Arch Argent Pediatr. 2026;e202510835

Short lingual frenulum in pediatrics: when to act and how to select the appropriate surgical technique

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ABSTRACT

Tongue-tie is a congenital condition characterized by an abnormal insertion that limits tongue mobility. Its prevalence in pediatrics ranges from 1.7% to 10%, depending on the diagnostic criteria applied. Although it can be asymptomatic, in many cases it causes significant functional repercussions from the neonatal period to late childhood.

This article aims to describe the clinical manifestations by age, the primary surgical indications, the optimal timing for intervention, and the currently available surgical techniques.

Keywords: *lingual frenulum; ankyloglossia; breastfeeding; specific language impairment; frenoplasty.*

doi: http://dx.doi.org/10.5546/aap.2025-10835.eng

To cite: Simkin JA, Mighera MP, Borrmann PF, Demarchi MV. Short lingual frenulum in pediatrics: when to act ad how to select the appropriate surgical technique. *Arch Argent Pediatr.* 2026;e202510835. Online ahead of print 8-JAN-2026.

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Funding*: None.*

Conflict of interest: *None.*

Received*: 7-26-2025*
Accepted*: 10-1-2025*

INTRODUCTION

In recent years, there has been increased recognition of the short lingual frenulum (*Figure 1*) as a cause of alterations in vital functions such as feeding, speech, breathing, and orofacial development.[1,2] Multiple tools are available for its evaluation, ranging from anatomical scales (Coryllos, Kotlow) —which classify short lingual frenulum according to anatomical insertion from anterior to posterior or according to the length of free tongue mobility, from normal to complete ankyloglossia— to functional criteria (Hazelbaker), as well as mixed protocols, such as Marchesan (*Figure 2*).[3-5]

Early detection by the pediatrician is essential to identify clinically relevant cases and refer them to the interdisciplinary team composed of pediatric otolaryngologists and speech therapists specializing in orofacial motor skills.

CLINICAL MANIFESTATIONS ACCORDING TO AGE

In newborns and infants, tongue-tie can make effective breastfeeding difficult. It is associated with ineffective sucking, early fatigue, poor weight gain, and pain in the mother's nipple.[1,6]

The presence of persistent drooling without a neurological cause is also a warning sign. Compensatory swallowing patterns may also be observed, which tend to persist beyond the first year of life.[7] In preschoolers and schoolchildren, manifestations include articulation disorders of phonemes (/l/, /r/, /t/, /d/, /n/), difficulties in performing complex tongue movements (protrusion, elevation, lateralization), and altered tongue posture at rest.[8] Chronic functional restriction can condition craniofacial development, favoring malocclusions such as anterior open bite or posterior crossbite,[9,10] and its association with mild forms of obstructive sleep apnea has even been suggested.[11]

SURGICAL INDICATIONS

Frenotomy consists of making a simple cut with a cold instrument (scissors or scalpel) in the lingual frenulum. At the same time, frenoplasty is a surgical procedure in which one or more cuts are made in the lingual frenulum, followed by reconstruction with tension-free sutures.

Surgery is indicated when ankyloglossia compromises essential functions. In infants, difficulty feeding is the main indication, particularly when it cannot be resolved with breastfeeding support measures.[1,12] Recent studies warn about

Figure 1. Short lingual frenulum

Figure 2. Protocol I. Marchesan

Examples of different types of frenula

Type	Description
A - Normal	*Attached in the middle of the inner surface of the tongue and, on the floor of the mouth, the frenulum is usually visible from the sublingual caruncles.*
B - Anterior	*When, on the underside of the tongue, the attachment is above the middle.*
C -Short	*The attachment in the middle of the underside of the tongue is like that of a normal frenulum, but smaller. Generally, the attachment to the floor of the mouth is visible from the alveolar ridge, and the three points of the frenulum attachment are almost always visible on this ridge.*
D - Short and anterior	*This presents a combination of short and anterior frenulum characteristics.*
E - Ankyloglossia	*The tongue is completely attached to the floor of the mouth.*

Fuente: https://cefac.br/themes/2016/protocolos/protocolo_7_14.pdf

the overdiagnosis of this condition, reinforcing the need for a multidisciplinary approach by professionals trained in its correct detection.[13]

In older children, indications include persistent articulation disorders refractory to speech therapy, chronic sialorrhea, and dysfunctional swallowing.[8] Other indications include orofacial developmental disorders and the presence of obstructive sleep apnea associated with tongue restriction.[11,14]

SURGICAL TIMING

The timing of the intervention should be individualized based on its clinical impact. In infants with feeding difficulties, early intervention is recommended, preferably before the first month of life, to optimize breastfeeding efficiency and reduce early weaning.[6,15] In these cases, frenotomy can be performed on an outpatient basis, with topical anesthesia and minimal instrumentation. In older children, the indication is usually linked to speech or orofacial development disorders, so prior speech-language evaluation and adequate surgical planning are essential. These procedures typically require general anesthesia and more complex reconstructive techniques.[16]

Figure 3. Frenuloplasty

AVAILABLE SURGICAL TECHNIQUES

The choice of technique depends on the age and type of restriction. In infants, whose frenulum is usually velamentous, translucent, and avascular, simple frenotomy is the procedure of choice because it is quick, safe, and can be performed in the doctor's office.[1] In older children with thick or fibrous frenula, frenoplasty (*Figure 3*) (Z-shaped, diamond-shaped, among other variants) offers better functional and aesthetic results.[5,16] This technique should be performed in the operating room under general anesthesia, and an electrosurgical knife is the instrument of choice. FiO_2 of 21% should be used with caution to avoid potential complications.

Currently, assisted technologies such as CO_2 lasers or diode lasers are also used, which facilitate less bleeding and better surgical visualization.[17,18] However, their use involves higher costs, requires specialized training for the treating team, and has not been shown to yield better functional outcomes.[19]

One of the main complications of surgery is postoperative wound retraction. To avoid this, it is essential to perform a good dissection down to the muscle plane and to ensure good rehabilitation by the speech therapist.[20]

ROLE OF THE SPEECH-LANGUAGE PATHOLOGIST

Speech therapy intervention for short lingual frenulum begins with an age-appropriate assessment: in infants under six months of age, priority is given to assessing sucking, swallowing, and breathing; while in children over four years of age, the Marchesan protocol (*Figure 2*) is applied, which includes anatomical and functional analysis with objective measurements and assessment of the impact on speech. The use of standardized protocols allows for objective findings and better-informed therapeutic or surgical decisions.

Treatment depends on the results of the evaluation: short frenula with less than 50% mobility usually require surgery followed by speech therapy to optimize orofacial functions and prevent restrictive scarring, while in cases with good mobility, myofunctional therapy may be sufficient. The approach should be tailored to age, context, and muscle performance, with continuous monitoring to ensure stable results and improve the patient's quality of life.

CONCLUSION

A short lingual frenulum can have significant functional repercussions on feeding, speech, and orofacial development. Early detection by the pediatrician enables a comprehensive, timely approach. The indication for surgery should be based on functional criteria and the multidisciplinary team's evaluation. Knowledge of the available techniques facilitates appropriate referral and optimizes treatment. ■

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