

# TOTS

## -Tethered Oral Tissues

### The Assessment and Diagnosis of the Tongue and Upper Lip Ties in Breastfeeding

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#### Abstract

The roll of tethered oral tissues (TOTS) such as an infant's tongue and upper lip attachment are often overlooked or dismissed as cause of infant distress or maternal discomfort during breastfeeding. Successful resolution of problems and understanding of these two structures depend on simple, easy and safe methods of diagnosis and treatment.

**T**he concept that our tongue could be considered an organ rather than just another muscle, affecting many of the other body systems, seems to be foreign to many in the dental and medical community. If we consider all the different body systems, it becomes obvious that our tongue interacts with many of these systems. When an infant is tongue-tied, the tongue restriction may cause it to rest in the airway, interfering and reducing the flow of oxygen to the brain,<sup>1</sup> thus interfering with normal neurologic growth and development. This reduction in oxygen has the potential to also affect the cardiovascular and respiratory systems. When the tie is ignored and left untreated, as the infant matures it may also affect the skeletal and oral facial development.<sup>2,3</sup> Ankyloglossia<sup>4,5</sup> may contribute to speech difficulties, which can play a role in psychological

development and behavioral growth of these children.<sup>6</sup>

One of the first problems involving a tethered or restrictive tongue attachment often goes undetected, misdiagnosed or summarily dismissed by many healthcare professionals. It occurs in mothers seeking professional help in diagnosing problems related to breastfeeding. Difficulties and symptoms associated with a poor latch during breastfeeding include:<sup>7</sup> difficulties in breathing (apnea), nasal congestion (silent reflux), colic, reflux<sup>8</sup> (aerophagia), nipple damage, bleeding and pain. In addition, babies are often diagnosed as failure to thrive infants.<sup>9</sup> These mothers may display signs and symptoms of postpartum depression. Unfortunately, rather than having these ties corrected, mothers are just told to use formula and a bottle or worse, are told the attachments will stretch or tear without treatment.

Diagnostic approaches<sup>10,11</sup> to evalu-

ating ankyloglossia range from a simple scale of 1,2,3,4, based on insertion location of the tie restrictions for both the upper lip and tongue, to more complex movement evaluations.<sup>12</sup> The initial evaluation should occur at the time of infant delivery. Properly trained delivery room personal, responsible for examining the newborn infant, need to be aware of the effects of ankyloglossia on reducing an infant's ability to achieve a successful and efficient latch. Immediately after birth, a simple finger sweep, under the infant's tongue, across the floor of the mouth in the area where the second primary molars will eventually erupt, can alert the mother of potential latch difficulties. During this initial examination, if a minor interference is detected, the mother can be advised to be aware of potential latch difficulties and the symptoms associated with an incomplete or shallow latch. If a significant obstruction or interference is detected the infant be referred for an immediate revision.

After evaluating under the tongue for any type of obstruction, the infant's suck should be evaluated by placing an examiner's finger gently into the infant's mouth and allowing the infant to attempt sucking. A shallow latch can result in gum pad pressure or discomfort on the examiner's fingernail and may

Feel for any problems	Interpreting your findings
1. A smooth uninterrupted pass under the tongue	Most likely the infant will not have difficulties achieving a successful latch
2. A slight interference or bump	The mother can be made aware of symptoms to be looking for when the baby attempts to latch
3. A significant interference or bump	Advise the mother that a shallow latch may occur and the symptoms to look for
4. A small, medium, or large piece of membranous mucosal tissue interfering with the finger sweep	Almost always will interfere with the infant's ability to achieve an adequate latch. Mother should be made aware of symptoms to be looking for
5. A thin or thick piece of membranous mucosal tissue attaching close to the tip of the tongue, obstructing the ability to allow a finger sweep. An appearance of a heart shape tip of tongue.	This should be revised immediately, before symptoms develop

cause the infant to gag. The gagging results because of the tongue's inability to extend forward and pass under the finger tip. This is caused when a restrictive tongue-tie reduces the ability of the tongue to protrude forward and not block the infant's airway. Tongue thrusting is another problem to look for and occurs when an infant pushes his/her tongue outward, pushing the breast away and interfering with latching on. An adequate latch or a latch achieved after a successful revision will allow for the tongue to slide under the fingernail, eliminating or preventing any gagging, as well as producing a gentle massaging action on the area of the finger above the fingernail between the first and second knuckle.

Successful care and treatment of these infants requires multidisciplinary approach.<sup>12</sup> The mother and infant should be evaluated and examined within the first 24 to 48 hours after birth by a certified lactation consultant (IBCLC). During this visit, the IBCLC will again evaluate the infant's latch. The signs and symptoms of a shallow latch should be addressed, before the mother and infant are discharged from the birthing center, hospital or at the time of a home birth.

Identifying lip and tongue problems

requires a correct examination position. In order to adequately evaluate the infant's oral structures, the infant's head should be positioned so that it faces the same direction as the examiner. In the delivery room area, the infant can be examined in the infant warmer and thereafter using the knee-to-knee position, where the mother can hold the infant's feet in her lap and the examiner has the infant's head in his or her lap.

**Revisions should be evaluated with three diagnostic criteria.**

The most important diagnostic criteria to consider are the symptoms exhibited by the infant and/or the mother that can be traced to a poor latch of the infant onto a mother's breast.<sup>13</sup> Some or all of the following may indicate a shallow or incomplete latch.

The second group of criteria to be evaluated is based upon the appearance and ability of the tongue and maxillary lip to achieve efficient mobility and function. The following classifications of the tongue and lip should be part of the IBCLC oral examination. The tongue attachment is classified by the location of the lingual frenum insertion to the underside of the tongue. One classification used in identifying the attach-



1. Initial delivery room protocol assessment tool.



2. Shallow latch on the fingernail.



3. Deeper latch.



4. Infant examined in the knew-to-knee position.



**5.** Class IV tongue-tie located at the tip of the tongue and extending half way between the salivary duct and tip of the tongue.



**6.** Class III tongue-tie located from the salivary duct half way to the tip of the tongue.



**7.** Class II tongue-tie located between the back of the salivary duct halfway to the base of the tongue.



**8.** Class I tongue-tie is located from the base of the tongue, halfway to the salivary duct.

Infant symptoms	Mother symptoms
1. Frequent, unfulfilling attempts at nursing	1. Painful latch due to biting of the nipples, resulting in cracked or cut areas.
2. Colic, Reflux and gassy infant	2. Flattened, creased or blanched nipples
3. Failure to gain weight and thrive	3. Failure to achieve a successful bond with her infant leading to post partum depression
4. Calloused or blistered upper and lower lips	4. Bleeding nipples
5. Sliding off nipple, unsustained latch	5. Plugged ducts, mastitis, engorgement, thrush

ment of the tongue, is identifying the attachment of the tongue as an anterior tongue-tie or a posterior tongue-tie. The position of the tie is described as located either anterior or posterior to submandibular salivary duct, which is located in the floor of the mouth. Any attachment forward of the salivary duct is considered an anterior tie and attachment behind the salivary duct is identified as a posterior tie.

A more clearly defined tongue classification divides the area in front of the salivary duct as a Class IV tongue-tie, when located closest to the tip or a Class III tongue-tie if closer to the anterior part of the salivary duct. When the attachment is located distal or behind the duct, the area just behind the duct would be a Class II tie and the area closest to the base of the tongue is a Class I tie. Class I ties may also be identified as submucosal ties if they are buried deep within the base of the tongue.

### Kotlow classification of the tongue-tie in infants<sup>14</sup>

The ability of the tongue to properly function and have good mobility is included in the diagnostic criteria. Evaluating the tongue for its ability to extend upward toward the maxillary alveolar ridge and sweep the palate, extend beyond the lower alveolar ridge and ability of the posterior part of the tongue to freely elevate up and down should all be included in the examination. However,

just the ability of the tongue to extend over the alveolar ridge and move up and down, when the posterior area of the tongue remains tethered, does not eliminate the diagnosis of a tongue tie. The examiner's finger should also slide across the hard palate to examine its shape and depth and determine if there are any other abnormalities such as buccal ties or submucous cleft.

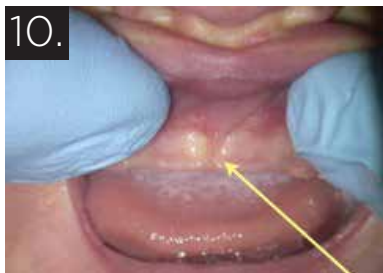
In addition to the ability of the tongue to function in achieving a successful latch, the maxillary lip should be free to enable the infant's lip to extend upward to maximize the infant's attachment onto the areola, rather than onto just the nipple. When the upper lip's inner mucosa is attached to the alveolar ridge of the maxillary arch and the lip is unable to fully flange upward, it also can become a factor in creating a shallow latch which then can allow the passage of excess air to be introduced into the infant's belly resulting in apnoea and reflux.

The following criteria are used to classify and evaluate the upper lip attachment. The upper lip can be classified by assessing the inner lip's mucosal attachment. When the lip attachment inserts into the zone where the two upper front teeth will emerge and extends beyond the maxillary alveolar ridge into the palatal area, the lip-tie is classified as a Class IV lip-tie, inserting into the zone just forward of the palatal area between the area of the future two front teeth is a Class III lip-tie, the insertion zone

Location of the lip-tie is based on the zone of attachment of the inner lip's mucosa.



Class I lip-tie



Class II lip tie, inserting at the zone of the free and attached gingival tissue



Class III lip-tie inserting at the zone between the areas of the future central incisors



Class IV lip-tie, inserting at the zone extending into the anterior palatal area

into the area of the free and attached gingival is identified as a Class II lip-tie and if the attachment is above this area, it is identified as Class I.

### Kotlow classification of the lip-tie in infants<sup>15</sup>

Once an examination verifies the diagnosis of a restrictive upper lip and tongue attachment, the infant should be referred to an appropriate surgeon for revisions. Those who should receive training in completing these revisions include pediatric dentists, oral surgeons, family dentists, and ear nose and throat medical doctors. Revisions can be revised in the office, without the need for a general anesthetic or operating room. The state of the art and most efficient manner to revise these areas involve using lasers. If scissors are used, care must be taken to avoid incomplete revisions.

Upon completion of the releases and/or revisions of the lip and tongue-ties, infants should immediately be placed onto the breast and the latch again evaluated. A deep latch may occur immediately or can take up to a week or more depending on other factors such as the infant's age, strength, palatal depth, presence or absence of a submucosal cleft. The mother's nipple size, ability to extend or be inverted, past surgery for breast reduction, nipple injuries or breast size are also additional considerations when evaluating an infant's latch.

Post surgery, it is extremely important for parents to be instructed in appropriate active wound management to prevent primary healing together of the surgical sites. Active wound management is defined as appropriate exercises for maintaining separation of the edges of the surgical sites, allowing for secondary healing and reduced potential for additional surgical releases. Parental compliance and involvement in this management is paramount for the surgery to be successful.

After the surgery is completed infants should be referred back to their lactation

consultant and when indicated, referred for appropriate bodywork by a cranial sacral therapist to assist in reducing tightness of the surrounding structures of the head and neck areas.

### Conclusion

All newborn infants should have an initial oral evaluation as early a birth. Infants having difficulty in achieving a deep, comfortable and efficient latch onto a mother's breast should be examined a lactation consultant within 24 to 48 hours after birth and complete an oral evaluation oral tissues especially of the tongue and upper lip attachments. Mothers should be given information concerning the effects of a shallow latch on her comfort and the infant's ability to latch. Upon completion of the assessment and when there is a diagnosis of tongue and or lip ties the infant should receive treatment by a properly trained surgeon as soon as possible and then returned to the Location consultant and when indicated receive proper post surgical body work.

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