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Academy of Breastfeeding Medicine Position Statement on Ankyloglossia in Breastfeeding Dyads

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Introduction

In recent years there has been growing interest in ankyloglossia or tongue-tie as evidenced by a substantial increase in the number of publications.[1] This parallels a dramatic increase in the diagnosis and treatment of tongue-tie globally.[2–4] Despite this reality, there exists a lack of agreement regarding the diagnosis and treatment of tongue-tie around the world and among various health professions.[5]

The lack of high-quality evidence-based studies including randomized-controlled trials and longitudinal data to guide clinicians to develop the optimal management of this condition is problematic. In response to this situation, the Academy of Breastfeeding Medicine gathered a task force of experts—clinicians who have worked extensively in this area—to provide a position statement to summarize the available evidence regarding tongue-tie. It is our hope that all who assist breastfeeding mothers and their infants become familiar with this document as to achieve collaborative consistency and care.

Background

Clinical experience has identified neonatal ankyloglossia, or ''tongue-tie,'' in a breastfeeding infant, as a potential source of maternal nipple discomfort and trauma, and of impeded breast milk transfer by the infant, thereby being considered a risk factor for premature breastfeeding cessation.[6]

A tongue-tie exists when the tongue is limited in its range of movement, and subsequent function, due to the presence of a restrictive sublingual frenulum. Recent anatomic studies on the microanatomy of the sublingual frenulum show that it is not a histologically discrete structure or band. The sublingual frenulum is a fold of tissue that arises as the tongue lifts and places tension on the floor of the mouth. This fold is always composed of oral mucosa. Sometimes the fold also contains floor of mouth fascia, or fascia and genioglossus muscle, which remain normal anatomic variations.[7,8]

Ultrasound imagery has identified that specific movements of the tongue and the positional proximity of the maternal nipple relative to the infant's hard/soft palate junction are associated with effective and comfortable breastfeeding. When the tongue moves up and down within the oral cavity, tracking the excursion of the mandible, the magnitude of negative pressure changes, facilitating the transfer of milk during breastfeeding. An increase in vacuum or negative pressure occurs when the tongue is lowered and conversely a decreased negative pressure occurs as the tongue elevates.[9,10] It is further understood that the presence and tactile sensation of breast tissue in the oral cavity cause a reflexive lower jaw excursion, which the tongue follows, generating a vacuum in the context of a seal.[11]

Clinical Considerations

A restrictive sublingual frenulum, resulting in less movement of the tongue, may cause a significant functional impediment to effective infant latch, suckling, and breast milk transfer, along with maternal nipple/areolar discomfort and trauma while breastfeeding, resulting in an increased risk of discontinuing breastfeeding.[6,12]

Subjective complaints reported by mothers who are breastfeeding an infant with a tongue-tie may include latching difficulties, nipple pain, poor breast drainage, prolonged duration of individual breastfeeding sessions, and inadequate infant satiation when directly feeding at the breast. Objective findings may include nipple compression and/or damaged

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nipples, milk stasis within the breast, and suboptimal infant weight gain due to inefficient milk transfer/intake at the breast.[13–16] As these are not uncommon issues among many breastfeeding dyads, it is important to note that they may be inappropriately attributed to an anatomically normal sublingual frenulum, which has been labeled as ''restricted.'' The primary importance of performing a thorough skillful clinical breastfeeding assessment, including the consideration of the differential diagnoses, and addressing these potential confounders, cannot be overstated.[17]

Assessment and Diagnosis

Several tools pertaining to tongue movement in the presence of a potentially restrictive sublingual frenulum have been published with the purpose of assisting the clinician in determining whether a particular infant requires surgical intervention.[18–23] These tools vary greatly in their specific assessment components and their complexity as well as the inter-rater reliability of the tool. No specific tool is meant to be used in the clinical setting as the sole means of deciding whether a frenotomy is indicated or not. Such a decision can only be made in conjunction with a skilled clinical breastfeeding assessment.[24]

A detailed clinical breastfeeding assessment, before the decision to treat a tongue-tie, should include the maternal history taking and physical examination, looking for evidence of nipple trauma and poor breast drainage, and the infant history and physical examination with emphasis on the detailed oral anatomic findings. Direct observation of breastfeeding is essential. The potential impact of any anatomic variation, such as tongue-tie, on the infant's ability to transfer milk at the breast requires an assessment at the breast that includes maternal comfort and milk transfer as evidenced by audible and/or visible swallowing.[25] Test weighing of the infant before and after breastfeeding, on digital infant scales, can provide an indication of the amount of milk transferred in a single specific feeding session but cannot be interpreted as applicable to all feeding sessions of given mother and infant dyad.

Conservative/Expectant Management

Many breastfeeding problems can be effectively managed by skilled lactation support. By modifying the latch and position and with the temporary use of nipple shields and expressed breast milk for supplementation when necessary, many breastfeeding and lactation challenges can be improved upon if not resolved. With time, the baby's ability to latch effectively may improve with overall growth.[26,27] However, as is the case with the lack of high-quality evidence concerning the efficacy of a frenotomy for tongue-tie, there are limited similar studies regarding the efficacy of nonsurgical strategies for the range of breastfeeding problems mothers encounter and their long-term follow-up.

Surgical Management

Among the numerous publications on tongue-tie over the past 20 years, at least five randomized-controlled trials have been performed, comparing the outcomes of surgically treated versus nonsurgically managed infants with a diagnosis of tongue-tie. These selected studies were analyzed in a 2017 Cochrane Database of Systematic Reviews.[28] All five studies were found to be limited by several key factors including the lack of a standardized tongue-tie definition and treatment method, the consistently small sample sizes, and a lack of long-term follow-up data. However, in pooled analysis, frenotomy was associated with reduced nipple pain experienced by breastfeeding mothers. The authors point out that many unanswered questions remain including the optimal timing of a frenotomy and the long-term outcomes for treated versus nontreated infants.

Indications for Frenotomy

Classic tongue-tie is a fold of mucosa and sometimes fascia that is visible on elevation of the tongue and that restricts its function. If it is assessed to be significantly restricting the infant's tongue function, regarding breastfeeding, a frenotomy can be offered at this time.

As with any intervention, this should be a shared decision between the clinician and the family, incorporating the family's values and preferences, with attention to the risks and the benefits of each alternative. If conservative management is chosen, follow-up in a setting where breastfeeding can be assessed and a frenotomy performed if indicated at a future time needs to be made accessible to the family.

As tongue-tie is a functional diagnosis, the presence of a sublingual frenulum alone, a common and normal anatomic structure, is not an indication for surgical intervention.[29–31] The surgical release of a restrictive sublingual frenulum, a ''classic'' tongue-tie, can be an effective intervention if maternal nipple pain and/or poor milk transfer cannot be corrected in a timely way through conservative measures.[24,32–38]

Methods of Frenotomy

There are several methods of frenotomy that can be done depending on the expertise of the clinician. The overall goal is to perform the surgery in a minimally invasive way, effectively dividing the sublingual frenulum to release the restriction of the tongue and restore an adequate range of movement, allowing for effective and comfortable breastfeeding. All clinicians who perform frenotomies need to be aware of the risks of the procedure they undertake, which are then clearly communicated to the parents and acknowledged by their written informed consent. Such Clinicians must be prepared to provide appropriate immediate postsurgical management and support as required.[30]

The use of scissors for treating a ''classic tongue-tie'' in breastfeeding infants has a long clinical history and remains the gold standard. In addition, scalpels, electrocautery, and lasers are currently used to perform frenotomies. To date there are no published studies comparing these surgical instruments or the methods used when performing frenotomies. There are, however, some animal studies regarding oral surgery where cold steel incisions were shown to heal faster than diode laser-treated tissue possibly due to a thermal injury to the frenulum and surrounding tissues when laser is used.[39,40] These principles may apply to human oral mucosal incisions.[41]

Deep oral tissue incisions, beyond the classic tongue-tie incision, in breastfeeding infants, have unique hazards and require a high level of skill and attention to avoid the potential risks of bleeding, hematoma formation, collateral tissue damage or nerve injury with resultant paresthesia, or numbness of the tongue.[42] It is not possible to visualize all

branches of the lingual nerve and infants are unable to report any loss of tongue sensation.[8] Postprocedural pain from extensive mucosal incisions can result in oral aversion in an infant.[43,44] There is one published case study of oral aversion associated with staphylococcus infection in the wound after a frenotomy, and other published case reports of life-threatening hemorrhage[45,46] which attest to the possible serious complications of a frenotomy.

Postfrenotomy Care

The members of this task force believe that clinical follow-up after a frenotomy has been performed is imperative. In doing so, the clinician should assess the effectiveness of the surgery and document the occurrence of any adverse event or complication experienced by the infant—including protracted bleeding, persistent pain, infection at the incision site, and/or oral aversion experienced by the infant, noting any worsening or cessation of breastfeeding that occurred after the procedure. Further breastfeeding assistance should be made available if required by the mother and infant at this time.

Evidence is lacking to support the prescribing of post-procedural manual manipulation or stretching at or near the incised area after a frenotomy procedure. Similarly, there is no evidence or safety guidelines supporting the use of topical substances being applied to the incision site after a frenotomy.

The practice of surgically treating other intraoral or perioral tissue beyond the sublingual frenulum has no published evidence of improving milk transfer or of reducing maternal nipple trauma in breastfeeding dyads.[41] The upper labial frenulum specifically is a normal structure with poor evidence for intervention improving breastfeeding and therefore cannot be recommended. Additionally, surgery to release a ''buccal tie'' should not be performed.[47–50]

Conclusion

In the presence of a restrictive sublingual frenulum, frenotomy can be an effective way to increase maternal comfort and breast milk transfer by the infant. Providing this service may prevent the premature cessation of breastfeeding.

However, the decision to treat is one that requires a high level of clinical skill, judgment, and discernment.

There is an ongoing need for high-quality research in these specific areas related to the treatment of tongue-tie:

1. A clear definition of ''tongue-tie'' in distinction from the normal sublingual frenulum.
2. The extent of incision of the sublingual frenulum required for an optimal breastfeeding outcome.
3. Consistent documentation of immediate and long-term adverse outcomes after surgical intervention by any method,
4. Identification of the optimal surgical instrument and technique for frenotomy.
5. The subsequent long-term outcomes after frenotomy in the presence of a restrictive sublingual frenulum on effectiveness and duration of breastfeeding.

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References

1. Bin-Nun A, Kasirer YM, Mimouni FB. A dramatic increase in tongue-tie related articles: A 67-year systematic review. *Breastfeed Med* 2014;12:410–414.
2. Joseph KS, Kinniburgh B, Metcalfe A, et al. Temporal trends in Ankyloglossia and frenotomy in British Columbia Canada 2004–2014: A population-based study. *CMAJ Open* 2016;4:E33–E40.
3. Kapoor V, Douglas P, Hill P, et al. Frenotomy for tongue-tie in Australian Children, 2006–2016, an increasing problem. *Med J Australia* 2018;208:88–89.
4. Walsh J, Links A, Boss E, et al. Ankyloglossia and lingual frenotomy: National trends in inpatient diagnosis and management in the United States, 1997–2012. *Oto Head Neck Surg* 2017;156:735–740.
5. Jin RR, Sutcliffe A, Vento M, et al. What does the world think of tongue tie? *Acta Paediatr* 2018;107:1733–1738.
6. Todd DA, Hogan MJ. Tongue-tie in the newborn: early diagnosis and division prevents poor breastfeeding outcomes. *Breastfeed Rev* 2015;23:11–16.
7. Mills N, Pransky S, Geddes D, et al. What is a tongue-tie? Defining the Anatomy of the in-situ Frenulum. *Clin Anatomy* 2019;32:749–761.
8. Mills N, Keough N, Geddes D, et al. Defining the anatomy of the neonatal frenulum. *Clin Anatomy* 2019;32:824–835.
9. Geddes DT, Langton D, Gollow I, et al. Frenulotomy for breastfeeding infants with ankyloglossia: Effect on milk removal and sucking mechanism as imaged by ultrasound. *Pediatrics* 2008;122:e188–e194.
10. Geddes DT, Kent JC, McClellan HL, et al. Sucking characteristics of successfully breastfeeding infants with ankyloglossia: A case series. *Acta Paediatr* (Oslo, Norway: 1992) 2010;99:301–303.
11. Douglas P, Geddes D. Practice-based interpretation of ultrasound studies leads way to more effective clinical support and less pharmaceutical and surgical intervention for breastfeeding infants. *Midwifery* 2018;58:145–155.
12. Scott JA, Binns C, Oddy W, et al. Predictors of breastfeeding duration: Evidence from a Cohort Study. *Pediatrics* 2006;117:e646–e655.
13. Wright JE. Tongue-tie. *J Paediatr Child Health* 1995;31:276–278.
14. Messener AH, Lalakea L, Aby J, et al. Ankyloglossia: Incidence and associated feeding difficulties. *Arch Otolaryngol Head Neck Surg* 2000;126:36–39.
15. Griffiths DM. Do tongue ties affect breastfeeding? *J Hum Lactat* 2004;4:409–414.
16. Ricke LA, Baker N, Madlon-Kay DJ, et al. Newborn tongue-tie: Prevalence and effect on Breastfeeding. *J Am Board Fam Pract* 2005;18:326.
17. Caloway C, Hersh C, Baars R, et al. Association of Feeding Evaluation with frenotomy rates in Infants with Breastfeeding Difficulties. *JAMA Oto Head Neck Surg* 2019;145:817–822.
18. Hazelbaker A. Assessment Tool for Lingual Frenulum Function. Columbus, OH: Aiden and Eva Press, 2010.
19. Hazelbaker A. Assessment Tool for Lingual Frenulum Function. Columbus, OH: Aiden and Eva Press, 2012.
20. Srinivasan A, Al Khoury A, Puzhko S, et al. Frenotomy in infants with breastfeeding problems. *J Hum Lactat* 2019;35:706–712.

21. Marchesan IQ. Lingual frenulum protocol. *Int J Orofac Myol* 2012;38:89–103.
22. Ingram J, Johnson D, Copeland M, et al. The development of a tongue assessment tool to assist with tongue-tie identification. *Arch Dis Child Fetal Neonatal Ed* 2015;100: F344–F349.
23. Ingram J, Copeland M, Johnson D, et al. The development and evaluation of a picture tongue assessment tool for tongue-tie in breastfed babies (TABBY). *Int Breastfeed J* 2019;14:31.
24. Schlatter S-M, Schupp W, Otten J-E, et al. The Role of tongue-tie in breastfeeding problems—a prospective observational study. *Acta Peadiatrica* 2019;108:2214–2221.
25. Riordan J, Gill-Hopple K, Angeron J. Indicators of effective breastfeeding and estimates of breast milk Intake. *J Hum Lactat* 2005;21:406–412.
26. Lalakea ML, Messener AH. Ankyloglossia does it Matter? *Pediatr Clin North Am* 2003;50:381–397.
27. Douglas PS. Making sense of studies that claim benefit of Frenotomy in the absence of classic Tongue-tie. *J Hum Lactat* 2017;33:519–523.
28. O'Shea JE, Foster JP, O'Donnell CPF, et al. Frenotomy for tongue-tie in newborn Infants. *Cochrane Database Syst Rev* 2017;3:CD011065.
29. Haham A, Marom R, Mangel L, et al. Prevalence of Breastfeeding difficulties in newborns with a lingual frenulum: Prospective cohort study. *Breastfeed Med* 2014;9: 438–441.
30. Power RF and Murphy JF. Tongue-tie and frenectomy in infants with breastfeeding difficulties: Achieving a balance. *Arch Dis Child* 2015;100:489–494.
31. Walker R, Messing S, Rosen-Carole C, et al. Defining tip to frenulum length for Ankyloglossia and its impact on Breastfeeding: A Prospective Cohort Study. *Breastfeed Med* 2018;13:204–210.
32. Hogan M, Wescott C, Griffiths M. A Randomized controlled trial of division of tongue-tie in infants with feeding problems. *J Paediatr Child Health* 2005;41:246–250.
33. Srinivasan A, Dobrich C, Mitnick H, Feldman P. Ankyloglossia in breastfeeding infants: The effect of frenotomy on maternal nipple pain and latch. *Breastfeed Med* 2006;1:216–224.
34. Dollberg S, Botzer E, Grunis E, Mimouni F. Immediate nipple pain relief after frenotomy in breastfed infants with Ankyloglossia: A randomized prospective study. *J Plastic Surg* 2006;41:1598–1600.
35. Buryk M. Bloom D, Shope T. Efficacy of neonatal release of ankyloglossia: A randomized trial. *Pediatrics* 2011;128:280.
36. Kumar M and Kalke E. Tongue-tie, breastfeeding difficulties and the role of Frenotomy. *Acta Paediatr* 2012;101: 687–689.
37. O'Callahan C, Mccary S, Clemente, S. The effects of office-based frenotomy for anterior and posterior ankyloglossia on breastfeeding. *Int J Ped Otol* 2013;77:827–832.
38. Ramoser G, Guoth-Gumberger M, Baumgartner-Sigl S, et al. Frenotomy for tongue-tie (frenulum linguae breve) showed improved symptoms in the short and long-term follow up. *Acta Paediatr* 2019;108:1861–1866.
39. Morosolli ARC, Veeck EB, Niccoli-Filho W, et al. Healing process after surgical treatment with scalpel electrocautery and laser radiation. *Lasers Med Sci* 2010;25:93–100.
40. D'Arcangelo C, Di Maio FDN, Prosperi GD, et al. A preliminary study of healing of diode laser versus scalpel incisions in rat oral tissue: A comparison of clinical, histological and immunochemical results. *Oral Surg Oral Path Oral Radiol Endodont* 2007;103:764–773.
41. Romeo U, Russo C, Palaia G, et al. Biopsy of different oral tissue lesions by KTP and diode laser: Histological evaluation. *Sci World J* 2014:6.
42. Varadan M, Chopra A, Sanghavi AD, et al. Etiology and clinical recommendations to manage complications following lingual frenectomy: A critical review. *J Stomatol Maxillofac Surg* 2019;120:549–553.
43. Walsh J, McKenna Benoit M. Ankyloglossia and other oral ties. *Otolaryngol Clin North Am* 2019;52:795–811.
44. Hale M, Mills N, Edmunds L, et al. Complications following frenotomy for ankyloglossia: A 24-month prospective New Zealand Paediatric Surveillance Unit study. *J Paediatr Child Health* 2019;56:557–562.
45. Reid N, Rajput N. Acute feed refusal followed by Staphylococcus aureus wound infection after tongue-tie release. *J Paediatr Child Health* 2014;50:1030–1031.
46. Kim DH, Dickie A, Shih ACH, Graham ME. Delayed hemorrhage following laser frenotomy leading to hypovolemic shock. *Breastfeed Med* 2021;346–348.
47. Messener AH, Walsh J, Rosenfeld RM, et al. Clinical Consensus Statement: Ankyloglossia in Children. *Otolaryngol Head Neck Surg* 2020;162:597–611.
48. Rizeq N, Wasserteil N, Mimouni F, et al. Upper lip tie and breastfeeding: A systematic review. *Breastfeed Med* 2019; 14:83–87.
49. Douglas P, Cameron A, Cichero J, et al. Australian Collaboration for Infant Oral Research ACIOR Position Statement: Upper lip tie, buccal ties and the role of frenotomy in infants. *Austr Dental Pract* 2018.
50. Santa Maria C, Aby J, Truong MT, et al. The Superior Labial Frenulum in Newborns: What is normal? *Global Pediatr Health* 2017;4:1–6.

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