

# Untangling Tongue-tie

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## Overview

Although commonly used as a figure of speech, tongue-tie (also referred to as Ankyloglossia or TOT – Tethered Oral Tissue) is a very real condition that can affect both oral and craniofacial development. Everyone has what is called a lingual frenulum, which is tissue that connects the tongue to the floor of the mouth. Some people have a tighter, thicker or shorter lingual frenulum, which can cause movement of the tongue to be restricted.

Normally, when the mouth is closed, the tongue should normally rest on the hard palate with the tip of the tongue touching the first and second rugae (about a half inch behind the front teeth). This position of the tongue helps to shape and support the maxilla correctly. It also influences the way that the face grows. However, as is the case with someone who has tongue-tie, their tongue cannot touch the top of their mouth because it is restricted. Because of this, they will develop a small and narrow palate and their teeth will probably be crooked. The mandible will also appear smaller and the person will have a retrognathic facial profile. This is most commonly called “long face syndrome.”

If children who have tongue-tie are not treated early, they may develop various oral myofunctional signs and symptoms such as: mouth breathing (due to a restricted airway), headaches, tension in the head, neck and shoulders, forward head posture, increased risk of caries and periodontal disease, issues with speech, clenching, grinding and TMJ pain, orthodontic relapse, orthodontic treatment that takes longer than usual to see results, SDB (Sleep Disordered Breathing), snoring, UARS (Upper Airway Resistance Syndrome) and sleep apnea.

Usually tongue-tie is discovered when a baby starts to breastfeed. However, if babies are bottle-fed and are determined to be within the range of normal weights and heights during regular pediatric check-ups, the condition may either go undiagnosed or will be discovered but no treatment is recommended. However, even if the baby is actively growing properly, the tongue-tie will still continue to adversely affect oral development, specifically affecting the mandible, maxilla and the dentition. Sometimes, tongue-tie causes problems with speech. Specifically, children are not able to pronounce the letters “l” and “r.”

## Etiology

Recent research suggests that tongue-tie comes from a mutation in the MTHFR (Methylenetetrahydrofolate reductase) gene. A condition called syndactyly (webbed fingers) that has been proven to be caused by this particular gene mutation is similar to tongue-tie because it is a flap of skin that remains between the fingers. Ducks, for example, have webbed feet because they do not have the lysosome necessary to cause cell death which would remove the webs between their feet. With the MTHFR gene mutation, a process called methylation occurs which does not

allow the body to process folate, an essential prenatal nutritional element. In the womb at week thirteen, the tongue of the fetus is completely formed and cell death of the lingual frenulum normally occurs. This genetic mutation doesn't allow for the cell death to occur, leaving the lingual frenulum at its initial development stage, causing a tongue-tie.

Because tongue-tie is genetic, it can be hereditary. This means that either one or both parents can also have the condition.

### **Clinical Presentation**

When assessing a child who may have tongue-tie, it is important to note whether they are experiencing feeding difficulties, (front-to-back peristalsis and tongue palate synchronization during breastfeeding or problems with licking ice cream, for example - in older children) if the clinician cannot initiate tongue grooving, cupping or depression and if (as is the case in older children) they are having speech issues.

Tongue-tie typically presents itself clinically in four different types:

Type 1: The frenulum attaches to the tip of the tongue in front of the alveolar ridge in low lip sulcus.

Type 2: The frenulum attaches 2-4mm behind the tongue tip and attaches on the alveolar ridge.

Type 3: The frenulum attaches to mid-tongue and middle of the floor of the mouth and is usually tighter and less elastic. The tip of the tongue may appear "heart-shaped" in this type.

Type 4: The frenulum attaches against the base of tongue, appears shiny and is very inelastic.

### **Demographic**

Boys are typically more susceptible to tongue-tie because it is a semi-dominant x-linked inheritable trait. Also, those that have some type of orofacial cleft are also more likely to exhibit the condition (the ratio is 1.5:1 to 2.6:1). Tongue-tie affects about 10% of the population.

### **Biopsy / Histology / Radiographs**

The histological features of tongue-tie exhibit bundles of striated skeletal muscle fibers, high frequency of type I collagen in the deep layers and compact bundles of elastic fibers positioned near the epithelial lining. In anterior frenulum and short frenulum with anterior fixation, there are type I collagen and bundles of elastic fibers sparse and far from the epithelial lining.

Typically, there are no radiographic features of tongue-tie and no biopsy is taken.

### **Treatment**

In most cases, tongue ties are treated with a frenectomy (a minor surgical procedure to release the tie). This procedure is also called a frenotomy or frenulectomy. It is a simple procedure that only takes a few minutes. It's usually done in-office by a dentist or ENT using a laser or scalpel without general anesthetic. However, if it's not done correctly, or released completely, there will be a high chance that the frenectomy will need to be done again. Myofunctional therapy exercises can be done around 2-3 weeks before the frenectomy to help strengthen the muscles of the tongue prior to the surgery. After the surgery is completed, proper wound care is essential. The tongue could

actually reattach and heal back to what it was if not cared for appropriately. With proper wound care and gentle exercises, this can be prevented.

### **Prognosis**

After the tongue-tie is released, the tongue has to be retrained so that it can move correctly. Because the tongue was always used to being tied down, it has to learn to rest in the correct position and to move normally in the mouth. If the proper post-op treatment is followed, the success of the tongue-tie release is highly probable.

If left untreated, it remains to be seen what the effects will be on the person's overall health and craniofacial development. Many children who are left with untreated tongue-tie develop sleep apnea. There is an increase for airway-related issues occurring in childhood. Adults with untreated tongue-tie have poor orofacial development and airways. This increases their risk for adverse effects like mouth breathing, TMJ pain, etc. Some people have no signs or symptoms for much of their life and then all of sudden start to experience issues. This is an accumulation of living with a compromised orofacial structure. However, it is never too late to seek treatment for this condition.

### **Citations**

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