



Release and Revive - Optimizing Pediatric Tongue Tie Care with Oromyofunctional Therapy: A Case Series

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Abstract

Ankyloglossia, commonly known as tongue-tie, whether partial or complete, can cause significant issues such as speech abnormalities, malocclusion, and swallowing difficulties, impacting daily routine activities. Various techniques, including scalpel, laser, electro-surgery, This novel research has shown that the atmospheric plasma is a minimally invasive method, successfully used for frenectomy, without important or fibrotic complications and with very low recurrence rates. have been employed over the past few decades to treat tongue-tie. Every approach aims to improve tongue mobility by releasing tight muscle attachment, yet each has benefits and drawbacks. Oromyofunctional therapy (OMFT) used

after treatment can significantly enhance oral health and tongue function substantially. This series presents three cases of partial ankyloglossia, each exhibiting speech difficulties and restricted tongue movements, necessitating definitive treatment to correct the deformity. The main objective of releasing the tongue tie was accomplished in all the cases, as the results demonstrated adequate healing and increased tongue mobility above pre-operative circumstances. Post-operative OMFT was implemented to further improve tongue movements and function substantially. The clinical outcomes following surgical tongue-tie release in the cases demonstrated better healing and improved tongue movements. This suggests that surgical treatment

complemented by OMFT, is a reliable technique for treating ankyloglossia. Post-operative OMFT is crucial in enhancing the results by improving muscle strength and coordination, leading to optimal tongue function and overall oral health.

Keywords: ankyloglossia, frenectomy, frenotomy, speech disorder, tongue-tie

Introduction

Ankyloglossia, commonly known as tongue-tie, has been described as restricted tongue mobility due to a tight lingual frenulum. However, other overlooked factors such as airway obstruction, lack of general practice in tongue movement, insufficient tongue space, and extraoral fascial restrictions can contribute to the impaired tongue.^[1] According to Meissner's study, 71% of young children with ankyloglossia had speech abnormalities related to restricted tongue mobility. The correlation between ankyloglossia and speech disorders, however, remains controversial.

Only 23% of pediatricians have identified this association.^[2] Treatment of choice for ankyloglossia includes various surgical techniques like frenectomy, frenuloplasty, and frenotomy. In recent years, the oromyofunctional therapy (OMFT) has emerged as a complement to surgical intervention. OMFT along with surgical intervention has given better results compared to surgery alone.^[1,3]

Though there is substantial literature on the various treatment modalities for tongue tie, there is a lack of evidence regarding the management of tongue tie using both surgery and OMFT. Therefore, we present this case series reporting treatment that combines excision and OMFT.

Case Presentation

Case 1

A pre-schooler male patient reported to the Department of Paediatric and Preventive Dentistry, with the chief complaint of restricted tongue mobility, leading to speech difficulty in pronouncing certain words. On intraoral examination, the tongue exhibited limited movements due to high frenal attachment to the floor of the mouth, leading to inability to protrude and perform lateral movements of tongue. Characteristic V shaped notch was seen at the tip of the tongue showing heart shaped tongue on protrusion. It was diagnosed as Kotlow's Class III ankyloglossia^[4] and grade 4 according to tongue range of motion ratio (TRMR).^[1] (Figure 1).

Case 2

A school going boy reported to the Department of Paediatric and Preventive Dentistry, with the chief complaint of speech difficulties. On intra-oral examination, the tongue exhibited limited movements due to high frenal attachment to the floor of the mouth. Kotlows free tongue measurement was 16mm, suggestive of class I classification. Even though it was mild ankyloglossia patient showed limited tongue movement, we assessed anterior and posterior tongue mobility, it was diagnosed as grade 4 TRMR. (Figure 2)

Case 3

A schooler reported to Department of Paediatric and Preventive Dentistry, with the chief complaint of speech difficulties. On intra-oral examination we confirmed that low tongue posture was the possible reason for maxillary hypoplasia. Additionally, an anterior crossbite was noticed on examination. Patient was diagnosed with class 2 Kotlow's and grade 2 TRMR. (Figure 3)

Treatment

After obtaining informed consent, preoperative OMT⁵ (Table 1) in 3 cycles/day with each exercise repeated 10 times was introduced through self-structured animated videos, a month before the surgical procedure for all the patients. A self-structured video consists of 8 exercises, in which different animated animal characters are shown for each exercise. Animals did a similar activity for each exercise to make it more interesting and encouraging for the patients. Video is made in hindi. Also, the same exercise done by the patients was shown.

In the first case, under local anesthesia (2% Lidocaine with 1:200000 adrenaline), a bilateral lingual infiltration was given, with the tongue sutured at its tip using 3-0 silk suture material to hold or retract the tongue conveniently. The tongue tie was released using electrocautery.

In the second case, under local anaesthesia, bilateral lingual nerve block was given, tongue was sutured at its tip for retraction during surgery. Frenum excision was done using scalpel. Suture was placed.

In the third case, under local anaesthesia, bilateral lingual nerve block was given, with the tongue sutured at its tip for retraction. The tongue tie was released using electrocautery. Post-operative instructions were given in all the cases following surgery.

After 1 week following surgery, suture removal was done in the case where frenectomy was performed using scalpel. Postoperative OMT began immediately after surgery and was continued for 3 months for all the cases.

Outcome and Follow-Up

The patient was periodically followed up till 3 months. After three months, all patients showed excellent healing, improved tongue movements, speech, mastication, and crossbite correction in the third case.

Discussion

Ankyloglossia, commonly known as tongue-tie, presents significant clinical challenges due to its impact on essential oral functions such as speech, feeding, and dental development. The condition, characterized by a short, thick lingual frenulum, can severely limit tongue mobility, affecting an individual's quality of life from infancy through adulthood.¹ Effective management often requires a multidisciplinary approach, combining surgical and non-surgical interventions to address anatomical and functional deficits. Surgical intervention, particularly frenectomy or frenotomy, remains a cornerstone treatment for moderate to severe cases of ankyloglossia.² The primary objective of surgery is to release the tight frenulum, thereby freeing the tongue from its tethered state and allowing for improved mobility.¹ The present case series demonstrated that electrocautery for frenotomy resulted in immediate and noticeable improvements in tongue movement, such as enhanced protrusion and lateralization. The resolution of the characteristic V-shaped notch and heart-shaped tongue on protrusion post-surgery highlights the effectiveness of the surgical procedure in addressing the physical limitations imposed by the tight frenulum.

While surgery is effective in addressing the anatomical constraints of tongue-tie, OMT plays a critical role in optimizing functional outcomes. OMT involves a series of exercises designed to improve the strength, coordination, and overall function of the orofacial muscles, including those involved in tongue movement. Implementing OMT before and after surgical intervention provides a comprehensive treatment strategy that maximizes the benefits of both approaches.³ The objective of pre-surgical OMT initiated 2-4 weeks before the surgical procedure is to enhance tongue mobility and prepare the orofacial muscles for the

changes that occurs post-surgery. Exercises during this phase focus on improving muscle strength and flexibility, which can facilitate a smoother recovery and more rapid functional improvements following the surgical release.³

Post-surgical OMT typically begins one week after the surgical procedure and continues for several months. The focus during this phase is on maintaining the surgical gains and further enhancing tongue function. The exercises are designed to progressively challenge the tongue and surrounding muscles, ensuring continued improvement in mobility and function. For instance, exercises like "Jump as High as Fish," involve holding the tongue tip in a specific position for a set duration, help strengthen the tongue muscles and improve their coordination.

Self-structured video in Orofacial Myofunctional Therapy (OMFT) are invaluable for demonstrating exercises, ensuring proper technique, also child find it more interesting and it helps in tracking a child's progress over time. They engage children, helping them visualize success, while giving parents confidence in supporting therapy at home.

Surgical release resolves immediate anatomical issues, while OMT maximizes mobility for better speech, feeding, and oral hygiene. Pre-surgical exercises prepare muscles for smoother recovery, and consistent post-surgical OMT maintains results and prevents regression. Tools like a tongue diary can encourage patient compliance, leading to further better long-term outcomes.

Clinical significance and future directions

- Ankyloglossia is a prevalent congenital malformation in children, leading to multiple abnormalities including speech and swallowing difficulties along with craniofacial deformities.

- Presently, there is no standardized treatment regimen for ankyloglossia. Combining OMFT with surgical interventions has shown improved outcomes.
- The present evidence will enable pediatric dentists and other clinicians to recommend clear guidelines to ensure optimal care for children undergoing ankyloglossia surgery.

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Legend Table & Figures

Table 1: Pre and Post Oral Myofunctional Therapy (OMT).^[5]

Exercise 1	Licking bear	In this patient was asked to close his mouth place the tongue between lip and teeth and move it in a circular motion.
Exercise 2	open and close as tiger	Patient was asked to touch the spot with the tip of his tongue and then open and close the mouth.
Exercise 3	Jump as high as fish	Patient touch the spot with his tongue tip then close his mouth and hold the position for 10 secs.
Exercise 4	Tickling tortoise	In this exercise patient placed the tongue on the spot then roll his tongue backwards and forward onto the spot.
Exercise 5	Open your mouth as wide as crocodile	Patient touched the spot with his tongue and then was asked to open his mouth as wide as he can.
Exercise 6	Tongue out as dog	Patient was asked to stick out his tongue as long as he can
Exercise 7	Jumping Frog	Patient stretch out his tongue upward toward the nose and then downwards toward the chin likewise on the right and left cheek
Exercise 8	Teasing Monkey	In this exercise patient was asked to touch the palate behind the spot then suck the air slightly open his mouth hold it for 5 secs then detach the tongue from the palate making a chuck sound.



Figure 1 (a): Lateral view with minimal tongue protrusion



Figure 1 (b): Intraoral view with short and high lingual frenum attachment



Figure 1 (c): Tongue retraction,



Figure 1 (d): Tongue tie released using electrocautery,



Figure 1 (e): 3 months post-operative image with improved tongue protrusion,



Figure 1 (f): 3 months post-operative image represents the free tip of the tongue touching the maxillary central incisors.



Figure 2 (a): Lateral view with minimal tongue protrusion,



Figure 2 (b): Intraoral view with short and high lingual frenum attachment,



Figure 2 (c): Tongue-tie release and excision using scalpel,



Figure 2 (d): 1 month post-operative image,



Figure 2 (e): 3 months post-operative image with improved tongue protrusion,



Figure 2 (f): 3 months post-operative image represents complete healing.



Figure 3 (a): Frontal view representing crossbite



Figure 3 (b): Intraoral view revealed short and high lingual frenum attachment on tongue retraction,



Figure 3 (c): 3 months post-operative image with improved tongue protrusion after tongue-tie release using electrocautery,



Figure 3: (d): 3 months post-operative image with improved tongue protrusion after tongue-tie release using electrocautery,



Figure 3: (e) 3 months post-operative image with correction of crossbite



Figure 3: (f) 3 months post-operative image represents complete healing