fit to be tied

Cliff O’Callahan, MD, PhD, FAAP, Middlesex Hospital, Middletown, Oct 2011
• SOME IMAGES MAY BE DISTURBING.
Harry

- 3 week old with feeding problems and challenging weight gain and frustrated mother in a lot of pain when breastfeeding.
- Prior 39 wk gest born vag in hospital with healthy course apart from a little jaundice.
- Has seen the lactation consultant in the hospital and in his pediatrician’s office. Even worked with one in the community.
More about Harry

- The hospital nursery team clipped his sub-lingual frenulum on DOL 2
- He’s had 2 craniosacral sessions
- He’s barely back to birth weight
- He’s not the happiest infant on the block
Harry’s feeding characteristics

- He chomps and flicks
- He tends to get frustrated and fall off the breast despite positioning
- Feeding can go for 30-50 minutes and then he’s back to feeding again an hour or two later
- He clicks
- He sputters a bit on the bottle of EBM
Harry’s mothers story

- It hurts when Harry is feeding at breast
- Sometimes less pain with nipple shield but he still doesn’t transfer much
- Nipple skin broken down, bleb, healing crack
- Nipple “lipsticked” after feed but not blanched
- Every feed demands her full attention
- She’s exhausted and worried and not having fun
- (She secretly wonders if a scar under the tongue would be as bad as one on the forehead)
Objectives

- Review understanding of ankyloglossia and maxillary tie
- Discuss the relevance of above to breastfeeding
- Who and what is being done to address the challenges
- Share some preliminary local data
- Open discussion
Upper labial maxillary tie

- No uniform classification
- Thickness, insertion point on gingival surface, indentation at papilla, ability to flange lip back against nose
Ankyloglossia classification

- Various interpretations
  - Hazelbaker, Murphy, Kotlow, Corrylos, Fernando, Griffiths, Srinivasan, Garcia Pola, Ruffoli, Marchesan
- Generalized Type 1 to 4
- Broader anterior vs. posterior
- Diaphanous, opaque, beefy?
Ankyloglossia
anatomy vs. functionality

Murphy Classification of Newborn Tongue Ties

Description should include:
1) Distance of attachment from the tongue tip
2) Distance the tongue tip rises above the lower gingival ridge
3) Visible "sail" membrane above the mouth floor

Types 1 & 2 are "Anterior"; Types 3 & 4 are "Posterior"

Type 1 - attached from the very tip of the tongue to 4 mm from the tip with a sail; Type 1 submucosal without a sail.
Always has a complete obstruction to finger sweep.

Type 2 - attached 4-18 mm from the tongue tip with a sail; Type 2 submucosal without a sail. Usually has a complete obstruction to finger sweep but must have at least a large sized bump.

Type 3 - attached 20 mm from the tongue tip with any visible membrane above the mouth floor. Has a small or large speed bump to finger sweep.

Type 4 - attached 20 mm from the tongue tip with no visible membrane above the mouth floor, all submucosal. Has a small or large speed bump to finger sweep.

Height of tongue tip above the lower gingival ridge with crying:
Normal: Rises above the mid-mouth (midway from the upper to lower gingival ridges) with the leading edge(spathe) and level (no notch or "U" shape with crying)
Mild: Rises to the mid-mouth with minimal or no notch and minimal or no "U" shape with crying
Moderate: Rises less than to mid-mouth (3-18 mm) with moderate notch or moderate "U" shape with crying
Severe: Rises less than 5 mm and usually has a deep notch and/or deep "U" or "V" shape with crying

Murphy classification

Hazelbacher Score

<table>
<thead>
<tr>
<th>Function Item Score</th>
<th>Combined Score</th>
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<tbody>
<tr>
<td>Appearance Item Score</td>
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TREATMENT RECOMMENDATIONS BASED ON SCORING

16. Perfect function score regardless of appearance item score. Surgical treatment not recommended.
15. Acceptable function score if Appearance item score is 16.
14-11. Function Score indicates function impaired. Frequent should be considered if management fails.
10-6. Function score dependent on function impaired. Frequent necessary if Appearance item score is < 6.
Suck evaluation

- Tip to hard-soft palate junction
- (Issue of value without liquid)
- Sensing motion or pressure along finger
- Chomping, cupping, strength of neg pressure, difficulty to break seal
Incidence

- Wide variation in literature 0.2 to 10%
  - About 4%?
- Lack of universal clarity in what is being identified
- Unclear sex distribution
- Strong genetic component
Another environmentalist plot?

- **Bible** *(Moses had a late frenotomy?!)*
- **Midwife pinkie nails**
- **Much written about in 1700’s**
- **Common in USA up to 1940’s and the elevator is *still* in our circ kits**
- **Formula culture**
Embryogenic origins

Tongue cells differentiate from bottom of oral pit.

Apoptosis creates the space

Frenulum is remnant of separation process

Ankyloglossia is incomplete separation resulting in diaphanous membrane or thicker fibrous band or strands of genioglossus muscle

Figure 1. Embryology of tongue development. A. and B. Scanning electron micrographs of mouse embryo at days 10 and 12, respectively, approximately equivalent to human weeks 5 and 7. Courtesy of K. K. Sulik, all rights reserved. C. and D. Corresponding mid-sagittal anatomy. Drawn by Kelly Ledbetter, © 2010, University of Washington. E. and F. Corresponding coronal sections through the anterior tongue.
From Brian Palmer, DDS in Kansas City from his 2003 lecture
From Brian Palmer, DDS in Kansas City from his 2003 lecture
From Brian Palmer, DDS in Kansas City from his 2003 lecture. Original source not known.
Michael Woolridge, The ‘anatomy’ of infant sucking. 

From Brian Palmer, DDS in Kansas City from his 2003 lecture
Images originally from Donna Geddes, PhD
Tongue and lip as vital body parts

- Swallowing
- Creating suction
- Molding palate & nasal cavity
- Teeth orientation and stability
Future potential problems

- Clefting of the border of the tongue
- Heart shape, cupping
- Limited mobility and function of the tongue
- Dental decay
- Pulling the lower teeth towards the tongue
- Creating a gap between the lower front teeth

Orthodontics

Lawrence Kotlow DDS 2010
My Mom will be on the call.
Responses to this crisis!

- Historically
- Stick-on pinkie nail scalpels
- Head in sand and say it’ll stretch
- Find an ENT or dentist or Oral Surgeon
- Primary care education
- Lactation consultants, chiropractors

- Make awareness a basic competency?
Tongue-tie researchers and clinical experts from around the world comprise the members of the International Affiliation of Tongue-tie Professionals (IATP). Founded in 2009 under the leadership of Dr. Alston K. Hazelbaker in tandem with the first Summit participants, this organization dedicates itself to educating parents and professionals about tongue-tie and its proper assessment and treatment and furthers tongue-tie research by launching multi-center studies and supporting those who wish to formulate and implement new research.

Focus
The IATP's current focus centers on standardizing the conceptual definition of tongue-tie, classifying its types, generating both first and second encounter assessment processes, and issuing policy statements about early assessment, proper treatment and post-surgical therapy and follow-up. IATP members remain dedicated to two main principles: the prevention of later-in-life problems due to untreated tongue-tie, and the education of all based on both current research and solid clinical evidence.

What is Tongue-Tie
The IATP defines tongue-tie as an: Embryological remnant of tissue in the midline between the undersurface of the tongue and the floor of the mouth that restricts normal tongue movement.

The members of the IATP have universally adopted this definition and use it consistently in presentations, discussion and research. The IATP recommends strongly that all future research be based upon this definition and that practitioners adopt this definition as the basis for their assessments and treatment decision processes.
Defining ankyloglossia: A case series of anterior and posterior tongue ties

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ABSTRACT

Introduction: Ankyloglossia is a congenital condition in which tongue mobility is limited due to an abnormality of the lingual frenulum. The impact of ankyloglossia on breastfeeding is poorly understood but there is a recent trend toward more recognition of this condition and early intervention when needed. Currently, there lacks clear definition of ankyloglossia and different subtypes have been proposed with no clinical correlation.

Objective: To determine the prevalence of anterior versus posterior ankyloglossia in a large series of consecutive patients and to assess clinical outcomes after frenotomy.

Methods: Retrospective chart review of patients from July 2007 to July 2009 who were diagnosed with ankyloglossia and underwent office frenotomy. Baseline characteristics, specific feeding issues, type of ankyloglossia, and clinical outcomes after frenotomy were reviewed.

Results: Of the 341 total patients, 322 (94%) had anterior ankyloglossia and 19 (5.6%) had posterior ankyloglossia. Median age at presentation was 2.7 weeks (range 1 day of life to 24 weeks); 227 were males and 114 were females. Revision frenotomy rates were significantly higher for the posterior ankyloglossia group (3.7% anterior and 21.1% posterior, p = 0.008).

Conclusion: Anterior ankyloglossia is much more common and readily managed when compared to posterior ankyloglossia. Posterior ankyloglossia is a poorly recognized condition that may contribute to breastfeeding difficulties. The diagnosis is difficult due to the subtle clinical findings but relevant healthcare providers should be aware of this condition. Frenotomy is a simple, safe, and effective intervention for ankyloglossia which improves breastfeeding.
Efficacy of Neonatal Release of Ankyloglossia: A Randomized Trial

WHAT'S KNOWN ON THIS SUBJECT: Ankyloglossia affects 1.7% to 4.8% of all infants. There is evidence that poor latch and maternal nipple pain are more common in infants with ankyloglossia. Some studies have shown that frenectomy benefits these infants; however, significant controversy regarding frenectomy still exists.

WHAT THIS STUDY ADDS: When frenotomy is performed for clinically significant ankyloglossia, there is a clear and immediate improvement in reported maternal nipple pain and infant breastfeeding scores. This study also provides compelling evidence to seek frenectomy when indicated.

abstract

BACKGROUND: Ankyloglossia has been associated with a variety of infant-feeding problems. Frenotomy commonly is performed for relief of ankyloglossia, but there has been a lack of convincing data to support this practice.

OBJECTIVES: Our primary objective was to determine whether frenotomy for infants with ankyloglossia improved maternal nipple pain and ability to breastfeed. A secondary objective was to determine whether frenotomy improved the length of breastfeeding.

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KEY WORDS
ankyloglossia, frenotomy, breastfeeding, Hazelbaker, tongue-tie

ABBREVIATIONS
NMCP—Naval Medical Center Portsmouth
HATFF—Hazelbaker Assessment Tool for Lingual Frenulum Function
ENT—ear, nose, and throat
SF-MPQ—Short-Form McGill Pain Questionnaire
IBFAT—Infant Breastfeeding Assessment Tool

Dr Buryk contributed to the study design, data analysis, and drafting of the manuscript; Dr Bloom contributed to the study design and data collection and also performed the frenotomies, and Dr Shope contributed to the study design, data analysis, and drafting of the manuscript.

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or the US Government.

This trial has been registered at www.clinicaltrials.gov (identifier-NCT00967915).

Dr Buryk is a military service member; this work was prepared as part of her official duties. Title 17 U.S.C. 105 provides that “Copyright protection under this title is not available for any work of the United States Government.” Title 17 U.S.C. 101 defines a US Government work as a work prepared by a military service member as part of that service member's official duties.

Efficacy of Neonatal Release of Ankyloglossia: A Randomized Trial
Melissa Buryk, David Bloom and Timothy Shope
Pediatrics 2011;128:280; originally published online July 18, 2011;
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Frenotomy for lip & tongue-tie

- **Frenotomy** is a simple clipping of the frenular tissue.
- **Flenulectomy** is more involved, removing or reorganizing tissue through Z-plasty, cautery, or laser ablation.
- Office based without anesthesia
- Within hours to days of birth, to months to years, depending on the provider
Instruments and emergency kit
Dr. Kotlow correcting abnormal frenum attachments

Surgical procedures completed in the dental office
Three week old with mother having mastitis and poor latch: revising the tongue

Revision using lasers, quick healing, little bleeding, no stitches

Revising the maxillary or labial frenum

Lawrence Kotlow DDS 2010
Consult: 99242 (30 minutes)
- Reason, birth & feeding history, bleeding hx
- Consent and time out.
- Copy to PMD and family.

- Ankyloglossia 750.0
- Coordination disorder 315.4
- Feeding problem infant 783.3
- Benign neoplasm lip 210.0

- Frenotomy (incision tongue fold) 41010
- Incision lip fold 40806
Reason for Appointment
Ankyloglossia: Based on exam and symptoms per referring provider.

History of Present Illness

GENERAL:
Parents report an increased frequency of milk reflux noted over the past week. No other symptoms noted.

The primary care provider is recommending a consult.

Symptoms: There is a history of ankyloglossia and the infant has difficulty with feeding and swallowing. The tongue is thickened and preventing the lower lip from fully extending over the lower incisors.

The primary care provider is recommending a consult.

Vital Signs

Examination
Infant:

Assessments

1. Ankyloglossia
2. Developmental Disability - Coordination
3. Feeding Problem Infant - 784.3, no significant symptoms noted
4. Benign Neoplasm Lip

Treatment

1. Ankyloglossia

Procedures

Incision, Lingual frenum (Frenotomy) - 3590
Incision of Lip Fold - 3590

Follow Up

The infant is scheduled for a follow-up appointment in one week.

Procedure Notes:

Cliff O’Callahan, M.D., Ph.D.

Progress Notes:

02/05/2014

Current Medications
None

Past Medical History
No medical problems noted.

Surgical History
None

Family History
None

Social History
None

Allergies
None

Hospitalization/Major Diagnostic Procedure
None
Complications

- Parental anxiety
  - understanding
- Discomfort
  - 22% sucrose
  - NO Benzocaine 20%
- Bleeding
  - More than with membranous
  - Needs direct pressure
  - Epinephrine swab, Gelfoam, silver nitrate
- Infection
- No effect
  - Scar knot, muscular bands, other entities
Impressions

- Started in Dec 2006
- Have done about 500 in office and <50 in nursery
- Mostly a referral population CT and western MA
- Trending to mostly posteriors
- Greater proportion previously clipped elsewhere
- Significantly less repeat clips due to scarring since swipe and lift
Impressions

- Familial tendency: a large number have siblings and relatives with various degrees of ankyloglossia

- Remarkable improvement in the vast majority with significant decrease in pain and improved ability to breastfeed efficiently, happily, and for longer overall time frame.
Acknowledgements

- Betty Corrylos
- Jennifer Tow
- My office staff
- Drs Kotlow and Palmer
- Stephanie Clemente & Susan Macary
Resources

- [http://tongue-tied.net/](http://tongue-tied.net/) International Affiliation of Tongue-Tie Professionals


- **Tongue-Tie.** Alison K. Hazelbaker 2010. Aidan and Eva Press. [www.aidanandevapress.com](http://www.aidanandevapress.com)