

Rethinking “Posterior” Tongue-Tie

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Abstract

Currently, many clinicians who help with breastfeeding problems are diagnosing “posterior” tongue-tie in infants and performing or referring for frenotomy. In this “Speaking Out” article, I argue that the diagnosis of “posterior” tongue-tie has successfully raised awareness of the importance of impaired tongue function in breastfeeding difficulty. However, the diagnosis of “posterior” tongue-tie also applies a reductionist, medicalized theoretical frame to the complex problem of impaired tongue function, risking unintended outcomes. Impaired tongue function arises out of multiple interacting and co-evolving factors, including the interplay between social behaviors concerning breastfeeding and mother–infant biology. Consideration of theoretical frames is vital if we are to build an evidence base through efficient use of the scarce resources available for clinical breastfeeding research and minimize unintended outcomes.

Introduction

CURRENTLY, MANY CLINICIANS who help with breastfeeding problems are diagnosing “posterior” tongue-tie in infants. Once the diagnosis is made, the baby is referred for a frenotomy by a sympathetic dentist or doctor. In this article, I reflect upon the strengths and limitations of this diagnosis and consider the theoretical frames we might apply as we develop an evidence base for clinical interventions to improve tongue function during breastfeeding.

Impaired Tongue Function During Breastfeeding Emerges Out of Multiple Interacting and Co-evolving Factors

The tongue is composed of multiple muscle groups allowing remarkable flexibility of movement in different directions, and its effective function is vital to successful breastfeeding. The sucking mechanisms required for successful breastfeeding are initiated by primitive neonatal reflexes, specific to early life.^{1,2} New ultrasound studies increasingly elucidate the peristaltic and other components of tongue function during an infant’s suck.^{3,4}

In the newborn, the tongue is supported at its intersection with the floor of the mouth by the frenulum, a 2-cm-wide band of connective tissue, with a visible, narrow, and elastic midline prominence. The frenulum is characterized by remarkable anatomic variation. The two parts of the genio-glossus muscle also join in a decussate ligament, a connective tissue structure intimately related to the frenulum.⁴ Frenotomy is a simple but important intervention that

preserves breastfeeding in circumstances of “anterior” tongue-tie, when a visible frenulum variant connects the undersurface of the anterior portion of the tongue to the alveolar ridge or floor of the mouth, mechanically restricting tongue movement.^{5–8} But the frenulum, in all its anatomic variations, is just one factor among many that affect tongue function.

The primitive neonatal reflexes of breastfeeding, including of tongue function, may be inhibited by multiple intrapartum and postpartum factors, including placental transfer of medications and lack of skin-to-skin contact.^{1,2,9,10} In addition to the effects of technologized birth, many other variables interact and co-evolve to impair tongue function, resulting in nipple pain and/or poor milk transfer. These may include poor positioning and latch, infant anatomic variations, including of jaw and palate, and maternal anatomic variations. Because of the extreme neuroplasticity of the newborn, suboptimal tongue function may very quickly entrench neurologically.

The Diagnosis of “Posterior” Tongue-Tie Has Highlighted the Importance of Impaired Tongue Function in Breastfeeding Difficulty

In 2004, as awareness of the significance of “anterior” tongue-tie grew, it was suggested that a less obvious frenulum located under folds of mucosa at the base of the tongue in babies of mothers with breastfeeding difficulties also was a form of tongue-tie, which was named a “posterior” or “sub-mucosal” tongue-tie.¹¹ Today, babies who feed fretfully, who feed for prolonged periods, who refuse the breast, or who latch poorly, often in the context of maternal nipple damage, may be diagnosed with a “posterior” tongue-tie on the basis of

impaired tongue function on oral assessment.¹² Ultrasound studies have demonstrated that poor coordination of tongue peristalsis correlates with posterior humping of the tongue in mother–baby pairs with breast and nipple pain or other breastfeeding problems, and some assume this posterior humping results from a “posterior” frenulum that tethers the tongue during sucking.

All babies have a frenulum, some more hidden than others, with a wide range of normal anatomic variation. But in assessing tongue function, clinicians may rely on tools designed to classify tongue-tie and to determine the need for frenotomy. For example, the Coryllos–Watson Genna–Saloom typing system classifies frenulum variations as presumed degrees of tongue-tie.¹¹ The Hazelbaker Assessment Tool for Lingual Frenulum Function assesses tongue function by arriving at a score to indicate whether or not frenotomy is required.¹³ Once the diagnosis of “posterior” tongue-tie is made, there is wide variability in how frenotomy for “posterior” tongue-tie is performed. Scissors may be used to snip deeply into the frenulum down to the muscle; a deep laser cut may be made, even into the muscle and decussate ligament. In addition, laser or scissors may be used to release the labial frenulum.

Postfrenotomy, parents may be advised to lift the tongue with fingers placed on either side of the diamond-shaped wound a number of times daily, stretching the wound to avoid adherent scarring, particularly if the incision has been deep. Digital tongue interventions to decrease “posterior” humping of the tongue may be prescribed. If there is little or no improvement postfrenotomy, the procedure may be repeated after a fortnight. Some babies are receiving multiple frenotomies, up to five times in one local anecdote. In these instances, parents are advised that the first incision has been inadequate, or that deeper parts of the frenulum have now been exposed, requiring further release.

It is important that published studies concerning “posterior” tongue-tie do not provide evidence that the diagnosis of “posterior” tongue-tie has validity, or that frenotomy is effective treatment. Often, photographs of the frenulums purported to show “posterior” tongue-tie are indistinguishable from normal frenulum variants.^{14,28} Data are either unreliable or interpreted through the lens of “posterior” tongue-tie when multiple other potential factors could explain the results.

For example, a retrospective study reviewed the charts of 341 patients who presented to an otolaryngologist with tongue-tie concerns in the context of maternal nipple pain, latching on difficulties, and prolonged feeds. Nineteen were diagnosed and treated for a “posterior” tongue-tie, and four of those had a subsequent revision procedure; the authors acknowledged the unreliability of their diagnostic criteria.¹⁴ In another study of 311 infants up to 11 months old referred for assessment and treatment of ankyloglossia, 36% of infants were diagnosed with Type 3 (which could also be classified as a visible, “anterior”) tongue-tie and 49% with Type 4 (“posterior”) tongue-tie. But, the study’s evaluation of maternal perception of improvement occurred up to 52 months after the intervention, and 45% of mothers whose babies received frenotomy for Type 3 or 4 ankyloglossia did not respond, resulting in an unacceptably high response and recall bias.¹⁵

Clinical observation and teaching concerning “posterior” tongue-tie have had the benefit of raising our awareness of the frenulum and of alerting us to the importance of impaired

tongue function in breastfeeding. I argue, however, that if an intervention is instigated in the absence of an evidence base, and particularly if this involves a procedure in babies, it is essential that we carefully test the theoretical frames, or lenses, that we are applying.

Impaired Tongue Function Emerges Out of a Complex Interplay Between Social Behaviors Concerning Breastfeeding and Mother–Infant Biology

Some clinicians theorize that epigenetic changes are causing widespread and morphological abnormalities of the frenulum. Although there is strong evidence to suggest that epigenetic modulation of DNA expression in response to environmental factors may permanently reset the infant’s microscopic neurological stress circuitry,¹⁶ evolutionary biology demonstrates the stability of macroscopic human morphology over tens of thousands of years. It is unlikely that a novel anatomic abnormality of the frenulum is now emerging.

A much more likely explanation for the dramatic rise in incidence of tongue functionality problems lies in the complex interplay between social behaviors concerning breastfeeding and mother–infant biology, out of which impaired tongue function during breastfeeding emerges. The complex mechanisms by which technologized birth and lack of intergenerational role-modeling impact on breastfeeding are only just beginning to be elucidated: the relationship between impaired tongue function and impaired breastfeeding is a research frontier. It is, however, well established that doctors, midwives, and nurses have large knowledge gaps concerning the clinical support of breastfeeding.^{17–20} Even among lactation consultants, clinical skills are widely divergent, reflecting the profession’s relatively new status, lack of benchmarks concerning clinical skills, and the under-researched nature of clinical breastfeeding support.²¹ At the time that the diagnosis of “posterior” tongue-tie first emerged, for example, restraining the infant’s hands and forearms by placing them between the mother’s and baby’s bodies was common clinical practice—now acknowledged as an intervention that impairs positional stability and latch, and therefore tongue function.

The Coryllos–Watson Genna–Saloom typing system and Hazelbaker Assessment Tool for Lingual Frenulum Function Assessment tools, commonly used to diagnose “posterior” tongue-tie, conflate functionality with appearance. These tools are based on the assumption that functional impairment of the tongue must result from an anatomic abnormality of the frenulum. This cause-and-effect assumption is typical of biomedical theoretical frames. I suggest that we consider a problem as complex as impaired tongue function through the lens of complexity theory, which proposes that impaired tongue function in breastfeeding emerges out of the dynamic interaction and co-evolution of multiple factors (including structure and elasticity of the frenulum).

Simplistic Interventions Applied to Complex Problems Risk Unintended Consequences

Simplistic interventions, when applied to complex systems, risk unintended outcomes.²² For example, the diagnoses of “reflux,” allergy, and “lactose intolerance” have been commonly applied to crying babies in the first 3 or 4 months of life, particularly if the baby shows feeding refusal, back-arching, wind, crying when put down, or frequent feeds. Applying a

reductionist or biomedical lens to the complex problem of cry-fuss behavior assumes that excessive crying must have a linear, causative relationship with an underlying medical abnormality. In fact, these signs in crying babies are most often signs of a range of other unidentified problems, in particular, feeding problems. But, inappropriate diagnoses of “reflux,” allergy, and “lactose intolerance” in crying babies in the first few months of life have resulted in premature breastfeeding cessation, the side effects of unnecessary medications, increased risk of allergy, increased maternal anxiety, and the risk of persistent feeding difficulties into later childhood.^{23–25}

What might be the unintended outcomes of a simplistic surgical solution, frenotomy, applied to the complex problem of impaired tongue function in breastfeeding (when there is no visible “anterior” frenulum)? Even when the clinician explains that a problem is harmless and treatments are ineffective, families whose baby are given a medical diagnosis are more likely to pursue a medical treatment.²⁶ Could it be that the diagnosis of “posterior” tongue-tie leads families to hope that their distressing breastfeeding difficulty has a simple “quick fix,” resulting in unnecessary, even repeated, frenotomies?

The proliferative phase of any skin or mucosal incision is characterized by collagen deposition, granulation tissue formation, epithelialization, and wound contraction. After a deep frenotomy, which may even penetrate the decussate ligament, could the healed connective tissue prove to be less flexible than the pre-incision frenulum? Could the deep frenotomy cause substantially more pain than simple “anterior” frenotomy? Could this more invasive procedure result in subtle oral defensiveness, delaying improvement of tongue function? Could the intrusion of oral digital maneuvers postfrenotomy also contribute to subtle oral defensiveness?

Could it be that the controversial and, indeed for many health professionals, implausible diagnosis of “posterior” tongue-tie works against the important newly raised awareness of the need for prompt treatment of “anterior” tongue-tie?

Is There a Relationship Between Habituated Muscle Tension in the Tongue and Connective Tissue Tension in the Frenulum?

In the human body, connective tissue flexibility or contraction is intimately connected to muscular relaxation or contraction. The fields of physiotherapy, musculoskeletal medicine, and osteopathy agree that the muscle tension that results from chronic hyperarousal of the sympathetic nervous system may be associated with tightened and contracted connective tissue. Muscle tension may be either gross, as occurs in functional torticollis, or more subtle, as occurs with oral defensiveness in babies. Could it be that in the highly neuroplastic newborn, experiences in the technologized birth environment or challenges of mother–baby fit (anatomic or functional) affect oral motor functions, including of the tongue, and therefore neurologically habituate subtle dysfunctional or restricted tongue movements? Could it be that habituated or defensive muscular tension has the potential to affect the apparent elasticity of connective tissue and the tongue’s function during oral examination and during breastfeeding?

The pioneering work concerning “posterior” tongue-tie has taught us that initial breastfeeding consultations should include a noninvasive assessment of tongue function in addition to history, examination of the infant (and his or her oral cavity, including frenulum), and observation of a feed. The tongue and frenulum are described by appearance, and tongue functionality is described in terms of extension, lateralization, tongue lift, cupping, and the digital suck examination. A visible, “anterior” frenulum usually requires prompt frenotomy.

Clinical decisions are made taking into account multiple factors and patterns. I propose that there is no good rationale for numerically quantifying tongue function, just as there is no good rationale for numerically quantifying the findings of an auscultation of the lungs. If impaired tongue function is observed (in the absence of “anterior” tongue-tie), the clinician continues to identify and manage all possible breastfeeding problems that may contribute, including of latch and positional instability, and follows up closely over a period of time. Could it be appropriate that the clinician then occasionally, in carefully selected mother–baby pairs, nevertheless recommends a compensatory release of frenulum connective tissues (avoiding diagnostic labels), in the hope that this procedure might optimize latch and suck? In my view we need to be extremely cautious given the absence of reliable evidence or historical precedence to support the efficacy of frenotomy other than for “anterior” tongue-tie.

The development of an evidence base for prevention and repair of the profound neurobehavioral disruptions of breastfeeding, including of infant tongue function, that have emerged out of a century of technologization of birth remains the most important task ahead for researchers and clinicians who help mothers and babies breastfeed. Thinking through our theoretical frames is vital early on, if we are to minimize unintended outcomes, and invest the scarce resources available for clinical breastfeeding research most efficiently.²⁷

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