ANKYLOGLOSSIA
TO CLIP OR NOT TO CLIP
IT’S COMPLICATED
Suzanne S. Schneider, MS, CCC/SLP

FINANCIAL DISCLOSURES
• In the past 12 months, I have not had a significant financial interest or other relationship with the manufacturer(s) of the product(s) or provider(s) of the services that will be discussed in my presentation.
• This presentation will not include discussion of pharmaceuticals or devices that have not been approved by the FDA.

LEARNER OBJECTIVES
• Understand how oral feeding mechanics are altered in infants with ankyloglossia.
• Identify criteria for assessing & classification of ankyloglossia.
• Understand ways to apply assessment criteria to everyday practice.
HOW MUCH INSTRUCTION DID YOU RECEIVE ABOUT ANKYLOGLOSSIA DURING YOUR SCHOOLING?

HOW MANY HAVE CONFIDENCE IN YOUR SKILL LEVEL TO DIAGNOSE AND RECOMMEND MANAGEMENT OF ANKYLOGLOSSIA?

ASHA POSITION STATEMENT

The decision to clip the frenulum is a medical decision made by physicians and is not in the scope of practice for speech-language pathologists. The SLP may play an evaluation and treatment role from a speech, feeding or swallowing standpoint, but ultimately the decision—as it is a medical procedure—is up to the physician.

FRENULUM VS FRENUM

YOU SAY TOMATO, I SAY...
Terms are used interchangeably.
WHAT IS A LINGUAL FRENUM OR FRENULUM?


Generally under the mid portion of the tongue, the lingual frenum (or lingual frenulum) is the cord that stretches from under the tongue to the floor of the mouth. Stabilizes the base of the tongue but does not interfere with tongue tip movement.

ETIOLOGY


Tongue is fused to the floor during early development.

Cell absorption and apoptosis/programmed cell-death free the tongue.

Frenulum is the only remnant of attachment.

Tongue tie is the result of a short fibrous lingual frenulum or a highly attached genioglossus muscle.

A CLOSER LOOK AT THE LINGUAL FRENULUM

Sebesta E, Bennett M (2016)

- The lingual frenulum guides growth of the tongue in utero.
- Most of the frenulum goes away via apoptosis.
- At the base of the frenulum is a group of smooth, terminal salivary gland ducts.
DEFINITION OF ANKYLOGLOSSIA

Restricted mobility of the tongue resulting from tight frenulum

Characterized by partial fusion, or in rare cases, total fusion, of the tongue to the floor of the mouth due to an abnormality of the lingual frenulum

INCIDENCE OF ANKYLOGLOSSIA

Reported incidence of tongue tie ranges in worldwide studies from 3% to 6%

Feeding difficulties (both breast and bottle) have been reported in 25% to 44% of infants with tongue tie

More tongue-tied boys than girls

A Study on the Genetic Inheritance of Ankyloglossia Based on Pedigree Analysis


149 patients with no other congenital anomaly who underwent frenuloplasty between March 2001 and March 2010 were studied.

Inheritance rate was 20.69% in the 58 cases with a hereditary nature.

In the group with no family history of ankyloglossia, the male-female ratio was 3.79:1, which significantly differed from that of the group with a family history of ankyloglossia.

Hereditary nature: Data suggests X-linked inheritance.

CRANIOFACIAL FEATURES ASSOCIATED WITH SHORT FRENULUM


- High-arched palate: characterized by a higher than normal arch of the roof of the mouth
- Retrognathia: very small chin
- Micrognathia: a recessed or undefined chin
- Prognathism: a protruding lower jaw

IS THE TONGUE REALLY THAT IMPORTANT?

- Shapes the palate
- Influences the way our teeth are seated in our mouth
- Regulates our posture
- Dictates our speech
- Determines the opening of our airway
- Influences the development of our facial structure
- Tongue base shapes the throat muscles
- Essential in jaw, upper airway, and nasal passage development

**COMPLICATIONS FOR INFANTS with TOT**
- Impact on milk supply
- Termination of breastfeeding
- The baby failing to thrive
- Poor bonding between baby and mother
- Sleep deprivation
- Problems with introducing solids

**MATERNAL EXPERIENCE OF BREASTFEEDING A TONGUE TIED INFANT**
- Restricted frenulum
- Pain
  - Nipple damage, bleeding, blanching or distortion of the nipples
  - Mastitis, nipple thrush or blocked ducts
  - Severe pain with latch or losing latch
  - Sleep deprivation caused by the baby being unsettled
  - Depression or a sense of failure
The muscles involved in breastfeeding, particularly the masseters, are the same muscles that will later (from the age of six months onward) carry out chewing and swallowing.

- Chewing continues the process of stimulation of the orofacial muscles that begin with sucking at the breast.
- Correct sucking, chewing, and swallowing plays a role in the development of the upper and lower jaws.
- Together with genetic and environmental factors, this provides stability of the dental occlusion, function, and muscle balance.
The position of the tongue in the oral cavity is critical to proper dentofacial growth and development.

Macaluso & Hockenbury, 2005

It’s Worth Repeating

TRADITIONAL DIAGNOSTIC CRITERIA

- Malnourishment
- Misarticulation of tongue tip sounds such as /t/, /d/, & /n/

ADVANCED DIAGNOSTIC CRITERIA

- Appearance of the tongue and its movements
- Minor factors including pain, nipple injury, blocked ducts or mastitis during breastfeeding
- Infant factors including low weight, vomiting and gagging
- Lack of lingual mobility which affects speed and accuracy of tongue movements
- Eating difficulties caused by poor coordination of oral musculature
- Drooling – which is prolonged
- Dental problems which are severe and wide ranging
- Speech which is unclear due to several aspects, especially coordination
ASSESSMENT TOOLS
Gold Standard: Oral Motor Examination

CLASSIFICATION OF ANKYLOGLOSSIA

- Measurements of free tongue and height to which the tongue can be lifted
- Appearance of the margin of the tongue, and whether indentation is present
- Function and ability to protrude or to elevate the tongue
- Breastfeeding, and any problems experienced
- Speech problems

https://vimeo.com/86784777
CLASSIFICATION BY TYPES

• TYPE 1: lingual frenulum attaches to the tip of the tongue
• TYPE 2: lingual frenulum attaches 2-4mm behind the tongue tip and attaches to the alveolar ridge
• TYPE 3: lingual frenulum attaches mid-tongue and to the middle of the floor.
• TYPE 4: posterior tongue tie: frenulum tissue exists behind the mucosal lining and is far back toward the junction of the tongue's underside and the floor of the mouth and the tongue is attached directly to the floor of the mouth

ANTERIOR TONGUE TIES
CLASSIFICATION 1 & 2

POSTERIOR TONGUE TIES
CLASSIFICATION 3 & 4
“POSTERIOR” TONGUE TIE

Name is NOT ideal as the putative site is the anterior portion of the genioglossus not the posterior base of tongue.

“In my experience, every anterior tongue tie has a posterior tongue tie behind it.”

Dr. Ghaheri
March 23, 2014

Rethinking Tongue Tie Anatomy: Anterior vs Posterior Is Irrelevant

Dr. Ghaheri's Illustration of the Relevance of Posterior Tongue Ties (2014)
Pediatric dentist Larry Kotlow classifies tongue ties in 4 classes based on length of free tongue defined as distance from tip of the tongue to the attachment of the frenum:

1. Class I (12-16 mm) is mild
2. Class II (8-11 mm) is moderate
3. Class III (3-7 mm) is severe
4. Class IV (<3 mm) is complete.

A distance of >16 mm is considered clinically acceptable.
BRISTOL TONGUE ASSESSMENT TOOL

- Tongue tip appearance
- Attachment to the lower gum ridge
- The lift of the tongue
- Protrusion of the tongue

HAZELBAKER/ATLFF

- Most commonly used by Lactation Consultants
- Score based on:
  - Functional items: Lateralization/Lift of Tongue/Extension of Tongue
  - Appearance Items: Appearance when Lifted/Elasticity/Length of Lingual Frenulum when Lifted

INTERPRETATION OF HAZELBAKER SCORE

- Perfect item score: 2 points
- Perfect Appearance: 10 points
- Perfect Function: 14 points
- Function outweighs appearance
  - Function < 11 suggests impaired tongue function
  - Appearance < 8 in the presence of impaired function suggests need for frenotomy
HAZELBAKER VIDEO

https://youtu.be/-4Gv7UL0ya

Selectively chosen from the "Lingual Frenulum Protocol With Scores For Infants" to demonstrate varying degrees of lingual frenulum thickness and attachment

TONGUE TIE ASSESSMENT PROTOCOL

• Speech Therapist Carmen Fernando
• Assesses significance of tongue tie by appearance and function
• Scoring system provides a final score to establish if surgical intervention is indicated


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Parents of infants and toddlers with tongue-tie are sometimes advised that the tie will 'stretch', or 'break' permitting a free range of movement, as the child grows.

These stretching and breaking phenomena have not been formally studied or documented in the medical or speech-language pathology literature.

SO WHAT DO YOU DO?

I TOLD YOU AT THE BEGINNING,
IT’S COMPLICATED
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SURGICAL OPTIONS


- Frenotomy: snipping the frenum of neonates
- Frenectomy/Frenulectomy/Frenuloplasty: Surgical revision of the frenum under a general anesthetic at or after 6 months of age; submucous dissection into genioglossus
- Revision of the frenum by laser without a general anesthetic
- Revision by electrocautery using a local anesthetic

HISTORY OF FRENOTOMY FOR ANKYLOGLOSSIA

Jeanne L. Ballard, Christine E. Auer and Jane C. Khoury

Ankyloglossia: Assessment, Incidence, and Effect of Frenuloplasty on the Breastfeeding Dyad. J Pediatrics 2002;110;63-DOI: 10.1542/peds.110.5.e63

- Popularity of casual frenotomy in the early 20th century
- Procedure fraught with complications: bleeding, infection, scarring, "regenerating"
- Fell into disrepute in the mid 20th century
- Concurrent popularity of formula feeding
- Older and recent text books claimed frenotomy unnecessary
- Current resurgence of breastfeeding demands revisit of topic
HISTORY OF FRENOTOMY

• “and the string of his tongue was loosed and he spoke plain” Mark 7:35
• The Young Wife’s Guide to the Management of Children, by John Theobald, MD 1794 describes nurse midwife’s use of sharp fingernails to divide the lingual frenulum
• “(tongue-tie can be divided) with little or no pain to the child who will commonly take to the breast immediately” physician 1794
• “usually it gives no trouble, but uncommonly and in marked cases, it may interfere with suckling and later with articulation. Treatment consists in nicking the edge of the frenulum with Rueb pointed scissors, and tearing through the remaining membrane” Griffith and Mitchell The Diseases of Infants and Children 1934

RETHINKING TONGUE TIE
ANATOMY: ANTERIOR VS POSTERIOR IS IRRELEVANT
Dr. Bobby Ghaheri

IF THERE IS NO DIAMOND THEN THE RELEASE IS INCOMPLETE

POST PROCEDURE EXPECTATIONS
Do the secondary problems disappear?

• Lactation Consultant improve breastfeeding
• Speech Language Pathologist improve feeding &/or articulation problems
• Dentist or Orthodontist can help with problems of crooked or decayed teeth and infected gums
More common with posterior than anterior tongue ties

IS FRENOTOMY THE ANSWER FOR OLDER CHILDREN?


Most experienced speech-language pathologists would conclude that frenulectomy is rarely indicated for speech reasons unless it is very severe or there are concomitant oral-motor problems. It may, however, be warranted for problems with soft feeding, bolus manipulation, dentition, or aesthetics. Although frenulectomy is a minor procedure with a low risk of morbidity, it can lead to the disappointment that can result when parents are led to believe that this will correct speech problems that are actually due to other causes.

There is virtually no evidence in the literature to establish a definite causal relationship between ankyloglossia and speech disorders. In fact, there is very little in the literature that addresses ankyloglossia and speech at all. This is probably because a causal relationship is not what is typically non-clinically. Therefore, it can be assumed that ankyloglossia is unlikely to cause speech problems at all times.
COMPLICATIONS FOR CHILDREN WITH TONGUE TIE

- Inability to chew age appropriate solid foods
- Gagging, choking or vomiting foods
- Persisting food fads
- Difficulties related to dental hygiene
- Persistence of dribbling
- Delayed development of speech

- Deterioration in speech
- Behavior problems
- Dental problems starting to appear
- Loss of self confidence because they feel and sound ‘different’
- Strong, incorrect habits of compensation being acquired
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