Feeding Difficulties Associated with Tongue Tie

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DATE: August 31st, 2021
Introductions and Disclosures

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Both presenters are employed at OHSU in the Department of Pediatrics, working as members of the Pediatric Feeding and Swallowing Disorders Program at the Child Development and Rehabilitation Center (CDRC) in Portland, OR.

Neither presenter has any nonfinancial disclosures to discuss, however we are both receiving honorariums for today’s presentation.
Purpose

Growing conversation and longstanding professional and societal disagreement about the potential role of tongue tie, ankyloglossia, in pediatric feeding and swallowing disorders.
Feeding... It's Complicated

- Feeding is one of the only actions that requires all 8 sensory systems
- Involves coordination of 7 functions of the body
- Eating happens 4-11x/day, depending on age and stage
- Success in this activity impacts growth and development.
- Successful feeding depends on both functions of the body and success within the family environment.
CDRC Pediatric Feeding & Swallowing Disorders Clinic: Who We Are

• Medical Provider (MD, PNP)
• Speech-Language Pathologist
• Occupational Therapist
• Dietitian
• Lactation Consultant
• Behavioral Psychologist
Pediatric Feeding Disorders (PFD): ICD-10 F98.29

www.feedingmatters.org/what-is-pfd
Medical Contributions to PFD:

**GI:** GERD, constipation, diarrhea, food allergy, EoE

**Cardiorespiratory:** cardiac abnormalities (most commonly VSDs, ASDs), pulmonary hypertension, need for supplemental O2

**Neurodevelopmental Disorders:** seizures, Down Syndrome, CP, Autism, global developmental delay, intellectual disability

**Anatomical abnormalities:** cleft lip and/or palate, **tongue tie**, dental malocclusions, retracted and/or small jaw

**Other:** history of prematurity, genetic and chromosomal differences, craniofacial anomalies, orofacial trauma

Feeding Skill Contributions to PFD:

**Unsafe oral feeding - Pharyngeal function:** Choking, cardiorespiratory events during feeds, recurrent respiratory infections. Suspicion of lack of or incomplete airway protection during swallowing. Consideration of an MBSS or FEES.

**Delayed/Impaired feeding skills - Oral function:**
Unable to consume age-appropriate food or liquid textures by traditional oral meals. Often related to delayed or impaired oral motor function or structure.

**Inefficient oral feeding - Oral, sensory, and behavioral components:** prolonged meal time, food refusal, and/or inadequate intake. Oral, pharyngeal, digestive, sensory and behavioral factors to be considered.
Nutritional Contributions to PFD:

Limited quality, quantity and variety of food intake that results in:

- Slow Growth or Malnutrition
- Overnutrition
- Vitamin or mineral deficiency or toxicity
- Dehydration, constipation
Psychosocial Contributions to PFD:

Mental and Behavioral Health Differences:

• Development delay, dysregulated temperament, or anxiety leads to disruptive feeding.
• Caregiver stress or mental health impacts their ability to remain calm, to feed the child appropriately, and note hunger/satiety cues.
• Disruption of the caregiver-feeder relationship can result from feeding challenges and stress.
Controversy

• Tendency of medical providers to oversimplify tongue’s role in feeding problems
• MULTIFACTORIAL issue
• Disagreement in diagnostic process
• Not all medical providers perform a thorough physical exam or take an early feeding history
Mechanics of Breastfeeding

- https://www.youtube.com/watch?v=XZae0tz8RPE
How sucking works

• Mechanics of Sucking
  – System of Tubes (oral cavity, pharynx and esophagus), Pumps (jaw, tongue, hyoid), and Valves (lips, velum, glottis, UES/LES)
  – Pressures are needed in the system to express, transfer and swallow
  – Not simply "peristalsis" or "stripping" of the nipple with the tongue
  – Instead VACUUM generation
Function of the Tongue

• Assisting with sealing oral cavity anteriorly and posteriorly
  – Anterior: tongue on floor of mouth
  – Posterior: Contact with palate (sometimes via nipple) and posterior, superior pharyngeal wall for suction and swallowing

• Changes configuration to compress nipple and increase volume of oral cavity for suction

• Bolus formation

• Initiation of pharyngeal SWALLOW response
Infant Assessment

- Overall state of regulation, including posture and positioning
- Respiratory status and quality of voice/cry
- Exam of oral peripheral mechanism
- Exam of non-nutritive sucking
- Direct observation of nutritive suck/swallow/breathe (through breast and/or bottle feeding)
- Spoon feeding and soft solids if appropriate
- Estimate of global developmental status
- Review of family system and mealtime practices
- Assessment of growth trends and nutritional status
Interview Questions

• Chief complaints specific to the areas of feeding, swallowing, growing
• Review of all systems: including:
  – Birth history
  – Respiratory
  – Cardio
  – Neuro
  – GI
  – Sleep
  – Skin
• Overall development
• Social situation and family support
• Inquire about past and current services: lactation, PCP, chiro, craniosacral
Interview Questions (continued)

• Early Feeding History:
  – success with breast/bottle feeding
  – bottles, nipples, and formulas tried
  – quality of latch (oral containment)
  – duration of feeds
  – frequency of feeds
  – maternal milk supply / pumping history
  – ability to use pacifier
  – maternal nipple damage/pain, history of sucking blisters/cracked nipples
  – history of mastitis and thrush
  – infant weight trends
Oral Motor Exam

• Importance of exam technique
• Ok for baby to cry
• Positioning and focusing on range of motion and FUNCTION
• Ghaheri Tips: Don’t focus on protrusion of the tongue tip. Instead focus on mid tongue elevation (and ability and ease to get mid tongue to palate)
• (link to video)
Video of Oral Motor Exam here
Oral Motor Exam

- Face, Ears, and Nose
  - Tone, asymmetries, spacing of eyes,
  - Shape and position of ears, ability to breathe through nose
- Mouth
  - Size/shape/strength/excursion of jaw (take specific note of retro/micrognathia), lip flare
  - Dental status and condition - including shape of teeth
  - Size/shape/tone/strength/range of motion of tongue, labial and lingual frenulum connections
  - Size/shape and movement of palate
  - Observation of tonsils
  - Presence and viscosity of saliva, evidence of thrush
  - Gag reflex, rooting reflex, bite reflex
What is a frenulum?

• Definition and discussion of frenulum vs “tie”
  – Frenulums are imperative for connecting structures together!
  – "Tie" = a restriction in movement and function
  – Location of frenulum does not always mean that it is a "tie"
  – Focus on TENSION

• Anterior vs Posterior
  – ANTERIOR: at or close to tip of tongue; sometimes heart shaped/dimpling, fairly obvious and agreed on, possibly of speech/dental implications
  – POSTERIOR: should be thought of as SUBMUCOSAL, difficult to see, appears thicker and is FEELS restrictive on exam/elevation

• Kotlow diagnostic categories
  – Classifies ties into 4 categories based on the distance from tongue tip to the attachment of the frenulum
Upper Lip Tie

- unable to flare the upper lip to the nares
Tongue Tie Classification

*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 (*1LK) Posterior area which may not be obvious and only palpable. Some are submucosally located

**Lactation consultants diagnostic criteria
**Class 1 Tongue Tie- (anterior)**

- attachment of the frenulum to the tip of the tongue
- classic heart-shaped tongue, dimpling
- easiest to diagnose
Class 2 Tongue Tie - (anterior)

- attachment is 2-4 mm behind the tip of the tongue
- heart-shaped tongue is not evident but the tie is clearly seen
Class 3 Tongue Tie - (posterior)

- attachment is mid-tongue/middle of the floor of mouth
- thin membrane of frenulum still visible and present
Class 4 Tongue Tie- (posterior)

- attachment is against base of tongue, thick and inelastic
- submucosal
- no obvious membrane present/visible
- tissue tends to be THICKER
- front and side of tongue elevate but mid-tongue cannot
- most commonly missed
Referral Stated: “Feeding difficulty not related to tongue tie.”

- 3 month old boy, early feeding notable for maternal breast feeding pain, frequent/continuous grazing at the breast, small volume bottle feeds, reflux/gassiness, and growth concerns
Possible Feeding Presentations of Restricted Frenlums/"Ties":

-Premise: “The ability of a baby to compensate for tethered tissue doesn’t justify inaction. These compensations cause negative downstream effects...” (Ghaheri)

- **Lip**: small/narrow mouth opening, poor splay, shallow latch, anterior loss/spillage, air swallowing, sliding off the nipple

- **Tongue**: poor suction, poor latch, exaggerated cheek retractions, wide jaw excursions, compression style suck, lingual palatal clicking, frequent pauses/fatigue, poor feeding endurance, small volume feeds/grazing

- **Both Lip and Tongue**: sucking blisters, maternal pain/discomfort, cracked/bleeding/blanched nipples, low milk supply, poor weight gain
# Clinical Observations of Feeding Difficulties

**BREAST:**
- Maternal nipple damage and pain
- Poor latch
- Frequently pulling off the breast
- Poor feeding durations and frequent feeds
- Wide jaw excursions with weak/poor labial seal
  - Loss or spillage of milk
  - Air swallowing
- Dwindling maternal milk supply
- Recurrent mastitis
- Declining growth trends

**BOTTLE:**
- Reports of failed breastfeeding and multiple bottles/nipples tried
- Tongue rolled to stabilize nipple (may see rolled tongue at corners of mouth)
- Pulling off or slipping off nipple frequently
  - Unable to maintain latch/seal
- Fatigue- frequent breaks, poor feeding durations, grazing style- low volumes, frequent feeds
- Failing or declining growth trends
  - Particular focus at 3-4 months transition
- Poor weight gain
- Difficulty with pacifier maintenance and use
- Oral/lingual “clicking” while feeding
Common Misconceptions

• Bleeding cracked nipples are NOT normal
• Nipples should not require an extended time to "toughen up"
• Baby’s are not inherently tired or lazy
• Weight is not necessarily an indicator of feeding success
• Nipple shields are NOT the answer
Goal of Treatment/Release

• Improved quality of feeding
  – Reduce psychosocial stress and the development/continuation of feeding aversion
  – Reduce maternal pain
• Improved growth

• CONSIDERATIONS IN OPTING FOR NO RELEASE:
  – Neurological/genetic/chromosomal differences
  – Retro/micrognathia (= retracted and/or small mandible/lower jaw)
  – Presence of oral aversion
  – Infant (and paternal) temperament
  – Trending growth and timing of assessment
  – Concern for the need for anesthesia/OR release
Treatment Options

- Knowledgeable provider - likely ENT, dentist, or PCP (with specialty training/experience)
- Scissors
  - Disadvantage - age, OR requirements, blood occluding visual field
- Laser
  - Little to no bleeding, no sedation/OR, more precise
  - No sutures
  - No published studies (yet) demonstrating superiority of one tx over the other
- No Release
  - If anterior - could results in speech difficulties and/or poor dental hygiene/frequent dental caries in future
  - Suspected association with GERD as well
  - Difficulty with progression to complimentary solid foods!
  - Continued slow growth

- FEEDING THERAPY & IBCLC or RDN support could be still be needed in all scenarios!
Case Study

• LJ referred to Feeding Clinic after a hospital admission for FTT @ 9 months of age. Experienced BF mom. He came to clinic with Mom, Dad and 4 siblings with NG feeding. Medical team had discouraged further breast feeding.

• We will talk through the case noting age and recommended interventions. What went well and what was challenging for this dyad.
<table>
<thead>
<tr>
<th>Age</th>
<th>Provider</th>
<th>Problem/Diagnosis</th>
<th>Intervention or Noteworthy data</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 weeks</td>
<td>PCP</td>
<td>none</td>
<td></td>
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<tr>
<td>6 months</td>
<td>PCP</td>
<td>Failure to thrive</td>
<td>Unimmunized RDN consulted</td>
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<tr>
<td></td>
<td></td>
<td>Missed well child visits</td>
<td></td>
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<tr>
<td>7 months</td>
<td>PCP and RDN</td>
<td>Failure to thrive</td>
<td>Supplementation with formula after nursing suggested High calorie complimentary foods</td>
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<tr>
<td></td>
<td></td>
<td>Malnutrition</td>
<td></td>
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<tr>
<td>9 months</td>
<td>Hospital</td>
<td>Failure to thrive</td>
<td>Nasogastric tube feeding with cessation of breast feeding recommendation</td>
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<tr>
<td></td>
<td>Admission for FTT</td>
<td>Feeding/Bottle Aversion</td>
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<tr>
<td></td>
<td>SLP and RDN team consulted. IBCLC not consulted</td>
<td></td>
<td>Mom continues to pump to maintain supply Child protective service-report of medical neglect Feeding Clinic consulted at hospital discharge</td>
</tr>
<tr>
<td>9.5 months</td>
<td>Feeding Team-MD, SLP, RDN/IBCLC</td>
<td>Feeding aversion Tube fed infant Ankyloglossia Improved maternal breast milk supply</td>
<td>oral defensiveness/oral dysphagia low volume eater, tentative/slow acceptance of complimentary foods with frequent gagging 120 ml transfer of breast milk with nursing Feeding tube discontinued High family stress- secondary to child protective service call</td>
</tr>
<tr>
<td>9.6 months</td>
<td>Feeding Team-RDN/IBCLC</td>
<td>Weight check after tube removal</td>
<td>Referred to ENT for possible tongue tie release</td>
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<tr>
<td>12 months</td>
<td>ENT</td>
<td>Frenectomy with laser</td>
<td></td>
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<tr>
<td>13 months</td>
<td>Feeding Team- MD, SLP, RDN/IBCLC</td>
<td>Slow growth Low volume eating Less gagging noted</td>
<td>Aftercare stretches challenging Infant driven feeding and meal time/breast feeding scheduling CPS case closed</td>
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<tr>
<td>15 months</td>
<td>Feeding Team – RDN, SLP</td>
<td>Eating well with out gagging, showing typical interest Breast feeding frequency appropriate Accepting open cup Slow growth</td>
<td>High calorie foods reviewed Follow up as needed</td>
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</tbody>
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Late feeding challenges

• Grazing pattern of feeding - small or short frequent feedings well past 6 months of age
• Slow growth, oral defensiveness, gagging or vomiting around the time of complimentary food introduction.
• Parent report of low appetite drive
Take Away Points

• Early assessment of oral structures and function matters

• Lack of release or LATE release will certainly impact maternal milk supply
  – Particularly after 4 months of age when feeding/sucking becomes more volitional and anatomical lengthening and widening of oral structures (and loss of sucking pads) require more skill and coordination

• A breast-feeding pattern of small frequent feeds that persist well past the 4 to 6 month mark with slow growth or FTT should trigger a careful oral exam

• Infants with ankyloglossia identified but not released should be followed closely. Poor growth or difficulty with progression to complimentary foods warrants further evaluation with a physician/dentist and/or feeding expert experienced with release
Time for Q&A....
Contact Us!

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• CDRC Feeding and Swallowing Program: 503-494-8086
References

- Functional Infant Anatomy and Physiology Associated with Breastfeeding, Jones and Barlett Learning, Chapter 3