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Tongues that Bind:

Tongue and Lip Ties

Cosette Audirac, MSPAS/MPH, PAC



Speaker Disclosure

None

Course Objectives

- Discuss the issues and controversies related to diagnosis, impact and surgical release of tongue and lip tie.
- Review 2019 Ankyloglossia Clinical Consensus Statement for ankyloglossia diagnosis, indications and benefits of lip and tongue frenotomy (CCS#)
- Participants should be able to identify appropriate recommendations or referrals for ENT intervention if needed.

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What is ankyloglossia?

How do you define it?

Definitions

- Ankyloglossia is a “condition of limited tongue mobility caused by a restrictive lingual frenulum” (CCS#4)

> “A congenital oral anomaly that may **decrease the mobility of the tongue tip** and is **caused by an unusually short, thick lingual frenulum**, a membrane connecting the underside of the tongue to the floor of the mouth. Ankyloglossia varies in degree of severity from mild cases characterized by mucous membrane bands to complete ankyloglossia whereby the tongue is tethered to the floor of the mouth.” WikipediA

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Trends

- Between 1997 and 2012 the number of frenotomies performed in the US increased 10-fold.
- Between 2012-2016 ankyloglossia diagnosis saw a 110.4% increase.
- Frequency of frenotomy procedures have doubled in the last 20 years.

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Why the rise?

Joint

for Disease
and Prevention

Nutrition

Nutrition Home

Recommendations and Benefits

Breastfeeding

The U.S. Dietary Guidelines for Americans [PDF-30.6MB] recommend that infants be exclusively breastfed for about the first 6 months, and then continuing breastfeeding while introducing appropriate complementary foods until your child is 12 months old or older. The American Academy of Pediatrics and the World Health Organization also recommend exclusive breastfeeding for about the first 6 months, with continued breastfeeding along with introducing appropriate complementary foods for up to 2 years of age or longer.

Vitamins & Minerals

Breastfed babies need additional vitamin D and may need additional iron. Although breast milk is an excellent source of the nutrition your baby needs, he or she will need to get extra vitamin D (beginning at birth) and possibly iron from supplements. Learn more at Vitamins & Minerals.

Benefits

Breastfeeding is good for both you and your baby. Breast milk is the best source of nutrition for most babies. As your baby grows, your breast milk will change to meet his or her nutritional needs. Breastfeeding can also help protect you and your baby against some short- and long-term illnesses and diseases.

Benefits to Baby

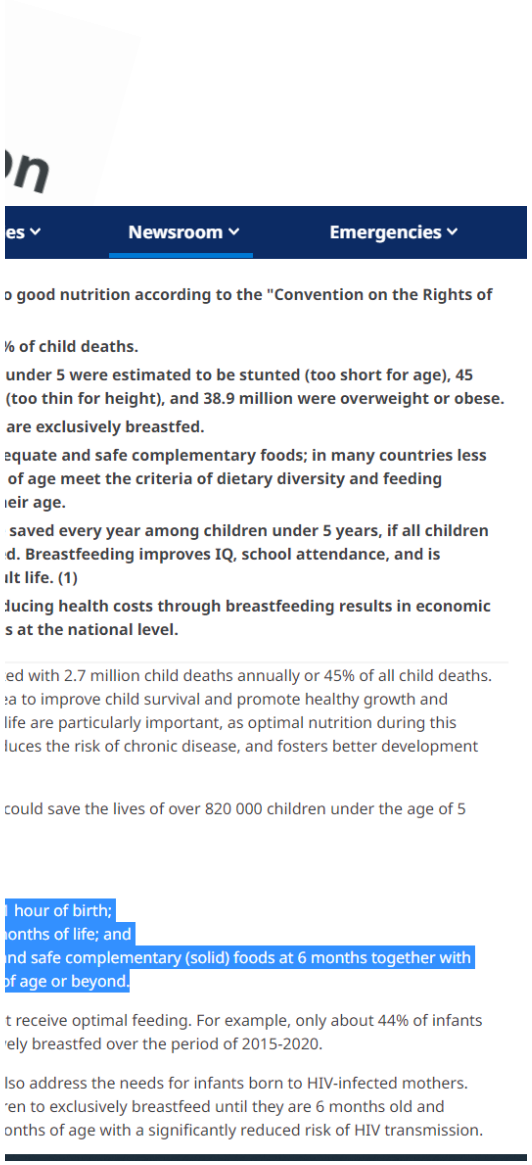
Babies who are breastfed have a lower risk of:

- Asthma.
- Obesity.
- Type 1 diabetes.
- Severe lower respiratory disease.
- Acute otitis media (ear infections).
- Sudden infant death syndrome (SIDS).
- Gastrointestinal infections (diarrhea/vomiting).
- Necrotizing enterocolitis (NEC) for preterm infants

Benefits to Mother

Mothers who breastfeed their babies have a lower risk of:

- Breast cancer.
- Ovarian cancer.
- Type 2 diabetes.
- High blood pressure.



Newsroom Emergencies

o good nutrition according to the "Convention on the Rights of

% of child deaths.

under 5 were estimated to be stunted (too short for age), 45 (too thin for height), and 38.9 million were overweight or obese.

are exclusively breastfed.

equate and safe complementary foods; in many countries less of age meet the criteria of dietary diversity and feeding eir age.

saved every year among children under 5 years, if all children d. Breastfeeding improves IQ, school attendance, and is lt life. (1)

ducing health costs through breastfeeding results in economic s at the national level.

ed with 2.7 million child deaths annually or 45% of all child deaths.
a to improve child survival and promote healthy growth and life are particularly important, as optimal nutrition during this luces the risk of chronic disease, and fosters better development

could save the lives of over 820 000 children under the age of 5

hour of birth;
onths of life; and
nd safe complementary (solid) foods at 6 months together with
f age or beyond.

t receive optimal feeding. For example, only about 44% of infants ely breastfed over the period of 2015-2020.

lso address the needs for infants born to HIV-infected mothers. en to exclusively breastfeed until they are 6 months old and onths of age with a significantly reduced risk of HIV transmission.

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Physical Exam and Diagnosis

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Describe some of the exam findings

A.

B.

C.

Maxillary Labial Frenulum

- Upper lip frenulum is a normal finding in infants CCS#15
- There is an unclear relationship between maxillary labial frenulum and breastfeeding difficulties. CCS#17c
- Upper lip frenotomy will not prevent the occurrence of an upper incisor gap. CCS#56c
- Buccal/Cheek ties should not be released. CCS#36
  - Release of these ties might worsen breastfeeding technique.

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Diagnosis is often difficult, but consider ROM

Symptoms are mostly related to tongue range of motion (ROM).

- Infants
  - limited ability for milk transfer → damaged nipples → painful breastfeeding (Mom) → reduced frequency or early cessation of breastfeeding → worst case scenario failure to thrive.
- Older Children
  - Difficulty eating, dental issues, speech articulation difficulties.

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Signs and Symptoms
Ankyloglossia

Infancy < 3 months old:

- Breastfeeding pain (mom) and difficulty (baby).

Babies and Toddlers:

- Feeding difficulty therefore difficulty gaining weight.
- Can’t keep food in mouth.
- Can’t clear food residue from cheeks or teeth -> Caries

Older Children/Teens:

- Social/mechanical issues impeding quality of life CCS#49b
- Speech restrictions/articulation difficulties.
    - Can the child produce alveolar consonants (n, l, d, t)
    - Speech therapy assessment is key!!! CCS#39

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Confounding factors
~Infants~

- Prematurity (suckle reflex 34-37 weeks)
- Cleft palate
- Trisomy 21
- Cardiac history (fatigue)
- Laryngomalacia
- Other Head and Neck sources: nasal obstruction, airway obstruction, laryngopharyngeal reflux, CF anomalies CCS#22

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Review: Ties and Swallowing

Eating and swallowing are complex behaviors involving volitional and reflexive activities of more than 30 nerves [including cranial nerves: V, VII, IX, X, XII] and muscles. Matsuo et. Al 2008

Review: Ties and Swallowing

Suck-Swallow-Breathe sequence:

1. Mouth closes over the nipple.
2. The tongue moves in and out in a suckle motion and presses the nipple against the roof of the mouth, creating pressure on the nipple.
3. As the jaw moves down, it helps create suction to pull the liquid into the mouth. The infant then must swallow the liquid, and the infant must stop breathing during each swallow and then breathe after swallowing.
4. The suck-swallow-breathe sequence then starts again.

Video 1 - Normal swallowing in infants (Normal Study) - YouTube

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Review: Ties and Speech

- Speech delay or disorder: 2.3% to 24.6% of school-aged children (the American Speech and Hearing Association)
- The anterior portion of the tongue help produce the alveolar consonants (n, l, d, t: Never, Lick, Dirty, Teeth)
- Causes of speech delay *other* than tongue tie:
  - motor speech disorder, an articulation delay, or a phonological processing delay.

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Classifying ankyloglossia and Frenotomy Complications

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Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLLF)

Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLLF)

Appearance Items	Score	Function Items	Score
1. Appearance of tongue when lifted		**1. Lateralization**	
☐ Round OR square	2	☐ Complete	2
☐ Slight cleft in tip apparent	1	☐ Body of tongue but not tongue tip	1
☐ Heart-shaped	0	☐ None	0
2. Elasticity of frenulum		**2. Lift of tongue**	
☐ Very elastic (excellent)	2	☐ Tip to mid-mouth	
☐ Moderately elastic	1	☐ Only edges to mid-mouth	
☐ Little OR no elasticity	0	☐ Tip stays at alveolar ridge or ri mouth only with jaw closure	
3. Length of lingual frenulum when tongue lifted		**3. Extension of tongue**	
☐ More than 1 cm OR embedded in tongue	2	☐ Tip over lower lip	
☐ 1 cm	1	☐ Tip over lower gum only	
☐ Less than 1 cm	0	☐ Neither of above, OR anterior humps	

4. Attachment of lingual frenulum to tongue		**4. Spread of anterior tongue**	
☐ Posterior to tip	2	☐ Complete	2
☐ At tip	1	☐ Moderate OR partial	1
☐ Notched tip	0	☐ Little OR none	0
5. Attachment of lingual frenulum to inferior alveolar ridge		**5. Cupping**	
☐ Attached to floor of mouth OR well below ridge	2	☐ Entire edge, firm cup	2
☐ Attached just below ridge	1	☐ Side edges only, moderate cup	1
☐ Attached at ridge	0	☐ Poor OR no cup	0
TOTAL APPEARANCE SCORE		**6. Peristalsis**	
		☐ Complete, anterior to posterior (originates at the tip)	2
FUNCTION ITEMS SCORE		☐ Partial: originating posterior to tip	1
		☐ None OR reverse peristalsis	0
14 Perfect score (Regardless of ***Appearance Item*** score)		7. Snapback	
		☐ None	2
11 Acceptable, if ***Appearance Item*** score is 10		☐ Periodic	1
		☐ Frequent OR with each suck	0
<11 Function impaired		TOTAL FUNCTION SCORE	

- Frenotomy should be considered if management fails.
- Frenotomy necessary if ***Appearance Item*** score is <8.

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Exam:

- **Appearance**:
  - forked tip/heart shaped tip
  - Can you see frenulum or must you palpate.
  - Long or short
  - Thin or thick
- **Protrusion**:
  - none, past the lower gums, past the lower lips
- **Elevation**:
  - can they touch superior anterior alveolar ridge (anterior 1/3 HP)
  - Can they lick upper lips
- **Rotation**:
  - Twist left and right
- ***Clicking**
  - When feeding. Loosing Latch
- ***Mid tongue elevation**

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Frenotomy, Frenectomy, Frenuloplasty….

- Office procedure vs OR
  - Performed typically in children under 3 months old.
    - Too painful of an office procedure after this age.

- Surgical Instruments:
  - Cold cut (scissors; ENT preference), cautery, electrocautery, or a laser

Complications

- Bleeding
- Infection
- Scarring
- Damage to base of tongue
- Damage salivary glands
- Burn injuries
- Larger than normal incision
- Exposure of floor of mouth muscles
- Ludwig Angina
- Reduced feeding
- OSA

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Complications from frenotomy:

- Complications are not well studied due to the varying disciplines performing frenotomy, range of technique (laser, scissors, electrocautery)
  - Midwives, PCP, LCC, Dentist, ENT

- In a systematic lit review of articles between 1965 and April 2020 by Solis-Pazmino et al. 2020, the bulk of major complications included:
  - Poor feeding
  - Hypovolemic shock
  - Apnea
  - Acute airway obstruction
  - Ludwig angina

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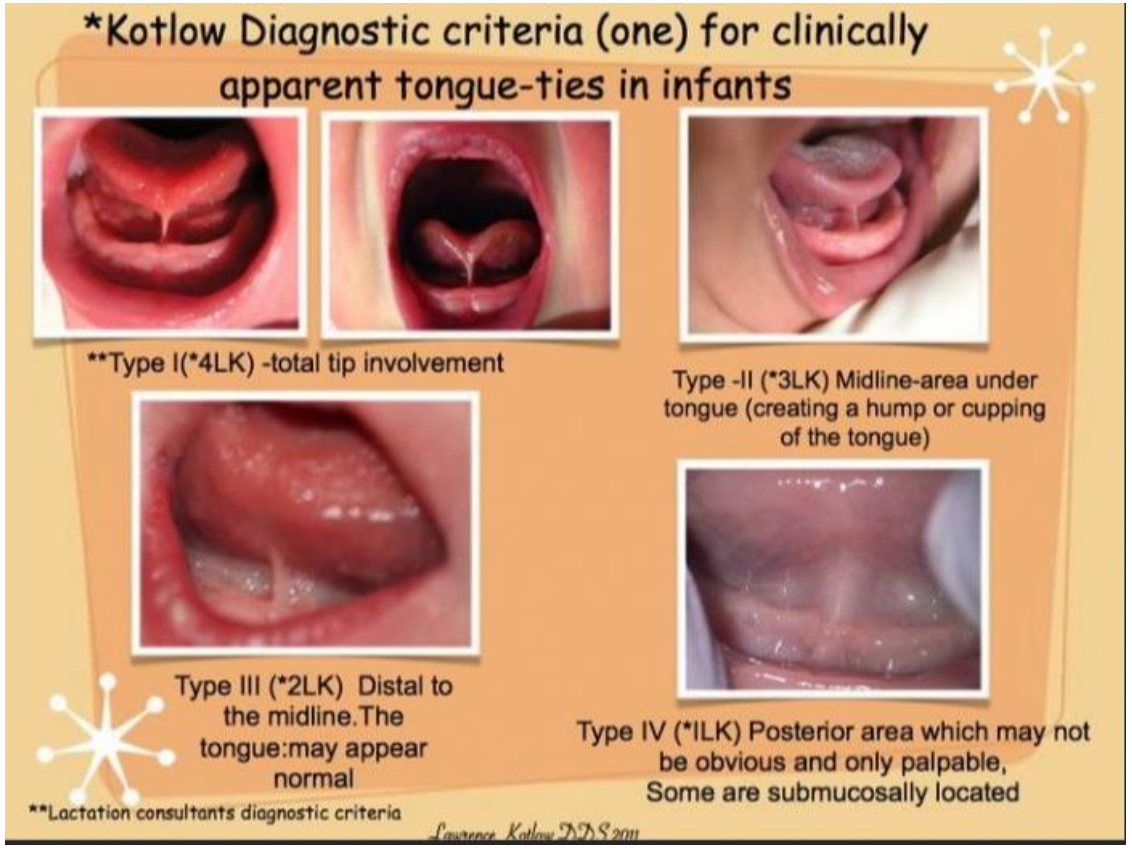
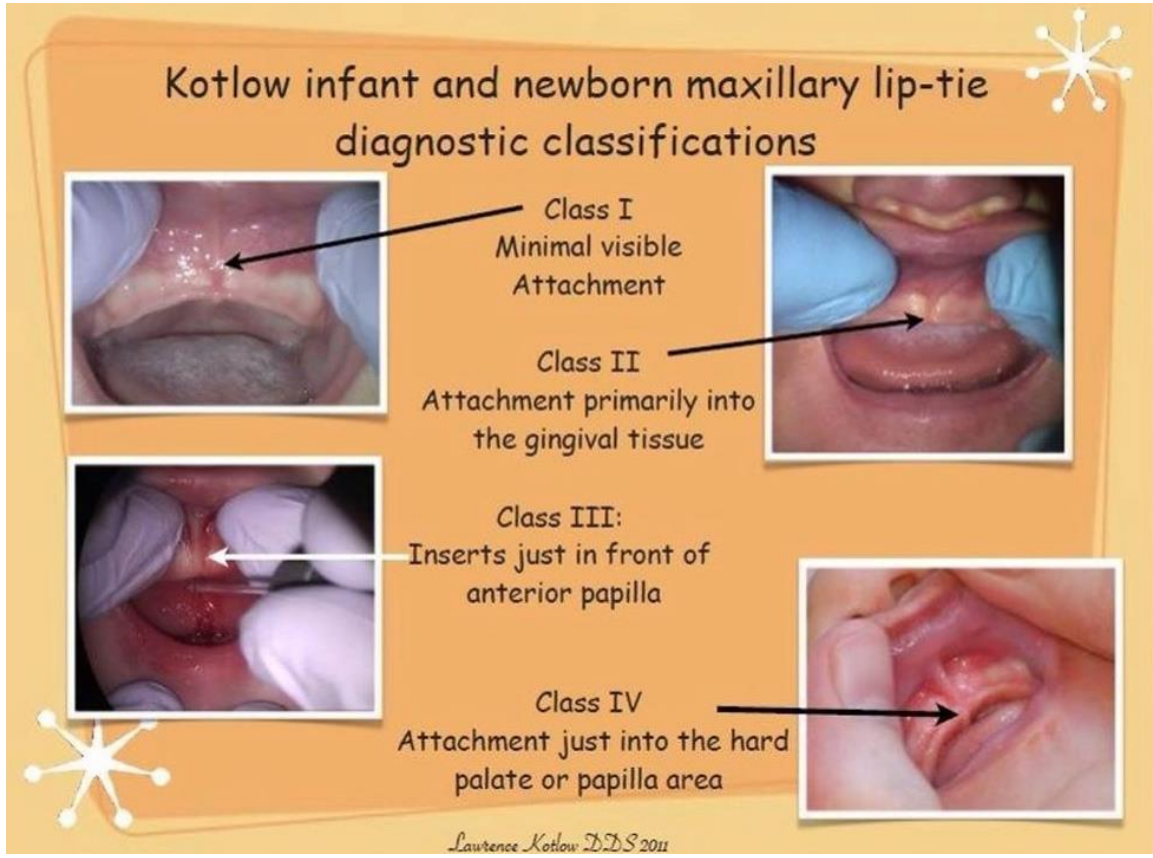
Frenotomy: A Periodontic Business





Lawrence A. Kotlow, DDS, PC | Pediatric Dentist Albany NY (kiddsteeth.com)

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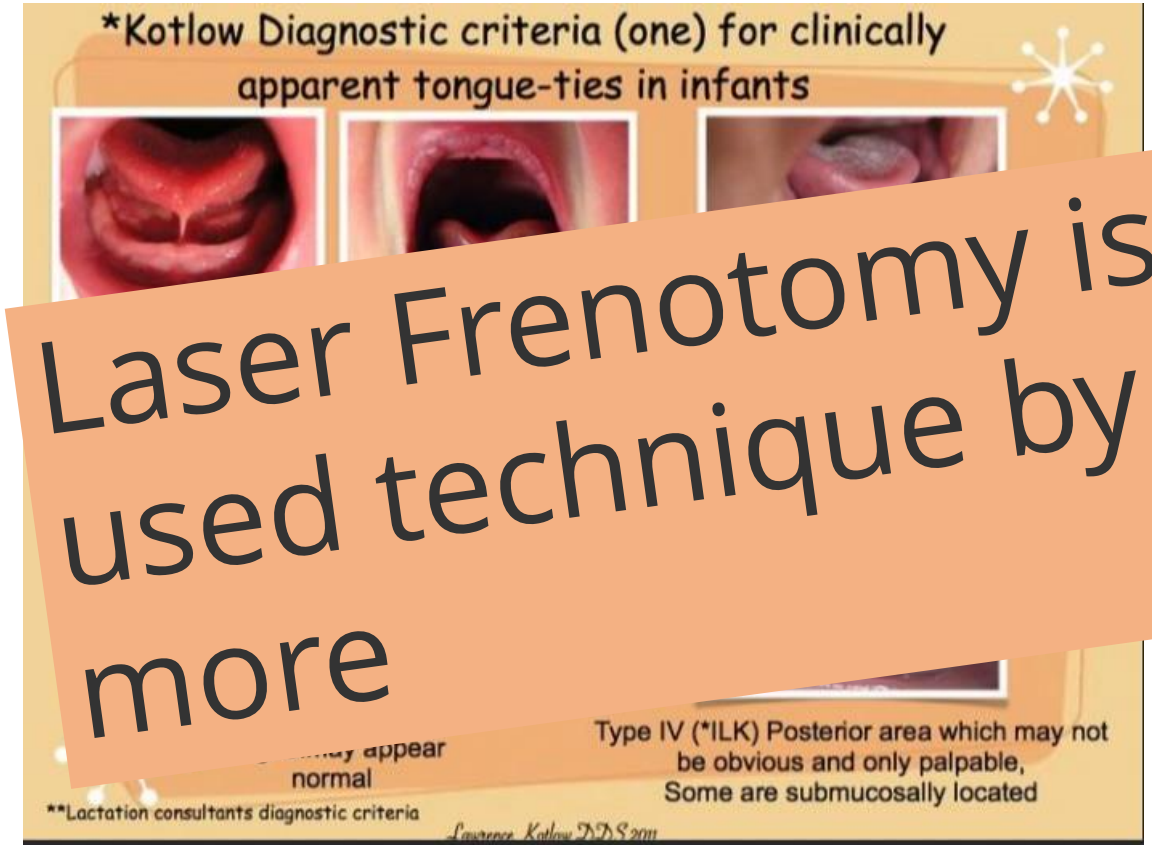
Frenotomy: A Periodontic Business



Laser Frenotomy is most commonly used technique by Dentist → $800 or more

[Lawrence A. Kotlow, DDS, PC | Pediatric Dentist Albany NY (kiddsteeth.com)]

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In summary

Tongue tie diagnosis and need for frenotomy varies by age.

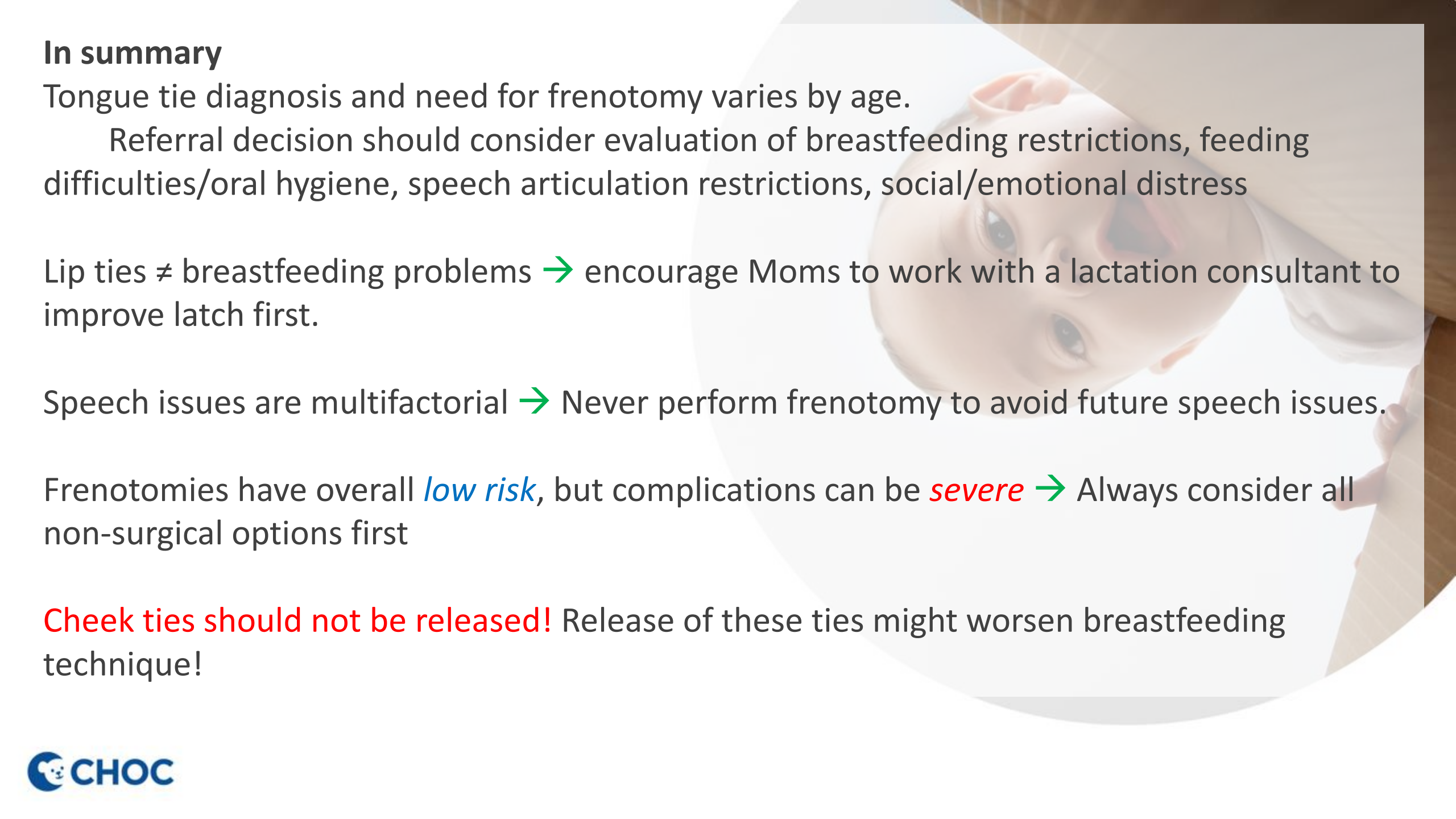
Referral decision should consider evaluation of breastfeeding restrictions, feeding difficulties/oral hygiene, speech articulation restrictions, social/emotional distress

Lip ties ≠ breastfeeding problems → encourage Moms to work with a lactation consultant to improve latch first.

Speech issues are multifactorial → Never perform frenotomy to avoid future speech issues.

Frenotomies have overall *low risk*, but complications can be *severe* → Always consider all non-surgical options first

Cheek ties should not be released! Release of these ties might worsen breastfeeding technique!



AMERICAN ACADEMY OF OTOLARYNGOLOGY–HEAD AND NECK SURGERY FOUNDATION

Invited Article

Otolaryngology–Head and Neck Surgery
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http://otojournal.org
SAGE

Clinical Consensus Statement: Ankyloglossia in Children

Anna H. Messner, MD[1], Jonathan Walsh, MD[2], Richard M. Rosenfeld, MD, MPH, MBA[3], Seth R. Schwartz, MD, MPH[4], Stacey L. Ishman, MD, MPH[5], Cristina Baldassari, MD[6], Scott E. Brietzke, MD, MPH[7], David H. Darrow, MD, DDS[6], Nira Goldstein, MD, MPH[3], Jessica Levi, MD[8], Anna K. Meyer, MD[9], Sanjay Parikh, MD[10], Jeffrey P. Simons, MD[11], Daniel L. Wohl, MD[12], Erin Lambie, MS, MPH[13], and Lisa Satterfield, MS, MPH, CCC-A[13]

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Table 1. Statements That Reached Consensus: Ankyloglossia (General).

No.	Statement	Mean	Outliers
4c	Ankyloglossia is a condition of limited tongue mobility caused by a restrictive lingual frenulum.	8.00	0
6b	In recent years, some practitioners have described ankyloglossia as being anterior or posterior.	8.18	1
6c	Those practitioners who describe ankyloglossia as being anterior or posterior typically use the term anterior ankyloglossia to refer to a lingual frenulum that extends to the tip of the tongue or near the tip of the tongue that restricts tongue mobility.	7.45	1
2b	In some communities, infants and children are being over-diagnosed with ankyloglossia.	8.09	0
3b	In some communities, a significant number of children are having unnecessary surgery on the lingual frenulum.	7.82	0

Table 2. Statements That Reached Consensus: Buccal Tie/Ankyloglossia and Sleep Apnea.

No.	Statement	Mean	Outliers
36	Surgery to release a "buccal tie" should not be performed.	8.64	1
54	Ankyloglossia does not cause sleep apnea.	8.36	0

Table 3. Statements That Reached Consensus: Ankyloglossia and Breastfeeding.

No.	Statement	Mean	Outliers
10	Breastfeeding difficulties are common in the newborn period and evidence shows that anterior ankyloglossia is a potential contributor to infant feeding problems	7.82	1
12	Maternal pain and poor infant latch can be caused by ankyloglossia but these symptoms can also be present with other etiologies of breastfeeding difficulties	8.73	0
8	Ankyloglossia in an infant should be evaluated by a careful history (including lactation history) and physical examination, including inspection and palpation	8.85	0
19	The maternal and infant breastfeeding dyad should be recognized as a vulnerable patient population and care should be taken to ensure adequate support services, education and counselling, and shared decision making.	8.82	0
20	Infants should ideally be evaluated by a lactation consultant prior to lingual frenotomy	7.27	1

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Table 4. Statements That Reached Consensus: Frenotomy Indications and Informed Consent.

No.	Statement	Mean	Outliers
22	Before performing a frenotomy on an infant with breastfeeding difficulty, it is appropriate to evaluate the child for other potential head and neck sources of breastfeeding problems such as nasal obstruction, airway obstruction, laryngopharyngeal reflux, and craniofacial anomalies (eg cleft palate).	8.00	1
23b	Relative contraindications to infant frenotomy include, but are not limited to, retrognathia, micrognathia, neuromuscular disorder, hypotonia, and coagulopathy.	8.18	0
25	Rare complications of lingual frenotomy include hemorrhage, airway obstruction, injury to salivary structures, oral aversion, and scarring.	7.91	0
27	Informed consent for lingual frenotomy should include mention of the possibility of failure to experience improvement in breastfeeding.	8.82	0
37	Breastfeeding difficulty and maternal pain in the presence of ankyloglossia may resolve without surgical treatment.	8.18	0
28	Patients and caregivers of patients with ankyloglossia should be counselled about the non-surgical options of observation, lactation consultation, and/or speech-language pathology consultation.	8.55	0
43b	Potential benefits from lingual frenotomy in the infant with breastfeeding difficulties are relief of maternal symptoms (eg less pain) and maternal reported improvement in infant feeding	8.18	1
44	Frenotomy is not always effective in relieving maternal pain and breastfeeding difficulty.	7.91	1
38b	Maternal reported breastfeeding efficacy and nipple pain in the presence of ankyloglossia are more likely to improve with lingual frenotomy compared to no surgical treatment.	7.73	1
31/32b	Lingual frenotomy should ideally be performed as soon as possible after diagnosis of ankyloglossia in an infant with breastfeeding problems not improving with conservative management.	7.73	1
33c	It is not necessary to perform lingual frenotomy in an infant with little or no restriction in tongue mobility to prevent a future feeding disorder.	8.55	0
33d	It is not necessary to perform lingual frenotomy in an infant with little or no restriction in tongue mobility to prevent a future speech disorder.	7.91	1

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Table 5. Statements That Reached Consensus: Frenotomy Procedure.

No.	Statement	Mean	Outliers
24	Lingual frenotomy is generally a safe and well-tolerated procedure	8.00	0
30b	Topical anesthetic agents are not recommended prior to infant frenotomy.	7.82	1
30c	Injected anesthetic agents are not recommended prior to infant frenotomy.	7.82	1
30d	Oral sucrose has been shown to decrease pain response in infants undergoing procedures and can be given to an infant prior to undergoing frenotomy.	7.73	1
39	There is insufficient evidence to support claims that one technique of frenotomy, such as laser, is superior to other techniques.	8.09	1
42b	After frenotomy is performed for ankyloglossia there is no evidence to support a standard post-procedure care regimen (eg stretching, massaging, manual elevation of the tongue by the parents).	7.36	1

Table 6. Statements That Reached Consensus: Ankyloglossia in Older Children.

No.	Statement	Mean	Outliers
13b	Ankyloglossia does not typically affect speech.	7.82	1
34	A consultation with a speech pathologist is encouraged before frenotomy/frenuloplasty in an older child who is undergoing the procedure for speech concerns.	7.73	0
48b	Ankyloglossia may cause social/mechanical issues in older children (difficulty licking, difficulty keeping teeth clean, lower central incisor diastema, sense of social embarrassment)	7.55	1
49b	Some older children with social/mechanical issues related to ankyloglossia will experience improved quality of life after frenotomy/frenuloplasty.	7.91	1
14	There is no maximum age for a patient undergoing frenotomy/frenuloplasty.	7.73	1
35	There is not a preferred surgical procedure for correction of ankyloglossia in the older child.	7.55	1

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Questions???

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Contact:

Cosette Audirac / cosette.audirac@choc.org

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