

Treatment of partial ankyloglossia using Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF): A case report with 6-month follow-up

ABSTRACT

Ankyloglossia or “tongue-tie,” observed in neonates, children, or adults, is characterized by an abnormally short, thick, fibrosed lingual frenulum which may cause restriction in function of tongue including limitation in tongue movement. The use of Hazelbaker Assessment Tool for Lingual Frenulum Function allows elaborate and extensive scoring of the anomaly. This article reports the surgical management of an 11-year-old patient having ankyloglossia associated with restricted movement of tongue and difficulty in speech. Six months postoperatively, the patient showed uneventful healing and was satisfied with the procedure.

Keywords: Ankyloglossia, children, Hazelbaker Assessment Tool for Lingual Frenulum Function, surgical management

INTRODUCTION

Partial ankyloglossia also called as tongue-tie is a condition caused by abnormally short frenum of the tongue, or the frenum is attached too close to the tip of the tongue.^[1] The other category is total ankyloglossia which is rare and occurs when the tongue is completely fused to the floor of the mouth.

The prevalence of ankyloglossia is well established in newborn and is seen in approximately 4%–5% in the newborn population with a 3:1 male-to-female preponderance.^[2]

An abnormally tight lingual frenulum often makes the tongue tied down to the floor of the mouth restricting the functions of tongue. It affects speech, feeding, oral hygiene, as well as social environment also. It causes blanching of soft tissue during tongue retrusion and also exerts force on mandibular anteriors.^[3]

There is continuing controversy over the diagnostic criteria and treatment of ankyloglossia.^[4] Diagnostic criteria established by various studies are based on the length of the lingual frenulum, amplitude of tongue movement,^[5] heart-shaped look when the tongue is protruded and/or

thickness of the fibrous membrane.^[6] As there is no generally agreed definition of tongue-tie, a quantitative instrument has been developed: the Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF).^[7]

CASE REPORT

An 11-year-old male patient came with the chief complaint of difficulty in speaking and difficulty during the intake of

**ASTHA JAIKARIA, SUHANI K PAHUJA¹,
SEEMA THAKUR², POOJA NEGI³**

Private Practitioner, MDS Pedodontics HP Govt Dental College,
¹Consultant Pedodontist, Prime Dental Care Palampur,
Departments of ²Pedodontics and ³Prosthodontics, HPGDC,
Shimla, Himachal Pradesh, India


Address for correspondence: Dr. Pooja Negi,
Room No. 408, 4th Floor, HPGDC, Shimla,
Himachal Pradesh, India.
E-mail: asthajaikaria25@gmail.com

Received: 28 October 2019, **Revised:** 25 June 2020,
Accepted: 11 February 2021, **Published:** 15 July 2021

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Jaikaria A, Pahuja SK, Thakur S, Negi P. Treatment of partial ankyloglossia using Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF): A case report with 6-month follow-up. *Natl J Maxillofac Surg* 2021;12:280-3.

| Access this article online | |
|--|---|
| Website: www.njms.in | Quick Response Code  |
| DOI: 10.4103/njms.NJMS_69_19 | |

food. He also complained regarding the restricted tongue movement. There was no contributory medical or family history. On intraoral examination, short lingual frenum and restricted tongue movements were observed as seen in Figure 1a and b.

Informed consent and necessary blood investigations were obtained. Recommendation for frenotomy was established using HATLFF [Table 1] under topical anesthesia on tongue's inferior surface. After anesthesia, the tongue was retracted superiorly and stabilized with silk sutures placed at the tip of the tongue. A narrow vertical incision was then made through the mucosa alongside of the frenulum, from beneath the tip of the tongue to just in front of the orifices of the submaxillary ducts [Figure 2]. Blunt dissection was carried down to the floor of the mouth on both sides of the frenum facilitating its removal from lingual and alveolar insertions [Figure 3]. Surgical wound was sutured with catgut suture 4/0 [Figure 4].

Postoperative care includes analgesics, mouthwash containing chlorhexidine, as well as recommendations on diet and maintaining good oral hygiene.

The postoperative period was uneventful. After 1 week, the tongue was evaluated and early mobilization was indicated to minimize scarring and improve tongue range of motion [Figure 5]. The patient is asked to perform tongue exercises that are designed to improve protrusion, elevation, and side-to-side motion 3 or more times daily. The patient was referred to a speech therapist to have his tongue movement and speech articulation improved.

Although some improvement in tongue mobility occurred in the early postoperative period, a noticeable gain in mobility has been noted 1 month postoperatively with further improvements 3 months after surgery [Figure 6]. Postoperative assessment reveals improved results postsurgical intervention [Table 2].

DISCUSSION

Ankyloglossia, partial or complete, causes specific speech disorders in certain individuals. It does not prevent or delay

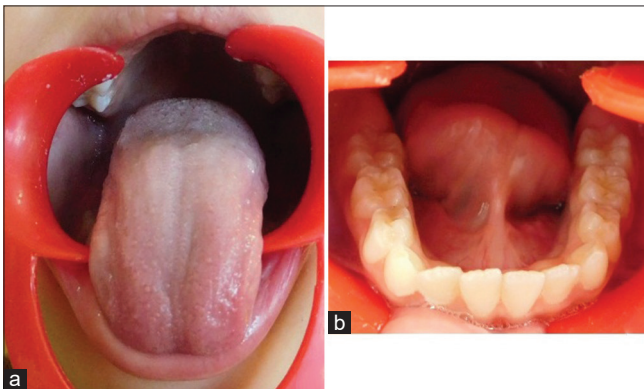


Figure 1: (a and b) Restricted tongue movements with short and thick frenum



Figure 2: Narrow vertical incision made through the mucosa alongside of the frenulum



Figure 3: Excised triangular tissue held with silk suture at the tongue tip and excision of fiber remnants



Figure 4: Tension-free closure with silk sutures



Figure 5: Follow-up after 1 week

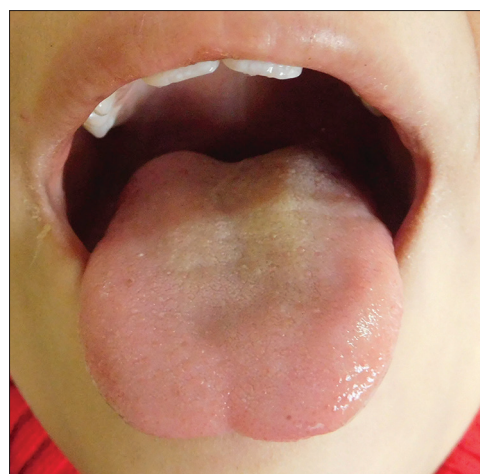


Figure 6: Follow-up after 1 month after surgery showing easier lingual mobility

Table 1: Scoring of the patient on the basis Hazelbaker Assessment Tool for Lingual Frenulum Function preoperative

| HATLFF | |
|-----------------------------|--|
| Functional items-score | Appearance items-score |
| Lateralization-1 | Appearance of tongue when lifted-0 |
| Lift of tongue-0 | Elasticity of frenulum-0 |
| Extension of tongue-2 | Length of frenulum when lifted-2 |
| Spread of anterior tongue-1 | Attachment of lingual frenulum to tongue-1 |
| Cupping of tongue-1 | Attachment of lingual frenulum to inferior ridge-1 |
| Peristalsis-1 | |
| Snap-back-2 | |
| Total score=8 | Total score=4 |

According to Hazelbaker tool, score < 11 for functional items and appearance score < 8, then frenotomy is necessary. HATLFF: Hazelbaker Assessment Tool for Lingual Frenulum Function

Table 2: Hazelbaker Assessment Tool for Lingual Frenulum Function postoperative

| HATLFF postoperative | |
|-----------------------------|--|
| Functional items-score | Appearance items-score |
| Lateralization-1 | Appearance of tongue when lifted-2 |
| Lift of tongue-2 | Elasticity of frenulum-1 |
| Extension of tongue-2 | Length of frenulum when lifted-2 |
| Spread of anterior tongue-2 | Attachment of lingual frenulum to tongue-2 |
| Cupping of tongue-2 | Attachment of lingual frenulum to inferior ridge-2 |
| Peristalsis-2 | |
| Snap-back-2 | |
| Total score=13 | Total score=9 |

According to Hazelbaker tool, score < 11 for functional items and appearance score < 8, then frenotomy is necessary. HATLFF: Hazelbaker Assessment Tool for Lingual Frenulum Function

the onset of speech but interferes with articulation which is consistent with our case. It causes blanching of soft tissue during tongue retrusion and also exerts force on mandibular anteriors.^[3] Moreover, it interferes in toothbrushing process, consequently, favoring the risk of plaque accumulation,

tissue inflammation onset, and gingival recession.^[8] It also results in improper chewing and swallowing of food which in turn increases the gastric distress and bloating, snoring, and bed wetting at sleep. Dental caries may also occur due to restricted tongue's action on the teeth and spreading of saliva. Malocclusion like open bite due to thrust created by tongue-tie spreading of lower incisors and tooth mobility due to long-term tongue thrust.

Tuerk and Lubit proposed two dental deformities as a consequence of ankyloglossia which are open-bite deformity and mandibular prognathism. The inability to raise the tongue to the roof of the palate encourages the continuation of the infantile swallow, prevents the development of the adult swallow, and leads to an open-bite deformity. The lack of a free upward and backward movement of the tongue which may result in an exaggerated anterior thrusting of the tongue against the anterior body of the mandible produces mandibular prognathism.^[9] Horton *et al.* reported that the prominent lower frenulum may lead to repeated lower denture plate dislodgment when the tongue is elevated. The above possibility was also noted by other authors.^[10]

While evaluating the effect of ankyloglossia on speech, it is important to focus on lingual-alveolar sounds. Mobility of the tongue is measured in millimeters the tip of the tongue extended past the lower dentition, while elevation is measured by recording interincisal distance with the tongue tip maximally elevated and in contact with the upper teeth. If there is ankyloglossia, the protrusion and elevation values of 15 mm or less will be recorded and 20–2 mm for normal individuals^[11] which applied to our case as well. The myofunctional therapy is a program of specific exercises that strengthen the muscles of the tongue.^[12]

The ankyloglossia correction at early ages reduces the risks of complications to nursing babies, and surgical intervention should be performed when there is interference in deglutition and speech.^[13]

CONCLUSION

Tongue-tie or ankyloglossia, frequently seen in infants and young children, causes various functional and esthetic complications that may affect the physical and mental health of the individual. Timely detection followed by quick intervention prevents problems not only related to feeding and speech but also involving growth and posture.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Ramya V, Manisundar N, Balaji A. Management of ankyloglossia with scalpel and electrosurgery method. *Indian J Multidiscip Dent* 2012;2:472-4.
2. Ricke LA, Baker NJ, Madlon-Kay DJ, DeFor TA. Newborn tongue-tie: Prevalence and effect on breast-feeding. *J Am Board Fam Pract* 2005;18:1-7.
3. Verdine VA, Khan R. Management of ankyloglossia – Case reports. *IOSR J Dent Med Sci* 2013;6:31-3.
4. Hogan M, Westcott C, Griffiths M. Randomized, controlled trial of division of tongue-tie in infants with feeding problems. *J Paediatr Child Health* 2005;41:246-50.
5. Jorgenson RJ, Shapiro SD, Salinas CF, Levin LS. Intraoral findings and anomalies in neonates. *Pediatrics* 1982;69:577-82.
6. Chu MW, Bloom DC. Posterior ankyloglossia: A case report. *Int J Pediatr Otorhinolaryngol* 2009;73:881-3.
7. The Assessment Tool for Lingual Frenulum Function (ATLFF): Use in a Lactation Consultant Private Practice. Pasadena, California: Pacific Oaks College; 1993.
8. YaredK FG, Zenobio EG, Pacheco W. Aetiologiamultifatorial da recessão periodontal. *R Dent Press Ortodon Ortop Facial* 2006;11:45-51.
9. Tuerk M, Lubit EC. Ankyloglossia. *Plast Reconstr Surg Transplant Bull* 1959;24:271-6.
10. Horton CE, Crawford HH, Adamson JE, Ashbell TS. Tongue-tie. *Cleft Palate J* 1969;6:8-23.
11. Kupietzky A, Botzer E. Ankyloglossia in the infant and young child: Clinical suggestions for diagnosis and management. *Pediatr Dent* 2005;27:40-6.
12. Ferrés-Amat E, Pastor-Vera T, Ferrés-Amat E, Mareque-Bueno J, Prats-Armengol J, Ferrés-Padró E. Multidisciplinary management of ankyloglossia in childhood. Treatment of 101 cases. A protocol. *Med Oral Patol Oral Cir Bucal* 2016;21:e39-47.
13. Babu HM. Surgical management of ankyloglossia: A case report. *Int J Contemp Dent* 2010;1:58-61.