

## ***A Review of the Tongue-tie Phenomenon***

*Wattis, Kam, Douglas*

### **COMMENTARY**

#### **A Review of the Tongue-tie Phenomenon**

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Scenario – I've dashed into a coffee shop, ordered my take-away flat white and while waiting I observe a group of three mothers sitting outdoors with prams carefully arranged not to obstruct the flow of customers, enjoying a coffee and chat with babes in arms. One mum is patiently wrestling with her about 1-month old baby trying to latch him to breastfeed, while the others watch sympathetically, offering support and advice. 'He always fusses like this, sometimes it takes 5 minutes to get him on and by then he's lost the plot. Being somewhere different seems to make him worse'. 'Have you had him checked for tongue-tie?' one mother asks knowingly. I listen in, deliberately eaves-dropping now. 'Yes, the Child Health Nurse had a look but said his mouth is quite normal, and the fussing is just his impatience to get the food'. She popped a dummy in the baby's mouth and he calmed down temporarily. My coffee is ready and I sit down for a few sips. 'My friend's baby needed a release for a tongue-tie which many health professionals missed but the osteopath found. Maybe you should take him to an osteopath?' The baby squawks spitting out the dummy, and the mother firmly lays his flailing arms across his chest trying valiantly to latch him again. At this point I cannot resist getting involved too, my heart is pounding as I introduce myself as an international board certified lactation consultant (IBCLC) 'Gosh you're having a battle there... can I offer a suggestion?' All three pairs of eyes look astonished at my bold intervention, but she gladly agrees 'Yes, whatever can help'. I verbally guide her to position her baby differently — his hip towards her hip, arms either side of her breast, his chest snuggling in contact with her own and holding him only over his shoulders allowing his head to fall back. She resists allowing his head to be free but complies as his chin rests at the base of her areola. Baby gapes widely and spontaneously latches as my hand supports her hand on his shoulders to maintain a secure hold. The expression on her face tells me she is greatly relieved. 'It doesn't hurt,' she says with a look of disbelief as she stares at me, smiling. 'Great, remember what you and your baby have just done. Keep going. You are doing a fantastic job!'

What does this short encounter tell us? Women today are keen to breastfeed their babies and mother-to-mother support is fundamental to perseverance and success. Mothers are sharing the information about tongue-tie (ankyloglossia) which has flooded social media and captured the attention of a variety of health practitioners and parents, especially breastfeeding mothers, throughout the English-speaking world. This awareness has led to an

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increase in diagnosis and treatment of tongue-tie, particularly among babies who are experiencing breastfeeding difficulties.

### **What is a tongue-tie?**

Definitions of tongue-tie vary, but it is generally agreed that a tongue-tie exists when the frenulum (membrane of connective tissue) underneath the tongue (known as the lingual frenulum) restricts tongue movement in a way that negatively affects function. There are varying degrees of tongue movement restriction.

It is important to determine whether the degree of tongue movement restriction is, or isn't, affecting function (eg breastfeeding). When a baby's frenulum is restricting tongue movement and causing a functional problem with breastfeeding, a release (see frenotomy and frenectomy below) is warranted. Hence, a frenulum shouldn't be defined as a tongue-tie unless the frenulum is restricting tongue movement AND this restriction is contributing to a functional problem (eg interfering with feeding) (Haham, 2014). This is the definition of tongue-tie in babies which we use throughout this review.

### **What is frenotomy? And what is a frenectomy?**

A *frenotomy* is division of a frenulum and a *frenectomy* is removal of the frenulum.

Frenotomy is most commonly performed by a doctor or appropriately-credentialed clinician using scissors to carefully snip the frenulum separating it from the underside of the tongue, often accompanied by pressure from the operator's finger to further release the connective tissue. This takes a few seconds to complete and no anaesthetic is used when performed on young babies.

Frenectomy — a cut through the entire frenulum — requires attention to the control of bleeding and also anaesthesia when performed by ear, nose and throat (ENT) surgeons. More recently, this procedure is being performed on babies by dentists who use laser equipment to control the bleeding at the same time as they resect the frenulum. Laser frenectomy may take at least few minutes to perform. An anaesthetic may still be required if the baby is older.

### **How prevalent are tongue-ties?**

Because studies assessing the prevalence of tongue-tie use different criteria, there is wide variability in reported prevalence. Jorgenson et al (1992) reported a prevalence of 1.7% and diagnosed tongue-tie when 'the lingual frenum prevented protrusion of the tongue, the lingual frenum extended to the papillary surface of the tongue, or the frenum caused a fissure in the tongue tip during normal movement'. Flinck et al (1994) reported a tongue-tie prevalence of 2.5% and diagnosed tongue-tie when the lingual frenulum was attached close to the border of the papillated part of the tongue, preventing its protrusion. Ricke et al (2005) reported a 4.24% prevalence when tongue-tie was identified by nursing staff who

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referred babies suspected of having tongue-tie to the study investigators for confirmation. Hogan et al (2005) reported a 10.7% prevalence when tongue-ties were identified visually by midwives, neonatal nurse practitioners, and junior doctors after being given an explanation and comparison photographs of tongue-tie. This study also reported that only 43.8% of these mother/baby dyads had a feeding problem associated with the tongue-tie. A later review therefore (Todd, 2015) indicated 4.7% of the babies in this original population had 'problematic' tongue-ties. This figure is similar to the rate of tongue-tie division in their Australian hospital in 2008 and 2011 (4.7% and 5%, respectively).

### **Who assesses a baby's tongue-tie and determines whether it needs to be released?**

Midwives caring for women and newborn babies in postnatal settings are best equipped to support breastfeeding initiation and mother-baby skill development in the early weeks of life. Midwives who see babies in the early days with a suspected tongue-tie usually refer such babies to the hospital IBCLC and paediatrician for review. After discharge from the service, it may be the child and family health nurse who refers the baby to a private IBCLC for assessment. The baby may or may not be experiencing difficulty establishing breastfeeding.

The causes of breastfeeding difficulties are multi-factorial. The first step should always be to observe a breastfeed and work with the mother to improve her breastfeeding technique, which may be all that is needed, as in the scenario described at the beginning. Adjustment of the mother's positioning and attachment technique can enable the baby to respond to his or her instinctive reflexes and achieve a comfortable and effective latch.

A prominent lingual frenulum may or may not be a problem for a breastfed baby. It is the role of the IBCLC to consider all the potential contributing factors when breastfeeding problems occur and to provide a comprehensive assessment of the mother-baby dyad. This enables the IBCLC to recommend an appropriate management plan which in some cases may include referral for interventions such as frenotomy.

Factors that impact on a baby's tongue function are complex. A stressful birth, technological interventions and disrupted early feeding experiences may culminate in spirals of frustration, distress and physical tension for both mother and baby, including physical tension in a baby's oral musculature and connective tissues. Most importantly of all, a baby's tongue function is affected by the way the baby — with his or her uniquely-shaped little mouth, chin and body — fits into the mother's uniquely shaped abdomen, arms, thighs and breasts, since human bodies, breasts and oral structures are highly anatomically diverse (Douglas, 2016).

With the right support from caring helpers often the mother's skills develop and confidence grows as she achieves comfortable breastfeeds with minimal intervention. However, if the baby's ability to latch and suck is limited by restricted tongue function, which often

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contributes to nipple pain and injury, a frenotomy is likely to greatly assist the mother and baby to achieve comfortable and effective breastfeeding.

Sometimes a multidisciplinary approach helps a breastfeeding dyad. When complex oral function anomalies are identified, a speech pathologist is also likely to work collaboratively with the IBCLC to assess the baby's suck as well as swallowing and breathing abilities. If musculoskeletal problems (eg functional torticollis) are evident, gentle manual therapy performed by a skilled physiotherapist, osteopath or chiropractor may help release physical tensions which contribute to a baby's discomfort during breastfeeding. However, while such health professionals have a role in collaboratively assessing problems, they are not experts in the field of lactation. IBCLCs are uniquely skilled to consider all aspects of the breastfeeding experience and determine if breastfeeding is being affected by a tongue-tie, or whether other mother-baby breastfeeding interventions may rectify the breastfeeding challenges. As with all health professionals, experience and clinical skills vary among IBCLCs so the effectiveness of supportive guidance may vary between clinicians. Unfortunately, the clinical skills of IBCLCs are not as yet formally assessed during qualification and opportunities to develop breastfeeding support skills in acute settings across the spectrum of breastfeeding babies' ages (pre-term to toddlers) are limited.

Indeed, many of the signs and symptoms some attribute to tongue-tie (e.g. colic, reflux, clicking, gassiness or tummy pain, painful nipples, low weight gains in baby, fussiness, arching away from the breast) can also be signs and symptoms of sub-optimal breastfeeding technique or management, or other baby-related issues, which may be alleviated by expert breastfeeding guidance and support (Douglas, 2011; Douglas, 2013).

### **What does the research tell us?**

There are currently two well conducted systematic reviews which analyse and synthesise existing studies to offer high level evidence about the effects of surgical intervention for a diagnosis of tongue-tie. A 2014 systematic review by Power et al concluded that half of breastfeeding babies with tongue-tie will not have problems. If there are difficulties, mothers reported improvements after frenotomies or frenectomies. But the authors note that it is difficult to determine how much of this effect is placebo. A 2015 systematic review by Francis et al concludes 'A small body of evidence suggests that frenotomy may be associated with mother-reported improvements in breastfeeding, and potentially in nipple pain, but with small, short-term studies with inconsistent methodology, strength of evidence is low to insufficient.'

To date, studies conducted to determine when it is appropriate to perform frenotomy lack clear and consistent definitions of tongue-tie. Definitions of accompanying breastfeeding difficulties are also inconsistent and confused. The nature of the surgery is inconsistently reported. It is not possible to measure meaningfully the effects of the surgery because breastfeeding interventions are commonly applied at around the same time, although the

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nature of this support is not defined. There are few comparisons with the effects of the passage of time.

Other studies analysed in these systematic reviews rely on a commonly used diagnostic tool, the Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF). For example, Buryk et al 2011 assigned 58 breastfed babies with a 'significant' tongue-tie (ie HATLFF functional score less than 11 or appearance score less than 8) to either frenotomy (30 babies) or a sham procedure (28 babies). All mothers had nipple pain or difficulty breastfeeding. An immediate and statistically significant improvement in nipple pain (using the Short-Form McGill Pain Questionnaire) was reported by mothers in each group but the frenotomy group improved significantly more than the sham group. Breastfeeding scores, as determined by the IBFAT (Infant Breastfeeding Assessment Tool), also improved significantly immediately after in the frenotomy group, but not the control group. Emond et al 2014 assigned 107 breastfed babies with 'mild to moderate' HATLFF scores (6-12) whose mothers were experiencing similar breastfeeding difficulties to either frenotomy (55 babies) or standard postnatal care (52 babies). This study found that there was no improvement at 5 days post frenotomy in the mothers' nipple pain (Pain VAS score), LATCH (Latch, Audible Swallowing, Nipple Type, Comfort, Hold) or IBFAT scores. However, the change in BSES (Breastfeeding Self Efficacy score) between 0 and 5 days was significantly greater in the frenotomy group compared with the control group who received standard postnatal care.

The HATLFF pioneers a systematic approach to the clinical examination of oromotor and tongue anatomy and function, a historical step forward in the development of the relatively new field of clinical breastfeeding support. Amir et al 2006 found the Appearance items of the HATLFF received kappa values (Kappa is a measurement of reliability) between about 0.4 to 0.6 ('moderate' reliability) and the first 3 Function items (lateralization, lift and extension of tongue) had kappa values over 0.65 ('substantial' agreement). The 4 Function items relating to infant sucking (spread, cupping, peristalsis and snapback) all received low kappa values.

However, the HATLFF is still based on underlying subjective clinical assessments (Webb et al, 2013) and a well-conducted 2008 study of 148 newborn babies concludes that the HATLFF is not reliable (Madlon-Kay, 2008). There is currently no reliable tool for the diagnosis of a clinically significant tongue-tie, a problem which underlies the lack of good-quality evidence concerning the efficacy of frenotomy or frenectomy.

When it comes to determining if a baby requires a frenotomy, clinical judgement is required. Other than in the case of a very prominent membrane under the tongue, when frenotomy prior to breastfeeding is a sensible precaution, a full assessment of the mother and baby should be conducted by an experienced IBCLC. This involves the taking of a thorough maternal and baby history, examination of mother and baby including an oral examination, and observation of a breastfeed, all prior to referring for a tongue-tie release.

### **How effective is frenotomy compared to frenectomy?**

As per the systematic review by Francis et al (2015), there is considerable evidence indicating an immediate mother-reported improvement in breastfeeding after simple frenotomy for tongue-tie. Interestingly, while the randomised controlled trial by Berry et al 2012 found that 78% (21 of 27) of mothers reported an immediate improvement in feeding following frenotomy, 47% (14 of 30) of mothers also reported improved feeding when no frenotomy was performed, suggesting a possible placebo effect of frenotomy.

Some practitioners assert a frenectomy (ie a 'full release of the posterior component of anterior tongue-tie' or severance of the frenulum) is required to achieve optimal results (Todd, 2015). However, there is no research to support this assertion. It is not currently known what degree of release of a tongue-tie is required to optimise function in individual babies.

Frenectomy is a significant procedure regardless of who performs it. If a wound is left to heal by secondary intention (ie not sutured), the wound can take approximately 2 weeks to heal. Dentists who perform frenectomies using lasers commonly instruct parents to perform post-procedure wound-stretching exercises to help avoid wound reattachment during healing. There is currently no evidence to demonstrate the efficacy of such stretches. Nonetheless, parents are advised to perform the stretches multiple times each day for the following weeks, an uncomfortable or even distressing activity for both the baby and the parents. Providers of laser frenectomies often attribute some of the post procedure success to the parent's diligence in performing the wound stretches regularly and correctly after the procedure.

Frequent manual therapy (or 'bodywork') and IBCLC visits are also often strongly recommended by providers post laser frenectomy. Parents are also often advised it may take many weeks before breastfeeding problems resolve. This could lead to the belief it was the frenectomy that helped resolve the baby's feeding problems when it may be that the problems would have resolved over time without the frenectomy procedure. If breastfeeding problems are not resolving within a certain time frame, parents may be advised that a revision of the incision is required. Revisions are more commonly performed for posterior tongue-ties than for anterior tongue-ties (Brookes, 2014; Hong, 2010), suggesting that release of posterior (as compared to anterior) tongue-ties may be less likely to address the underlying cause of the breastfeeding problems.

Providers of laser frenectomy may also recommend release of the baby's upper lip (labial or maxillary) frenulum due to upper lip-tie (ULT), asserting this will further enhance a baby's latch for breastfeeding. The baby's upper lip does not have to flange outwards like the lower lip for effective breastfeeding. It merely needs to rest in a neutral position on the breast. There is no valid assessment tool for ULT and a lack of evidence to support the efficacy of a frenotomy of labial frenula in breastfed babies.

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Further, in our experiences working as IBCLCs we have been informed by clients that some providers of laser frenectomy are identifying buccal (cheek) ties (restrictive bands in the buccal mucosa) and are also recommending the release of these to resolve breastfeeding issues. However, there is no evidence to inform how buccal ties may impact breastfeeding.

### **What about long term outcomes?**

Long-term breastfeeding improvements (ie beyond 5 days) post frenotomy (as compared to a control group) have not been adequately determined by the research. Steehler et al's (2012) retrospective review is the only study to compare long-term outcomes between babies who did and did not have a frenotomy. They found that 83% of the frenotomy group continued to breastfeed for an average of 7.09 months, compared to 67% of the babies who received no intervention and continued to breastfeed for 6.28 months. Lack of data on long-term breastfeeding improvements is concerning since a main goal of frenotomy (when done for the purpose of helping breastfeeding problems) is to increase breastfeeding duration.

Limited evidence exists that tongue-tie can contribute to other long-term problems (eg speech). Chinnadurai et al's 2015 systematic review about the treatment of tongue-tie for non-breastfeeding problems concluded:

'Although individuals and clinicians report anecdotally that challenges and concerns persist into childhood related to feeding, speech, and social outcomes among children with ankyloglossia, evidence is sparse on management of the condition. Very little is known about whether ankyloglossia treatment, particularly frenotomy, is associated with positive changes in these nonbreastfeeding outcomes.'

Indeed, we cannot accurately predict if a baby's tongue movement restriction is likely to contribute to future functional problems. The practice of advocating frenotomies to avoid potential future problems is not substantiated by current research.

### **Which way forward regarding tongue-tie and breastfeeding?**

There is lack of agreement among health practitioners regarding the overall prevalence of tongue-ties which affect breastfeeding. Many health professionals caring for mothers and babies are concerned about the increasing number of babies being diagnosed with tongue-tie by a variety of practitioners, and the subsequent rising number of referrals being made for laser frenectomy. This trend has been confirmed in a recent population-based cohort study whose interpretation regarding the increasing identification of tongue-ties and subsequent frenotomy procedures 'may indicate a diagnostic suspicion bias and increasing use of a potentially unnecessary surgical procedure among infants' (Joseph et al, 2016). Whilst frenectomies can be performed by various specialists including ENT and paediatric surgeons, anecdotally, laser frenectomy is now frequently performed on babies by dentists.

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Concerned health professionals believe many breastfeeding problems could be better addressed by skilled adjustments of breastfeeding technique along with greater understanding of the wide range of normal behaviours and diverse oral connective tissue anatomies typically exhibited by babies, thus avoiding significant and expensive procedures. The focus on tongue-ties as the cause of breastfeeding problems is creating confusion among parents, some of whom wisely contact an experienced IBCLC for a second opinion, and who are often relieved to find frenectomy is unnecessary when their issues are examined, explained and resolved with appropriate expert breastfeeding advice and support.

In day to day practice, some IBCLCs work with mothers and babies whose laser frenectomies haven't provided the desired results. Some babies can exhibit breast refusal or oral aversion behaviours and a long journey must be travelled to reinstate trust in these damaged breastfeeding relationships. When a laser frenectomy procedure is unsuccessful, mothers may lament the considerable money they have spent (often up to \$1000), and feel reluctant to return to the dentist because they feel they have failed their baby somehow in their after-care.

Studies of the long-term outcomes of babies who have had laser frenectomies do not exist as the procedure is less than a decade old. Without this data, we cannot be certain complications or unexpected adverse effects will not arise. This is especially pertinent when frenectomies are being performed on babies in the absence of breastfeeding problems, but instead are treated in anticipation of future problems.

The rising popularity of frenectomies to 'fix' breastfeeding problems is a recent phenomenon which lacks a credible scientific basis. Unfortunately, inserting a simplistic intervention into the evolving and complex system of the breastfeeding mother-baby pair may risk unintended consequences (Douglas, 2016).

So where does this leave parents hoping to make sense of their baby's breastfeeding struggles? Health professionals are trusted to provide unbiased, evidence-based information so parents can make well-informed decisions about how best to protect their baby's health and wellbeing. The IBCLC has a pivotal role in ensuring evidence-based support (refer to the Code of Professional Conduct for IBCLCs) and wise guidance is provided to every mother, enabling her to achieve her personal breastfeeding goals with her baby.

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