Tongue Tie and The Impact on Breastfeeding

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Evolutionary Angle

• Breastfeeding is one of the most basic instincts
• Difficulty with breastfeeding is common. That does NOT mean it is normal
• Breastfeeding is an essential component of normal infant life and its absence means something is fundamentally wrong with the infant’s world

Skepticism

• Is an idea really “new”, or have we forgotten what we used to know?
• Skepticism is healthy - it forces science to justify change
• It should not be paralyzing
• Eugène Bouchut (1867):
  - “Il y a beaucoup d’enfants qu’on dit avoir le filet et qui ne l’ont pas”
  - “There are many children said to have the net and have not”

Breastfeeding Problems

• Poor quality latch
• Falls asleep prematurely while nursing
• Slides off breast
• Colic symptoms
• Reflux symptoms
• Gumming/chewing
• Pacifier problems
• Poor weight gain
• Nipple damage (creased, cracked, bleeding)
• Severe pain
• Poor/incomplete breast drainage
• Mastitis/thrush
• Vasospasm
• Infected nipples
• Low milk supply
Approach to These Symptoms

• What explains these symptoms?
• We must look for an anatomic reason for this difficulty if conventional interventions are unsuccessful
• Waiting is not an option
  – Weaning
  – Baby’s health can be jeopardized
  – Mom’s health can be jeopardized

Significance

• Ahluwalia et al (2005)
  – 32% of moms don’t initiate breastfeeding
  – 4% stopped BFing in 1st week, 13% more stopped by 4th week
  – Only 51% breastfed beyond 4 weeks

Mechanism of Breastfeeding

• Should be an active process, even in instances when mom has OALD or high flow
  – some babies will just drink, rather than nurse
• Contrary to popular belief, the baby does not “milk” the breast in a stripping motion
• Understanding the mechanism of breastfeeding is crucial in understanding why intervention may become necessary
**Tongue Function in Breastfeeding**

**ORAL PREPATORY PHASE**
- Brings tongue to mouth floor.
- Extends to cover alveolar ridge to inhibit bite reflex (not all the way out of the mouth).
- Anterior portion manipulates nipple into proper position and cups breast (very important for foundation of vacuum generation).
- Body of tongue grooves to hold breast.
- Avian lip is at right angle on areola.
- Tongue tip elevation against breast and palate.
- Rigid elevation occurs from tongue (front to back).
- Mid tongue drops as jaw opens (tongue and lips remain sealed on breast) to decrease mouth pressure and pull milk from breast.
- Tongue remains grooved - allows for bolus to form.
- Sticking the tongue out of the mouth is not part of this phase.

**ORAL TRANSITORY PHASE**
- Vocal cords snap shut, epiglottis covers the vocal folds, the larynx elevator and tongue dump bolus into pharynx.

Adapted from Watson Genna (2008, p. 10-11)

**Mechanism of Breastfeeding**

- Geddes (2008) and Elad (2014)
Examination Technique

- This is absolutely key to diagnosing a potential anatomical problem that affects BFing
- It’s ok to make a baby cry during examination
- Use a headlamp
- Proper positioning is the most important part of the examination
Breastfeeding - Transfer

**NORMAL**
- Rhythmic/fluid motion (grading)
  - Can visualize traveling through facial muscles and movement of cranial bones
  - Brow relaxed
  - Body slowly relaxes
  - Hands open

**RESTRICTION**
- Nibbles only, no long pauses
- Falling asleep/frequent rests
- Collapsing cheeks (AKA “dimples”)
- Snapping/chewing – phasic bite reflex
- Hands in fists near face
- Only drinks with letdown
- Passive
- Breaks suction
- Clicking, choking, gasping – aerophagia
- Leaks milk out of mouth/nose
- Long feedings
What is Tongue Tie?

- Frenulums/frenums – remnant of embryologic tissue
  - Usually recedes around end of 1st trimester
  - Normal
- Ankyloglossia or anchored tongue
  - Too far forward on the tongue or too short
- Ties
  - restriction/impedes normal function
  - abnormal anatomy

"Trying to talk, eat, or swallow with a tight lingual frenum is like trying to run a marathon with your shoes tied together."
— Brian Palmer, DDS

Anterior TT vs Posterior TT

- Anterior TT is the classic webbing that is at or near the tip of the tongue
  - heart shaped tongue
  - speech implications
  - relatively obvious
- Revising these alone (no bleeding, minimal crying) rarely leads to improvement

Anterior TT vs Posterior TT

- Posterior TT is a bad name
  - submucosal
  - hidden
  - invisible
- Tend to be thicker - significant restriction
- Must use your fingers to feel this type of restriction
- Think of a sailboat
Types of Tongue Tie

Classification System

- **Type I** – total tip involvement
- **Type II** – midline area under tongue
- **Type III** – distal to the midline
- **Type IV** – posterior area/submucosal
  
  (Kotlow, 2011)

- Type I and II AKA “classic.” Are the most obvious.
  - Posterior component behind them
- Type III to IV - much harder to ID
- Very frequently associated with an upper lip tie

Types of Lip Tie

Classification System

- **Class I** – Minimal visible attachment
- **Class II** – Attachment primarily to gingival tissue
- **Class III** – Inserts just in front of anterior papilla
- **Class IV** – Attachment into hard palate or papilla area
  
  (Kotlow, 2011)

“There are no studies to show that in infants class 3 or 4 frenas will stretch or migrate upward to correct the abnormal attachment as the infant’s growth occurs.”

Dr. Lawrence Kotlow
Incidence

- Research - 4-12% of babies with tongue tie (probably only anterior TT)
  - Incidence is increasing (genetic, epigenetic)
  - 45,000 births in Oregon in 2012
- “The presence of tongue tie triples the risk of weaning in the first week of life” (Ricke et al., 2005)

Genetic Predisposition

- Genetic (Han, et al 2012)
  - 149 babies with TT revision
  - Used pedigree analysis
  - Results:
    - 67% boys, 33% girls
    - Seems to follow an X-linked pattern
- Klockars 2009 - Autosomal Dominant with Variable Penetrance
- Take home message
  - If your dyad has a family history of TT or ULT, that should be a strong consideration if problems arise

The Challenge

- Lactation consultants: When will your interventions no longer suffice?
- MD/DO/NP/Midwife: Is there a motive for avoiding intervention? What are you going to do to make breastfeeding better?
- Chiro/CST: Is your treatment regimen going to result in a sustainable improvement or is it temporary?
- Don’t propagate myths

Moms are often told…

- “It’s normal to have pain/bleeding/cracking.”
- “You need time for your nipples to toughen up.”
- “Baby is just getting tired/baby is a lazy eater”
- “You’re not making enough milk”
- “She just has a small tongue”
- “Tongue tie doesn’t cause problems with breastfeeding”
- “Your nipples are too big” or “baby’s mouth is too small”
- “Your baby can’t be tongue tied b/c they can stick out their tongue”
- “Your baby is gaining weight, so there’s nothing more to worry about”
- “The frenulum will stretch over time”
- “One day, your child will fall and rip the upper lip tie and it’ll take care of itself”
**“Here’s a nipple shield”**

- Decreased stimulation = decreased supply
- Inconvenient
- Risk of latch refusal once mom tries to get off the shield
- If a patient needed oxygen, but we never found out why, would it be ok to just say “keep using oxygen”? 
- Best use: Getting a mom to “hang on” until a real treatment is available

**“Just Pump - Your Milk Still Gets In”**

- Rarely sustainable
  - Remember, the goal is to nurse as long as possible
- Decreased milk supply
- Horribly inconvenient
  - can add hours to each day for just pumping
- Loss of emotional experience
- Facial developmental changes

**Oral Evaluation**

- No two ties look/function the same
- External
- Lip
- Lingual frenulum
- Shape
- Elevation
- Side-to-side
- Extension
- Palate
- Around gumline
- Sucking evaluation

**Evaluation - External**

- Recessed jaw
- Cheek fat pad atrophy
- Facial asymmetry
- Torticollis
- Compensation blisters?
  - When vacuum is poor, will use lips/gums/teeth to hold breast in their mouth
Evaluation - Lip

• Highly associated with tongue tie

• NORMAL
  – Flanges out easily
  – Gumline doesn’t blanch
  – Babies often don’t react

• RESTRICTION
  – Gumline blanches
  – Babies fight peeking underneath
  – Difficulty flanging

Evaluation – Lingual Frenulum

• NORMAL
  – Flexible
  – No blanching

• RESTRICTION
  – Blanching when crying
  – Guitar string - tight
  – When pressed, does it change the shape of the tongue? Make a contact
  – May be very thick

  • Anterior ties usually have a posterior behind them
  • Best to examine from above, far away from you

Evaluation - Elevation

• The most important function of the tongue during breastfeeding
  – sticking out tongue irrelevant

• Easier to evaluate when crying

• NORMAL
  – Should be able to elevate towards palate

• RESTRICTION
  – Bowl shape
  – Severe cases – tongue looks flat

Sucking Evaluation

• May vary before, during and after feeds
• Must put your finger in baby’s mouth

• NORMAL
  – Motion should be fluid
  – Sides of tongue should “hug” finger

• RESTRICTION
  – Strings chewing
  – Gagging often
  – Can feel lower alveolar ridge constantly or often
  – Posterior bunching (impacts vacuum)
  – Tongue thrusting
  – Poor vacuum strength/elevation - baby lets go easily when trying to take away finger or when gently pressing down on chin (may feel tongue jerk back posteriorly)
### Treatment

- **To treat or not to treat?**
  - How hard is baby compensating?
  - How much is mom compensating?
  - Up to parents to decide

- **Goal is to normalize oral structure and function**

- **No guaranteed solution**

### If parents desire no treatment – baby may learn to compensate, but will vary with each dyad

- **Supply at risk**
  - Pumping to protect
  - FTT
  - Supplementation
  - Chronic breast infections and blebs
    - Pain, antibiotics

- **Biting**
  - Risks outside of breastfeeding
  - Difficulty with solids

### TT not just a breastfeeding issue

- Reflux from aerophagia
- Other digestive issues – irregular/abnormal BMs, colic, etc.
- Sleep apnea/snoring
- Stress on parents
- Difficulty drinking from bottles
- Eating/swallowing solids

- Dental decay, diastema, rotation and crowding
- Friction on frenulum – pain
- Can hinder orofacial and throat development
- Speech difficulties
- Kissing
- Embarrassment

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**Modified Barium Swallow in a Baby with Posterior Tongue Tie**
Is There Evidence?
- The desire to practice EBM vs the desire (and need) to treat a dyad where time is of the essence
- Safety
- Avoidance of panacea

Efficacy
- What are the outcomes we’re most interested in?
  - maternal pain
  - weight gain
  - speech (older children)
  - dental development/health

- 25 patients over a 3 year period
- Participants and graders blinded
  - Frenotomy vs Sham procedure
- Frenotomy patients had significant improvement in latch and pain scores
- Limitations
  - low numbers
  - no mention of PTT

Berry et al (2012)
- Double blind, RCT (60 babies)
- Immediate results:
  - Group A (treatment) - 78% noted improvement
  - Group B (no treatment) - 47% noted improvement
  - Group B then underwent treatment
- At 1 day post-tx, 90% report improvement
- At 3 months post-tx, 92% report improvement
Buryk et al (2011)
• Single blind, RCT (58 babies)
• Treatment group vs sham group
• Subjective improvement in treatment group
• Objective improvement in treatment group (used HATLFF)

Hogan et al (2005)
• 201 babies with TT - only 88 had breastfeeding difficulty (44%)
• 57 of 88 decided to undergo frenotomy
• 29 controls (no division) followed
  – 1 baby improved
  – 28 didn’t breastfeed
• 95% frenotomy patients reported improvement

• 24 mother-baby dyads
• Milk transfer, pain, and LATCH scores pre- and post-procedure
• Ultrasound pre- and post-procedure
• All but 1 improved in all arenas
• Ultrasound shows nipple compression before and improvement after
A: Pre-frenotomy, showing nipple compression
B: Post-frenotomy, showing less nipple compression

O’Callahan et al (2013)
- 311 babies - 299 underwent lingual frenotomy
- Only 16% had a classic anterior TT
- 37% had a labial tie
- 92% of dyads exclusively breastfed
  - mean duration 14 months
- Improvement in latch quality and nipple pain
  - limitation is subjective grading by moms - bias

Treatment

- Finding a knowledgeable provider
  - Will fully release LT/TT/PTT
  - Decreases chance of revision later
  - Supportive/knowledgeable of breastfeeding – receptive to IBCLCs
  - Some prefer eval with IBCLC before referring to them
  - No general anesthesia on babies

Treatment

- Procedure risks
  - May require further revision
  - Reattachment
  - Damage to salivary gland ducts or tongue muscles
  - Bleeding
  - Infection (very, very rare)
  - Painful
Treatment

• Can breastfeed immediately after – may or may not notice improvement
  – Provides compression to help stop bleeding
  – Breastmilk is antibacterial

• 3-5 hours after – very sore
  – Tylenol
  – Herbal
    • Arnica – inflammation (has been shown to help edema)
    • Hyland’s Teething Gel – Soothing lubricant for stretches

• 24-48 hours – latch may worsen, baby may refuse
  – Keep feedings the same as before – avoid too many changes
  – Skin to skin
  – Moving while feeding
  – Feeding in a bath

Personal Experience

• Between April 2012 and April 2013, 203 babies underwent TT and ULT revision using scissors
  • 203 babies experienced bleeding
  • Directly to breast afterwards - all bleeding stopped. None needed cautery
  • No general anesthesia - just local (ULT) or topical EMLA (TT)

Scissor Revision

• What do you need?
  – Swaddle
  – Assistant
  – Grooved Director
  – Tenotomy Scissors
  – Topical numbing agent (I use EMLA)
    • Benzocaine contraindicated under age 2
    • Lidocaine with Epinephrine
  – Gauze
• Technique
  – Baby swaddled (or arms secured by parents)
  – Swab topical numbing on upper lip tie
  • After 30 seconds, can inject the lip tie with a small amount of 1% lidocaine with 1:100000 epi. Try to inject the bulk of the tie and subperiosteal
  – Wait 10 minutes for epi to vasoconstrict
  – Swab topical numbing on tongue tie

How to Manage Bleeding
• Once procedure is complete, immediately to the breast (or bottle if not breastfeeding). The compression helps with hemostasis
• Have a glass of ice cold water (with salt) with gauze soaking - use if necessary
• Afrin-soaked gauze can help
• I have never needed to use cautery or stitches
**Scissor Revision**

- **Disadvantages**
  - Bleeding can limit your visualization and force you to undercorrect
  - Because scissors have an inherent thickness to them, some tissue is always left down on the gums when revising an ULT

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**Laser Revision**

- **These lasers are typically dental lasers**
  - Xlase
  - Biolase iLase
  - Waterlase
  - CO2
- **More than just a tool**
  - Must prepare for laser safety with training and specific precautions

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**Laser Revision**

- **Differences from scissor revision**
  - No parents in the room (laser safety, liability)
  - Little to no bleeding
    - No need to inject epi-containing local anesthetic
  - Much more precise - lack of blood allows for gradual division of fibers with tissue preservation
  - Complete removal of desired tissue
  - Slightly slower process

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**Laser Revision**

- **What do you need?**
  - Swaddle
  - Assistant
  - Grooved Director
  - Topical numbing agent (I use EMLA)
  - Benzocaine contraindicated under age 2
  - Gauze
  - Laser goggles
Appropriate Wound Healing

- The wounds always look infected
- Mirrors a tonsillectomy wound

(weight: 8 days later - 7lbs, 5oz.)
- No vomiting. Completely painless, normal latch
- She's a "different baby"
Conclusions

• TT and ULT are real phenomena. This is not a fad.
• If all other interventions fail to improve breastfeeding quality, TT/ULT is a potential cause
• TT and ULT revision is safe and extremely effective