



A multifaceted programme to reduce the rate of tongue-tie release surgery in newborn infants: Observational study



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ABSTRACT

Objectives: A programme was introduced in Canterbury, New Zealand to evaluate the diagnosis and treatment of frenulum releases in newborn infants with suspected tongue-tie (ankyloglossia). The primary goals were to support breastfeeding and ensure that unnecessary surgery was avoided.

Methods: Local healthcare professionals reached consensus on a pathway for improving management of infants with tongue-tie and breast-feeding difficulties. This embedded an expert breast-feeding review and assessment of lingual function using a validated method, the Bristol Tongue-tie Assessment Tool (BTAT). Infants with breastfeeding problems related to tongue-tie had a frenotomy at a hospital outpatient clinic. An education programme was developed to support introduction of the new clinical pathway and included seminars and online information for healthcare professionals and the general public.

Results: Frenotomy intervention rate reduced markedly from 11.3% in 2015 to 3.5% by mid-2017. Feeding methods were not different before or after surgery between infants who received a frenotomy and those who did not. Initially, the BTAT threshold for frenotomy was set at ≤ 5 , however the final clinical pathway combined a breastfeeding assessment and a BTAT threshold of ≤ 4 . The education programs assisted with the changes in practice, while increased use of the clinician guidance and public health information websites confirmed growing awareness of tongue-tie and community breastfeeding support.

Conclusions: Establishing consistent multidisciplinary assessment of tongue-tie in infants with feeding difficulties led to a marked reduction in frenotomy intervention rate. 23% of the frenotomy group in the 2016 audit showed a significant improvement in the ability to breastfeed, but overall there was no difference in the feeding pattern of infants who either received or were declined a frenotomy. The development of a supportive education programme and availability of online information about tongue-tie for health professionals and consumers contributed to successful uptake of the new clinical pathway.

1. Introduction

Tongue-tie (ankyloglossia) is a common condition occurring in 1–11% of newborn infants that may result in painful and early cessation of breastfeeding [1–3]. The presence of tongue-tie does not automatically result in breastfeeding problems and it is estimated that 40–75% of babies with tongue-tie will be able to breastfeed successfully [4]. In addition, breastfeeding improvement is not universal in infants with tongue-tie following surgical release of the frenulum (frenotomy or frenectomy) [5]. Interventions to alleviate tongue-tie-related breastfeeding difficulties may include monitoring, lactation support and surgical release of the frenulum. Guidelines cautiously support

frenotomies for babies diagnosed with tongue-tie related feeding difficulties but acknowledge that evidence of efficacy is weak due to the subjective nature of the measurable outcomes [3,6,7]. A 2017 Cochrane review [3] advised that surgical release of the tongue-tie does not consistently improve sustained infant feeding but is likely to improve maternal nipple pain. Clinical guidance and systematic reviews emphasise the importance of carefully selecting the infants who may benefit from a frenotomy, with the use of consistent criteria to diagnose symptomatic tongue-tie and assessment of function with a breast-feeding assessment being encouraged [1,4,7–11].

Despite the uncertainties regarding diagnosis and treatment indications for tongue-ties, the demand for frenotomies has increased in

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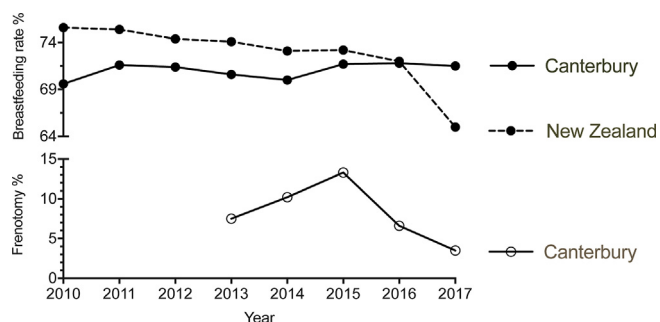


Fig. 1. Breastfeeding and frenotomy rates in Canterbury.

many Western countries in recent years [12–14]. As shown in Fig. 1 this trend became markedly apparent in the Canterbury province in New Zealand with frenotomy intervention in infants increasing from a relatively high rate of 7.5% in 2013 to a peak of 11.3% in 2015 (unpublished data of Christchurch Women's Hospital). Despite this high and rising rate of newborn frenotomies, in Canterbury the breastfeeding rates at discharge from the midwife at 4–6 weeks have remained unchanged from 2013 at approximately 72%, marginally lower than the national rate in New Zealand of approximately 74% [15].

In mid-2015, a multifaceted programme was initiated to improve the care offered to mothers and babies with breastfeeding difficulties. There was concern that over emphasis on tongue-tie may delay access to the most appropriate breastfeeding support and that unnecessary frenotomy surgery may have been provided. A working group was convened to understand the reasons for the rising frenotomy rate, and consisted of local hospital and community doctors, dentists, lactation consultants, allied health care professionals, and senior hospital managers. This group identified inconsistencies in anatomical description and assessment of tongue function and the lingual frenulum. There were uncertainties regarding the diagnostic parameters and referral criteria for frenotomy. It was apparent in some cases that frenotomy was seen as a quick surgical solution for more complex breastfeeding problems, and that availability of online information with a bias towards surgical release was influencing parent expectations of the potential value of the procedure [16].

A plan for a referral and assessment pathway that considered all causes for breastfeeding difficulties and assessed the functional impact of tongue-tie was needed. Internationally, the evaluation and management of infants with tongue-tie-related breastfeeding difficulties has generally shifted from assessment based solely on the anatomy of frenulum attachment to a more functional focus on restricted tongue movement caused by the lingual frenulum [2,8,17]. There are a variety of tongue-tie assessment tools available but none are universally accepted or applied [4,5,8]. The Hazelbaker tool [18] is recommended by the Academy of Breastfeeding Medicine because it is comprehensive, but it is also complicated and often too time consuming to use in a busy clinic [5,8,19,20]. The Bristol Tongue-tie Assessment Tool (BTAT) [21] was used in this programme as it is simpler, less time consuming, and has good inter-person reliability. The BTAT uses four criteria to evaluate tongue-tie that include appearance of the tongue tip, location of alveolar attachment, and tongue lift and protrusion. This generates a score between 0 and 8 with a lower score indicating more severe tongue-tie (Table 1). Research has shown a strong correlation between the findings of the BTAT and Hazelbaker tools [21]. Table 1 also describes the Coryllos system used to classify the type of tongue-tie.

The new clinical pathway with a change in emphasis on assessment and management of tongue-tie associated breast-feeding difficulties was supported by inclusion on a local guidance website called Community HealthPathways [22] and a comprehensive education programme for health professionals. Online information about breastfeeding, tongue-tie and access to community based lactation support was also made available to the general public on a locally developed open-access

Table 1

Description of the Bristol Tongue-tie Assessment Tool (BTAT) and the Coryllos classification system for tongue-ties.

Sources: Ingram J et al. Arch. Dis. Child. Fetal Neonatal. 100 (2015) F344–F348. Genna and Coryllos, 2009 Genna CW, Coryllos EV. J Hum Lactation 25 (2009) 111–112.

Bristol Tongue-tie Assessment Tool	Score		
	0	1	2
Appearance of tongue tip	Heart shaped	Slight cleft/notched	Rounded
Attachment of frenulum to lower gum edge	Attached at top of gum ridge	Attached to inner aspect of gum	Attached to floor of mouth
Lift of tongue wide mouth wide (crying)	Minimal tongue lift	Edges only to mid-mouth	Full tongue lift to mid-mouth
Protrusion of tongue	Tip stays behind gum	Tip over gum	Tip can extend over lower lip
Total score of 0–3 indicates severe reduction of tongue function			
Coryllos classification			
Type 1 Attachment of the frenulum to the tip of the tongue, usually in front of the alveolar ridge in the lower lip sulcus			
Type 2 Attachment of the renulum 2–4 mm behind the tongue tip and on or just behind the alveolar ridge.			
Type 3 Attachment to the mid-tongue or middle of the floor of the mouth.			
Type 4 Attachment against the base of the tongue, thick, shiny, and very inelastic.			

website called HealthInfo [23]. The details and the impact of these initiatives are described below.

2. Methods

2.1. Design, setting, and participants

The central location for the programme was the Neonatal Service, Christchurch Women's Hospital. A working group within the Canterbury District Health Board (DHB), coordinated by the Canterbury Initiative (<http://www.canterburyinitiative.org.nz/>) worked with clinicians and community representatives to support introduction of the new pathway. Ethical approval was not required for the study because it was conducted as part of audit and improvement of usual patient care by the Canterbury DHB. The time lines for programme development are shown in Fig. 2.

2.2. Clinical pathway for assessment of frenulum anatomy and function

An objective assessment for measuring frenulum function and anatomy using the BTAT score was introduced in January 2016. The threshold score for frenotomy was set initially at ≤ 5 . Surgical and feeding outcomes were audited for the next 6 months for all babies assessed at the clinic, regardless of whether or not they received a frenotomy. The audit data was then shared with the working group to inform further changes to the pathway.

In January 2017, a revised clinical pathway was developed that embedded an expert breastfeeding assessment in the earliest stages. It is generally acknowledged that frenotomy at age between 2 and 4 weeks is best practice to support breastfeeding [24–6]. Timely assessment to try to ensure early referral was therefore encouraged in the pathway as follows: 1) Frenotomy within the first 48 h was restricted to infants diagnosed with tongue-tie and severe feeding difficulties, following a specialist medical review, 2) Infants aged between 48 h and 8 weeks with breast-feeding difficulties needed an assessment by a lactation consultant (or midwife with additional training) and a BTAT score ≤ 4 for frenotomy with a neonatologist, and 3) An otorhinolaryngology surgeon would see infants older than 8 weeks following a breast-feeding

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