Feeding Difficulties Associated with Tongue Tie

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Introductions and Disclosures

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April Mitsch, MS, RDN, IBCLC- Registered Dietitian, Certified Lactation Consultant, and Assistant Professor.

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.

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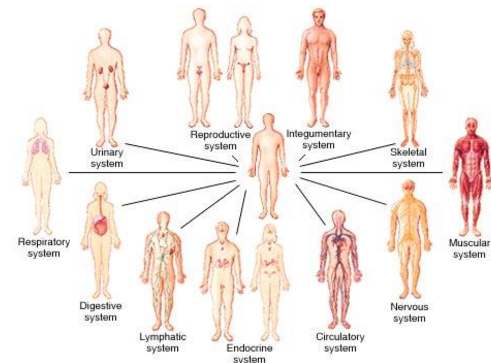
Purpose

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

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Pediatric Feeding Disorders (PFD): ICD-10 F98.29

www.feedingmatters.org/what-is-pfd

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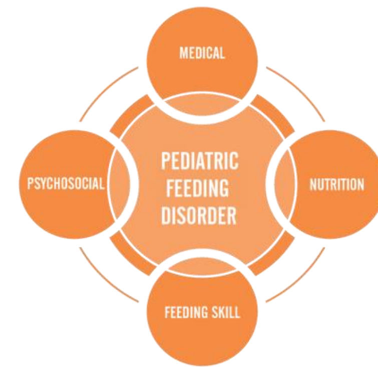
Medical Contributions to PFD:



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

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

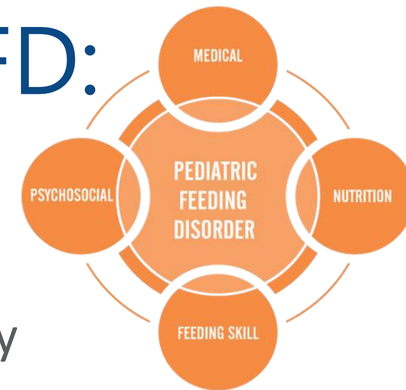
Neurodevelopmental Disorders: seizures, Down Syndrome, CP, Autism, global developmental delay, intellectual disability

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

Goday PS, et al. Pediatric Disorder: Consensus Definition and Conceptual Framework. JPGN 2019;68(1):124-129.

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

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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.

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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 a early feeding history

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Mechanics of Breastfeeding

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

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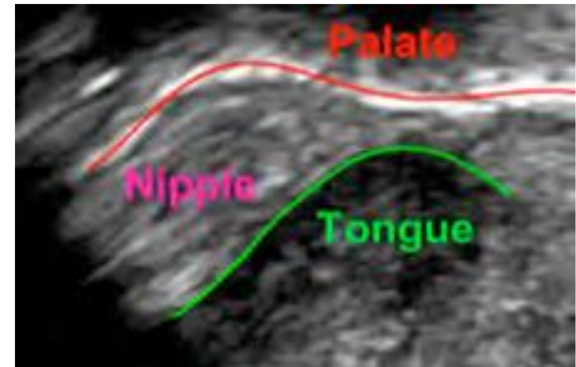
How sucking works



- 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

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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

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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

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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

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Oral Motor Exam

- Face, Ears, and Nose
  - Tone, asymmetries, spacing of eyes,
  - Shape and position of ears, ability to breath 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

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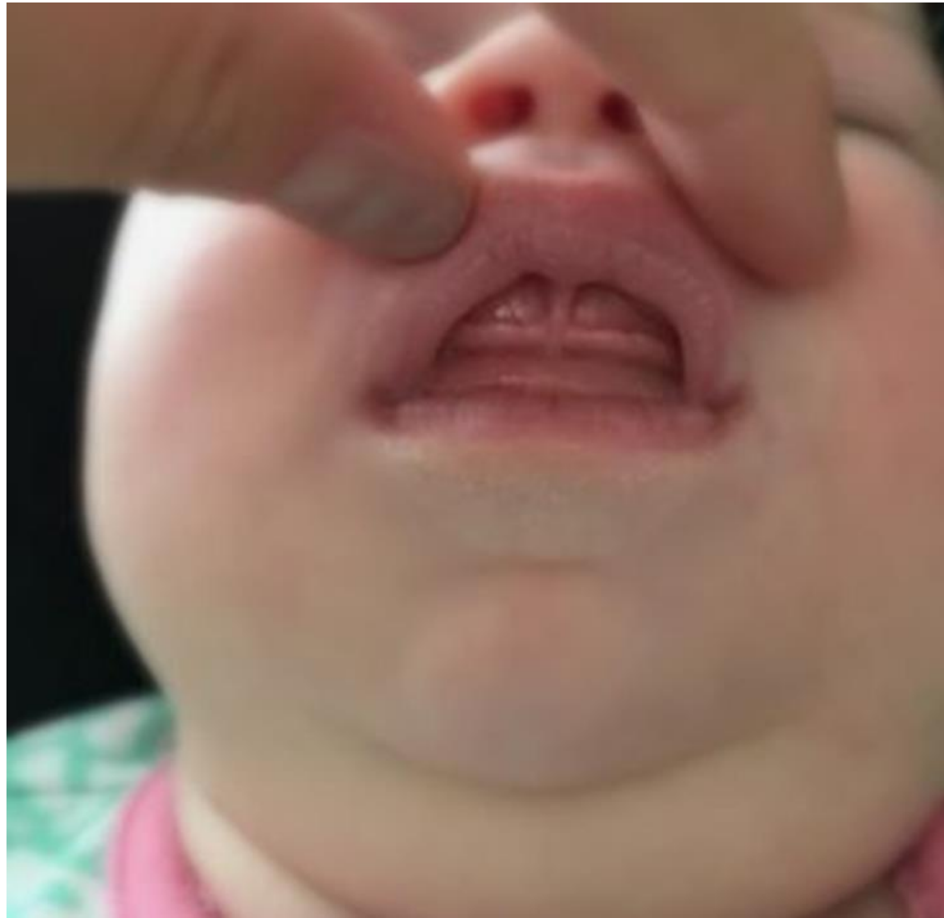
Upper Lip Tie

- unable to flare the upper lip to the nares



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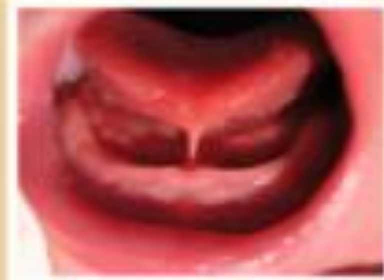
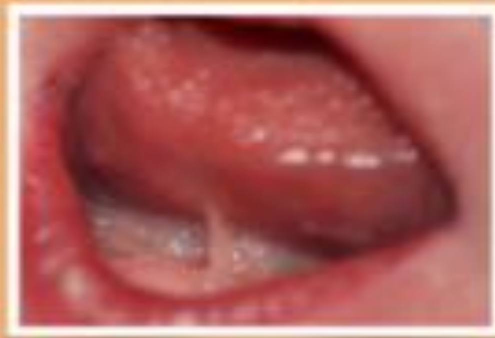
Tongue Tie Classification

*Kotlow Diagnostic criteria (one) for clinically apparent tongue-ties in infants

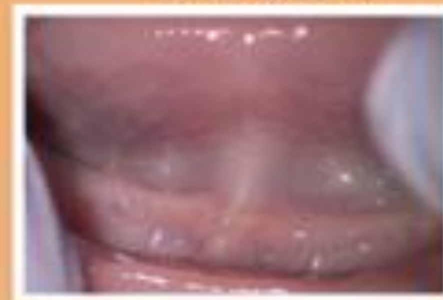


**Type I(*4LK) -total tip involvement

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 (*ILK) Posterior area which may not be obvious and only palpable, Some are submucosally located

**Lactation consultants diagnostic criteria

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Class 1 Tongue Tie- (anterior)

- attachment of the frenulum to the tip of the tongue
- classic heart-shaped tongue, dimpling
- easiest to diagnose

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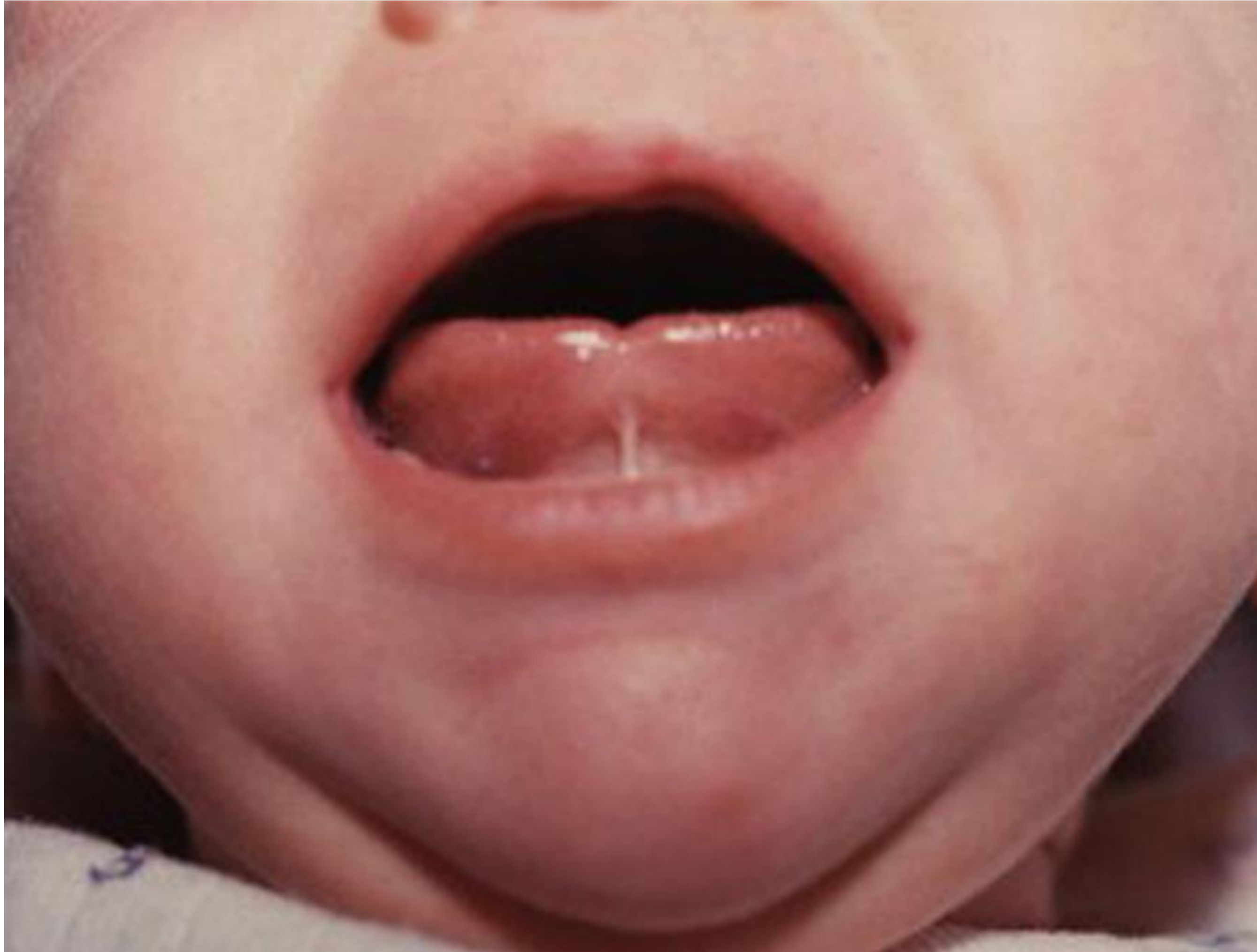
Class 2 Tongue Tie- (anterior)

- attachment is 2-4 mm behind the tip of the tongue
- heart-shaped tongue is not evident but the tie is clearly seen



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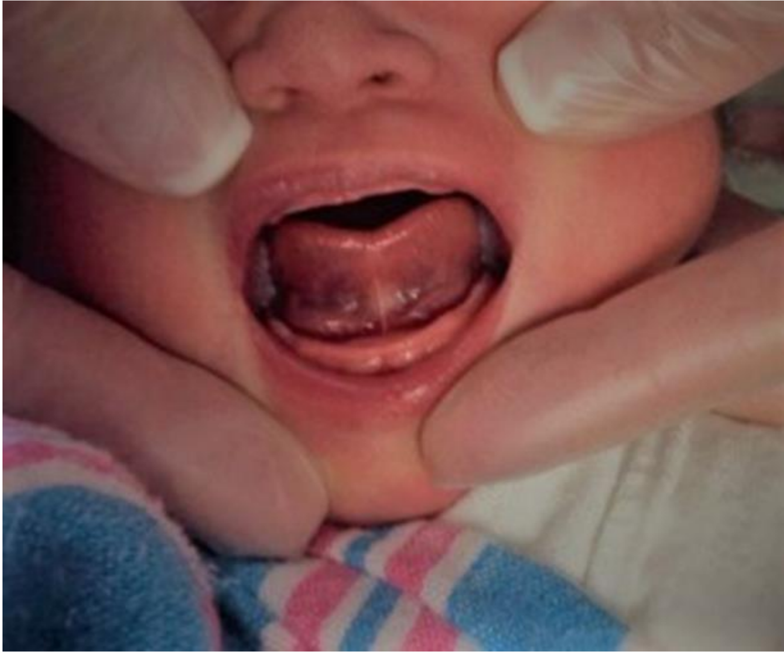
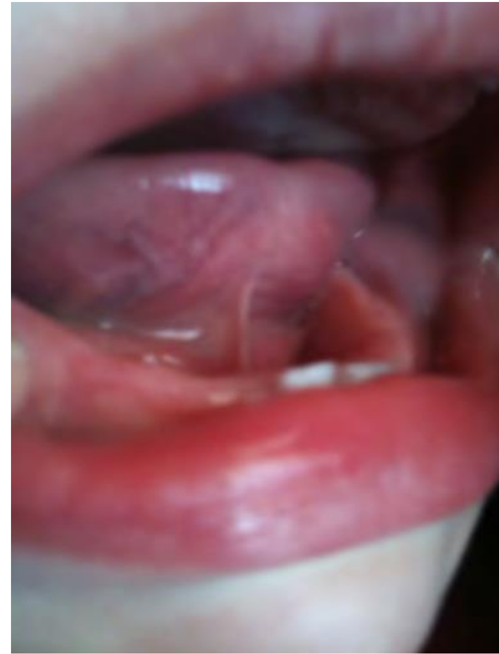
Class 3 Tongue Tie- (posterior)

- attachment is mid-tongue/middle of the floor of mouth
- thin membrane of frenulum still visible and present





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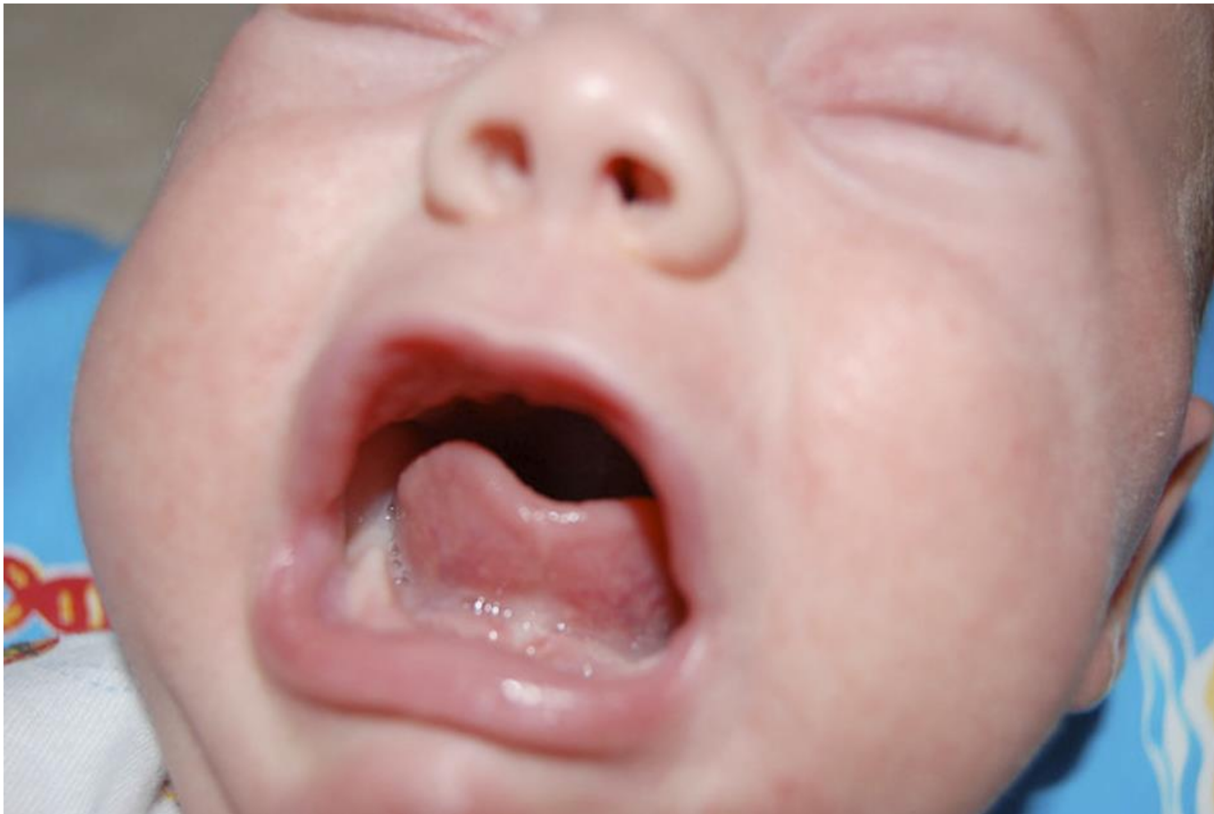
Class 4 Tongue Tie- (posterior)

- 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



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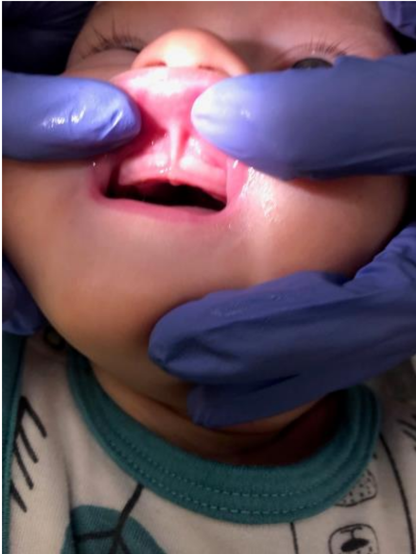
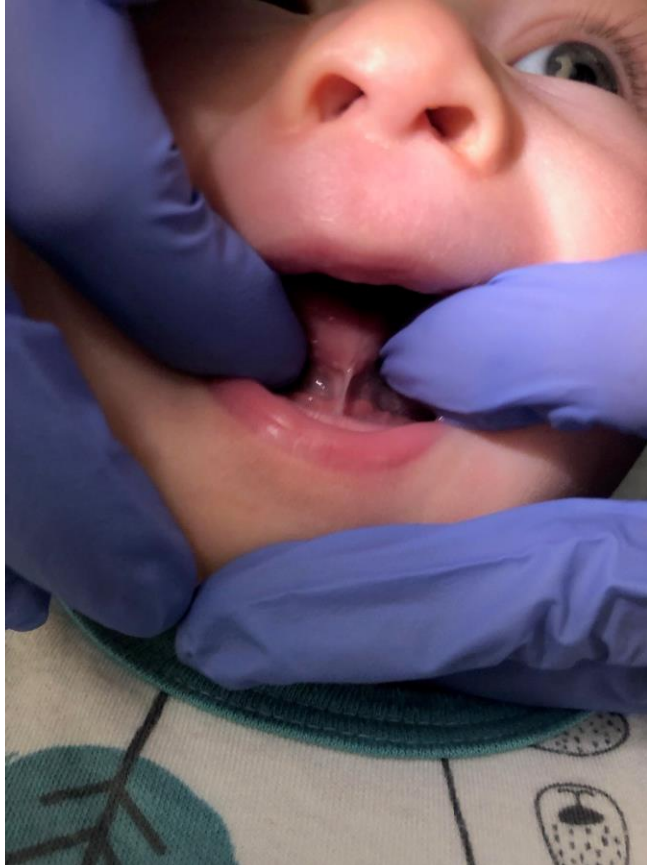
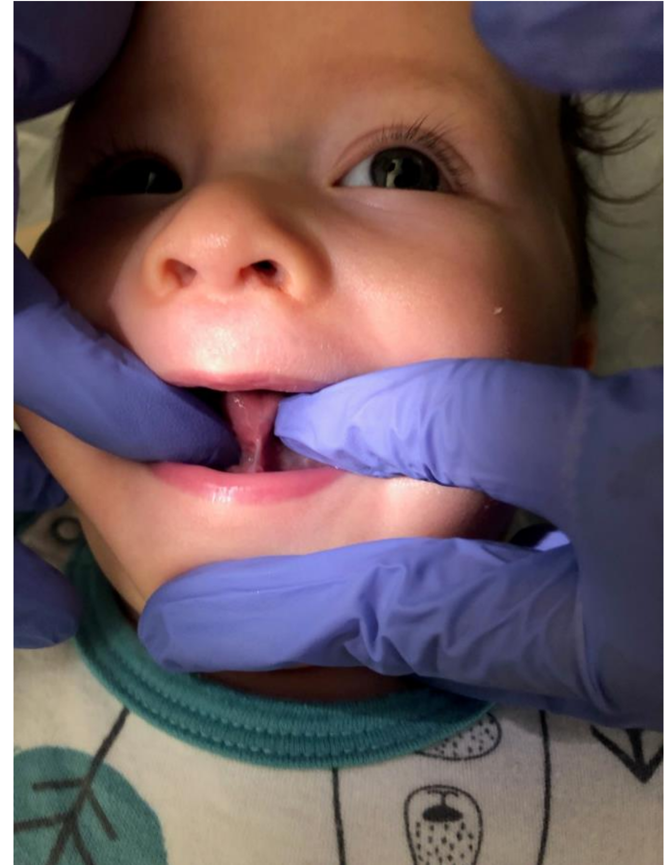
Referral Stated: “Feeding difficulty not related to tongue tie.”

- 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







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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

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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.

Term AGA newborn, P5G5- experienced breast- feeding Mom.			
Age	Provider	Problem/Diagnosis	Intervention or Noteworthy data
2 weeks	PCP	none	
6 months	PCP	Failure to thrive Missed well child visits	Unimmunized RDN consultated
7 months	PCP and RDN	Failure to thrive Malnutrition	Supplementation with formula after nursing suggested High calorie complimentary foods
9 months	Hospital Admission for FTT SLP and RDN team consulted. IBCLC not consulted	Failure to thrive Feeding/Bottle Aversion	Nasogastric tube feeding with cessation of breast feeding recommended Mom continues to pump to maintain supply Child protective service- report of medical neglect Feeding Clinic consulted at hospital discharge

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9.5 months	**Feeding Team- MD, SLP, RDN/IBCLC**	**Feeding aversion** **Tube fed infant** **Ankyloglossia** **Improved maternal breast milk supply**	**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**
9.6 months	Feeding Team- RDN/IBCLC	Weight check after tube removal	Referred to ENT for possible tongue tie release
12 months	ENT	Frenectomy with laser	

13 months	Feeding Team- MD, SLP, RDN/IBCLC	Slow growth Low volume eating Less gagging noted	Aftercare stretches challenging Infant driven feeding and meal time/breast feeding scheduling CPS case closed
15 months	Feeding Team – RDN, SLP	Eating well with out gagging, showing typical interest Breast feeding frequency appropriate Accepting open cup Slow growth	High calorie foods reviewed Follow up as needed

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Weight (kg)

12
11
10
9
8
7
6
5
4
3
2
1
0

0 2 4 6 8 10 12 14 16

Age (months)

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….

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Contact Us!

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- April Mitsch- mitsch@ohsu.edu
- CDRC Feeding and Swallowing Program: 503-494-8086

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Thank You