Frenotomy of the Frenulum Linguae in the Infant with Ankyloglossia

The tongue has important functions for eating, drinking, speaking and tasting. In particular, the infant needs a freely movable tongue in order to be able to suck, swallow and breathe effectively.

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The frenulum is a muscle and connective tissue fold, coated by the oral mucous membrane, on the underside of the tongue. It connects the muscle and connective tissue area, i.e., the underside of the tongue, with the floor of the mouth. If it is too short and hampers tongue mobility and function, it is referred to as a frenulum linguae breve (short frenulum), (*Figure 1*).

Fig. 1: Heart-shaped tongue with a frenulum linguae breve

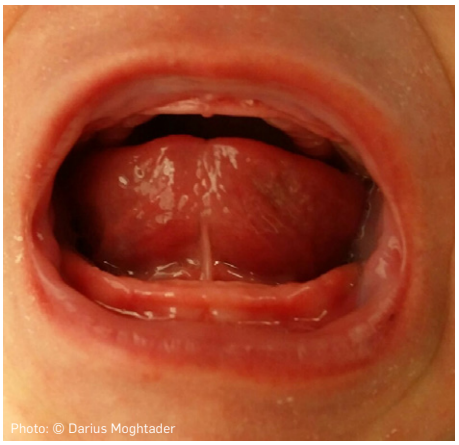

Fig. 2: Good anterior, but defective median and posterior mobility of the tongue

When is a frenulum too short?

The frenulum is characterized as too short if (a) it hinders the function of the tongue while eating, drinking, speaking, swallowing, or (b) due to the non-physiological resting tongue state, leads to the deformation of the facial bones and to malfunctions of the muscles resulting in tension in the facial and skeletal muscles.

A frequently disseminated definition states that the length of the frenulum is sufficient if the tongue can move halfway up into the mouth-opening when the baby is crying with their mouth wide open. This definition is not accurate because no statements about the mobility of the middle and rear parts of the tongue are made and babies with a short frenulum often just open their mouths a little.

In ***Figure 2***, a baby who is crying shows good mobility of the anterior (forward) part of the tongue and inadequate mobility of the median (middle) and posterior (rear) parts of the tongue. In accordance with the above definition, the frenulum would be long enough for the problem of inadequate mobility of the middle and rear parts of the frenulum not to be recognized. A better test is Michelle Emanuel's 'Sleeping Tongue Posture Hold'. [1] For this the mouth of the sleeping baby is closed with the long side of the index finger cranially, i.e., upwards, to the soft tissue which lies between the chin and the throat, and held for a few seconds. The tongue should lie flat on the roof of the mouth and, after a short time, with a wide-open mouth, separate from the palate. This process is illustrated in the following video: www.youtube.com/watch?v=Qb-TO-Zv-NEM

Currently there is no way to measure the length of a frenulum that is required for good tongue function.

There are tools that are suitable for evaluating good tongue function and thus length of the frenulum is sufficient. Among them are: the *Ingram Bristol Tongue Assessment Tool (BTAT)*[2]; the new version of TABBY[3] (illustrated with pictures), the *Frenotomy Decision Tool for Breastfeeding Dyads*[4], the *HATLFF-Screening-Sheet*[5]. The BTAT and the TABBY are simpler and faster but, in my opinion, less precise than the HATLFF. The too-short frenulum is more frequently overlooked when using the BTAT, as tongue function is not adequately assessed.

Ankyloglossia

In utero, the tongue and the floor of the mouth develop from the first four pharyngeal sheets. In the 12th week of pregnancy, the floor of the mouth and the tongue separate from each other through apoptosis, a controlled cell death of the connecting cell structure. If the apoptosis is incomplete, this leads to a too-short frenulum. Ankyloglossia is a congenital developmental disorder, in which the tongue-tie is too short or tight and/or the frenulum linguae extends too far forward, resulting in a fixed and captured tongue position on the floor of the mouth. Movement in all three dimensions, ventrally (forward), laterally (sideways) and cranially (upwards), can be limited. Histologically, Martinelli[6] was able to document collagen type 1, which is only 3 % stretchable, in all types of ankyloglossia. For this reason, stretching exercises mostly lead to the raising the floor of the mouth or changing the form of the tongue. Clinically, we see that the anterior (forward) frenula can be composed mostly of collagen while the middle and posterior frenula can be composed of mucous membrane, fasciae and muscles.

A freely moving tongue is important:

- For painless and effective breastfeeding.
- For good speech development. Only when the tongue can move freely to the roof of the mouth, can consonants be pronounced correctly.

- For the shaping of the palate, the jaw and the airway. If the tongue lies on the roof of the mouth, it is prevented from being shaped into a high arch. A higher, 'Gothic' form palate restricts the size of the sinuses, can lead to a narrow jaw with a lack of space for the teeth or teeth that are misaligned.
- For good nasal breathing. People whose tongue does not lie at rest on the roof of the mouth, mostly breathe through the mouth and often sleep with an open mouth. This can lead to increased susceptibility to infection, higher risk of developing rhonchopathy and an increase in the risk of allergy.
- For self-cleaning of the tongue on the roof of the mouth.
- For a relaxed baby through stimulation of the glossopharyngeal nerve in the tongue. Stimulation of the 9th cranial nerve of the vagus group belonging to the parasympathetic parts (activation inhibiting) produces relaxation of the body.
- For a physiological swallowing process.
- For a physiological chewing process.
- For a relaxed neck and throat musculature.

The physiological tongue function in breastfeeding with a freely moving tongue

The mouth opens, the lips and tongue seek and make contact with the breast and the tip of the tongue moves forward to breastfeed. With a wide open mouth and lips turned outwards, the infant draws the entire nipple, with the breast tissue, into their mouth. The anterior part of the tongue envelops the breast tissue in a spoon-shaped form, lies protectively on the chewing surface and holds the nipple in the oral cavity. The anterior part of the tongue, (which is wedged relatively immovable between the lower lip and the lower jaw), together with the lower lip, move as a close-knit entity with the upwards and downwards movements of the lower jaw, without losing the seal. With every sucking movement, the middle of the tongue moves upwards in a peristaltic, wave-like motion, pressing the breast tissue against the hard palate and produces the vacuum. Neither the tip of the tongue nor the wave-like movement of the tongue forwards and backwards is essential for milk transfer, but rather, it is the pumping motion in the middle of the tongue that is essential. The middle and posterior parts of the tongue control the act of swallowing.[7] Therefore, the complete release of the posterior part of the frenulum is important for the sustainable course of the treatment. Through this, the milk ejection reflex is triggered and the mother's milk flows into the infant's mouth. Since there is no pressure of the lips or the chewing action on the mammilla and it lies protected in the cavum orum (oral cavity), effective, pain-free breastfeeding is possible.

The middle and posterior parts of the tongue control the milk flow for a well-organized act of swallowing and protection of the airways because the soft palate and the tongue work together in order to separate the oesophagus and the airway from each other during sucking, swallowing and breathing. [8]

Inadequate tongue function when breastfeeding with ankyloglossia

When breastfeeding with ankyloglossia, the nipple is not drawn into the mouth or is only partially drawn in. Since the entire, middle or rear part of the tongue is fixed to the floor of the mouth and cannot produce a sufficiently effective vacuum, compensation takes place. The infant loses their grip and slips off the nipple. The baby presses with their lips and uses a chewing action in order to be able to drink. This strong pressure can deform and injure the nipple. This is the cause of pain for the mother during breastfeeding and of sucking blisters in the

Fig. 3: Plateau-like flattened jaw

infant. The pain during breastfeeding can decrease after a period of compensation, because the lower gum is flattened like a plateau and the forces which affect the nipple become distributed across a larger surface area (***Figure 3***). The seal between the breast and the lips and tongue gets temporarily lost again and again. As a result the infant swallows air while feeding. Colic, gas and air-related reflux can be the consequence.

Since the middle and posterior parts of the tongue are not movable, they cannot guarantee the necessary sealing of the airways in interaction with the soft palate, so that the infant may swallow more frequently and milk can get into the airways.

Due to the un-physiological sucking, the breast is not sufficiently emptied to stimulate and maintain milk production. As a consequence of this, milk production declines and the mammary ducts can become blocked, resulting in mastitis. The infant swallows air, behaves restlessly at the breast and does not gain weight in parallel with the percentiles. ›

Symptoms of frenulum linguae breve [9,10]

With breastfeeding problems, in addition to careful breastfeeding counselling and optimizing breastfeeding management, the mobility and function of the frenulum must be examined.

Possible symptoms in the breastfed baby with a too-short frenulum:

- The infant has difficulty grasping the breast.
- The infant has difficulty keeping the breast in their mouth, the vacuum is lost, the infant repeatedly attaches to and falls off the breast.
- Very frequent breastfeeding or very long breastfeeds.
- Ineffective breastfeeding. The baby feeds for a long while and must frequently go back onto the breast again after short intervals.
- Long comfort sucking.
- The infant is frustrated or exhausted by breastfeeding and rejects the breast because sucking requires extreme effort, but is not satisfying.
- The infant falls asleep quickly at the breast.
- The infant cannot keep a pacifier in their mouth.
- The infant develops a pathophysiological tongue thrust. (This does not have anything to do with the physiological tongue stretch reflex.)
- The infant loses an exceptionally large amount of weight after birth.
- Poor weight-gain of the infant despite more frequent breastfeeds.
- A white milk coating on the tongue that can be misdiagnosed as thrush. This indicates the limited cleaning function over the roof of the mouth, which the tongue cannot reach.
- The infant reluctantly lies on their back, because gravity pulls the tongue further towards the spine narrowing the airways.
- The infant only sleeps when carried in an erect position, in the car seat or on their tummy.
- While sucking, the milk runs out of the corner of the infant's mouth.
- The infant sleeps with and breathes through an open mouth.
- The infant makes loud breathing noises: 'rattling' or 'baby snoring'.
- When sucking, clicks and/or snapping noises occur.
- Colic and reflux caused by swallowing air affect the infant.
- The infant has a high 'Gothic' palate and, in the area of the lips, a plateau-like, flat lower jaw

The symptoms mentioned are, to some extent, unspecific and can also have other causes, which should be clarified first in breastfeeding counselling.

Despite ankyloglossia, some infants can breastfeed well in the first few weeks. When the (nutritional) needs of the infant increase or the milk production becomes increasingly autocrine instead of hormonally controlled, the amount of milk will be regulated downwards due to ineffective and non-physiological sucking. Then the infant becomes hungry and cannot meet their needs with their compensating sucking technique. Therefore, the frenulum should at this point be evaluated for ankyloglossia, if breastfeeding is (still) functioning.

Possible symptoms in the mother with a breastfed baby who has a too-short frenulum:

- Painful, injured or even bleeding mamillae.
- Lipstick-like deformed mamillae.
- Breast pain.
- Plugged milk ducts.
- Mastitis.
- Too little milk.

These symptoms are also to some extent unspecific and can have other causes. This should be clarified beforehand in breastfeeding counselling.

Emotional effects on the mother of a breastfed infant with a too-short frenulum:

- Bonding problems.
- Frustration.
- Depression.

Visual examination of the frenulum linguae breve [9, 10]

How can the suspicion of a too-short frenulum be confirmed? The following indicators of a too-short frenulum can usually be seen by looking in the infant's open mouth:

- The too-short frenulum is positioned anteriorly (in front) and is visible directly or when the infant is crying (***Figure 4***).
- The elevated tongue is heart-shaped or v-shaped (***Figures 1, 5***).
- The tongue looks square or flat-round (***Figure 6***).
- The infant does not stick their tongue out over the lower lip or out of their mouth.
- The infant does not raise their tongue to the palate in a resting state or when sleeping.

Fig. 4: An obviously too short frenulum

Fig. 5: Raised tongue is V-shaped

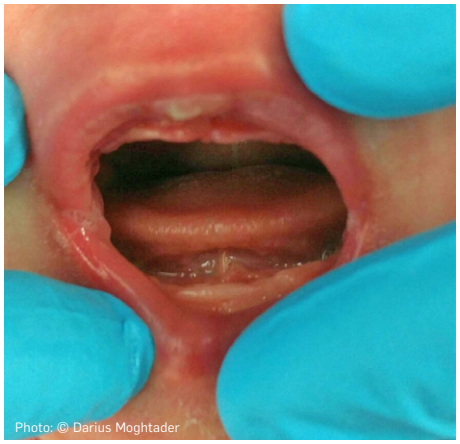

Fig. 6: Flattened tongue while crying

Fig. 7: Spoon-shaped tongue while crying

Fig. 8: The underside of the tongue is not visible while crying

Fig. 9: Two-toned tongue

- When the infant is crying, the tongue looks spoon-shaped. The tightly tied frenulum is often visible under the tongue (***Figure 7***).
- The tongue displays a chute form, a linear groove or notches on the tip of the tongue.
- The underside of the tongue is not visible when the infant is crying (***Figure 8***).
- The tongue displays two colours: anterior (forward) pink and median (middle) and/or posterior (rear) white (***Figure 9***).
- The mouth opening is small.

Manual examination of the frenulum linguae breve [9, 10]

Frequently, the too-short frenulum is not clearly recognizable.

- The frenulum in a median position cannot be recognized with visual examination.
- **The too-short frenulum in a posterior position,** lies way back, begins in the rear on the underside of the tongue.
- The **submucosal** short frenulum is hidden under the mucous membrane and, in some cases, cannot be delineated even with manipulation.

The Four-Six-Finger-Hold (***Figure 10***) is suitable for the presentation of the short frenulum. In accordance with Kotlov[11] and Ghaheri[12] the investigator **sits behind the infant's head.** The investigator and one parent sit knee to knee across from one another. The legs of the adults create a 'bed'. Then the infant is placed in the investigator's lap, with their head in the direction of the investigator. In this position the infant can be constantly secured and stabilized on both sides by the parent. The infant's face is in the same direction as the investigator's face (***Figure 11***). The investigator places one and then the other index finger under the infant's tongue. The chin is pressed downwards with the middle finger and then, with the index fingers, the tongue is moved upwards and backwards towards the investigator. Care must be taken to ensure that the thumbs of the examiner do not land in the area of the infant's eyes. The palm of the hand or the thumb can be used to stabilize the infant's head. **The following video illustrates the procedure:** https://vimeo.com/86784777.

The following techniques are suitable for manual examination:

- Testing the sucking reflex with the index finger.
- Testing the mobility of the tongue ventrally, laterally and cranially. When moving over the gum line (alveolar ridge) with the little finger, the tongue should follow it and not turn away.
- Murphy-Manoeuvre. Move the little finger along under the tongue. If there is noticeable resistance, this indicates a short frenulum.
- Additional probing of the palate.

The lactation consultant is one of the first contacts for the topic of breast- ›

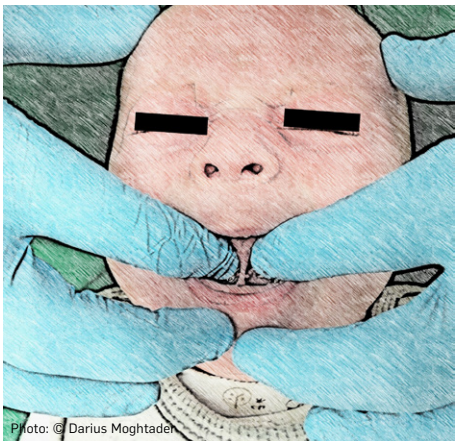

Fig. 10: Four-six finger hold to demonstrate the too-short frenulum

Fig. 11: Professional frenulum examination in accordance with the international standard

Fig. 12: Guidance for the parents on carrying out active wound management.

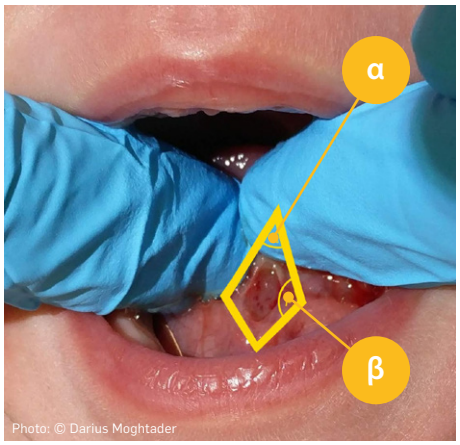

Fig. 13: Vertical corner α and horizontal corner β or diamond-shaped wound after a complete release

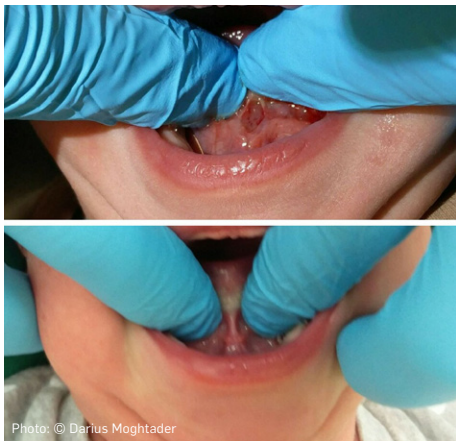

Fig. 14: Picture above: Frenulum after a complete separation.
Picture below: Frenulum after incomplete separation alio loco (at another location)

› feeding. The consultant has the opportunity to discover a too-short frenulum very early on. In the first weeks of the infant's life, the consultant can already prepare the breastfeeding dyad (mother and child) and refer them to a trained and specialized dentist or physician, who can carry out the diagnosis and therapy. Ideally, a summary of the observations and the documentation of the weight development would be transmitted to the physician. Good networking between midwives, breastfeeding consultants, dentists and physicians who carry out a frenotomy, is necessary to ensure that the infant is cared for comprehensively.[13]

Functional testing of the tongue for mobility

In order to determine whether a too-short frenulum is really present, all symptoms in the breastfeeding dyad should be carefully observed and documented and an examination of the function and mobility of the tongue should be carried out. The *Ingram BTAT Bristol Tongue Assessment Tool (BTAT)*[2,3] the *Frenotomy Decision Tool for Breastfeeding Dyads*[4] and the more accurate *HATLFF-Screening-Sheet (Hazelbaker Assessment Tool for Lingual Frenulum Function)*[5] are possible procedures to assess tongue mobility and function. The *HATLFF-Screening-Sheet* is not self-explanatory and further training is necessary. There is an authorised German translation by Márta Guóth-Gumberger, IBCLC which can be downloaded from her website. http://stillunterstuetzung.de/de/lit2.htm. The original English version can be purchased at: www.alisonhazelbaker.com/shop/

Differential diagnosis

Releasing the tongue-tie (frenotomy) should only be carried out when the diagnosis of a too-short frenulum is confirmed after a clinical examination and attachment to the breast has been optimised by the obligatory breastfeeding consultation where other causes for the breastfeeding problems have been evaluated and remedied.

Preparation for the frenotomy

The lactation consultant can contribute to the success of the frenotomy, in that, in addition to an examination of the tongue function and breastfeeding counselling, they can prepare and support the parents of the patient with information about the frenotomy. The following information is helpful for parents:

- What happens during the examination by the physician?
- What are the consequences beyond infancy if the too-short frenulum remains untreated?
- What happens during the releasing of the frenulum?
- What kind of pain and after-pain is expected?
- What is involved in pain management?
- Why, when and how is active wound management carried out?
- What is the significance of the 4-6 rule?
- Why are breastfeeding counselling and body work important before and after the release?

An appointment for breastfeeding counselling within the first 3-5 days after the separation should be arranged if possible.

Therapy – the frenotomy

A **complete** frenotomy is a minimally invasive procedure, which should take place as early as possible. This involves the clinically reachable part of the frenulum being **completely** severed. It is carried out by a trained and specialized dentist or physician under topical or local anaesthesia. With uncooperative children, sedation can be used if necessary. However, due to the risks associated with sedation, it should be avoided with infants.

Before the release, the physician practises with the parents what has been discussed in the breastfeeding counselling regarding active wound management (see under follow-up care of the frenotomy). The physician first demonstrates the necessary stretching exercises and allows the parents to practise them under supervision and instruction until they are correctly carried out (***Figure 12***).

The treatment can be carried out with scissors, a diode laser, an electrotome or, minimally invasively, with the CO_2-Laser. Typical for a **complete** release is a diamond-shaped wound, which automatically occurs with a horizontal separation, due to the anatomic tent-shape of the frenulum. Ideally, the vertical corner α is, thereby, smaller than 90° and the horizontal corner β larger than 90° (***Figure 13***). The collage in ***Figure 14*** shows an **incomplete** snip of the frenulum. Two weeks earlier, in the hospital, only the anterior part of the frenulum was snipped. The upper picture of the collage shows the state of things after a minimally invasive **complete** post-release of posterior part of the frenulum with a CO_2-Laser and with a diamond-shaped wound as a sign of the complete release.

Fig. 15: First stretching exercise directly after the release

Fig. 16: Demonstration with the trowel of the otherwise invisible frenulum

Performing the release using the CO_2-Laser takes only a few seconds. The temperature in the body tissue remains low at 90°C. Therefore, the release causes very little pain and makes it possible to protect the tissue. The nerve fibres and the blood vessels are 'welded' by the laser. The wound area has germ decontamination, no bleeding and is desensitized. This 'sealed' wound surface considerably reduces the amount of active wound management, since the stretching leads to no or less pain or secondary bleeding. Through the laser cut, the scarring is reduced, due to the reduced number of myofibroblasts in the wound. The CO_2-Laser disinfects while cutting and is used at a distance without direct tissue contact. The technique is complex and needs obligatory preparatory training. The CO_2-Laser can remove cell layer by cell layer and because of the special characteristic of this wave length, incisions can be made with a precision of 0.1 mm (approximately the diameter of a human hair) , enabling specific and minimally invasively tissue removal to leave the tongue freely movable. Once the last limiting cell layer is separated, the tongue sometimes races upwards with a clearly audible noise. We like to compare this moment with the opening of a door. Directly after the release, a stretching exercise is carried out by the practitioner (***Figure 15***). Ideally, this will be photo-documented and made available to the parents and the co-therapists and lactation consultant for further treatments. This also serves as a control for a **complete** release and for assessing the tongue mobility.

As preparation for the frenotomy, the infant will be swaddled. They may be breastfed up to the release if they do not tend to suffer from strong reflux. In our practice, the parents are allowed to be in the treatment room during the release to support their child with body contact and their voices, if they feel able to do that. The infant's eyes will be covered with laser protection pads. All persons present in the room wear laser protection glasses. An anaesthetizing cream suitable for infants will be applied to the frenulum. The infant's head will be stabilized from behind and aligned. Then, the tongue will be raised up and the entire frenulum with be presented (***Figure 16***). Thereby, the salivary glands and the sublingual caruncle are often raised as well (***Figures 17 and 18***). The two caruncles are two small papillae with a joint opening for the saliva of the glandula submandibularis (lower jaw salivary gland) and the glandula sublingualis (sublingual gland) under tongue salivary gland. With constant upward move- ›

Fig. 17: Gently lifting the salivary glands' excretory ducts, on both sides

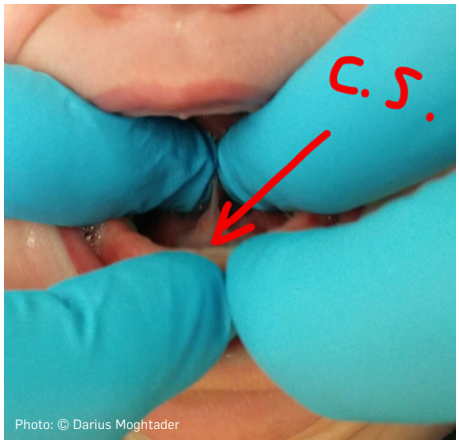

Fig. 18: Lifting the two C. sublingualis, take care to preserve them

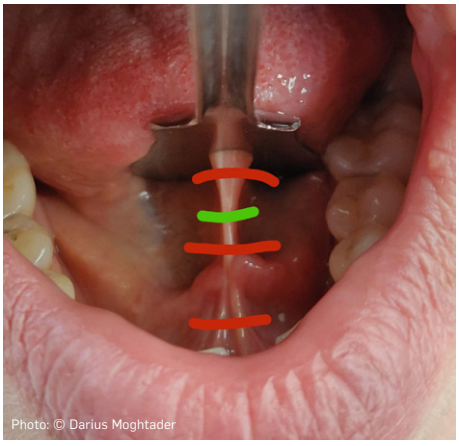

Fig. 19: Optimal cutting point, marked in green

Fig. 20: Resting position tested with the Tongue Posture Hold

Fig. 21: Ideal elongated diamond-form, under active wound management, with an acute rhomboid angle.

Fig. 22: Immediate changeover from mouth to nasal breathing after the separation of the frenulum.

Fig. 23: Parents' picture of stretching with normal fibrin coating.

› ment of the tongue, the frenulum will be released on the thinnest place marked in green, horizontally centred between the carunculae sublingualis and the underside of the tongue in the direction of the hollow probe end (***Figure 19***). If the frenulum is completely released, the tongue often races upwards. ***Figure 20*** shows the physiological resting position of the tongue on the palate directly after the release with the 'Tongue Posture Hold'. A diamond-shaped wound occurs that is a typical picture for a **complete** release. The M. genioglossus and the floor of the mouth must be protected. In infants an expansion of the cut to the sides does not, in our experience, bring any sustainable improvement of the result and we do not carry out this procedure.

After the release, a stretching exercise is conducted as a test of the free mobility of the tongue. It should be stretched so that the vertical rhomboid angle α falls significantly under 90° (***Figure 21***).

Directly after the release the baby is agitated, but free of pain. Now, it is essential that the infant is calmed down as quickly as possible. Therefore, anything that helps is allowed. Particularly appropriate is breastfeeding. Frequently, there is an immediate change in the closure of the mouth, as can be seen in the collage in ***Figure 22***. The two upper pictures show the state with a too-short frenulum, un-physiological resting position of the tongue and, due to this, breathing with an open mouth. The two pictures at the bottom taken five minutes after the release with a CO_2-Laser, show a complete release of the frenulum with the typical diamond-shaped wound, a physiological resting position of the tongue and breathing through the nose with a closed mouth. The lower jaw follows the tongue, which rests in a physiological state on the roof of the mouth. Due to this, the mouth closes and healthy nasal breathing can begin.

The CO_2-Laser 'welds' the blood vessels and nerve endings so that no or only a limited amount of bleeding is to be expected and the risk of infection in the mouth is even further reduced due to the high immunological competence of the oral mucosa.

Through the 'welding' of the nerve endings, the pain sensation when the wound is touched is reduced, which positively affects the required active wound management after a complete release of the clinically reachable portion of the frenulum

On the next day, a white coating, fibrin, can be seen (***Figure 23***), which indicates one of the first steps of natural wound healing, – the body's own 'band-aid', so to speak.

With very 'young' infants, it can happen that there is an immediate improvement in the breastfeeding situation. With 'older' infants we expect to see the first improvement on the third day. Then the roller-coaster ride of wound healing with good days and setbacks begins. The tongue must learn operational models and build up the muscles. In fact, muscle soreness can occur. Usually the tongue at rest very quickly starts to lie in the physiological resting tongue state ventrally (frontwards) on the palate and begins to re-shape it. Through the forward displacement of the tongue, the airways open up, often immediately or within a few days and the lower jaw follows the tongue. The mouth closes and nasal breathing starts. Pacifiers should be avoided as much as possible as they push the tongue away from its physiological position backwards and downwards and hamper the desired contact of the tongue with the palate. Avoiding pacifiers completely is ideal and as an alternative we recommend offering the breast or the little finger. The little finger is smaller than a pacifier, not always available and cannot be used autonomously by older babies. This automatically leads to a shorter duration of time in the mouth, especially when the baby is sleeping.

After a few hours, some infants can experience after-pain. Here, skin contact, breastfeeding and frozen pumped or expressed mother's milk helps. For this purpose, the mother's milk is poured onto a flat plate and is deep frozen in a thin layer. Then the mother's milk slices are broken into small pieces and placed under the tongue. The 'mummy' ice is cooling,

painkilling, wound- healing promoting, germ-reducing and smells good to the baby. If, despite this measure, the infant cannot calm down or sleep, then they are in pain and the pain reliever that the physician prescribed, just in case, will be administered. (See the brief video for parents: www.youtube.com/watch?v=FMzFPvoxqgs)

With good pain management, a breastfeeding strike can be avoided. If after-pain does occur, a duration of about 48 hours should be expected.

An ambulatory release with a CO_2-Laser is normally possible up to the age of 12 months and, in individual cases, far beyond this. The wound healing is mostly uncomplicated and is without scarring or with reduced scar formation

As an alternative, the frenulum can easily be released technically and cost-effectively using scissors in any dental practice in which the staff have been trained. **More important than the medium are the knowledge and skills of the physician carrying out the procedure and competent preparatory and post-op care by LCs.** The following video shows the release with scissors: www.youtube.com/watch?v=Ui1SUKV6vhw

Wound healing takes place openly. Due to the risk of bleeding with release using scissors, giving vitamin K before the procedure should be considered. With a release by scissors, infrequent complications, such as post-operative bleeding, post-operative pain and scarring should be borne in mind.

Physicians and dentists who carry out a frenotomy need the assistance of midwives, lactation consultants, osteopaths, oral therapists and parents. "Snipping or cutting" alone does not solve the problem. Only a full release, consistent preparation and post-op care can ensure the success of the therapy.

Aftercare for the frenotomy

The release takes place horizontally. The body attempts to close this horizontally-formed wound horizontally again. Without active wound management of a **complete** release of the clinically accessible part of the frenulum, this leads to a reattachment of the posterior part of the tie (***Figure 24***). This can result in renewed functional impairment of the tongue with the previously mentioned symptoms. Therefore, active wound management after the procedure, in accordance with the 4-6 rule (see below), is essential in order to prevent an adverse horizontal healing of the wound margins, which would, once again, restrict the mobility of the tongue. Dentists, physicians, midwives and lactation consultants are called upon to motivate the parents, to instruct them in the technique and to support them. Two weeks of stretching is sometimes advised but, in our experience, is significantly too short a period and reduces the likelihood of success of the frenotomy.

Fig. 24: Posterior part of the too-short frenulum (PZB)

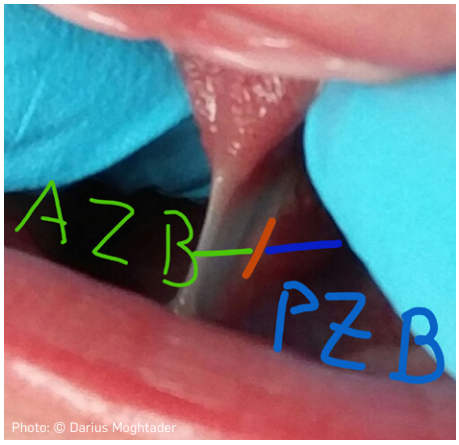

Fig. 25: Incomplete, only anterior separation

The 4–6 rule

The objective of active care of the wound is that the horizontal wound heals vertically so that the full mobility of the tongue is preserved. For at least a 4 weeks, the parents must carry out active stretching exercises with the baby, which should last for 4 seconds at least 4-6 times in 24 hours at intervals of 4-6 hours, even at night.

To do this, start from behind the infant's head, first use the 4-6 finger grip, by bringing one index finger, then the other index finger under the tongue **until the two fingertips touch.** Then, using the middle finger, press the chin downwards and the pull the tongue upwards and backwards, making sure to avoid touching the infant's eyes with your thumbs. Then stabilize the infant's head with the thumbs or the palms of your hands. Hold this position **once** for 4 seconds so that the diamond-shaped wound is clearly elongated and completely visible and the vertical diamond angle α sinks significantly under 90°. See this short video for clarification of this action: www.youtube.com/watch?v=YzMGZIIPE-o.

If the frenulum is only **incompletely** snipped – often in the purely collagen-containing and, therefore, in the white, not the blood-perfused anterior (forward) part of tissue (***Figure 25***), active wound management has only a limited advantage, because the stretching lifts the floor of the mouth and the tongue muscles stretch caudally (downwards). If the exercises stop, then the 'normal' condition, with limited tongue mobility, returns. The insufficient snipping of only the anterior (forward) part of the too-short frenulum can also lead to a time-limited improvement in the breastfeeding situation.

It is unlikely that the advantages of a freely moving tongue for eating, drinking, speaking, swallowing, breathing and the shaping of the palate, through the physiological resting position of the tongue, as well as the relaxed chewing and adjacent facial and skeletal muscles at rest, will be achieved by an incomplete release.

In addition to after-care of the infant, the following measures are paramount: instruction on optimal breastfeeding positions, appropriate breastfeeding management, support in reducing the amount of supplemental food and documentation of the course of weight gain[9], osteopathy, chiropractic and myofunctional therapy for the infant as well as therapy for the mammillae and support for the family. These diverse tasks could be fulfilled by the lactation consultant only together with cooperating therapists. Therefore, it makes sense to collaborate within a network with specially trained lactation consultants and oral therapists and to look after ›

these difficult and time-consuming cases jointly in a team with appropriate competences and capacities. We look after the breastfeeding dyads in cooperation with the lactation consultants for a period of four weeks after the release.

Summary

- Good **pre- and post-op care** is essential for successful therapy for a too-short frenulum.
- Trained lactation consultants, midwives, dentists and paediatricians should **routinely check** for tongue-tie and lip-tie.
- With a release with scissors, **giving vitamin K** should be considered.
- A key factor after a complete frenotomy is **active wound management,** with stretching exercises and training for the tongue. The parents must be motivated for this, instructed in the technique and feel supported.
- **Collaboration** among trained lactation consultants, midwives, oral therapists, dentists, physicians, osteopaths and chiropractors is essential for the success of the therapy. The path from the first breastfeeding problems to the diagnosis of too-short frenulum to successful completion of the therapy is a process in which all sides fine-tune and coordinate their work again and again.
- A frenotomy is **not a quick fix,** but requires an interdisciplinary network, which can, as a team, help many breastfeeding dyads to have a long, natural and enjoyable breastfeeding time.[14]

INTERESTING LINKS:
- www.drghaheri.com/blog
- www.kiddsteeth.com/breastfeeding.php
- https://tonguetieal.com/tongue-ties/

AUSTAUSCH FÜR BETROFFENE ELTERN:
- https://m.facebook.com/groups/174259416421025

INTERDISZIPLINÄRE FACEBOOK-FACHGRUPPE ZUNGENBAND/LIPPENBAND:
- www.facebook.com/groups/tots-deutschland/

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