhythm can give the therapist important information about restriction throughout the system and related symptoms/dysfunction elsewhere in the body.[2]

Due to the close relationship between the neurocranium and the viscerocranium, dysfunction within the craniosacral system often directly relates to orofacial dysfunction. Developmentally, palatal shape and form progress from the cranial base downward, with the tongue and mandible shifting lower during the various growth and development actions above the hard palate. This influences palate shape and position, as well as the width of the upper dental arch.[10,11] Additionally, many cranial nerves provide direct efferent innervation to facial, lingual, and pharyngeal structures. Restriction within the intracranial membrane system may lead to

compression of these cranial nerves anywhere along their course, from their brainstem nuclei to their foraminal egress from the cranial vault at the sphenoid, temporal bones, or occiput. This will ultimately cause devitalization of the tissues they innervate and can result in neuralgia due to aberrant afferent neural input.[4]

Through a whole-body evaluation, the craniosacral therapist is able to determine the origin of the dysfunction, whether it be internal to the craniosacral system or more peripheral. Once identified, self-correction at the source of the dysfunction can be facilitated.[12] In this way, craniosacral therapy supports orofacial myofunctional therapy by identifying craniosacral or peripheral restrictions that may cause or contribute to orofacial dysfunction, and by facilitating the entire system to achieve and integrate optimal structure and function.

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Unveiling the Hidden Truth: Decoding CBCT Scans and Reports for Myofunctional Therapists

Joy Lantz, RDH, PHDH, COM®, IBCLC
Inspire Dental Wellness, Orland Park, IL, U.S.

Abstract: This presentation focused on the knowledge and skills needed to interpret Cone Beam Computed Tomography (CBCT) scans. It is important to understand normal and abnormal structures in a CBCT scan to apply how they relate to potential issues in myofunctional therapy. The session reviewed observations of oral and nasal anatomy, measurements of the airway, tonsils, and adenoids, and insights for incorporating CBCT findings into comprehensive treatment plans.

Poster Presentations

Effects of Orofacial Myofunctional Therapy on Oral Functions, Speech and Dental Occlusion

Tammy Davidman-Goldberg, MA, CCC-SLP[1]
Ruth Vinacur-Ezrati, PhD, CCC-SLP[1]
Ofer Amir, PhD, CCC-SLP[1]
Noa Sadan, DMD[2]
[1]Department of Communication Disorders, Stier School of Health Professions, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel
[2]Department of Orthodontics, School of Dentistry, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Abstract: Orofacial myofunctional disorders (OMDs) affect craniofacial development and may cause malocclusion. This interventional study provided orofacial myofunctional therapy (OMT) for 3-4 months to 50 children scheduled for orthodontic treatment. Thirteen children agreed to delay orthodontic interventions for the 6-month implementation period. Pre and post intervention measurements showed improvement in OMDs and malocclusion.

Summary

Background: Normal orofacial muscle development is an integral part of the development of the stomatognathic system and the craniofacial structure. The integrated developmental process of the orofacial muscles and their functions begins in infancy, including breathing, chewing, swallowing, and articulation. The anatomical, physiological, and functional environments mutually affect development.[1] Dysfunction of the orofacial muscles (orofacial myofunctional disorders, OMDs) also affects the development of dental occlusion. Treatment of the functions of the orofacial muscles (orofacial myofunctional therapy, OMT) is based on correcting the oral functions that affect the muscular pressure distribution and usage on the craniofacial structure.

The extent of the impact of OMDs on facial structures and dentition depends on the frequency, length, and intensity of the disordered habit.[2-3] Development of dentition and dental occlusion progresses simultaneously with the development and function of the other organs of articulation. As a child grows, poor functional habits become established. In the absence of timely interventional treatment, the OMDs not only negatively affect functions but also creates abnormal muscular pressures that affect the development of the craniofacial structure including malocclusion Malocclusion types associated with OMD include overjet, open bite, and interdental incisor spacing.[4]

This longitudinal intervention-based study was based on an OMT protocol aimed at correcting four specific functions: oromotor stability and control, oral rest position, chewing and swallowing patterns, and interdental articulation.

Methods: Participants included children aged 8-16 years with malocclusions and OMDs, referred for treatment of OMDs prior to orthodontic treatment. Pre-intervention, participants were assessed by an orthodontist and a speech pathologist. Malocclusion type, malocclusion severity, OMDs and interdental articulation were measured. Dentition stage was measured. OMT was given for a period of 3-4 months. To assess the effects of an OMT intervention plan, a 6-month implementation period followed the conclusion of the OMT. During this period, orthodontic treatment was withheld. Of the 50 participants, 37 ultimately chose to start orthodontic treatment during implementation, leaving 13 participants as the research population. Participants underwent a designated OMT intervention. The intervention had three stages addressing: 1) The oral rest position including correct breathing. This stage also included sensory stimulation of the tongue and lips; 2) Normal tongue movement during deglutition with a focus on creating the bolus and transporting the bolus to the pharynx; 3) Interdental speech addressing phonemes based on closure problems.

Results: Occlusion parameters and oral functions were compared pre/post intervention. Results showed a significant improvement in rest position of jaw (p=.007), lips (p=.001) and tongue (p=.001), in swallowing patterns (p=.001) and interdental articulation (p=.001). Dental occlusion results showed significant improvement: overbite right (p=.012), overbite left (p=.018); overjet right (p=.003), overjet left (p=.006); spaces between the incisors (p=.014). Dentition stage in all participants was unchanged therefore did not act as a confounding variable. No significant differences were found in maxilla width, palate width/height, or lateral lip length. There were no significant correlations between the OMDs and the occlusion parameters.

Conclusion: Improvements in dental occlusion were associated with improvements of resting position and swallowing patterns but not with interdental speech articulation. Overall, the results support the positive effect of OMT on malocclusion and the effectiveness of the multidisciplinary approach.

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Physical vs. Functional Measures and the Possibility of Streamlining the OMES-E

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Abstract: OMD tests evaluate both physical and functional measures. Because OMD is a functional disorder, the authors questioned the use of physical characteristics to classify OMD. Regression analysis of forty adults' Expanded Orofacial Myofunctional Evaluation with Scores (OMES-E)[1] scores determined that the subtests predict OMD; however, only freeway space and Mallampati score predicted the Appearance/Posture subtest score.

Summary

The inclusion of physical measures is common in published diagnostic tests of OMD.[1-3] While this information is valuable for pre- and post-therapeutic measurement, the question arises as to whether physical measures are the best indicator of a functional disorder. The axiom "form follows function" is widely accepted in the OMD community, yet individuals with remediated OMD may retain physical characteristics in the absence of OMD functional behaviors. This study examined 40 adult participants aged 18-45 who were randomly

recruited at Arizona State University. Data were analyzed to explore the diagnostic impact of 4 of the 5 subtests of the OMES-E. The Breathing subtest was not included for two reasons: the Breathing subtest has fewer measures than other OMES-E subtests and the weighting of the subtest overall was questioned; and secondly, some participants in our sample were assessed with COVID restrictions (ie, facemasks) and analysis was done primarily using video. We were not confident that open-mouth posture exclusively indicated mouth breathing. A regression analysis was used to examine the remaining 4 subtests and to determine the impact of each on the total OMD score. All four subtests were identified as significantly predictive of OMD score: Movement, Mastication, Appearance/Posture, and Deglutition, with the Movement subtest alone being the most predictive of total score $r(4) = .768$, $p < .001$.

Because the Appearance/Posture subtest was the most time consuming and employed a higher percentage of subjective measures, this subtest was analyzed in greater depth. First of all, 7 of the 16 measures were modified to provide objective scores. Objective score cutoffs were determined based on either standard deviations, or in the case of skewed distribution, quartile scores. The following measures of the Appearance/Posture subtest were modified accordingly: proportion between thirds of the face, vertical mandibular posture (freeway space), anteroposterior relation, relation to midline, tongue volume (Mallampati score), palate width, and palate height.

All 16 measures of this subtest were subsequently included in a stepwise regression analysis, and only two of the measures were significantly predictive of the total OMD score: vertical mandibular posture (freeway space), and tongue volume (Mallampati score). Using these two measures in place of the Appearance/Posture subtest, a second stepwise regression was conducted to determine the predictive impact of the 5 variables: Movement, Mastication, Deglutition, Vertical Mandibular Posture (Freeway space) and Tongue Volume (Mallampati Score). Results indicated that the collective impact of these variables could provide an accurate model for identification of total OMD score, r (4) = range .768 - .969, $p < .001$ for all variables. The order listed above reflects the magnitude of contribution to the model from largest to smallest.

Although physical measures are valuable for pre- and post-remediation testing, the data suggest that not all Appearance/Posture measures may be necessary for diagnosis of OMD. It should be possible to streamline time-consuming diagnostic

tests using the measures indicated above for quicker diagnosis or screening.

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Oral muscle dysfunctions and Dental caries – A case series

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Abstract: Cavities in deciduous teeth can lead to difficulties in chewing, phonation, ability to maintain oral hygiene, and severe pain, thus compromising the overall quality of life. Multiple etiological factors have been correlated with tooth decay but the role of oral muscular dysfunction and oral restrictions have been underemphasized. A series of cases illustrated the benefits of addressing the root causes and providing holistic treatment.

Summary

Introduction: Early childhood caries is one of the most prevalent dental conditions in the pediatric population. Cavities in 'milk' (deciduous) teeth can lead to difficulties in chewing, phonation, ability to maintain oral hygiene, and severe pain leading to sleepless nights, lowering of self-esteem, and overall quality of life. Multiple etiological factors have been correlated with tooth decay but little attention has been given to the role of oral muscular dysfunction and oral restrictions.[1] The oral muscles are designed to protect the teeth and when optimally functioning, do not pave the way for harboring microbes and food debris on the tooth surface.

Case series: The presentation showcased a series of children in the 1 – 3 year age group with tooth decay as the main concern. These cases were managed holistically by addressing the root cause. In other cases, cavities were merely treated with no rectification of the muscle dysfunction, and outcomes varied significantly compared to the patients with holistic management. Complete functional history taking and radiographic analysis were done for all children and appropriate treatment plans were drafted. The management strategies included definitive treatment for tooth decay using pulp treatments, full coverage restorations, etc., along with myofunctional therapy and functional frenuloplasties wherever indicated.[2-5]

Discussion: Traditional dental curriculum has always been oriented towards training how fluoride coatings and sealants are preventive options. These are not effective and can only help in delaying the damage when the underlying muscle dysfunction is not rectified. Oral muscle dysfunctions can lead to narrowed jaws and non-spaced dentitions which can be a huge risk factor for decay development. It can also lead to open mouth breathing and increase germ load in the oral cavity further leading to treatment failure. OMDs associated with the tooth decay when not addressed often lead to repetitive occurrence of dental caries.

Conclusion: When toned, the oral muscles including the lips, cheeks and tongue are a natural cleanser that prevents bacteria from settling on teeth and initiating the process of decay. Oral myofunctional therapy improves orofacial strength and tonicity, and facilitates a wiper-like cleansing action on the tooth surface. Mechanical dental intervention like fillings and crowns when performed individually often fail when the underlying muscular dysfunction is unaddressed. Oral myofunctional therapy has a harmonious role along with dental intervention in preventing this mammoth of dental condition.

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Exploring the Connection Between Tongue-tie, Speech Errors and OMD

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Abstract: Tests of OMD vary regarding inclusion of speech errors and tongue-tie as criteria for diagnosis. The MGBR includes both measures, while the OMES-E does not. This study asked whether an OMD test not including the two measures would correlate OMD with independently determined tongue-tie and speech errors of /s, z/.

Summary

OMD and speech errors of alveolar sounds /t, d, s, z, n, l/ share the common trait of low, anterior positioning of the tongue. A few researchers have investigated the co-occurrence of OMD and alveolar speech sound errors.[1-4] Two widely used tests differ on inclusion of speech errors as a measure for the diagnosis of OMD; the MGBR[5] includes them, while the OMES-E[6] does not. Tongue-tie is also a condition which limits the mobility of the tongue, restricting it to the anterior and low position.[7] The MGBR and OMES-E similarly differ on the inclusion of tongue-tie as a determining criterion for OMD, with the MGBR again including it, and the OMES-E not including tongue-tie in the test instrument. This study aimed to look for correlations between OMD and speech errors of /s, z/ and between OMD and tongue-tie.

Forty adults aged 18-45 (6 male, 34 female) were assessed using the OMES-E, spontaneous speech, and oral reading sample analysis, and by tongue measurement using the tongue range of motion ratio (TRMR).[8] All participants spoke English as their first language, had no physical limitations that would affect speech, and had typical hearing.

Ten of 40 participants (25%) were classified as having OMD. This percentage is lower than the 38% reported by Kellum[9] but is an artifact of the OMES-E using the lowest quartile as a cut point. A Pearson Correlation was conducted using the hypothesized contributing factors of tongue-tie and speech score variables. There was a significant correlation between OMD score and tongue-tie, $r(39) = .325$, $p < .017$. The correlation between speech errors and OMD was not significant, $r(39) = .293$, $p < .067$, however 40% of participants with OMD also had co-occurring speech errors of /s/ and /z/. As a comparison, the participants without OMD had a speech error incidence of 7%. This result is similar to the low rate Flipsen[10] reported as an expected incidence of residual speech errors in the general population of 2%.

Our results appear to support the inclusion of scoring tongue tie as a measurement for classification of OMD. Somewhat surprisingly, speech errors and OMD were not significantly correlated, and therefore the authors would not support including speech errors of /s, z/ as a criterion for OMD diagnosis or vice versa. However, incidence in the OMD population was decidedly higher, which suggests that although OMD cannot be considered a predictor of speech errors, it may in fact be a contributor. There appear to be other factors at play beyond the motor modality to explain residual speech errors in adults.

A future direction for this study is to evaluate participants with OMD to look for differences in

speech perception skills. Results may help to determine to what extent perceptual deficits interact with functional motor deficits associated with OMD in the etiology of speech errors.

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Prevention of Obstructive Sleep Apnea – Myoline™ protocols

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Abstract: Sleep disordered breathing encompasses a spectrum of issues that affect breathing patterns in sleep. The issues broadly range from simple mouth breathing to severe apneas. Medical literature talks about numerous non-invasive or invasive methods to salvage the situation, however there are no prevention protocols to date.

Summary

Introduction: Sleep disordered breathing encompasses a spectrum of issues that affect breathing patterns in sleep. The issues broadly range from simple mouth breathing to severe apneas. Medical literature talks about numerous noninvasive or invasive methods to salvage the situation, however there are no prevention protocols till date. The major challenge lies in identifying early symptoms of SDB due to lack of knowledge on the role of the tongue as a respiratory organ and its impact on the craniofacial respiratory complex.

Case Presentation: This presentation comprised a culmination of case reports that talk about sleep issues seen from infants to adolescents and how a protocol (Myoline™) developed by our team is used as an interceptive and preventive tool for the same.

Myoline was strategically curated to be a treatment protocol that is airway-focused and myo-centric, targeted to optimize the functions of the craniofacial respiratory complex. The protocol employs myofunctional therapy, myofascial work, orthopedic appliances and functional frenuloplasties per individual treatment goals.

The case series encompassed the following:

- Infants with sleep disturbances as simple as short sleep episodes to apneic episodes
- Toddlers with ADHD like symptoms and concomitant sleep issues
- Young children with maxillomandibular retrognathia and SDB symptoms
- Adolescents with narrow jaws, full-fledged alignment issues and nonrestorative sleep

Establishing a diagnosis is based on comprehensive oral, dental, and functional history with inspection and palpation along with functional and radiographic investigations wherever needed.

The treatment strategies for infants are oriented towards establishing breastfeeding which is Nature's best way to augment maxillary growth and posterior nasal aperture which gradually results in correcting sleep issues.[1,2]

In toddlers and young children, the Myoline protocol provides the use of maxillary expanders, myofunctional trainers along with therapies, and functional frenuloplasty.[3-5]

In adolescent age groups, mini implant-assisted rapid maxillary expansion along with myofunctional therapy, release of tethered oral tissues, and orthodontic corrections are delivered.[6]

Discussion: Thorough functional evaluation and identification of OSA risk predictors early in childhood can help prevent the domino effect of something that starts as simple as mouth breathing in the sleep-disordered breathing spectrum.

Conclusion: The case series reiterated that an ounce of prevention is worth a pound of cure. Sleep issues are the slow pandemic that the globe is facing. Research-backed multidisciplinary approaches to help children get good restorative sleep is the need of the hour.

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Optimizing Function: There's More Than One Piece to the Puzzle

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Abstract: A transdisciplinary team addressing form, function and global health has the potential to more effectively support patients on their journey towards improved health and optimal function. Working together across disciplines is key to health, healing and improved medical care for the unique populations that orofacial myologists seek to serve.

Summary

When addressing orofacial myofunctional disorders and global body function, it is crucial to consider all contributing factors in order to facilitate optimal outcomes. Although as healthcare providers we specialize in one treatment domain, dysfunction and health do not. We must address each patient as a complex unit. It is imperative to look beyond the tongue and oral cavity and allow ourselves a bigger picture of the overall patient. Working across discipline lines and within a diverse team allows us to open our clinical eyes and understand how our treatment goals are limited to or supported by another body system. A transdisciplinary team promotes discussion, understanding, and the

development of a comprehensive treatment plan that has the potential to more effectively support the patient's treatment goals.

Historically, each discipline works in a distinctly separate model with little communication between specialities. In a fast-paced healthcare world there is often limited time to connect with other providers; however, when one domain is addressed in isolation, dysfunction is likely to persist resulting in difficulty in achieving long term benefits.

An example frequently observed in pediatric therapy is children who present with feeding disorders and picky eating that are often evaluated by a speech-language pathologist (SLP) or an occupational therapist (OT). The child who avoids specific food textures may do so as a result of the sensory properties of that food; however, they may also avoid that texture due to perceived or experienced challenges managing that texture from an oral motor standpoint. If the OT is only targeting the sensory system or the SLP is only targeting oral motor work, only a portion of the underlying cause is addressed and the child may continue to experience difficulties or progress very slowly. Additionally, children experiencing nutritional deficits can develop gastrointestinal distress such as constipation. These patients may prefer carbohydrates due to their abdominal discomfort; however, this can exacerbate symptoms and continue the cycle of gastrointestinal distress and excessive intake of carbohydrates. It is also not uncommon to see children who have experienced prolonged feeding discomfort, whether related to oral motor dysfunction or gastrointestinal symptoms, develop co-occurring sensory processing challenges including dysregulation and a fight-or-flight response to mealtimes. Clinicians must understand the complex relationships between the body systems, the child's overall nutritional needs and the influence each system has on the others. They must also be able to identify 'red flags' indicating the need for referral to additional specialists such as a gastroenterologist.

It is imperative, therefore, that myofunctional therapists and the teams they work with provide a comprehensive evaluation and identify challenges across body systems which may be contributing to the individual's overall dysfunction. This will enable a deeper understanding of the complexities that are influencing the ability to achieve the goals developed by the team. Furthermore, clinicians must be skillful in the selection and implementation of treatment interventions supporting the patient as a whole, considering each body system and the impact it has on success and the key players for each individual's treatment.

Relationship Between Tongue Muscle Performance and Flexibility in Healthy Young Adults: A Pilot Study

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Abstract: Tongue muscle performance and skeletal muscle performance are linearly associated. Additionally, flexibility plays a role in functional performance of skeletal muscles. Based on the knowledge that a series of connective tissue, fascia, connects the tongue down to the toes, this study sought to determine whether tongue muscle performance measures are associated with skeletal flexibility.

Summary

Healthy tongue muscle performance (e.g., tongue strength, tongue endurance) is important for completing everyday lingual tasks (i.e., swallowing, maintaining upper airway patency) and maintaining good health.[1] Prior research has shown that tongue muscle performance has also been shown to have a linear relationship with skeletal muscle performance.[2,3] Furthermore, skeletal muscle functional performance is associated with healthy normative flexibility.[4,5] Knowing the tip of the tongue is connected to the tip of the toes through a series of connected fascia,[6,7] tongue muscle performance may be impacted by skeletal muscle flexibility. This study sought to determine whether

tongue muscle performance measures are associated with skeletal muscle flexibility.

Methods: Participants included 19 healthy young adults, 19-43 yrs old (M=21.9, SD=5.5), 63.2% female. Each participant reported no known oral or lingual disorders that may negatively impact lingual performance, and no muscular or orthopedic conditions that may negatively impact skeletal flexibility. Each participant completed one Motioncapture assessment (DARI Motion, Overland Park, KS) to measure the range of motion of skeletal muscle flexibility across multiple body joints. Using the Iowa Oral Performance Instrument (IOPI Medical, Woodinville, WA), tongue strength was recorded as maximal pressure generated across 3 trials; 1 trial of tongue endurance was recorded as the maximal duration for maintaining 50% of maximal tongue strength.[2,3,8] Lingual measures were captured in both the anterior and posterior tongue region and followed bulb placement described by VanRavenhorst-Bell et al.[2,3]

Results: Descriptive measures showed that anterior and posterior tongue strength (M= 55.84 kPa, SD = 3.80; M = 46.53 kPa, SD = 3.34) and tongue endurance (M = 19.05 s, SD = 4.38; M = 11.74 s, SD = 2.34) fell within acceptable norms, respectively. A Pearson's Product Correlational Coefficient analysis found a significant moderate inverse relationship between anterior tongue strength and trunk flexion with squat, r = -.471, p = 0.042, and anterior tongue endurance with reverse lunge trunk rotation, r = -.615, p = 0.007, respectively. No other significant correlations were found.

Discussion: General findings indicated a weak inverse relationship between trunk and lower extremity flexibility and anterior lingual performance. A closer evaluation of the findings suggested that a change in biomechanical movement or stability of the core muscles during a lower extremity movement may negatively impact lingual performance. Limitations of the current study include the small sample size in addition to the absence of skeletal muscle strength and endurance measures to compare with lingual performance. To establish a better understanding of how skeletal flexibility may affect tongue muscle performance (strength, endurance), a treatment study that includes a structured flexibility routine is warranted.

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