



ISSN: 2476-8642 (Print)

ISSN: 2536-6149 (Online)

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# Annals of Health Research

(The Journal of the Medical and Dental Consultants' Association of Nigeria, OOUTH, Sagamu, Nigeria)

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**PUBLISHED BY THE MEDICAL  
AND DENTAL CONSULTANTS ASSOCIATION  
OF NIGERIA, OOUTH, SAGAMU, NIGERIA.**

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# Annals of Health Research

(The Journal of the Medical and Dental Consultants' Association of Nigeria, OOUTH, Sagamu, Nigeria)  
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Volume 10, Issue 1: 77-83

March 2024

doi:10.30442/ahr.1001-08-227

## CASE SERIES

### Management of Ankyloglossia Using Conventional Surgical Technique: A Case Series

Bhoir VV\*, Gujar DA

Department of Periodontology, Dr. D. Y. Patil Dental College & Hospital, Pimpri. Dr. D. Y. Patil Vidyapeeth,  
Pune 411018, India.

\*Correspondence: Dr VV Bhoir, C-102, Mangaltirth Society, Shindevasti, Ravet, Pune 412101, India.  
E-mail: vrushalibhoir89@gmail.com ; ORCID - <https://orcid.org/0000-0001-6230-5385>.

#### Summary

Periodontal plastic surgery is a more conservative and precise technique practised to create more functional and aesthetic results for the treatment of mucogingival problems. The presence of an aberrant frenum is one of the aetiological factors associated with the persistence of a midline diastema. Inadequate dental plaque removal, poor oral hygiene, bifid tongue, impaired speech, and mucogingival problems like recession and black triangles need more attention. Ankyloglossia, or tongue-tie, is a congenital anomaly with an abnormally short lingual frenulum. The aberrant frenum can be treated with surgical removal of the frenum using either frenectomy or frenotomy procedures. In the present case series, frenectomy was performed using a conventional scalpel technique for the treatment of tongue tie.

*Keywords: Ankyloglossia, Frenectomy, Frenotomy, Lingual frenum, Scalpel, Tongue tie.*

#### Introduction

Aesthetic concerns are essential in seeking dental treatment to achieve a perfect smile. A frenum is a mucous membrane fold which contains muscle and connective tissue fibres that attach the lip and the cheek to the alveolar mucosa, the gingiva, and the underlying periosteum. [1] In children, ankyloglossia can lead to breastfeeding difficulties, speech disorders, poor oral hygiene, diastema, gingival recession and bullying during childhood and adolescence. [2] Therefore, surgical removal of the frenum is necessary to repair such

cases. Ankyloglossia can be classified as follows, based on Kotlow's assessment: [3]

Class I: Mild ankyloglossia (12 to 16 mm)

Class II: Moderate ankyloglossia (8 to 11 mm)

Class III: Severe ankyloglossia (3 to 7 mm)

Class IV: Complete ankyloglossia (Less than 3 mm).

Frenectomy is the surgical procedure of removing the frenum, including its attachment to the underlying bone. This procedure can be accomplished with a scalpel (the conventional technique), electro-cautery, or soft tissue laser. [4] Several surgical techniques have been described in the correction of an aberrant frenulum. The

present case series describes three cases of ankyloglossia, which were treated using the scalpel lingual frenectomy method. This procedure is simple and effective, producing good results and patient satisfaction.

### **Case Description**

#### **Case 1**

A twenty-three-year-old male who felt socially embarrassed about his tongue-tie and inability to pronounce certain words visited the clinic for treatment. Clinical examination revealed a short and thick lingual frenulum, indicating a lingual frenectomy (Figures 1a and 1b). Following antisepsis, bilateral lingual nerve blocks and local infiltration in the anterior area were performed using 2% lidocaine with 1:100,000 epinephrine. A

3-0 silk suture was applied on the tip of the tongue for traction. After achieving good local anaesthesia, a straight haemostat was placed against the tissues between the superior and inferior aspects of the frenulum, with the tips meeting in the deep aspect near the base of the tongue (Figure 1c). Two incisions were made with a #15c blade following the use of the haemostat, cutting through the upper and lower aspects of the frenulum. Thus, a triangular tissue held with the haemostat was removed entirely (Figure 1d). Fibre remnants were excised, blunt dissection was performed, and 3-0 silk sutures were applied to close the wound (Figure 1e). Postoperative management included Ibuprofen 400 mg three times a day and Amoxicillin capsule 500 mg three times a day for five days. The postoperative period was uneventful, and sutures were removed after seven days.



Figure 1a: Preoperative view (Diastema).



Figure 1b: Preoperative view (Ankyloglossia).



Figure 1c: Frenum held using Haemostat.



Figure 1d: Frenectomy performed using Scalpel.



Figure 1e: Incision sutured.



Figure 1f: Postoperative view after four weeks.

### Case 2

A speech therapist referred an eighteen-year-old male with ankyloglossia to undergo a frenectomy due to restriction of tongue movement and function. Clinically, the patient had a thick and short lingual frenulum with anterior insertion (Figures 2a and 2b). After antisepsis, bilateral lingual nerve blocks and local infiltration in the anterior area were performed with 2% lidocaine with 1:100,000 epinephrine. A 3-0 silk suture was put on the tip of the tongue for traction. The frenulum was held with a straight haemostat with the convex curve facing the ventral surface of the tongue (Figure 2c). The first incision was made with a #15c blade following the curvature of the haemostat, cutting through the upper

aspect of the frenulum (Figure 2d). The second incision was made at the lower aspect of the frenulum, close to the floor of the mouth (Figure 2e). The frenulum was then excised, leaving a diamond-shaped wound. The wound margins were undermined with the tips of blunt-ended dissecting scissors (Figure 2f). Tension-free closure was checked by inserting the first absorbable 3-0 silk suture at the middle of the wound. Additional sutures were placed along the tongue base and on the floor of the mouth. Postoperative care included Ibuprofen tablet 400 mg three times a day and Amoxicillin capsule 500 mg three times a day for five days. The postoperative period was uneventful, and sutures were removed after seven days.

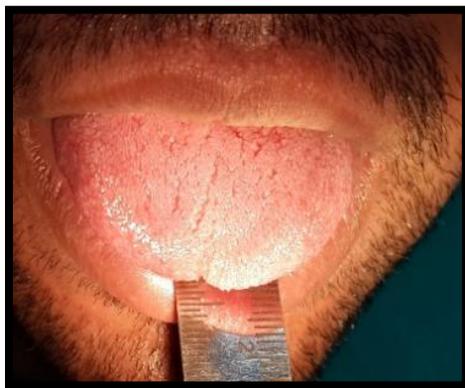


Figure 2a: Preoperative view (Ankyloglossia).



Figure 2b: Preoperative view (Ankyloglossia).



Figure 2c. Frenectomy was performed using the Scalpel.

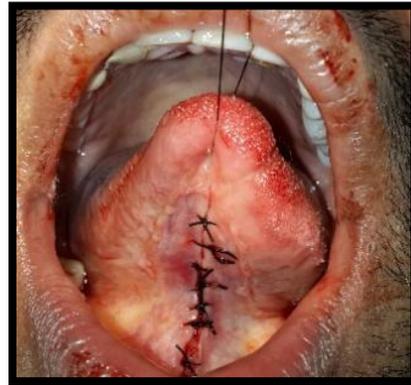


Figure 2d. Incision sutured.



Figure 2e: Postoperative view after four weeks.



Figure 2f: Postoperative view after four weeks.

### Case 3

A fifteen-year-old female with ankyloglossia was referred to the Department of Periodontology for restricted tongue movements and function. Intraoral clinical examination revealed a heart-shaped, short lingual frenulum with apical insertion (Figures 3a and 3b). Antisepsis, anaesthesia and tongue traction were performed as previously described in the earlier cases. Following good anaesthesia, a curved haemostat was placed against the tissues between the superior and inferior aspects of the frenulum, with tips meeting in the deep aspect near the base

of the tongue (Figure 3c). Two incisions were made with a #15c blade following the haemostat, cutting through the upper and lower aspects of the frenulum. Thus, a triangular tissue held with the haemostat was removed entirely (Figure 3d). Fibre remnants were excised (Figure 3d), blunt dissection was performed, and 3-0 silk sutures were placed over the wound (Figure 3e). Postoperative care included the same antibiotics and analgesics for five days, and the sutures were removed after seven days. The postoperative period was uneventful, and the patient was referred to a speech therapist after that.



Figure 3a: Preoperative view (Ankyloglossia).



Figure 3b: Preoperative view (Heart shape tongue)



Figure 3c: Frenulum being held with a curved haemostat



Figure 3d: After Frenectomy performed



Figure 3e: Incision sutured.



Figure 3f: Post-operative view after four weeks

## Discussion

The lingual frenum is a thin, vertical fold of tissue with attachments that connect the ventral surface of the tongue to the floor of the mouth. Frenectomy is the procedure that involves the removal of the band of tissue, i.e. the lingual frenulum, which connects the tongue with the floor of the mouth. [5] Tongue movements are crucial to normal orofacial functions such as chewing, swallowing, speech, phonetics and sucking.

In the present case series, patients diagnosed with ankyloglossia were treated with a conventional scalpel-incision frenectomy procedure. Frenectomy may be deferred during infancy and older childhood due to the potential for natural resolution as the child grows, the need for careful risk-benefit analysis considering the child's overall health, the possibility of addressing issues through alternative interventions like speech therapy, parental preferences, lack of consensus among healthcare professionals, and the emphasis on a

multidisciplinary approach to evaluate and manage the condition.

Ankyloglossia is a condition characterized by impaired tongue functions, including speech. The exact cause of ankyloglossia is unknown, although it is likely due to abnormal development of the mucosa covering the anterior two-thirds of the mobile tongue. [6] The prevalence of ankyloglossia reported in the literature varies from 0.1% to 10.7%. The prevalence is also higher in studies conducted among neonates (1.72% to 10.7%) than in studies of children, adolescents, or adults (0.1%–2.08%). There is some evidence that ankyloglossia can be a genetically transmissible pathology. [7] It is unknown which genetic components regulate the phenotype and penetrance in the patients affected. [7] More basic research is required to clarify the exact aetiopathogenesis of ankyloglossia. Ankyloglossia was also found to be associated with some rare syndromes, such as X-linked cleft palate syndrome, Kindler syndrome, Van der Woude syndrome, and Opitz syndrome. [7]

Due to tongue tie, it is difficult to pronounce certain alphabets. The articulation difficulties are evident for consonants and sounds such as "s, z, t, d, l, j, zh, ch, th, d," and rolling an "r" is tough. [8, 9] Therefore, when severe or complete ankyloglossia is present in an adult, the tongue's protrusion is restricted, and there may be issues with elevation and speech that can be resolved with surgery. [10]

According to Patel *et al.*, compared to lasers, healing was better in cases treated using conventional Scalpel after the seventh day and one month postoperatively. [11] Messner *et al.*, [9] in their study, reported that more than 75% of patients had demonstrable improvements in speech articulation postoperatively, as judged by a speech pathologist, compared to the preoperative states.

The one-week postoperative outcome of the frenectomy performed using a Scalpel showed better healing without postoperative complications. The tongue performed better movements compared to the preoperative state. All the patients in the present series were referred to a speech therapist for proper tongue movement and speech articulation training. After surgical interventions, speech therapy delivers satisfactory results in a shorter time period than expected.

## Conclusion

This case series demonstrates the successful management of ankyloglossia through conventional scalpel incision frenectomy. The procedures improved tongue movements and speech articulation, highlighting the effectiveness of surgical intervention in the condition. Integrating speech therapy further enhances the outcomes, emphasizing the importance of a multidisciplinary approach to ankyloglossia.

Frenectomy is an effective and reliable surgical procedure that can improve tongue movements, tongue functions, and speech. Due to increased awareness about the surgical management of tongue tie, the procedure is now commonly performed. For the patient's general well-being, it is important to diagnose and manage the condition as early as possible. Further research is needed to explore long-term efficacy and advancements in ankyloglossia management.

The authors declare that explicit consent was obtained from each patient for the use of their data and images in this report, in adherence to ethical guidelines.

**Authors' Contributions:** BVV conceived and designed the report, reviewed the literature and collected and analysed the data. Both authors drafted the

manuscript, revised the draft for sound intellectual contents, and approved the final version.

**Conflicts of Interest:** None.

**Funding:** Self-funded.

**Publication History:** Submitted 16 January 2024;

Accepted 09 March 2024.

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