TONGUE TIE AND LIP TIE: A NEW FAD OR A TRUE FUNCTIONAL ISSUE?
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The tongue is a powerful structure that plays a critical role in craniofacial development, influencing breastfeeding, swallowing, speech and breathing. During fetal development, the forward growth of the tongue is guided by the lingual frenulum, a thin band of tissue that attaches the base of the tongue to the floor of the mouth. It functions to create a balance between the tongue, lip muscles, and growing facial bones. After birth, the lingual frenulum typically retracts and thins. Occasionally, the lingual frenulum fails to properly shrink, resulting in a tethering of the tongue to the floor of the mouth. This leads to ankyloglossia, or tongue-tie (TT), a congenital oral abnormality that limits the mobility and function of the tongue due to a short or tight lingual frenulum.

It is typically easier for practitioners to visualize, diagnose and, if necessary, recommend treatment for an upper lip tie (ULT), also known as ankylolabia. This is another congenital malformation of the maxillary labial frenulum that restricts range of motion of the lips, contributing to functional deficits. It has been found that patients with a ULT have a 90% chance of having some degree of a coinciding TT.

There are various ULT/TT classification systems in the literature that categorize the level of restriction based on the location and/or size of the frenulum attachment and it's affect on movement and function of the lip or the tongue. Ankyloglossia may be divided into two subclassifications of anterior tongue tie (ATT) and posterior tongue tie (PTT). Historically, the more obvious and easy to visualize ATTs have been thought to cause more severe symptoms warranting treatment, but practitioners have had limited knowledge and education on the definition, existence, and/or effects of a PTT. Current evidence is illustrating that the more difficult to diagnose PTTs can cause similar or even more severe symptoms with breastfeeding, swallowing, speech, and breathing compared to ATTs.

ULT and TT are suggested to be part of a specific genetic predisposition. An autosomal dominant pattern of inheritance has been identified in TT. The prevalence of *anterior* TT in the general population is 4-5% with males being more commonly affected by than females with a 4:1 ratio, suggesting an X-linked pattern of inheritance. To my knowledge, there aren't any prevalence studies on *posterior* tongue tie at this time. The overall prevalence of TT would likely be much higher if both anterior and posterior tongue tie percentages were included.

Children with untreated TT may develop abnormal tongue function with a collateral impact on orofacial growth and sleep disordered breathing (SDB). This may reduce the width of the upper airway, increasing it's risk of collapse, especially during sleep. Early recognition and treatment of TT, preferably at birth, can improve normal orofacial growth and prevent development of SDB. TT can also influence numerous orthodontic issues by altering the development of the maxilla (upper jaw) due to the tongue resting low in the floor of the mouth rather than up in the palate. This leads to the development of a narrow, high-vaulted hard palate and mouth breathing and snoring, especially during sleep. Mouth breathing is also considered to be a factor in tonsillar enlargement. These anatomical changes in the oral cavity may all be contributors to SDB, which could potentially develop into obstructive sleep apnea (OSA).

I have come to realize over that last 3 years that most healthcare providers, including but not limited to pediatricians, dentists, ENTs, speech therapists, and occupational therapists, receive little to no training in treatment of TT, ULT, and breastfeeding mechanics. That said, it should come as no surprise that one may receive conflicting opinions or advice from various healthcare providers on a treatment plan of care for patients with ULT/TT.

I began researching the most up-to-date information on these topics in 2014. I must admit that it was a bit of a hard pill for me to swallow when I realized that I was giving antiquated advice on the matter after having only completed my pediatric dental residency training 5 years prior at a very reputable program that focused heavily on both pediatric dentistry and orthodontics. However, the more I read, the more courses I attended, and the more cases I reviewed, the more intrigued I became. One of my biggest questions was how to treat the child who is no longer breastfeeding or having speech issues but still has a tongue tie. Could this become an issue later in life? See the list below for consequences of untreated ULT/TT.

CONSEQUENCES OF UNTREATED ULT/TT

FOR INFANTS/MOTHERS

· Impact on milk supply	· Difficulty sucking a bottle/pacifier
· Severe pain with latch or inability to latch	· Reflux, colic, gas, bloating
· Failure to thrive	· Termination of breastfeeding
· Sleep deprivation	· Difficulty introducing solids
· Nipple pain, damage, bleeding, blanching	· Poor bonding between dyad
· Mastitis, nipple thrush, blocked ducts	· Depression, sense of failure

FOR CHILDREN

- Inability to chew age appropriate solid foods; gagging, choking or vomiting
- Persistent food fads
- Difficulties with dental hygiene and increased dental problems
- Persistence of dribbling and drooling
- Delayed development of speech and/or deterioration in speech
- Behavior problems
- Sleep disordered breathing
- Loss of self confidence because they feel and sound “different”
- Strong incorrect habits of compensation being acquired

FOR ADULTS

- Inability to open the mouth widely

- Difficulty talking even after moderate amounts of alcohol
- Clicking/pain in jaw, protrusion of lower jaw
- Migraines and tension headaches
- Negative effects in work and social situations, dining out and relationships
- Poor dental health, inflamed gums and increased need for fillings and extractions
- Sensitivity about personal appearance
- Emotional factors resulting in rising levels of stress, anxiety and depression
- Sleep disordered breathing

ORAL HYGIENE AND DENTAL HEALTH, GROWTH AND DEVELOPMENT

- Poor swallowing and a risk of anterior open bite
- Mouth breathing and a propensity to allergies
- Open mouthed posture associated with an imbalance in skeletal structure
- Restricted dental arch development and facial development
- Recurrent orthodontic issues

Babies begin learning to suck while in the womb so tongue tied (TTd) babies begin to compensate early on. This inevitably causes problems once born and, if left untreated, can continue well into adulthood. These symptoms are not merely pieces to be picked apart, but are part of a total picture. Just because your baby is gaining weight well doesn't necessarily mean ULT/TT should be rejected as the culprit for breastfeeding difficulties. ULT/TT are often the last complication an infant is evaluated for. If you and/or your baby are experiencing any of these symptoms, seek help from an International Board Certified Lactation Consultant (IBCLC) and advocate for your baby. Often times it is missed entirely due to a lack of up-to-date knowledge on the part of healthcare providers. The great news is that this is changing through a network of passionate advocates, IBCLCs, therapists and providers for ULT/TT education in our area.

When my partners and I attended the Academy of Laser Dentistry (ALD) Annual Session and completed the Standard Proficiency Certification course in April 2016, many pieces of this intriguing puzzle starting coming together for me. It is not a requirement to be certified by the ALD to use a laser in your dental practice. However, we were more comfortable incorporating the use of a laser in our office after completing an intense 2 day course and testing on laser physics and safety and experiencing hands on training with multiple different practitioners who had extensive knowledge and backgrounds with lasers use in dentistry. As I listened to a lecture on oral myofunctional therapy (OMT), the therapist presented a case that reminded me much of my own medical history and symptoms. Without going into too much detail and to make a long story short, I immediately talked to the lecturer after the presentation about my personal history, and she pointed me in the direction of an airway focused general dentist in Shreveport, LA who diagnosed me with TT, chronic mouthbreathing, and a mild sleep breathing disorder. I had never considered myself to be TTd and I'm a dentist... another hard pill to swallow! After a combination of OMT, a laser lingual frenectomy performed by my partner, and a conscious effort to train myself to nasal breathe with my lips sealed 24/7 except when speaking or eating,

my tongue now rests in the roof of my mouth where it's intended to. I have found my sleep and overall health to have improved drastically as well. My case is a perfect example of a undiagnosed TTd patient who had no obvious symptoms in infancy or childhood but began to experience complications as an adult.

The use of OMT in conjunction with frenectomies has become increasingly popular to train patients to reduce mouth breathing and return to normal nasal breathing. It is also useful in strengthening overall orofacial musculature and in eliminating numerous other oral habits, including but not limited to tongue thrust, tongue sucking, thumb sucking, etc.

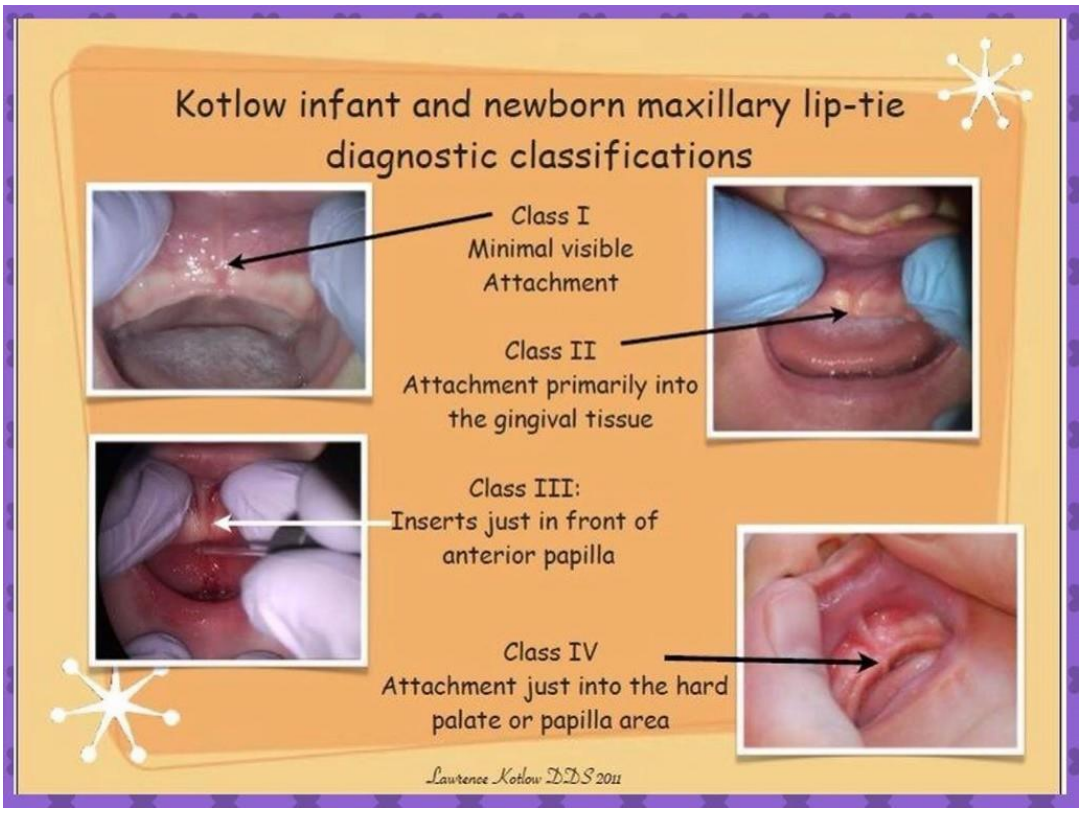
The most important point that I can stress regarding this vast topic is the importance of a collaborative team approach when treating patients with ULT/TT. It is not simply a laser or snip the tissue and send the patient on their way to figure out how to use their freely released tissues. Whether the issue is breast-feeding, speech, feeding/swallowing, oral motor function, or sleep breathing related, follow-up care with the appropriate IBCLC, therapist, body worker and/or doctor is critical to the success of the revision. Stretching, exercising and strengthening these freely released muscles is crucial for appropriate healing, prevention of reattachment, and improving function and range of motion. Throughout this journey, it is important for parents and patients to remember that this is a marathon, not a sprint. Much diligence and patience is required to achieve the desired results but it is worth it!

Louisiana Tongue Tie Support Group on Facebook is a valuable resource for support and accurate breastfeeding information for moms. Providers are also welcome to join, learn and be a part of advocating for better access to care.

The Evidence Supports Treating Tongue Tie for Breastfeeding Problems - Bobby Ghaheri, MD

Tongue and Lip Tie Articles - Larry Kotlow, DDS

The Basics of Tongue and Lip Tie: Related Issues, Assessment and Treatment - Melissa Cole, IBCLC, RLC and Bobby Ghaheri, MD.


Kotlow infant and newborn maxillary lip-tie diagnostic classifications
Class I
Minimal visible
Attachment
Class II
Attachment primarily into
the gingival tissue
Class III:
Inserts just in front of
anterior papilla
Class IV
Attachment just into the hard
palate or papilla area
Lawrence Kotlow DDS 2011


*Kotlow Diagnostic criteria (one) for clinically apparent tongue-ties in infants
**Type I(*4LK) -total tip involvement
Type -II (*3LK) Midline-area under tongue (creating a hump or cupping of the tongue)
Type III (*2LK) Distal to the midline.The tongue:may appear normal
Type IV (*ILK) Posterior area which may not be obvious and only palpable, Some are submucosally located
**Lactation consultants diagnostic criteria
Lawrence Kotlow DDS 2011

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