

**A case report on surgical management of ankyloglossia- An unspoken abnormality**

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**Abstract**

The tongue is a muscular organ that helps in manipulating food for mastication and is used in swallowing as well as speech. Ankyloglossia, also known as tongue-tie, is a congenital oral abnormality which shows an unusually short, thick lingual frenulum, a membrane connecting the underside of the tongue to the floor of the mouth that may decrease the mobility of the tongue tip. Ankyloglossia in children can lead to a range of problems, such as difficulties breastfeeding, speech impediments, poor oral hygiene, and being embarrassed by peers during childhood and adolescence. This present case report depicts an eight year old male patient with ankyloglossia and a chief complaint of difficulty with speech underwent lingual frenectomy under local anaesthesia using a standard surgical technique using scalpel and blade that was followed with speech therapy. Follow up showed marked improvement in tongue movements. Prompt diagnosis and correct surgical modality is key to assist the patient to avoid complications associated with ankylossia and lead a healthy life.

**Introduction**

The term “ankyloglossia” originates from the Greek words “agkilos” meaning curved and “glossa” meaning tongue. Back in 1960’s Wallace used the term in the medical literature and defined tongue-tie as “a condition in which the tip of the tongue cannot be protruded beyond the lower incisor teeth because of a short frenulum linguae, often containing scar tissue.”<sup>1</sup> Ankyloglossia has a prevalence of 4%-10% but varies in severity and clinical impact, resulting in considerable debate regarding optimal management. This wide range can be suggestive of the insufficient diagnostic criteria for tongue-tie. Although tongue-tie can affect anyone, it's more common in boys than girls.<sup>2</sup> Tongue-tie sometimes runs in families. Some professionals believe it is rarely symptomatic, whereas others believe it is associated with a variety of problems. Messner and Lalakea in 2000 documented this disagreement among professionals in their study<sup>3</sup>

**Case Report**

An 8-year-old male patient reported to the clinic with the chief complaint of difficulty in speaking and tongue

movements & inability to chew food properly. Thorough intraoral examination was done, and it was found that the patient had short and tight lingual frenum which was attached 4mm from the tip of the tongue (Figure 1,2) with limited tongue movements along with poor oral hygiene. Limited tongue movement may be the cause of the patient's inability to maintain oral hygiene in the lower anteriors. Difficulty in protrusion of tongue was seen with a bifid or heart shaped tip of tongue (Figure 3). No dentofacial abnormalities were found. This type of ankyloglossia is diagnosed as Type III "severe ankyloglossia" indicating movement of tongue between 3mm and 7 mm according to Kotlow's assessment.<sup>4</sup> According to Hazelbaker's classification, the appearance score was 3 (which was <8) and the functional score was 5 (which was <11) hence frenectomy was indicated.<sup>5</sup> No relevant findings were seen during ENT and general physical examination. Blood investigation of hemoglobin percentage, clotting time, bleeding time, differential count & total leukocyte count was found within normal range. After obtaining informed consent, frenectomy procedure was carried out.



Figure 2: Short and tight lingual frenum



Figure 3: Heart shaped Tongue

### Surgical Procedure

Prior to the surgery, 10ml of 0.2% chlorhexidine mouthwash was given to the patient to rinse the mouth. After application of topical anesthetic, 0.5-1ml local infiltration anesthesia was administered. Frenum was clamped with 2 hemostats (Figure 4) to increase the visibility of the surgical site, and frenectomy was initiated using a scalpel. Tongue protrusion was examined to obtain the total removal of frenum. Incisions were placed using a # 15 blade to eliminate the interfering frenum and a diamond-shaped wound (Figure 5) was achieved. To achieve healing by primary intention, muscle fibers

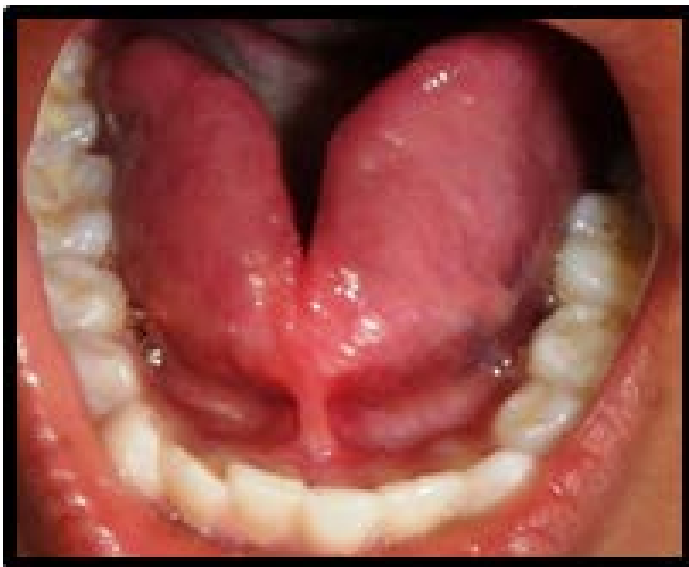


Figure 1: Ankyloglossia

remnants were excised.(Figure 6). 3 interrupted sutures were given using 3-0 silk suture material (Figure 7) to close the wound edges.



Figure 4: Frenum held with 2 hemostats



Figure 5: Diamond shaped wound



Figure 6: Excision of muscle fibre remnants



Figure 7: Sutures Placed

#### Post-operative

#### care

Amoxicillin (250 mg) twice daily for 5 days and paracetamol (250 mg) twice daily for 3 days were prescribed. Patient was asked to report for suture removal after 1 week. Pain & swelling were present for the first 3 postoperative days, but progressively subsided. Patient was instructed to initiate tongue exercises after 7 days. Absolute healing was seen after 1 month post-operatively.

#### Outcome

Quickly after the frenectomy, the patient was reassessed

(Figure 8). Follow up after 7 days showed primary closure of the wound by primary intention (Figure 9). Thereafter, the patient was instructed to start speech therapy. No postoperative complications were observed during the next week of the procedure.



Figure 8: Immediate Post-operative



Figure 9: Follow up after 7 days

### Result

Changes were observed in the frenulum and in tongue mobility. The best results were for tongue protrusion (Figure 10, 11) whereas the worst were for tongue elevation. Shape of the tip of the tongue altered after the

surgery. Speech was improved after the surgery due to improvement in tongue mobility. The patient reported improvement in their oral communication.



Figure 10: Frontal View



Figure 11: Lateral View

Using the Kotlow's criteria and Hazelbaker's assessment tool, preoperative and postoperative scores were recorded. After 1 month followup, significant improvement in prognosis of symptoms of ankyloglossia was observed. Free tongue movement increased from 4mm to 12mm and functional score of 5 and appearance score of 3 were changed to 13 and 9 respectively (Table 1).

	Function Score	Appearance Score	Free Movement of tongue	Kotlow's Classification (Diagnosis)	Speech
Pre-operative	5	3	4	Class III	Difficulty in speech
Post-operative	13	9	12	Class I	Improved Speech

Table 1: Pre-operative and post-operative assessment of tongue

### Discussion

Ankyloglossia is an anomaly present since birth that limits the tongue movements. Generally, the lingual frenum detaches prior to birth, permitting the tongue movements. In ankyloflossia, the frenum remains adhered base of the tongue. Generally its origin is unknown but a genetic mutation on TBX22 can also cause ankyloglossia.<sup>6</sup> Ankyloglossia is linked with a some rare syndromes such as Kindler Syndrome, Van der Woude syndrome, X-linked cleft palate syndrome & Opitz syndrome but generally these patients do not have these abnormalities.<sup>7</sup> The signs & symptoms of ankyloglossia are difficulty in protruding the tongue past the mandibular anterior teeth, trouble in elevating the tongue to the level of maxillary teeth or moving the tongue laterally and heart or notched shape of tongue while protruding.<sup>8</sup>

### Complications of Ankyloglossia.<sup>(9,10,11,12)</sup>

Ankyloglossia can influence an infant's developmental milestones and the way child eats, talks and swallows. For instance, Ankyloglossia can lead to:

1. Breastfeeding issues: It requires an infant to keep their tongue over the lower gum while sucking. If the child is not able to keep his or her tongue in correct position, the child may bite rather than suck on the areola. This can lead to huge areola torment and further impede child's capacity to suck milk. Ultimately poor breast-feeding can result in insufficient nutrition to the child.

2. Poor Oral Hygiene: For an adolescent or adult, ankyloglossia can make it hard to clear food debris from the dentition. This can lead to dental caries and gingivitis.

3. Challenges while speaking: Ankyloglossia can interfere with the capacity to make specific sounds, for example, "t," "d," "z," "s," "th," "r" and "l."

4. Difficulties with other oral exercises: Ankyloglossia can hamper with exercises, for example, playing a breeze instrument, licking an ice cream. Tuerk and Lubit proposed two dental deformations as a result of ankyloglossia which are open-bite and mandibular prognathism.<sup>13</sup> Horton et al. reported that the noticeable lower frenulum may cause mandibular plate dislodgement when the tongue is raised.<sup>14</sup>

### Diagnosis

Ankyloglossia is generally diagnosed during a physical examination. For infants, raise the tongue passively with a tongue depressor and for adults examine the several aspects of the tongue's appearance and ability to move. In addition, palpation of genioglossus on the underside of the tongue will aid in confirming the diagnosis.<sup>14</sup> Academy of Breastfeeding Medicine has recommended a severity scale for ankyloglossia, which categorize the appearance and function of the tongue.<sup>5</sup>

### Treatment

Treatment for ankyloglossia is debatable. A few specialists and lactation experts suggest correcting it immediately — even before an infant is discharged from hospital while others like to adopt a cautious strategy.<sup>15</sup> Ruffoli et al. reported that the frenulum normally recedes between a half year to six years of age. The lingual frenulum may loose after some time, correcting ankyloglossia.<sup>16</sup> In few cases, tongue-tie remains without causing issues. At times, consulting with a lactation advisor can help with breast feeding, and speech language pathologist may help improve speaking.

In the events when ankyloglossia causes challenges, at that point careful modalities might be required for babies, youngsters or grown-ups. Surgeries incorporate a frenotomy or frenuloplasty. A few conservative modalities for managing ankyloglossia incorporates wait and watch, speech therapy, otolaryngotherapy, frenotomy, Z-plasty, frenectomy and laser frenectomy. If there is no improvement in speech and tongue related issues, at that point it might be proper to think about surgical approach. The studies proposes that surgical modalities at any age are totally safe, yet carefully requires postsurgical speech therapy to accomplish satisfying outcomes.<sup>17</sup>

To decide the requirement for the surgical treatment of lingual frenulum, Kotlow hypothesized these guidelines<sup>4</sup>:

1. If the tip of the tongue can't touch the upper and lower lips effectively, without stressing
2. If the tip of the tongue clefts during protrusion
3. If the tongue places unnecessary forces on the lower front teeth
4. Blanching of the lingual tissue when there is retrusion of the tongue.
5. If the lingual frenum makes space between lower front teeth
6. If the frenum impedes with normal swallowing pattern
7. If the kid encounters abrasion lingual to the tongue
8. If the kid encounters speech trouble because of restricted tongue movements
9. During nursing, if the frenulum keeps newborn away from attaching to the mother's areola.

Timely surgical modalities (frenotomy or frenectomy) to address ankyloglossia at an early age diminishes long term inconveniences. Frenotomy is a straight forward surgery where the lingual frenulum is relocated. The method is fast with minimal discomfort since there are barely any blood vessels and nerve endings in the lingual. Complications of a frenotomy are uncommon — yet could

incorporate infection or bleeding, or harm salivary glands or tongue.<sup>18</sup>

Frenectomy is total removal of the frenum and frenuloplasty incorporates any of the various procedures used to untie the tongue and rectify the anatomic structures. Nonetheless, the studies needs adequate data to support these fundamental methods.<sup>18</sup> In this patient frenectomy which is an intrusive strategy to be executed among adolescents, despite the fact that the outcomes are more predictable and lesser recurrence rate.<sup>19</sup> Literature needs definitive parameters with respect to the timing of frenectomy. Nonetheless, correct time for surgery is before the start of speech and swallowing problems. When performed on adults, referral to a speech instructor is important to help establish normal tongue movements.

### Conclusion

There is typically a restriction of tongue movements and issues with discourse if severe or complete tongue tie is present. Early finding and immediate careful treatment can aid the patient to evade long haul impacts of these issues.

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