

Case reports

Frenotomy: from assessment to surgical intervention

Jamille Silva Nogueira¹<https://orcid.org/0000-0001-7582-2285>Cláudia Adriana Brito Gonçalves¹<https://orcid.org/0000-0001-6520-7377>Silvana Ribeiro Roda¹<https://orcid.org/0000-0002-6816-7777>

¹ Universidade Estadual de Campinas - UNICAMP, Faculdade de Odontologia, Piracicaba, São Paulo, Brasil.

Conflict of interests: Nonexistent



Received on: August 5, 2020

Accepted on: May 11, 2021

Corresponding address:

Jamille Silva Nogueira
Rua Francisco Bueno de Lacerda, 250,
apto 14 bloco C, Jardim Dom Vieira
CEP: 13036265 – Campinas, São Paulo,
Brasil
E-mail: jamille_snogueira@hotmail.com

ABSTRACT

The objective of this study was to demonstrate that frenotomy can help improve breastfeeding, tongue movement, and the mother's comfort, if the assessment criteria are respected and the infant's function and age are observed. Frenotomy was performed on two babies with breastfeeding difficulties who came to CEPAE – Center for Research and Dental Care, in 2018, as part of the course on Early Childhood Interdisciplinary Preventive Care at a Dental School. After anamnesis and clinical examination, the lingual frenulum assessment protocol for babies was applied. The necessary frenotomies were performed with topical anesthesia, scissors, and groove director. The babies were reassessed in follow-up visits 7 days after the procedure. The babies had gained weight and the mothers had found greater comfort and easiness when breastfeeding, after the procedure. It is concluded that the less time it takes from ankyloglossia diagnosis to intervention, the easier it is to resume breastfeeding. Also, the identification of ankyloglossia is more effective, and its intervention more efficient, through an interdisciplinary assessment.

Keywords: Infant; Lingual Frenum; Breast Feeding

INTRODUCTION

In the baby's early life, some anatomo-functional changes – including that in the lingual frenulum, which is a predisposing factor – may interfere with their cranio-facial development. The changes in size, shape, and position of the lingual frenulum may cause difficulties and even limitations to tongue movement. Besides influencing maxillary growth, the tongue participates directly in sucking and swallowing¹. These functions, once impaired, may hinder breastfeeding and cause early weaning²⁻⁴.

The functions of the tongue are directly influenced by its positioning, shape, and mobility⁵.

Ankyloglossia is a congenital oral pathology with a prevalence of 3.2% to 4.8% – which are, nonetheless, underestimated data because of the absence of specific diagnosis and symptomatology⁶. Other authors mention a prevalence between 0.1% and 10.7%, pointing out that such variation is due to nonuniform definition and classification⁷.

Currently, lingual frenulum assessment has been widely disseminated as a means to prevent early weaning. In Brazil, a protocol – which became mandatory in 2014 with Law no. 13,002/14 – was developed to standardize this assessment in newborns⁸.

The said law does not provide which professional must conduct the test. However, of those who work in hospital settings, the speech-language-hearing therapist is the one who performs this assessment, as they must know the orofacial structures and functions. Outside the hospital setting, the assessment is predominantly carried out by speech-language-hearing therapists and dental surgeons⁹. Other authors refer to the dental surgeon as the one who usually assesses the anatomical aspect of the lingual frenulum and tongue mobility¹⁰.

It is highly important to demonstrate that the interdisciplinary practice involving speech-language-hearing therapy and dentistry increases efficiency and effectiveness, speeds up the ankyloglossia assessment and intervention, and minimizes its impact on breastfeeding.

CASE REPORTS

This study was approved by the Ethics Committee of the Dental School of Piracicaba at the *Universidade Estadual de Campinas* (Campinas State University – FOP/UNICAMP), Brazil, under evaluation report number 3.664.186.

In 2018, the hospitals in the city of Piracicaba referred babies weekly for lingual frenotomy in the course on Early Childhood Interdisciplinary Preventive Care at the Dental School of Piracicaba (FOP/UNICAMP).

The babies who participated in this institution's breastfeeding program were also assessed. Besides evaluating their lingual frenulum, it was observed whether they had breastfeeding difficulties to indicate lingual frenotomy in the cases diagnosed with ankyloglossia.

Two cases referred for lingual frenotomy were randomly selected. It was verified in their follow-up whether their latch had improved and, consequently, if they had gained any weight. As this procedure is little invasive, topical anesthesia was standardized for use in this surgery. The mother and baby had a postoperative follow-up to identify difficulties that could have arisen.

In addition to the assessment, the mother was instructed on breastfeeding (e.g., the proper position and latch) and how to deal with the factors that might interfere with high-quality breastfeeding (e.g., breast volume and excessive milk flow).

In each baby's assessment, we collected their identification data and interviewed the mother, surveying information on birth and post-birth and evaluating the breasts and breastfeeding^{11,12}.

During the newborn's non-nutritive sucking, we evaluated their alertness, search reflex, sucking reflex, bite reflex, regurgitation reflex, and sucking strength¹³.

We also used the lingual frenulum assessment protocol for babies¹⁴. This protocol is divided into clinical history, anatomo-functional assessment, and nutritive and non-nutritive sucking assessment. If the total score of clinical history and clinical examination (anatomo-functional assessment and nutritive and non-nutritive sucking assessment) adds up to 13 or more, the lingual frenulum is considered to have interfered with tongue movement and the infant is referred for surgery. Likewise, if only the clinical examination is made (anatomo-functional assessment and nutritive and non-nutritive sucking assessment) and the total score adds up to 9 or more, the frenulum is considered to have interfered with tongue movement and the baby is referred for surgery.

After verifying that the lingual frenulum interfered with tongue movements and deciding on a frenotomy, the procedure was scheduled. The parents/guardians were informed about the surgical procedure and instructed about preoperative precautions, such as taking a 2-hour fasting interval before the procedure

and communicating with the team in case the patient had flu symptoms, fever, or any change in their health status, so the procedure could be rescheduled.

On the day of the procedure, after the parents/guardians had given their written consent, the infant was laid on the stretcher in the supine position and held still by the parents/guardians. The head was stabilized by a team member for the patient's safety during the procedure.

CASE 1 – Frenotomy using lidocaine ointment

Patient OFU, 4 months and 22 days old, male, born of natural birth after 39 weeks. He scored 9 and 10 in the one- and five-minute Apgar, respectively, and his birth weight was 3.29 kg. He was brought by his mother, who had a referral from the speech-language-hearing therapist of the Santa Casa Hospital of Piracicaba for lingual frenulum assessment.

The result of the lingual frenulum assessment protocol for babies revealed, from the clinical history, intervals of 1 hour or less in between breastfeeding sessions, breastfeeding fatigue, falling asleep after breastfeeding a little, and releasing and biting the nipple. As for anatomic-functional assessment, the baby's lips were closed at rest, the tongue was in the midline, lifting the sides when crying, with a small cleft on the tip. The frenulum was fixed between the middle third and the tip of the tongue; it was thin and visible from the lower alveolar ridge (Figure 1). The nutritive and non-nutritive sucking assessment showed that the infant would make inadequate tongue movements and bite the nipple (Figure 2). The total score was 15, demonstrating that the frenulum interfered with the tongue movements and needed to be released.



Figure 1. Initial clinical examination – short lingual frenulum



Figure 2. Non-nutritive sucking assessment

As we assessed breastfeeding, latch difficulties were noticed. In the speech-language-hearing assessment, the child would not show search and suck reflexes and was biting in the non-nutritive sucking. The mother reported that the infant breastfed hourly and used a pacifier for crying too much. She also reported breast engorgement and needed to express her milk often, although breastfeeding was not painful.

The dental surgeon used local topical anesthesia, applying 50mg/g lidocaine ointment with a swab (Figure 3). After waiting for about 2 to 5 minutes for its effect, the frenulum was pulled and raised with the assistance of a groove director. Thus, the surgical field (lingual frenulum) became clearly visible for its incision (Figure 4).

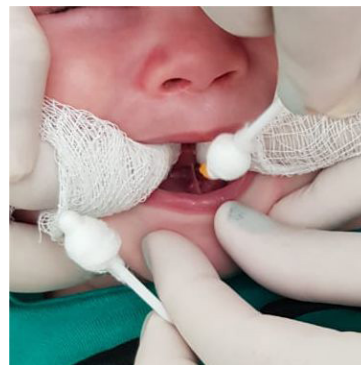


Figure 3. Topical anesthesia applied with a swab

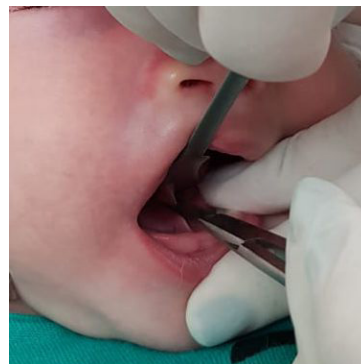


Figure 4. Lingual frenulum held with the groove director and cut with the scissors – Frenotomy

Postoperatively, hemostasis was necessary (Figure 5), and tongue mobility improved (Figure 6). The gauze was placed on the wound for some seconds for both precaution and surgical habit. After the procedure, the infant was taken to his mother to breastfeed, and she was instructed to hold her baby on her lap, calm him down, and breastfeed him (Figure 7). The child was assessed after 1 week to verify possible changes (such as scar tissue formation) and observe breastfeeding.

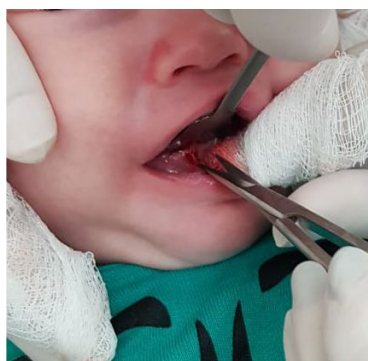


Figure 5. Immediate hemostasis with gauze.



Figure 6. Postoperative assessment.

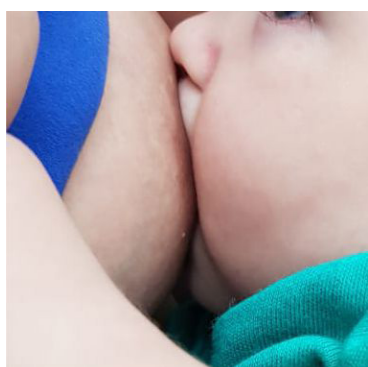


Figure 7. Immediate postoperative breastfeeding.

CASE 2 – Frenotomy using tetracaine hydrochloride

Patient SVP, 1 month and 23 days old, female, with good overall health. She was born of natural birth after 39 weeks, her birth weight was 2.7 kg, and she

scored 9 and 10 in the one- and five-minute Apgar, respectively. She was brought by her mother, who had a referral from the speech-language-hearing therapist of the Santa Casa Hospital of Piracicaba for lingual frenulum assessment.

The lingual frenulum assessment protocol revealed lips closed at rest. The tongue was in the midline, lifting the sides, and the frenulum was fixed between the middle third and the tip of the tongue; it was thin and visible from the lower alveolar ridge (Figure 8). In nutritive and non-nutritive sucking, her sucking/swallowing/breathing coordination was abnormal, and she was biting the nipple and clicking the tongue when sucking. The total score was 7, indicating lingual frenulum interference with tongue movements.



Figure 8. Tongue when crying

The breastfeeding assessment showed that the mother had cracked nipples and the baby had an incorrect latch and was biting and choking while breastfeeding. The baby did not show search reflexes, but she did have suck and bite reflexes.

The dental surgeon applied local topical anesthesia with two drops of sterile ophthalmic anesthetic solution with 1% tetracaine and 0.1% phenylephrine. He waited about 2 to 5 minutes for its effect. Both the procedure and the postoperative instructions were the same as those described in Case 1 (Figures 9 and 10).



Figure 9. Immediate postoperative



Figure 10. Aspect after 1 week

RESULTS

Seven days after the surgical intervention, the mother in Case 1 reported improved sucking and tongue movements and informed the baby was no longer biting her nipples and was gaining weight (approximately 20 grams a day).

As for Case 2, after 7 days, the mother reported improved sucking, less tongue clicking and biting, less pain, higher tongue elevation, increased salivation, longer breastfeeding sessions, longer intervals in between breastfeeding sessions, and weight gain (51 grams a day).

DISCUSSION

This study's findings corroborate others that associated lingual frenulum changes with functional limitations that directly influence breastfeeding^{2,15,16}. The lingual frenulum assessment instrument we used proved to be effective to diagnose limited tongue movement due to the frenulum¹⁷.

After the surgical procedure, tongue movement and elevation significantly improved, as reported in the scientific literature¹⁶. This study's anatomical findings and functional characteristics agree with the published literature^{13,14}.

The routine technique used in frenotomy was described, evidencing how easy it was to solve a problem that might otherwise have many negative consequences on the person's and family's lives. This study revealed the infant's weight gain and the mother's greater tranquility after the procedure.

Mothers are poorly instructed about breastfeeding, which greatly interferes with this process and may even mislead the diagnosis when the lingual frenulum is not so severely changed¹⁸. Functional, objective and easy-to-use assessment protocols need to be developed for the various professionals.

The assessment must be interdisciplinary, favoring a more precise diagnosis and a quicker intervention. Each case's agility and progress can benefit from the teamwork of professionals from various fields of health, whose assessment involves cooperative discussion and decision-making. Hence, while it is not established which professional should perform this assessment outside the hospital setting, it is predominantly performed by speech-language-hearing therapists and dental surgeons⁹.

The importance of interdisciplinarity must be emphasized, highlighting the partnership between speech-language-hearing therapy and dentistry. Frenotomy can help improve breastfeeding, tongue movement, and the mother's comfort. The quicker it takes from ankyloglossia diagnosis to intervention, the easier and faster the baby will resume breastfeeding.

The agility from the assessment to the procedure decreases the mother's and baby's time of suffering from breastfeeding difficulties; reduces their frustration, avoiding physical and emotional distress; and diminishes the likelihood of resorting to infant formula and the need for baby bottles. This was exemplified in Case 1, in which non-nutritive sucking (pacifier) was used to calm the baby down, as he was submitted to the procedure only when he was 4 months old. The longer it takes for the intervention, the longer the cracked nipple will take to heal, and the greater the mother's feeling of incapacity will be – which can bring about a condition difficult to reverse, resulting in early weaning.

Studies demonstrate that early diagnosis and intervention are essential to the development of the orofacial structures and the sucking necessary to breastfeeding^{2,15}.

In cases when the procedure took too long to happen, the mother felt unsure of herself to carry out the professionals' instructions. On the other hand, a few reports have already pointed out that prophylactic frenotomy may prevent future speech changes, although further research is still necessary¹⁹.

Interdisciplinary assessment speeds up the identification and the decision of whether a surgical procedure is necessary. Many cases, though, can raise doubts because of the mothers' lack of adequate knowledge and guidance regarding breastfeeding.

CONCLUSION

The two reported cases lead to the conclusion that the less time it takes from ankyloglossia diagnosis to intervention, the more effective and

easier breastfeeding is. For the mother to be properly instructed, it is important to carry out an early interdisciplinary assessment.

ACKNOWLEDGMENTS

Gratitude is extended to the whole CEPAE team at FOP/UNICAMP, including the board of directors, coordinators, supervisors, administration staff, and specialization classmates, for their support throughout this study.

REFERENCES

1. Kupietzky A, Botzer E. Ankyloglossia in the infant and young child: clinical suggestions for diagnosis and management. *Pediatric Dentistry*. 2005;27(1):40-6.
2. Segal LM, Stephenson R, Dawes M, Feldman P. Prevalence, diagnosis, and treatment of ankyloglossia: methodologic review. *Can Fam Physician*. 2007;53(6):1027-33.
3. Geddes DT, Langton DB, Gollow I, Jacobs LA, Hartmann PE, Simmer K. Frenulotomy for breastfeeding infants with ankyloglossia: effect on milk removal and sucking mechanism as imaged by ultrasound. *Pediatrics*. 2008;122(1):e188-94.
4. Procopio IMS, Costa VPP, Lia EN. Frenotomia lingual em lactentes. *RFO, Passo Fundo*. 2017;22(1):114-9.
5. Ministério da saúde. Nota Técnica Nº 09/2016 - Rede Brasileira de Bancos de Leite Humano. 2016.
6. Veyssiere A, Kun-Darbois JD, Paulus C, Chatellier A, Caillot A, Bénateau H. Diagnostic et prise en charge de l'ankyloglossie chez le jeune enfant. *Rev Stomatol Chir Maxillofac Chir Orale*. 2015;116(4):215-20.
7. Sethi N, Smith D, Korteque S, Ward V, Clarke S. Benefits of frenulotomy in infants with ankyloglossia. *Int J Pediatr Otorhinolaryngol*. 2013;77(5):762-5.
8. Brasil. Lei nº 13.002, de 20 de junho de 2014. Obriga a realização do Protocolo de Avaliação do Frênulo da Língua em Bebês. *Diário Oficial da União [homepage on the internet]*. Brasília, 23 jun. 2014.
9. Nascimento LS, Soares VSS, Costa TS. Tongue-tie test: situational diagnosis about the applicability of the protocol in newborns in Distrito Federal. *Rev. CEFAC*. 2015;17(6):1889-99.
10. Martinelli RLDC, Marchesan IQ, Lauris JR, Honório HM, Gusmão RJ, Berretin-Felix G. Validity and reliability of the neonatal tongue screening test. *Rev. CEFAC*. 2016;18(6):1323-31.
11. Fujinaga CI, Chaves JC, Karkow IK, Klossowski DG, Silva FR, Rodrigues AH. Lingual frenum and breast feeding: descriptive study. *Audiol Commun Res*. 2017;22:e1762.
12. Medeiros AMC, Nascimento HS, Santos MKO, Barreto IDC, Jesus SEM. Content analysis and appearance of the speech therapy protocol of accompanying – breastfeeding. *Audiol Commun Res*. 2018;23:e1921.
13. Castelli CTR, Almeida ST. Evaluation of orofacial characteristics and breastfeeding in preterm newborns before hospital discharge. *Rev. CEFAC*. 2015;17(6):1900-8.
14. Martinelli RLC, Marchesan IQ, Berretin-Felix G. Protocol for infants: relationship between anatomic and functional aspects. *Rev. CEFAC* 2013;15(3):599-610.
15. Webb A, Hao W, Hong P. The effect of tongue-tie division on breastfeeding and speech articulation: A systematic review. *Int J Pediatr Otorhinolaryngol*. 2013;77(5):635-46.
16. Messner AH, Lalakea ML, Aby J, Macmahon J, Bair E. Anquiloglossia: incidência e dificuldades de alimentação associadas. *Arquivos de Otorrinolaringologia - Head & Neck Surgery*. 2000;126(1):36-9.
17. Marchesan IQ, Martinelli RLC, Gusmão RJ. Lingual frenulum changes after frenectomy. *J Soc Bras Fonoaudiol*. 2012;24(4):409-12.
18. Venancio SI, Toma TS, Buccini GS, Sanches MTC, Araújo CL, Figueiró MF. Anquiloglossia e aleitamento materno: evidências sobre a magnitude do problema, protocolos de avaliação, segurança e eficácia de frenotomia: parecer técnico científico. São Paulo: Instituto de Saúde, 2015.
19. Brookes A, Bowley DM. Tongue tie: the evidence for frenotomy. *Early Human Development*. 2014;90(11):765-8.