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

Breastfeeding Problems

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

Donald Winnicott MD

- 1896-1971
- English psychoanalyst and pediatrician
- "There is no such thing as a baby - there is a baby and someone"
- We must look at the dyad

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

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<th>&quot;low&quot;</th>
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<td>24.9 (3.95-0.01)</td>
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Breastfeeding Rates and PPD

- Maternal Child Health Journal, Aug 2014
- Lowest risk of PPD - moms who wanted to breastfeed who were able to breastfeed
- Highest risk of PPD - moms who wanted to breastfeed but couldn’t (2x the risk)

Stuebe, et al

- Prevalence and Risk Factors for Early, Undesired Weaning Attributed to Lactation Dysfunction (J Women’s Health, 23:5. 2014)
- 2335 moms in study
- 12% experience disrupted lactation
  - In women who experience disrupted lactation, median weaning age 1.2 months.
  - In women who don’t experience disrupted lactation, median weaning age 7.0 months
- Presence of PPD nearly doubles the risk of disrupted lactation

Financial Burden

- March, 2012
- If 90% of infants breastfed exclusively for the first 6 months, the US would save $13 billion annually
Mechanism of Breastfeeding

- Should be an active process, even in instances when mom has DALD 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

Peristalsis Theory

Mechanism of Breastfeeding

- Geddes (2008) and Elad (2014)

Tongue Function in Breastfeeding
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

Normal Labial Frenulum
Normal Lingual Frenulum

Frenulum vs Tie

- The location of attachment of the frenulum does not mean it's a tie
- Many people will see a labial frenulum that comes down low on the gumline and assume it's pathologic
- The examination is key to determining tension
- Evaluation by IBCLC is key to determining abnormal function

Breastfeeding - Transfer

- NORMAL
  - Rhythmic/fluid motion (grinding)
  - 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

Patterns of Symptoms

- Strong baby
  - Chomping
  - Determined nurser
  - Flattened nipples, vasospasm, nipple damage
  - Pain
  - Often no weight gain issues

- Weak baby
  - Pops on/off
  - Slides off breast
  - Falls asleep nursing
  - Leaks out of side of mouth
  - Poor weight gain
  - Overall poor oral muscle tone
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

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 frena will stretch or migrate upward to correct the abnormal attachment as the infant’s growth occurs.”

Dr. Lawrence Kotlow
Flinck et al (1994)

- "Oral Findings in a Group of Newborn Swedish Children" - Int’l J. of Paediatric Dentistry
- Examinations on 1021 newborns
  - Ankyloglossia in 2.5% (4:1 M:F)
  - 6.7% had class 1 or 2 lips
  - 76.7% had class 3 lips
  - 16.7% had class 4 lips

Incidence

- Research: ~1-12% of babies with tongue tie (only anterior TT)
  - Incidence is increasing (genetic, epigenetic)
  - 45,000 births in Oregon in 2013 (if you assume 4% incidence, that’s 1800 babies)
- “The presence of tongue tie triples the risk of weaning in the first week of life” (Ricke et al., 2005)

Midline defect constellation - May occur with other midline defects

- Lip tie
- Umbilical hernia
- Gastrschio
- Cleft lip/palate
- Hypoplasia
- Sacral defect
- Tight frenum or penis
- Spina bifida
- Labial adhesions
- Heart defects
- Abdominal hernia

How Do People Diagnose TT?

Genetic Predisposition

- Genetic (Han, et al 2012)
  - 149 babies with TT revision
  - Used pedigree analysis
  - Results:
    - 85% boys, 35% 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
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."

- "Best use: Getting a mom to "hang on" until a real treatment is available"
- "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"?"
- "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
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

Lip Blisters Before Nursing

Lip Blisters After Nursing
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 it retract
  - May be very thick

Anterior ties have a posterior behind them
Best to examine from above, fast 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
  - Biting/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)

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
- Every study published shows an improvement in breastfeeding following frenotomy
Efficacy

• What are the outcomes we’re most interested in?
  – maternal pain
  – weight gain
  – breastfeeding quality
  – 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

Ito (2014)
- “Does Frenotomy Improve Breastfeeding Difficulties in Infants with Ankyloglossia?”
- Pediatrics International: 2014 June 30
- Meta-analysis looking at available literature
- “The literature review supported an overall moderate quality of evidence for the effectiveness of a frenotomy for the treatment of breastfeeding difficulties in infants with ankyloglossia. No major complications from a frenotomy were reported.”

Treatment
- Finding a knowledgeable provider
  - Will fully release LT/TT/PTT
  - Decreases chance of revision later
  - Supportive/knowledgeable of breastfeeding – receptive to IBCLC
  - 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
  - Provide compression to help stop bleeding
  - Breastmilk is antibacterial

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

- 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 anesthetic - 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 1:100,000 epi. Try to inject the bulk of the tie and supraperiosteal
  - 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
  - "More frenulum can come forward"
  - Because scissors have an inherent thickness to them, some tissue is always left down on the gums when revising an ULT

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

Laser Revision

- Differences from scissor revision
  - No parents in the room (laser safety, liability)
  - Little to no bleeding
    - No need to inject ep-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
**Laser Revision**

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

**Aftercare**
Appropriate Wound Healing

The wounds always look infected
Mirrors a tonsillectomy wound

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.