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# Myofunctional therapy

## Part 3: Tongue function and breastfeeding as precursor of oronasal functions

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### Abstract

Breastfeeding is the best practice to ensure proper nutrition, correct growth of the craniofacial complex and overall health of the baby with optimal breathing, feeding and sleeping functions.

Many mothers face breastfeeding problems due to the baby's difficulty in latching, especially if the lingual frenum is restricted.

Early detection and understanding of some of the root causes of those difficulties will lead to an early intervention, thus getting the babies on the right tract of their full potential of growth and development.

KEYWORDS Breastfeeding; Lingual frenulum; Tongue function; Facial asymmetry; Oronasal complex.

### Introduction

Breastfeeding is considered as the optimal nursing practice during the first period of life and exclusive breastfeeding is recommended for the first 6 months [AAP, 2012]. However, many mothers encounter difficulties when trying to breastfeed from the first day of life of the baby [AAP, 2012]. There are many reasons for breastfeeding difficulties, some of which are maternal-related and some are newborn-related. Early detection of a potential cause for a breastfeeding difficulty will assist in overcoming the issue [CDC, 2020; Paglia, 2019].

It was shown that during breastfeeding, the infant has to move the jaw and tongue in a natural physiological manner to aid in the compression of the lactiferous sinuses. This action, in addition to the normal swallowing motion, helps to develop proper perioral musculature and to create a wide U-shaped palate, wide airways, better oral development and less malocclusion [Elad et al., 2014], reduced risk of asthma [Palmer et al., 1998], reduced necessity for future orthodontic treatment [Saccomanno et al., 2019], and other advantages [Boyd et al., 2021; AAP, 2012].

If trained healthcare providers (paediatricians, nurses, lactation consultants) are aware of potential factors that impact on breastfeeding, early detection and intervention will occur.

The oronasal complex is shaped by the function of the various muscles of the tongue, face, head, neck and it may be affected if the tongue function is impaired [Kent et al., 2015; Quinzi et al., 2020].

Reasons for tongue dysfunction may include neural, muscular and anatomical conditions such as a restricted lingual frenum or "tongue tie" (Fig. 1). Altered tongue function is a very common finding in neonates [Yoon et al., 2017; Martinelli et al., 2018] and can be resolved with a simple, safe and effective surgical procedure called frenotomy [Martinelli et sostituito al., 2018; Maya-Enero et al., 2021; Coryllos et al., 2004; Ghaheri et al., 2017; Dollberg et al., 2014; Fisher, 2014].

The early detection of a dysfunctional tongue can be achieved by using screening tools such as the Martinelli protocol [Martinelli et al., 2012], the Assessment Tool for Lingual Frenulum Function (ATLFF) [Hazelbaker, 1993] and the Bristol Tongue Assessment Tool (BTAT) [Ingram et al., 2015]. The Martinelli protocol includes several parameters that relates to anatomy and oral functions such as breathing and crying [Martinelli et al., 2012].

Once a dysfunction is detected, the baby can be treated according to the origin of the dysfunction by conservative measures like tongue training and physiotherapy, osteopathy or a combination of surgery and post-surgical tongue training [Gelb et al., 2021; Saccomanno et al., 2019]. An early frenulum release intervention in the first 30–45 days after birth allows to solve the lingual functional restrictions and to continue a physiological breastfeeding [Power, 2014]. Apart from using a traditional scissors and scalpel, diode lasers (from 445 nm to 1470 nm), erbium lasers without water (2780-2940 nm) and $CO_2$ lasers (10600nm) are still valid options for a minimally invasive frenulum release [Olivi, 2012].

### The anatomy behind the lingual frenulum

It was recently shown that the lingual frenulum is comprised of the sublingual tissues as the oral mucosa, the fascia and sometimes fibers of the genioglossus muscle [Mills et al., 2019; Ingram et al., 2015]. These tissues can be manipulated manually or surgically and this will result in a greater range of motion and strength [Mills et al., 2019], thus improving breastfeeding.

FIG. 1 Short lingual frenulum.

FIG. 2 Asymmetry of the lower jaw and a short frenulum.

### Positional deformation in the newborn

Seventy-three percent of newborns exhibit one or more facial asymmetry [Yano et al., 2019] due to the compression or posture in utero. When the baby is born, the asymmetry of the scull, face and body should be evaluated because it can be a cause for breastfeeding difficulties [Stellwagen et al., 2008] (Fig. 2).

### Clinical evaluation of tongue function in the newborn

The clinician (paediatrician, nurse, lactation consultant) should evaluate and examine the newborn and look for potential contributors to breastfeeding problems. The examination should consist of observation of the baby's posture, symmetry, jaw position, movements, skin colour, muscle tone, lip posture during rest and during cry, tongue posture during rest and during cry, breathing (oral or nasal), palatal shape, tongue shape, and lingual frenulum, its origin, insertion, thickness and rigidity.

An evaluation of the tongue mobility should be performed, trying to evaluate the peristaltic-like movement from the tip of the tongue backwards. It has been shown that the tongue has two distinct areas of different motion when the anterior part is moving with the mandible movements and the posterior part has an undulation movement backwards in a pattern similar to a propagating peristaltic wave, which is essential for swallowing [Elad et al., 2014; Ingram et al., 2015; Wall and Glass, 2006].

## Treatment options

Following the diagnosis of a tongue tie that needs to be managed surgically, a team approach should be implemented. The team is led by the lactation consultant that makes sure the breastfeeding technique is optimal, and that the timing for frenotomy is right. In fact, a late frenulum release, after the fourth month from birth, limits the full benefit otherwise obtainable from an earlier optimal tongue function and the mother may already have considered suspending breastfeeding. Following the surgical procedure it is common practice to do post-surgical wound care to prevent reattachment and tongue training can be initiated when appropriate. After frenotomy, nipple and breast problems, such as soreness and fissures, improve and resolve; the baby latches more deeply to the breast with a better seal; the symptoms of aerophagia and reflux disappear; the duration of breastfeeding sessions is reduced by increasing its effectiveness; and the child is satisfied, reassured and gradually regaining weight [Bundogji, 2020]. There is no research behind neonatal tongue training and many protocols are suggested by various surgeons [Oddy et al., 1999; Gelb et al., 2021]. To date, there is no myofunctional protocol for neonatal treatment but hopefully, as this field grows, more and more research will be published.

## Conclusions

When the early diagnosis of a short lingual frenum is overlooked at birth, it is important to intercept and correct the related morpho-functional changes in growth as soon as possible, avoiding the onset of the cascade of functional impairments involving different body areas belonging to different paediatric specialists.

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