Case Report

Lingual Frenuloplasty for Ankyloglossia in Children: A Case Series

Abstract

Tongue is an important oral structure that affects speech, position of teeth, periodontal tissue, nutrition, swallowing, nursing, and certain social activities. Tongue-tie or ankyloglossia is a developmental anomaly of the tongue, characterized by an abnormally short, thick lingual frenulum resulting in limited tongue movement. Diagnosis must include functional assessment of tongue mobility, in addition to the physical appearance of the frenulum. Tongue mobility and appearance associated with the insertion, as well as the attachment and the shortness of the lingual frenulum should be evaluated. Ankyloglossia management should be considered at any age considering the risk-benefit evaluation and because of the highest vascularization and mobility of the tongue. Lingual frenuloplasty for the management of ankyloglossia in children is being discussed in the form of case series.

Keywords: *Ankyloglossia, children, lingual frenuloplasty, tongue-tie*

Tanu Rajain, Kesang Tsomu, Natasha Saini, Ritu Namdev

Department of Pedodontics and Preventive Dentistry, Post Graduate Institute of Dental Sciences, Pt. B.D. Sharma University of Health Sciences, Rohtak, Haryana, India

Introduction

Ankyloglossia, also known as tongue-tie, is a congenital oral anomaly characterized by an abnormally short lingual frenulum, in which the tip of the tongue cannot protrude beyond the lower incisor teeth. In the literature, such a condition occurs in 0.02%–10.7% of neonates, and males seem to be more affected than female patients in a proportion ranging from 4:1 to 1.7:1.[1] The incidence of tongue-tie in the general population is estimated between 0.02% and 12%.[2]

Coryllos classification using the anatomical criteria based on the point of tongue attachment as advocated by the American Academy of Pediatrics.[3]

i. Type I indicates attachment of the frenulum to the tongue tip
ii. Type II is attachment 2–4 mm behind the tongue tip and on or just behind the alveolar ridge
iii. Type III is a thickened frenulum with attachment to the mid-tongue and middle of the floor of mouth
iv. Type IV describes a submucosal frenulum visualized as a thick and inelastic attachment to the ventral tongue.

The risk of developing class 3 malocclusions along with reduced maxillary growth and mandibular prognathism is increased in children with ankyloglossia. Therefore, the surgical correction of aberrant lingual frenal attachment is essential to overcome these mechanical limitations and functional challenges. The most common method to correct ankyloglossia is by the surgical excision of aberrant frenal attachments by the process known as frenotomy, frenectomy, or frenuloplasty. Lingual frenuloplasty technique is being preferred because it may allow for more complete release of the tongue-tie and may conceivably reduce the chances of scarring and recurrence. Other techniques for surgical incision are with a scalpel, electrocautery, or soft-tissue lasers.[4]

Case Report

Case 1

A healthy 13-year-old girl reported with a chief complaint of restricted tongue movement and speech difficulties; she was neither able to utter letter sounds "l," "t," "d," "n," "s," and "th" distinctly nor to protrude her tongue over the vermillion border of lower and upper lip [Figure 1a]. Clinically, the patient presented a thick and short lingual frenulum with anterior insertion [Figure 2a] that is kotlows class 2 ankyloglossia (moderate ankyloglossia). Horizontal to vertical lingual frenuloplasty

How to cite this article: Rajain T, Tsomu K, Saini N, Namdev R. Lingual frenuloplasty for ankyloglossia in children: A case series. Contemp Clin Dent 2021;12:447-50.

Submitted : 24-Jul-2020
Revised : 24-Aug-2020
Accepted : 10-Feb-2021
Published : 21-Dec-2021

Address for correspondence:
Dr. Tanu Rajain, Department of Pedodontics and Preventive Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India.
E-mail: tanurajain@gmail.com

Access this article online

Website: www.contempclindent.org

DOI: 10.4103/ccd.ccd_660_20

Quick Response Code:

procedure was planned in this case. The bilateral lingual nerve blocks and local infiltration in the anterior area were performed. Then, the tongue was retracted superiorly. In a horizontal direction, the frenulum was then sharply divided at the junction of the frenulum and the ventral surface of the tongue, thus creating a diamond-shaped defect. The incision was then extended posteriorly until the tongue is sufficiently released to allow protrusion of the tip well beyond the lower incisors and unrestricted elevation of the tongue tip toward the maxillary incisor teeth. The wound was then sutured [Figure 3a]. On follow-up visit, there was an improvement in mobility of the tongue [Figures 4a and 5a].

Case 2

An 8-year-old boy reported with a chief complaint of difficulty in speech. On clinical examination, the patient presented with protruded mandible and restriction in growth of maxilla, which is one of the sequelae of untreated ankyloglossia [Figure 3b]. Intraoral examination revealed a thick lingual frenulum [Figures 1b and 2b]. Clinically, the patient presented with kotlows class 2 ankyloglossia, so lingual frenuloplasty procedure was planned. LA with bilateral lingual nerve blocks was given. The horizontal-to-vertical plasty was performed; the tongue was retracted superiorly by using the surgeon's fingers to expose the frenulum. The frenulum was then sharply divided in a horizontal fashion at the junction of the frenulum with the ventral tongue, creating a diamond-shaped defect. The movement of the tongue in terms of protrusion and elevation was verified. The defect was closed in a vertical fashion, without undermining, and then the wound was sutured [Figure 4b]. After ankyloglossia treatment, the patient was given Petit facemask for treating hypodeveloped maxilla [Figures 5b and 6].

Case 3

An 8-year-old boy reported with a chief complaint of difficult in speech and difficulty in protruding the tongue. The

Figure 1: Case 1: (a) Preoperative intraoral photographs. Case 2: (b) Preoperative intraoral photographs Case 3: (c) Preoperative intraoral photograph

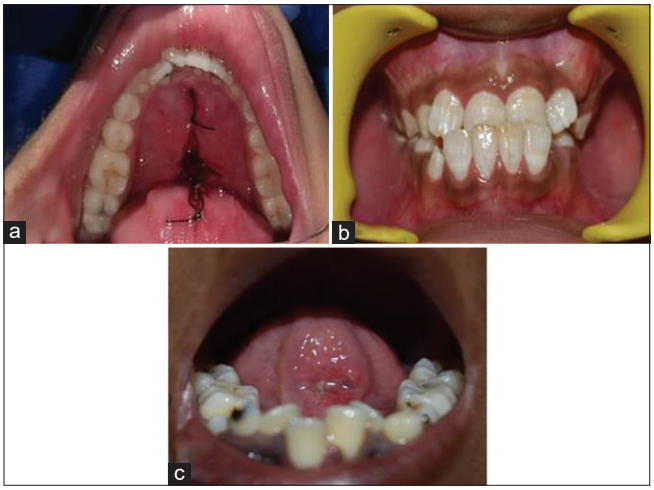

Figure 3: Case 1: (a) Intraoral sutures given. Case 2: (b) Intraoral photograph showing reduced maxillary growth and mandibular prognathism. Case 3: (c) Postoperative intraoral photograph

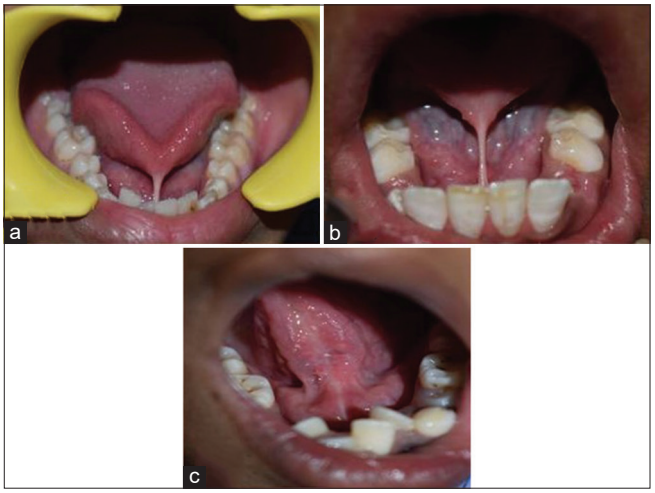

Figure 2: Case 1: (a) Preoperative intraoral photographs. Case 2: (b) Preoperative intraoral photographs Case 3: (c) intraoral sutures given

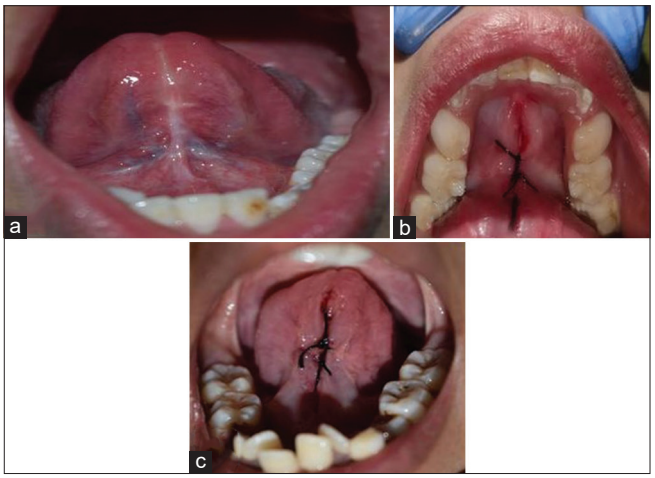

Figure 4: Case 1: (a) Postoperative intraoral photographs. Case 2: (b) Sutures given Case 3: (c) Follow-up photograph

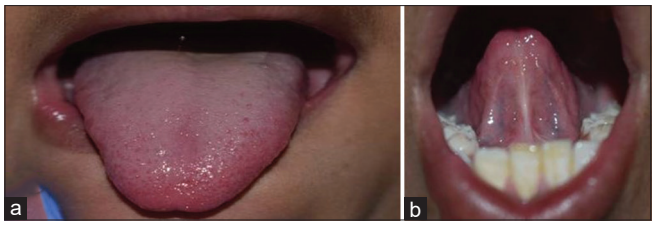

Figure 5: Case 1: (a) Postoperative intraoral photographs. Case 2: (b) Postoperative intraoral photograph

patient had a history of treated cleft lip and palate. Clinical examination revealed kotlows class 1 ankyloglossia, i.e., a short and thick lingual frenulum was present [Figure 1c], thus lingual frenuloplasty was indicated. After achieving good anesthesia, over the superior and inferior aspects of the frenulum, the tongue was retracted superiorly with a traction suture. Creating a diamond-shaped defect the frenulum was sharply divided in a horizontal fashion at the junction of the frenulum with the ventral tongue. The incision was carried posteriorly until the sufficient release of tongue similarly as in Case 1 and 2. Fiber remnants were excised, blunt dissection was performed. Care is taken to stay well above the submandibular ducts. With the help of pressure pack, hemostasis was achieved. The wound was then sutured [Figures 2c and 4c].

Discussion

Tongue-tie surgical techniques can be classified into three procedures: Frenotomy, Frenectomy, and Frenuloplasty (Z-frenuloplasty, the horizontal-to-vertical frenuloplasty and V-Y frenuloplasty).[5]

Frenotomy, or clipping, is the procedure of choice for the treatment of ankyloglossia in infants (e.g., for breastfeeding difficulties). On either side of midline, two fingers of the surgeons are placed below the tongue, retracting the tongue upward to expose the frenulum. The frenulum is divided. The incision is not sutured, and the infant is allowed to feed immediately after the procedure.[6]

Frenectomy with the use of one hemostat

The frenulum is held with a small-curved hemostat. Two incisions are made following the hemostats, cutting through the upper and lower aspects of the frenulum. The frenulum is then excised, leaving a diamond-shaped wound. Sutures are placed.

Frenectomy with the use of two hemostats

Two hemostats (one curved and the other straight) are placed over the superior and inferior aspects of the frenulum, respectively, with their tips meeting near the base of the tongue. Two incisions are made following the hemostats, cutting through the upper and lower aspects of the frenulum, thus a triangular tissue held with the hemostats is completely removed. Fiber remnants are excised, and the wound edges are sutured.[7]

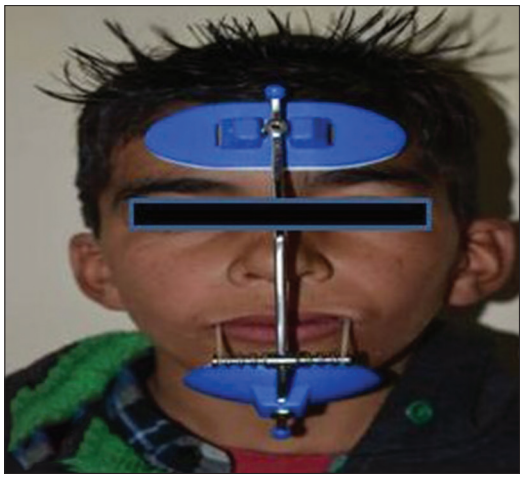

Figure 6: Case 2: Extraoral view showing petit facemask

Frenuloplasty is the preferred procedure for most patients >1–2 years of age, because it may allow for more complete release of the tongue-tie and may conceivably reduce the chances of scarring and recurrence. The preferred frenuloplasty technique is the horizontal-to-vertical plasty. In this, the tongue is retracted superiorly to expose the frenulum. The frenulum is sharply divided in a horizontal fashion at the junction of the frenulum with the tongue. The incision is carried posteriorly until the tongue is sufficiently released to allow protrusion. The defect is sutured.[6]

In the cases presented, Case 1 and Case 2 were both of kotlows class 2 and considering the age of the patient horizontal to vertical lingual frenuloplasty was performed. In case2, ankyloglossia was associated with retrognathic maxilla, so it was prudent to start the maxillary orthopedics treatment with Petit facemask after operating for ankyloglossia. Case 3 was the treated case of cleft lip and palate, here kotlows class 1 ankyloglossia was present and speech difficulty was evident which could be attributed to ankyloglossia and cleft palate. There was an improvement in speech after the surgical treatment of ankyloglossia.

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. Belmehdi A, Harti KE, Wady WE. Ankyloglossia as an oral functional problem and its surgical management. Dent Med Probl 2018;55:213-6.
2. Walsh J, Benoit MM. Ankyloglossia and other oral ties. Otolaryngol Clin North Am 2019;52:795-811.
3. Bundogji N, Zamora S, Brigger M, Jiang W. Modest benefit of frenotomy for infants with ankyloglossia and breastfeeding difficulties. Int J Pediatr Otorhinolaryngol 2020;133:109985.
4. Varadan M, Chopra A, Sanghavi AD, Sivaraman K, Gupta K. Etiology and clinical recommendations to manage the complications following lingual frenectomy: A critical review. J Stomatol Oral Maxillofac Surg 2019;120:549-53.
5. Suter VG, Bornstein MM. Ankyloglossia: Facts and myths in diagnosis and treatment. J Periodontol 2009;80:1204-19.
6. Lalakea ML, Messner AH. Frenotomy and frenuloplasty: If, when, and how. Oper Tech Otolaryngol Head Neck Surg 2002;13:93-7.
7. Junqueira MA, Cunha NN, Costa e Silva LL, Araújo LB, Moretti AB, Couto Filho CE, *et al*. Surgical techniques for the treatment of ankyloglossia in children: A case series. J Appl Oral Sci 2014;22:241-8.