

## TONGUE-TIE AND BREASTFEEDING

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Lactation Clinic  
Family Health Promotion Center, Sharjah

### Objectives

- Define a tongue-tie versus a normal frenum
- List the current evidence
- Describe how to assess a tongue-tie
- List the key points in management

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### PLAN

- Definitions
- Embryology
- History
- Current evidence
- Clinical assessment
- Differential diagnosis
- Main points of management
- Conclusion
- Resources



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### Lingual Frenum (or Frenulum)



Normal tongue movements:  
This is a frenum, NOT A TIE

emedicinehealth.com

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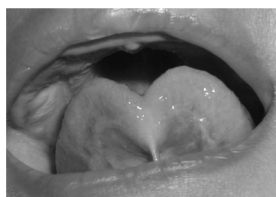


cyf

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### Ankyloglossia

From greek 'ankylos' = stiff, bent, crooked  
And 'glossos' = tongue



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### Definition of Tongue-tie

by the 'International Affiliation of Tongue-tie Professionals'


- **Restriction** of normal tongue movements in the presence of **persistent lingual frenum tissue**.

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### PLAN

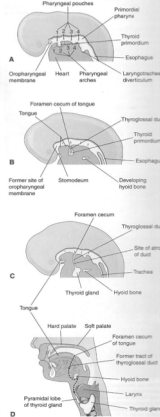
- Definitions
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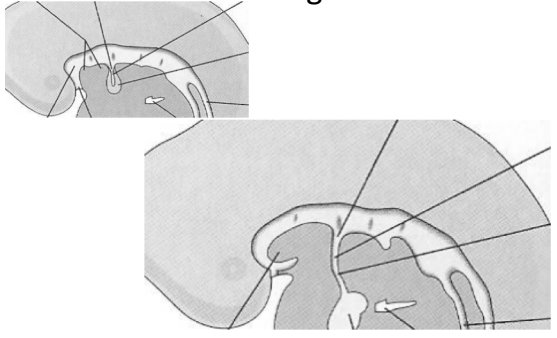
### Between 4<sup>th</sup> and 7<sup>th</sup> week

- Tongue develops from the inner surface of the oral tube: bilateral tissue buds which fuse posteriorly to anteriorly,
- And then SEPARATES FROM THE FLOOR OF THE MOUTH (by combination of tissue growth and apoptosis).



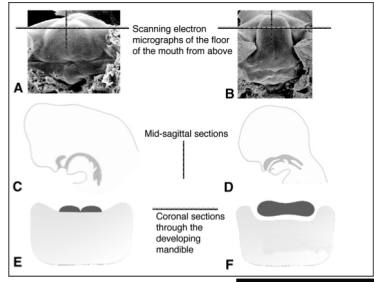
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### Separation between Tongue & Mouth Floor



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### Embryology of tongue development

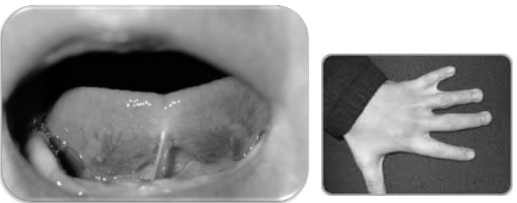


Knox I Neoreviews 2010;11:e513-e519  
©2010 by American Academy of Pediatrics NeoReviews.org 10

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### Persistent Lingual Frenum: Incomplete Disappearance

➤ **Embryologic remnant** of tissue in the midline



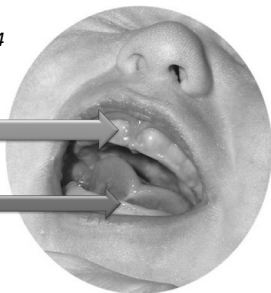
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<http://www.nhs.uk/Conditions/tongue-tie/Pages/introduction.aspx>

<http://www.institut-main.fr>

### Tethered Oral Tissues (TOTs)

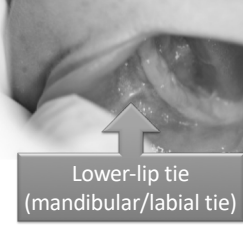
*Term coined at the IATP 2<sup>nd</sup> Tongue-tie World Summit in 2014*



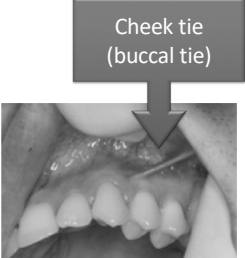
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<http://www.cvgenma.com/ttidentify.html>

### Tethered Oral Tissues (TOTs)



Lower-lip tie  
(mandibular/labial tie)




Cheek tie  
(buccal tie)

knockedupknockedover.com Kristen Berning, DDS

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### Trend following Bottle-feeding...

- << For generations, this condition was diagnosed and treated at birth to prevent breastfeeding and speech difficulties, but with the decline of breastfeeding in the 1940s and 1950s, treatment fell out of favor. >>

Catherine Watson Genna, LEAVEN, Vol. 38 No. 2, April-May 2002, pp. 27-29.

- << Today, many current textbooks and articles state that tongue ties rarely, if ever, impede feeding or speech, but this assertion is not evidence based. >>

Griffiths D.M., J Hum Lact 20(4), 2004.

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### Ankyloglossia and Controversy...

- 90% of Peds:** TT do not cause breastfeeding difficulties
- 70% of ENTs:** TT do not cause breastfeeding difficulties
- 99% of LCs:** TT do !! cause breastfeeding difficulties

Messner and Lalakea. Ankyloglossia: Controversies in Management  
*Int. Journal of Pediatric Otolaryngology* 2000

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### First Published Articles: 1990-91 in the Journal of Human Lactation

- Berg KL. **Two cases of tongue-tie and breastfeeding.** *J Hum Lact.*1990; 6 :124 –126[[Medline](#)]
- Berg KL. **Tongue-tie (ankyloglossia) and breastfeeding: a review.** *J Hum Lact.*1990; 6 :109 –112[[Medline](#)]
- Marmet C, Shell E, Marmet R. **Neonatal frenotomy may be necessary to correct breastfeeding problems.** *J Hum Lact.*1990; 6 :117 –121[[Medline](#)]
- Fleiss PM, Burger M, Ramkumar H, Carrington P. **Ankyloglossia: a cause of breastfeeding problems?** *J Hum Lact.*1990; 6 :128 –129[[Medline](#)]

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### First Published Articles (End)

- Wilton JM. **Sore nipples and slow weight gain related to a short frenulum.** *J Hum Lact.*1990; 6 :122 –123[[Medline](#)]
- Hingley G. **Ankyloglossia clipping and breast feeding.** *J Hum Lact.*1990; 6 :103
- Notestine GE. **The importance of the identification of ankyloglossia (short lingual frenulum) as a cause of breastfeeding problems.** *J Hum Lact.*1990; 6 :113 –115 [[Medline](#)]
- Huggins K. **Ankyloglossia: one lactation consultant's personal experience.** *J Hum Lact.*1990; 6 :123 –124
- Nicholson WL. **Tongue-tie (ankyloglossia) associated with breastfeeding problems.** *J Hum Lact.*1991; 7 :82 –84 [[Medline](#)]

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### Common myths

Lawrence Kotlow, DDS, 2011

- Tongue-ties do not exist.
- Tongue-ties will correct themselves.
- Tongue-ties will not affect breastfeeding.
- A tight lingual frenum will stretch or tear without treatment.
- Ankyloglossia doesn't cause maternal pain.
- Ankyloglossia doesn't affect speech.
- Surgery must be completed in the OT under GA.
- Children under age 3 years are too young to have surgery.

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### Anecdotal evidence... Listen to mothers!

Videos from Sharjah FHPC Lactation Clinic, with written permission by the mothers.



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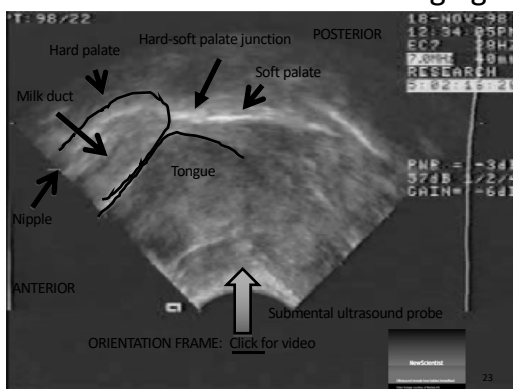
### Mounting Evidence

- 1990s: **Case reports**, case series (BF journals)
- 2004: First **RCT** (improvement for 95% of cases)
- 2005: **NICE Guideline** '*Current evidence suggests [...] no major safety concern about division of ankyloglossia [...] this procedure can improve breastfeeding. The evidence is adequate to support the use of the procedure*'
  - Requesting more controlled trials and long-term studies
- 2008: **Ultrasound imaging** of tongue and nipple before and after frenotomy

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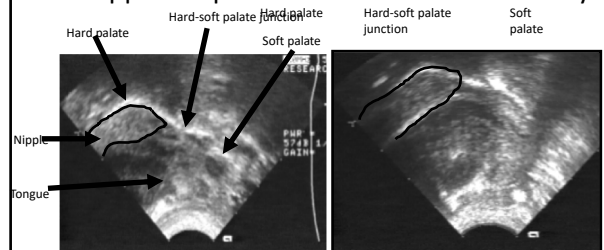
### Ultrasound Imaging



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### Nipple Shape Before and After Frenotomy



Geddes DT et al. , Pediatrics 2008

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### Mounting Evidence (cont.)

- 2011: **Review of research literature** ‘for most infants, frenotomy offers the best chance of improved and continued breastfeeding. Furthermore, [...] the procedure does not lead to complications for the infant or mother.’
- 2011: **Single-blinded RCT** ‘immediate improvement in nipple pain and breastfeeding scores, despite a placebo effect on nipple pain’
- 2012: **Double-blinded RCT** ‘There is a real, immediate improvement in BF, detectable by the mother, which is sustained and does not appear to be due to a placebo effect.’

### Mounting Evidence (cont.)

- 2013: **Post-intervention survey about anterior and posterior tongue-tie** ‘Breastfeeding difficulties associated with ankyloglossia in infants, particularly posterior, can be improved with a simple office-based procedure in most cases’.
- 2014: **Prospective follow-up study** (2 weeks, 3 months, 6 months) ‘favorable long-term effects of frenotomy on breastfeeding’
- 2016: **Prospective cohort study** (pre-op, 1 week, 1 month) on tongue-tie and lip-tie release

### ‘Breastfeeding Improvement Following Tongue-tie & Lip-tie Release’

Ghaehri B., Cole M. et al. **The Laryngoscope Sept. 2016**

**Prospective cohort study** (n=237): pre-op survey, at 1 week, at 1 month post-release.

Results:

- **Breastfeeding self-efficacy** improved ( $p < .001$ )
- **Nipple pain** decreased ( $p < .001$ )
- **Gastroesophageal reflux symptoms** decreased ( $p < .001$ )
- **Breastmilk intake** improved 155% from pre-op to 1 week

“Improvements occur early (1 week postoperatively) and continue to improve 1 month postoperatively. Improvements were demonstrated in both infants with classic anterior tongue-tie and less obvious posterior tongue-tie.”

### Syndactyly



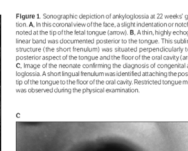
What existing evidence indicates this must be corrected?

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### Antenatal Screening!?



## NICE Guidelines

NICE CG 37 (Jul. 2006):

Routine postnatal care of women and their babies

“1.3.39 Evaluation for ankyloglossia should be made if **breastfeeding concerns persist** after a review of positioning and attachment by a skilled health care professional or peer counselor.

1.3.40 Babies who appear to have ankyloglossia should be evaluated further.”

## Obligatory Newborn Screening...

- Frenum inspection law in Brazil, 20/06/2014

Neonatal Tongue Screening Test (Martinelli)

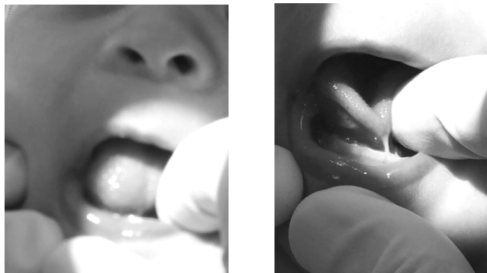
## Integral Part of Neonatal Visit in PHC Centers

- In MOHAP (UAE), April 2017

## Integral Part of Neonatal Visit in PHC Centers (end)

## Screening (Newborn Examination)

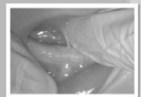
- Finger sweep (from one side to the other)



Both pictures from SIH FHPC Lactation Clinic

## How to determine if your newborn infant is tongue-tied ( completed in the delivery room immediately after birth)

- Before an infant or a mother develops breastfeeding difficulties, use the following steps to check to determine if your infant may have a problem with the lingual frenum. Place your index finger under the tongue and sweep it across the floor of the infants mouth from one side to the other.
  - A smooth mouth floor = No problem
  - A small speed bump = Potential problem
  - A large speed bump = Most likely will be a problem
  - A small, medium or large membrane = Definitely will develop into a problem
- If the membrane feels very thin and strong like fine wire, push on it and look for tongue tip indentation and a slight bow of the tongue tip (submucosal posterior tie)



## Three diagnostic criteria

1. Symptoms (maternal/infant)
2. Appearance
3. Function

Lawrence Kotlow, DDS

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## Criteria 1: Symptoms

- For the **infant**
- For the **mother**



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## Listen to the Mothers...

Video from Agave Pediatric (Phoenix, TX, USA), with permission from Dr Rajeev Agarwal



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## Signs & Symptoms of Tongue-Tie for the Mother

- Nipple pain (+/- trauma, *vasospasm*)
- Painful breasts
- Plugged duct, mastitis
- Low milk supply
- Exhaustion
- Frustration, disappointment, discouragement
- Untimely weaning

Knox I Neoreviews  
2010;11:e513-e519

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## Signs & Symptoms of Tongue-Tie for the Infant

- *Inability to latch*
- Difficulty to latch (several attempts)
- Difficulty to maintain the latch (slips off)
- Chewing on the nipple (gumming)
- Clicking sound (whole feed)
- Ineffective milk transfer
- Very frequent feeds
- Sleepy on the breast
- Unsatisfied after feeds
- Poor weight gain (FTT)
- *Less able to cope with Overactive MER*

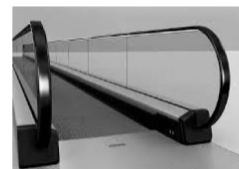
Knox I Neoreviews  
2010;11:e513-e519

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## Confounders!!!: Don't Look only at the Weight...

- Maternal patience: spending lots of time to feed her baby and not realizing she is compensating
- Mother's resilient milk supply / overactive MER: good weight gain  
! Slower weight gain after 2-3 months
- Nipple pain considered as 'normal', or not perceived as pain until the release...

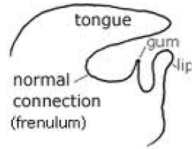


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### Criteria 2: Appearance

- Is there an abnormal frenulum?
- Where does it attach?
  - Upper side
  - Down side



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### Tongue Examination Steps

- Observing in mother's arms (spontaneous movements, lips...)
- Fixing the jaw (baby will move his tongue to 'get rid' of the hold)
- Assessment of aspect and function (knee-to-knee position)
- Observing a feed



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### Examination Technique: Better View with 'Knee-to-Knee'

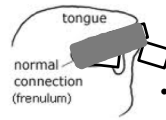


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### Appearance of Frenum: Types 1 to 4



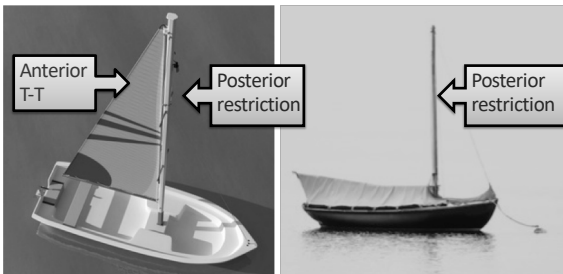
**Classification** according to the place of attachment:

- Type 1: from tip of the tongue to edge of lower gum
  - Type 2: from 2-4 mm behind tip to wall of lower gum
  - Type 3: from mid-tongue to floor of the mouth
  - Type 4: posterior area (can be submucosal; also called the 'hidden', or 'invisible' tongue-tie)
- N-B: Type '3-2' very common: from mid-tongue to wall of lower gum

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### Anterior\* Tie versus Posterior\* Tie



Drgaheri.square.com

\* Compared to salivary ducts position

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### Anterior TT vs Posterior TT

#### ➤ Type 1 & type 2



- Thin
- Can be stretchable
- Easy to visualize
- Attached inferiorly to the lower gum

#### ➤ Type 3 & type 4



- Thicker
- Significant restriction
- Needs special maneuver
- Attached to mouth floor
- Usually affects elevation more than extension

➤ *Should be released even if no obvious current feeding problems*

➤ *Make sure of S & S and rule out other causes before releasing*

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**\*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: Dr Evelyne Ruf, T-T and breastfeeding\_2020  
Lawrence Kotlow DDS 2009

**Tongue-Tie Type 1**

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**Tongue-Tie Type 2**

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**Tongue-Tie Type 3**

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**Tongue-Tie Type 4**


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**Diagnosing Submucosal Posterior Tongue-Tie**


Lawrence Kotlow DDS  
Submucosal tongue tie visible when pushed downward

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### Eiffel Tower (webbing, tenting)





James Murphy, MD



Clipart

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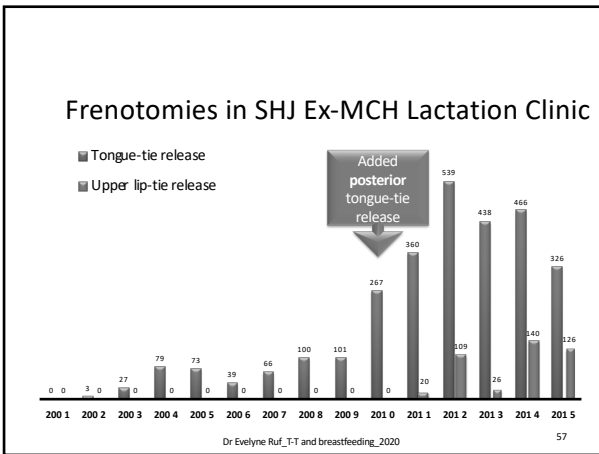
### Palpation & Stretching Needed

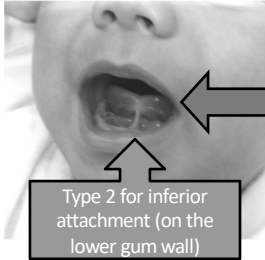
No visible string  
Only a big bump in the floor  
of the mouth

Easier to feel than see  
Stretching is the key

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### Tongue-Tie Type 3-2





Type 3 for superior attachment (mid-tongue)

Type 2 for inferior attachment (on the lower gum wall)

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### Tongue-tie Type 2

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### Tongue-tie Type 1

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### Assessing the Palate (Reflects Tongue Elevation)

From Sharjah MCH Lactation Clinic



Reference palate: gentle slope, U-shape

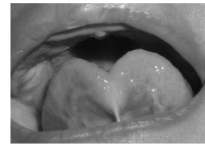


Reference tongue elevation

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### Narrow and/or High Palate



Catherine Watson Genna, BS, IBCLC  
Elizabeth V Coryllos, MD, FAAP, FACS, IBCLC



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### Whitish Tongue (Posteriorly)



Pseudoleukoplakia (Dobrich, BF Med., 2006)



Catherine Watson Genna, BS, IBCLC  
Elizabeth V Coryllos, MD, FAAP, FACS, IBCLC

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### Observing the Lips: Suckling Blisters



Shervin Yazdi, DDS



Bobby Gaheri, MD

Compensation for inadequate hold of the breast: excessive lip friction during suckling

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### Compensation for Tongue-Tie...



James Murphy, MD

Observe blanching of naso-labial creases

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### And/or for Upper-Lip Tie



Melissa Cole



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### Criteria 3: Function

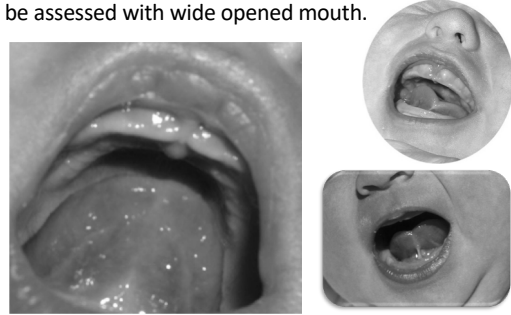
- Elevation
- Extension
- Lateralisation



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### Elevation: Reference/Restriction

To be assessed with wide opened mouth.

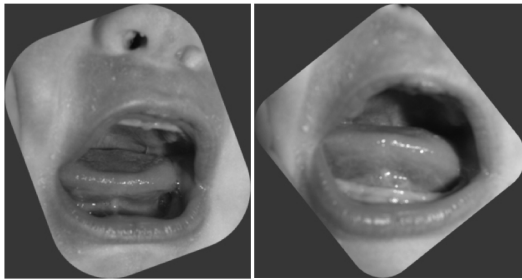


www.cwgenma.com Figure 2

www.cwgenma.com Figure 3  
The Breastfeeding Atlas  
2002: picture1704/fig.303

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### Elevation: Restriction (cont.)



www.cwgenma.com Figure 6, 7

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### Elevation: Restriction (cont.)



Kotlow L, DDS, 2011

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### Elevation: Restriction (cont.)

'Crying' test



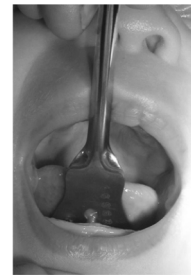
Shj, FHPC Lactation Clinic

www.cwgenma.com Figure 9

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### Elevation: Assessing Restriction (end)



Lifting the tongue with a Grooved director: helps to diagnose a posterior tongue-tie.



www.cwgenma.com Figure 8

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### Extension: Reference


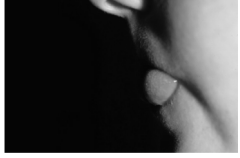



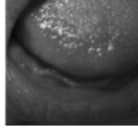
www.cwgenma.com Fig. 1 SHJ MCH Lactation Clinic

Tongue extending over the lower lip, without dipping down


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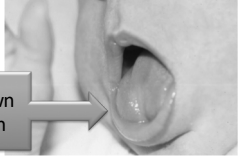
### Extension: Restriction



Dipping down  
on extension







Kotlow 2011 The Breastfeeding Atlas 2002: pictures 1706/305, 1708/307

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### Lateralization

The Breastfeeding Atlas 2002: 1711/310. www.cwgenma.com Figure 4

Normal lateralization: no TT    Tongue twisting to lateralize: TT

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### Assessment at Breast and/or Sucking Test (with Finger)

- Gape?
- Cupping?
- Gagging?
- Latching easily? Staying attached?
- Gumming?
- Clicking?
- Milk transfer (jaw movements, post-feed weight)?
- Nipple shape after

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### What Else Could It Be?

- **Ill-defined posterior tie** could be due to the tongue pulled back (tension in the neck, the jaw, due to birth trauma, in utero position...)
  - needs CST (cranio-sacral therapy); tummy time could also help.





And then re-assessment for decision about release.

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### Two types of Release for Ties

<ul style="list-style-type: none"> <li>➤ <b>FRENOTOMY</b></li> <li>• INCISION (tension release)</li> <li>• OPD procedure</li> <li>• GA not needed</li> <li>• Back to breast quickly</li> <li>• Risk of re-attachment</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>FRENECTOMY</b></li> <li>• EXCISION (tissue removed)</li> <li>• OT procedure</li> <li>• GA needed</li> <li>• First breastfeed delayed</li> <li>• Stitches / Z-plasty</li> <li style="padding-left: 20px;">→ no re-attachment</li> </ul>
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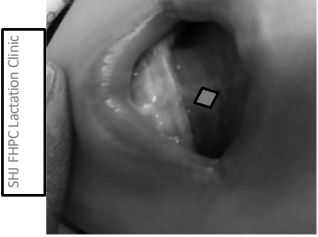
### Frenotomy with Full Release: Reaching the 'Diamond Shape'

Glove demonstration Mary Ann O'Hara, MD



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### Frenotomy with Full Release: Reaching the 'Diamond Shape' (end)



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### Frenotomy

- Scissors
- Electrocautery / Radiofrequency
- Laser (diode/waterlaser)

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### OPD Procedure

To reduce stress and pain for baby and mother:

- As gentle as possible
- As quick as possible
- Going back to the breast as soon as possible
- Same room as the mother or nearby room

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### Hemostasis

Ask for history of:

- Vitamin K after birth (universal in UAE)
- Neonatal screening test: any bleeding?
- If circumcision: any bleeding?
- Any bleeding disorder in the family?

Prepare:

- Sterile gaze (5 x 5)
- Cold normal saline
- Epinephrine
- Silver nitrate? **NO**



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### Analgesia

- Endorphins in mother's milk (BF before & after)
  - Paracetamol suppository/drops (BNF pre-op dosage)
  - Local anesthesia
    - Lidocaine (risk of methemoglobinemia with benzocaine\*), EMLA
    - Only surface anesthesia
    - Numbing preventing immediate latch
- \* Didn't reduce crying (Acta Paediatr. 2014 Jul)*

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### Lactation Clinic at SHJ FHPC: Procedure Room

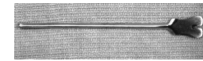


Armchair for breastfeeding in the same room. The mother has the choice to stay or go out.



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### Preparing for Scissors Frenotomy



Groove director?

Hemostasis:

- ✓ Sterile gaze
- ✓ Cold normal saline
- ✓ Epinephrine for local application (very rarely needed)

Sterile gloves  
Sterile scissors

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### Frenotomy at SHJ FHPC Lactation Clinic



- Good lighting
  - Good holding
  - Good frenulum stretching
- Good release



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### Just After... Back to Breast within Few Minutes



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Surgical release of the lingual frenum in the dental office using lasers

Stretching the tongue upward to expose the frenum using a \*grooved director.

Completed frenum release.

\*available through "Miltek" and your dental supply dealer

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Diamond-shape Wound, Secondary Healing

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We want secondary healing, not primary healing

Primary intention

Clean incision Early suture Fine small line of healing

Secondary intention

Gaping wound with blood clot Granulation tissue fills in wound Granulation tissue

Lawrence Kotlow, DDS

Stretching and Massage  
Several times per day, for 2 weeks

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Lawrence Kotlow, DDS

Lawrence Kotlow DDS  
Post surgery stretching and massage of the revision sites.

Follow-up appointment next day, then at 7 days

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**PLAN**

- Definitions
- **Embryology**
- History
- Current evidence
- Clinical assessment
- Differential diagnosis
- Main points of management
- **Conclusion**
- Resources

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Listen to the Mothers, Fathers, ...

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Agave Pediatrics (Phoenix, TX, USA)

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## ...And Supportive Professionals

AGAVE PEDIATRICS  
DR. RAJEEV AGARWAL



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## Conclusion

- Tongue-tie (and/or upper-lip ties) can lead to unwanted and disheartening weaning.
- Unfortunately these conditions are either not detected or not managed early.
- Suboptimal care in lactation is frequent but not acceptable.
- Counseling skills and technical expertise are required.

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## Proposals

- Screening for tongue-tie should be integrated in the newborn examination (and/or at first visit in a health center)
- The full assessment (especially for posterior ties) should be done by a lactation-trained health care professional
- Early management should be offered, in order to relieve/prevent much suffering for babies and mothers

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## PLAN

- Definitions
- **Embryology**
- History
- Current evidence
- Clinical assessment
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## Resources (websites)

- [www.tonguetieprofessionals.org](http://www.tonguetieprofessionals.org) (IATP)
- [www.kiddsteeth.com](http://www.kiddsteeth.com) (Lawrence Kotlow)
- [www.cwgenna.com](http://www.cwgenna.com) (Catherine Watson Genna)
- [www.lunalactation.com](http://www.lunalactation.com) (Melissa Cole) **Exercises** on Vimeo
- [www.drghaheri.com](http://www.drghaheri.com) (Bobby Ghaheri)
- [www.alisonhazelbaker.com](http://www.alisonhazelbaker.com) (Alison Hazelbaker)
- [www.drjaintonguetie.com](http://www.drjaintonguetie.com) (Evelyne Jain) **DVD**
- [www.goldlearning.com/](http://www.goldlearning.com/) Search 'Tongue-tie'

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## Resources (Books)



'Supporting Sucking Skills in Breastfeeding Infants'  
Catherine Watson Genna,  
Jones and Bartlett Publishers.  
2<sup>nd</sup> ed. 2013



'Tongue-tie – morphogenesis,  
impact, assessment and Rx'  
Alison K. Hazelbaker, Aidan  
and Eva Press. 2010



'SOS 4 TOTS'  
Lawrence A. Kotlow, The  
Troy Book Maker. 2016

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### Resources (Articles/Books)

- 1) Walker M. Breastfeeding management for the clinician - using the evidence. 4th ed. Burlington, MA, 2017, Jones & Bartlett Learning.
- 2) Watson Genna C. Supporting sucking skills in breastfeeding infants. 3rd ed. Burlington, MA, 2017, Jones & Bartlett Learning.
- 3) O'Callahan C, et al., The effects of office-based frenotomy for anterior and posterior ankyloglossia on breastfeeding, *Int. J. Pediatr. Otorhinolaryngol.* 2013. 77(5):827-32. Available at <http://dx.doi.org/10.1016/j.ijporl.2013.02.022>. Accessed on 24/09/2019.
- 4) Dobrich C. Frenotomy decision tool for breastfeeding dyads. 2015. Based on "Ankyloglossia in breastfeeding infants: the effect of frenotomy on maternal pain and latch." In *Breastfeeding Medicine*: 2006. 1(4): 216-224.
- 5) Mannel R, Martens JP, Walker M. Core curriculum for lactation consultant practice. International Lactation Consultant Association. 3<sup>rd</sup> ed. Burlington, MA, 2013, Jones & Bartlett Learning.

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### Resources (cont.)

- 6) Lawrence RA, Lawrence RM. Breastfeeding - A guide for the medical profession. 7th ed. Maryland Heights, MO, 2011, Elsevier.
- 7) Wambach K, Riordan J. Breastfeeding and human lactation. 5th ed. Burlington, MA, 2016, Jones & Bartlett Learning.
- 8) Breastfeeding protocols for health care providers. Protocol # 2: Positioning and latching; Protocol # 4: Sore nipples. Toronto Public Health, 2013. Available at <https://www.toronto.ca/wp-content/uploads/2017/11/9102-tph-breastfeeding-protocols-1-to-21-complete-manual-2013.pdf>. Accessed 24/09/2019.
- 9) Knox I. Tongue-tie and frenotomy in the breastfeeding newborn. *Neoreviews* 2010; 11; e513. Available at (accessed on 24/09/2019) : <http://neoreviews.aappublications.org/content/11/9/e513>
- 10) Gaheri B., Cole M. et al. Breastfeeding improvement following tongue-tie and upper-lip tie release: a prospective cohort study. *The Laryngoscope*. 19/9/2016. Available at <http://online.library.wiley.com/doi/10.1002/lary.26306/full> Accessed on 24/09/2019.

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### Resources (cont.)

- 11) Kotlow LA. Diagnosing and understanding the maxillary lip-tie (superior labial, the maxillary labial frenum) as it relates to breastfeeding. *J Hum Lact.* Published online 2 July 2013. Available at (accessed on 24/09/2019): <http://www.kiddsteeth.com/assets/pdfs/articles/journal-human-lac2013.pdf>
- 12) Kotlow L. Infant reflux and aerophagia associated with the maxillary lip-tie and ankyloglossia (tongue-tie). *Clinical Lactation*, 2011, Vol. 2-4, 25-29. Available at (accessed on 24/09/2019): [https://www.kiddsteeth.com/assets/pdfs/articles/aerophagia\\_2011.pdf](https://www.kiddsteeth.com/assets/pdfs/articles/aerophagia_2011.pdf)
- 13) Herzhaft-Le Roy J, Xhignesse M, Gaboury I. Efficacy of an osteopathic treatment coupled with lactation consultations for infants' biomechanical sucking difficulties: a randomized controlled trial. *J Hum Lact.* 2017, 33 (1), 165-172. Available at: <http://journals.sagepub.com/doi/pdf/10.1177/0890334416679620> Accessed 24/09/2019.

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### Resources (end)

- 14) Vallone S. Chiropractic evaluation and treatment of musculoskeletal dysfunction in infants demonstrating difficulty breastfeeding. *J Clin Chiropr Pediatr.* 2004;6(1):349-61. Abstract available at: [https://www.spinallogicchiropractic.com/wp-content/uploads/2012/12/Breast\\_Feeding.pdf](https://www.spinallogicchiropractic.com/wp-content/uploads/2012/12/Breast_Feeding.pdf). Accessed 28/09/2019.
- 15) Arcadi VC. Birth induced TMJ dysfunction: the most common cause of breastfeeding difficulty. Proceedings of the National Conference on Chiropractic and Pediatrics. Oct, 1993 Palm Springs, CA. Pub. International Chiropractors Assoc., Arlington, VA Abstract available at: [https://www.spinallogicchiropractic.com/wp-content/uploads/2012/12/Breast\\_Feeding.pdf](https://www.spinallogicchiropractic.com/wp-content/uploads/2012/12/Breast_Feeding.pdf). Accessed 28/09/2019.
- 16) Wilson-Clay B, Hoover K. The Breastfeeding Atlas. 5<sup>th</sup> Edition, 2013.
- 17) Martinelli, Marchesan, Lauris and al. Validity and reliability of the neonatal tongue tie screening test. *Rev. Cefac.* 18(6):1323:1331. Accessed on [https://www.scielo.br/pdf/rcefac/v18n6/en\\_1982-0216-rcefac-18-06-01323.pdf](https://www.scielo.br/pdf/rcefac/v18n6/en_1982-0216-rcefac-18-06-01323.pdf)

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**Thank You!**

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