



## Tackling ankyloglossia in the office

Ankyloglossia can have a significant impact on breastfeeding moms and their growing newborns. More often than not, resolution can be delivered in a snip—literally. Here's how.

**A**nkyloglossia, or tongue-tie, is the complete or partial fusion of the lingual frenum to the floor of the mouth, which results in a restriction of the tongue's movement. This limited motion can have implications on nursing moms and their newborns because the tongue's ability to reach the palatal roof is the most important lingual movement for successful breastfeeding.<sup>1</sup> Repercussions for the child may include poor nutrition, dehydration, and potential orthodontic problems. For mothers, ankyloglossia can inflict a considerable amount of physical pain during breastfeeding

(in contrast, ankyloglossia rarely causes problems during bottle feeding because of the different technique required to express milk from an artificial nipple [i.e., a gum-biting action instead of lingual massage of the human nipple and areola]).<sup>2</sup>

Fortunately, pediatricians are poised to help both mother and child. This article reviews the fundamentals surrounding ankyloglossia and offers pediatricians a step-by-step guide through one of the most successful interventions for ankyloglossia: lingual frenotomy.

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**Target audience:** Pediatricians and primary care physicians

### EDUCATIONAL OBJECTIVES

- Identify the signs of significant and partial ankyloglossia
- Describe how to conduct an office examination for ankyloglossia
- Summarize the steps of an in-office lingual frenotomy procedure, the necessary equipment, and the exceptions to performing the procedure
- Summarize the consequences of inadequate breastfeeding for infant and mother

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### A complete or partial case?

The degree of ankyloglossia depends on the thickness, elasticity, and place of origin and insertion of the lingual frenulum. Complete tethered tongue, or true ankyloglossia, is a rare congenital deformity in which a short, thick, taut, and often anteriorly located lingual frenulum tethers the tongue to the floor of the mouth, rendering it immobile. It is characterized by less than 3 mm of lingual movement in extension and elevation (normal extension is 16 mm by 18 months). Signs of complete ankyloglossia are summarized in [Table 1](#).

Partial ankyloglossia, or tongue-tie, is a common minor congenital malformation. It occurs in approximately 3% of consecutive

newborns,<sup>2</sup> with a higher prevalence among boys than in girls (2.6:1). Many of these cases also carry a family history of the condition.<sup>3</sup>

Partial ankyloglossia ranges from severe (3 to 7 mm lingual movement in extension and elevation) to moderate (a 50% to 75% reduction from the normal movement).<sup>4</sup>

While complete ankyloglossia makes breastfeeding difficult if not impossible, even partial ankyloglossia can cause problems for mother and infant ([Table 2](#)). A study of 2,763 breastfed newborns found significant ankyloglossia in 3%.<sup>5</sup> Within two days of birth, these infants had exhibited problems with latching onto the breast, and their mothers frequently complained of nipple pain. Another study reported that ankyloglossia accounted for 13% of breastfeeding problems in mother-newborn dyads.<sup>6</sup>

Babies with ankyloglossia were also approximately three times as likely as a group of infants with normal frenulums to be bottle fed at one week after birth; however, this meant that only one of every five babies with ankyloglossia failed breastfeeding in the first week of life.<sup>7</sup>

### Physical and emotional effects

For the infant, the major consequence of inadequate breastfeeding is insufficient transfer of milk to the mouth. Well-meaning but usually counterproductive attempts to continue breastfeeding when the infant has moderate or severe ankyloglossia can lead to poor weight gain, oliguria, neonatal dehydration, and severe hypernatremia.

The penalty for the mother is incomplete emptying of the lactiferous ducts, breast congestion and pain, and nipple erosion and bleeding. Examination of the mother's nipple after breastfeeding may reveal a transverse white line across the erect nipple where the infant's gums clamped down on the nipple. Nipple tenderness, pain, and bleeding occur

Table 1

#### Signs of complete ankyloglossia

- Tongue does not protrude past the alveolar ridge
- Tongue tip cannot rise to touch the hard palate
- Tongue cannot move laterally
- Tongue tip may be notched or heart-shaped when extended



because the infant clamps the nipple between the hard upper and lower alveolar ridges, instead of massaging the erect nipple between the tongue and the upper alveolar ridge or hard palate. If this situation continues, the mother may become exhausted. She may experience guilt, loss of sleep, depression, and even criticism from spouse and mother or mother-in-law.

### The case for intervention

Correction of complete ankyloglossia requires surgical treatment by a frenuloplasty (Z-plasty) procedure, which is done under general anesthesia. For less severe cases, a lingual frenotomy, performed in the office with no need for general anesthesia, can untether the tongue and provide immediate benefits to mother and baby.

This procedure, however, has not gained wide acceptance for a number of reasons, one of which being that the medical literature suggests that ankyloglossia rarely, if ever, causes feeding difficulties and that surgical intervention is generally unnecessary.<sup>2</sup> Another factor is that frenotomy is seldom discussed during pediatric residency programs. The American Academy of Pediatrics' Section on Breastfeeding, however, has taken a different view, stating that, "Tongue-tie is a significant clinical entity, which, when symptomatic, should be treated as early as possible."<sup>4</sup> How then should a pediatrician proceed?

### Assessing range of motion

A careful examination of the frenulum linguae and the tongue range of motion by a physician, nurse practitioner, or lactation consultant is recommended to determine whether tongue-tie is the reason for an infant's failure to breastfeed.<sup>8</sup> Assessment of range of motion should include an examination of three movements: (1) the ability of

the tongue tip to extend beyond the lower alveolar ridge and labial commissure (lip boundary) without clefting or down-curling of the tongue tip; (2) the ability of the tongue tip to sweep the upper and lower lips easily and to touch the hard palate with the mouth wide open (use of a tongue depressor and lingual elevator facilitates this); and (3) transverse movement of the tip of the tongue from one corner of the lips to the other corner, without lingual twisting.<sup>3,4</sup> »p.62

Table 2

### Symptoms of partial tongue-tie in breastfed infants

- Nipple pain and damage
- Misshapen nipple after breastfeeding
- Compression/stripe mark on the nipple after breastfeeding
- Loss of suction while feeding
- Clicking sound while feeding
- Failure to gain weight



The assessment may reveal a spectrum of dysfunction. In less restrictive cases, the lingual frenulum is thin and pliable, transiently restricting the forward motion of the tip of the tongue. Repeated sucking may stretch, attenuate, and tear a thin lingual frenulum, thus leading to a spontaneous cure. In more problematic ones, the baby can extend the tongue through the lip commissure, but the tip of the tongue is sharply angulated downward or has a central cleft (heart-shape with a central notch) (see Table 1), which divides the tip of the tongue. In extreme/severe cases, the lingual frenulum is inelastic and thick, tethering the entire anterior third of the ventral surface of the tongue, which in turn causes major difficulties with latching on to the breast.

Based on your findings, a lingual fren-

otomy may be the best course of action. The effectiveness of this procedure has been documented in the literature.

Lingual frenotomies were performed in 36 (1.5%) of 2,450 infants who had symptomatic ankyloglossia with feeding problems. The feeding problem resolved within a week in 75% of these babies.<sup>9</sup>

Hogan, et al reported a randomized, controlled trial of 40 babies with difficulty breastfeeding. Twenty babies underwent lingual frenotomy and 20 did not. Improvement in latch and suck, and reduction of nipple trauma, occurred within 48 hours by 96% of mothers in a frenotomy group and 5% in a control group ( $p < .001$ ).<sup>10</sup>

A small, controlled, prospective cross-over study of 12 infants with symptomatic ankyloglossia has been reported by Dolberg, et al.<sup>11</sup> Each infant involved in this study was randomized to one of two sequences: Part 1: frenotomy/breastfeeding or sham procedure/breastfeeding and then cross-over to Part 2: sham procedure/breastfeeding or frenotomy/breastfeeding. The combined score of standardized latch scores and pain scores were obtained from the mother's history. The combined score favored infants in the frenotomy groups to a statistically significant degree ( $p < .012$ ).

### Step-by-step frenotomy

Simple frenotomy is safe and effective.<sup>12-18</sup> General anesthesia is not required if the procedure is performed in the neonatal period. (If the infant is over the age of 4 months, anesthesia is required due to the greater strength and awareness of the infant.)

Table 3 lists the equipment for the procedure, while Table 4 lists the steps of the procedure, which can be performed in less than five minutes in the office. Preoperative analgesia may include acetaminophen (10 mg/kg). Local anesthesia using topical tetracaine,

Table 3

### Tools for in-office lingual frenotomy

- Restraint: papoose board, swaddle wrap, assistant to restrain of infant's extended arms and extended legs (optional)
- Small, straight-blade hemostat
- Blunt-ended sharp scissors
- Lorenz grooved tongue elevator (see below)
- Gauze bandages, 2 x 2
- Tongue depressor



benzocaine, or lidocaine, applied with a dental pledget held next to the ventral surface of the tongue, is optional. The use of the Lorenz grooved tongue elevator facilitates immobilization and lifting of the tongue and isolation of the lingual frenulum. Sutures are generally unnecessary because the lingual frenulum contains no large blood vessels. Complications are quite unusual and include prolonged bleeding or oozing and infection of the surgical site. In the case of bleeding, direct pressure usually is adequate; topical thrombin, gel foam, or a similar product may

be used in the rare case in which ligation is needed. Wharton's duct exits in the floor of the mouth but is protected from harm if a lingual elevator is used.

To watch a video of the procedure, go to [www.youtube.com/watch?v=XN-vVYd1m-o](http://www.youtube.com/watch?v=XN-vVYd1m-o). At least one follow-up visit is recommended to assess for infection and to assess effect on breastfeeding. A newborn infant may also need to relearn how to breastfeed correctly, and this process should be monitored closely until the mother-child dyad is successful.

When frenotomy is not performed in the

Table 4

### How to perform an in-office lingual frenotomy

- 1 Gently restrain the child on an examination table. If the infant is sleepy, it may be possible to perform the procedure on the mother's lap.
- 2 Open the infant's mouth with a tongue depressor and insert a grooved tongue elevator so that the lingual frenulum is captured in the groove.
- 3 With a straight hemostat, crush about 1 cm of the lingual frenulum. Leave the hemostat in closed position for a few minutes, using the tongue elevator to exert upward pressure on the tongue to prevent the mouth from closing.
- 4 Cut along the path of the crush mark on the lingual frenulum. Take care not to incise the base of the tongue, the genioglossus muscle, or the gingival mucosa. Bleeding should be minimal.
- 5 Release the hemostat mechanism and withdraw the hemostat. Dab any oozing blood with a gauze pad.
- 6 Apply direct pressure or use topical thrombin, gel foam, or a similar product if oozing continues.
- 7 Have the mother immediately place the baby to her breast to see if there is still any problem with latching or sucking.
- 8 Check the frenulum again before the infant and mother leave the office.





newborn period, there are potential dental and articulation consequences beyond a disruption in the breastfeeding dyad. Dental problems may include malocclusions, irregular eruption of teeth, and an open bite. These

risks are not well documented, and it is unclear how often ankyloglossia may be the underlying cause in such cases.

### Drawing from one's own experience

We have performed six lingual frenotomies in the past six months. In every case, a lactation consultant had witnessed breastfeeding difficulties related to a symptomatic partial ankyloglossia. The mother's nipples and part of the areola were chafed and bleeding, and breastfeeding was painful. Immediately after the lingual frenotomy, the baby breastfed without difficulty and the mother had a marked reduction in discomfort.

We recommend this procedure for all infants who experience difficult breastfeeding due to tongue-tie, regardless of the degree of restriction. Most cases

can be managed in the office with the exception of the following:

- Complete ankyloglossia with a thick frenum extending from the tip of the tongue; Z-plasty is often required
- Infants with a highly vascular frenulum
- Infants at risk of excessive bleeding
- Infants with a family history highly suggestive of a bleeding disorder

Lingual frenotomy (ICD-9 code 41010) is also one of the few reimbursable surgical procedures that can be performed in pediatric offices. We charge \$200.00 for the pro-

cedure, and are reimbursed for 80% to 100% of our total charge. □

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### Point Taken

Lingual frenotomy should not be performed in cases of complete ankyloglossia with a thick frenum extending from the tip of the tongue.

