Received: 05 February 2024 | Revised: 03 April 2024 | Accepted: 03 April 2024

DOI: 10.56501/intjorofacres.v8i1.996

CASE REPORT

Journal Section

Ankyloglossia-Related Speech Articulation Correction in Orthodontics: A Case Report

Purva Joneja, BDS, MDS.[1*] | Neha Patil, BDS, MDS[1*] | Richa Sharma, BDS, MDS[1*]

[1]Department of Orthodontics, Bhabha College of Dental Sciences, Bhabha University, Bhopal-462026, Madhya Pradesh, India

Correspondence
Dr. Neha Patil, Post-graduate student, Department of Orthodontics, Bhabha College of Dental Sciences, Bhabha University, Bhopal-462026, Madhya Pradesh, India
Email: nehapatil58791@gmail.com

Funding information
Nil

Abstract

The ability of the tongue to protrude and elevate is the most crucial characteristic for activities like eating, speaking, nursing, and the development of dental arches. When the lingual frenum is short and tight, it can hinder the movement of the tongue, leading to malalignment of anterior teeth and Speech Articulation. This article discusses a case report of a 20-year-old male patient with a chief complaint of speech difficulty, maxillary anterior teeth spacing, and mandibular anterior teeth crowding. There was lingual frenum attachment suggestive of mild ankyloglossia. Patient underwent a lingual frenectomy procedure under local anaesthesia which resulted in speech correction and relief of lower anterior crowding. Maxillary anterior spacing and midline diastema was corrected with orthodontic mechanotherapy and labial frenectomy, respectively. In cases where the frenulum anomaly is severe enough to result in both mechanical and functional limitations, surgery to reduce the frenulum (frenulectomy) is recommended. In consequence, it is fair to state that the chief complaint of inappropriate speech of the patient need to be resolved by an interdisciplinary approach.

KEYWORDS

Speech problem; ankyloglossia; tongue-tie; case report

1 | INTRODUCTION

Ankyloglossia is a rare congenital oral abnormality that can lead to problems with oral hygiene, speech articulation, and breastfeeding.[1] Wallace coined the term "ankyloglossia" in 1963 and described it as a condition in which a short frenulum prevents the tongue tip from extending past the incisal edge of the lower incisors. Ankyloglossia affects 0.02 to 10.7% of people, with boys 1.5–3 times more likely than girls to have it.[2] Speech issues linked to ankyloglossia are thought to be related to articulation errors brought on by restricted tongue tip movement. Ankyloglossia is treated with tongue-tie release. If limited tongue movement is the cause of speech problems, tongue-tie release should improve these problems.[3] Most newborns with ankyloglossia don't have any symptoms. It's possible that infants with ankyloglossia are more likely to experience difficulties nursing.[4] Ankyloglossia may lead to

[*] All authors have contributed equally.

This is an open access article under the terms of the Creative Commons Attribution-Non Commercial 4.0 International License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes. To view a copy of this license, visit https://creativecommons.org/licenses/by-nc/4.0/

tongue thrust aggravating the malocclusion.[5] Ankyloglossia occurs in 5% of newborns and usually occurs as an isolated event.[6] On the other hand, malformation syndromes like cleft lip and palate, orofacial-digital syndrome, Beckwith-Wiedemann syndrome, Opitz syndrome, Simpson–Golabi–Behmel syndrome, and others may also be linked to it .[7] Pronouncing certain consonants and sounds, like /z/, /s/, /t/, /d/, /l/, /sh/, /ch/, /th/, /dg/, and particularly the letter /r/ can be challenging for people with ankyloglossia.[8] To help with consonant pronunciation and tongue mobility, speech therapy may be used in conjunction with frenulectomy, frenulotomy, or frenuloplasty. Speech therapy can assist those with ankyloglossia in improving their articulation and general speech abilities by addressing any limitations in tongue movement and working on particular speech exercises.[9]

2 | CASE PRESENTATION

A 20-year-old male patient visited to Department of Orthodontics and Dentofacial Orthopaedics with the complaint of abnormal speech and spacing in upper arch. Patient was having problem in pronouncing 'r' and 's' falling in the category of Rhotacism and Lisping speech disorders. There was no significant medical or dental history. After detailed examination of the diagnostic records of clinical and functional examination, model analysis, and radiological evaluation of orthopantomogram and lateral cephalogram (Fig. 1 and 2), the final diagnosis mild ankyloglossia and midline diastema of was derived based on following observations. There was ankyloglossia, malocclusion, spacing, tongue thrusting. Dental examination observed angle's Class 1 type 2 malocclusion, overjet (2 mm), overbite (5 mm), proclined upper and lower incisors, midline diastema, lower anterior crowding, prognathic maxilla. OPG and lateral cephalogram showed absence of any pathology. Further, soft tissue examination showed papillary upper labial frenum, convex profile, average nasolabial angle, average mentolabial sulcus, competent lips (Fig. 3). Kotlow's assessment showed Class -1 lingual frenum attachment that was suggestive of mild ankyloglossia (Fig. 1), and the root cause of the inappropriate speech.

3 | TREATMENT

Case was started with orthodontic fixed appliance MBT .022x .028 system and initial wires in both upper and lower arch were .014 NITI. Lingual frenectomy was performed after one month of initial wire placement which helped in relieving mandibular anterior crowding and speech articulation problem. This was an interdisciplinary case and frenectomy[3] was performed under local anaesthesia with 2% lignocaine hydrochloride and 1:80,000 adrenaline, the patient underwent a frenectomy procedure using a scalpel method. First, a curved hemostat was inserted to the bottom of the lingual frenum at the vestibule's depth and clamped into place. Next, two incisions were made at the hemostat's superior and inferior aspects. In doing so, the intervening frenum was removed, leaving a wound in the shape of a diamond. Then, using the same hemostat, the muscle fibres to close the wound edges were released well and without tension. Then, the wound edges were approximated using (4-0) black braided silk sutures, allowing the tissues to heal naturally and leaving the scar as small as possible. Non-steroidal anti-inflammatory medication and antibiotic Cap. Amoxicillin (500 mg) three times a day for three days.[1]

FIGURE 1 Intraoral photographs showing (A,B,C,D) maxillary teeth protrusion. mild midline diastema, and interdental spacing, (E,F) mild ankyloglossia

To minimise pain and post-operative infection, Ketorolac DT (10 mg) was prescribed three times a day for three days. One week later the sutures were removed and speech therapy was started. Initial levelling and alignment was achieved with .014 NITI and .016x.022 HANT

and routine fixed orthodontic mechanotherapy was performed for both arches without interproximal reduction in lower arch as relief of lower anterior crowding was achieved after the surgical procedure. The orthodontic and surgical correction resulted in closure of upper midline diastema, alignment of lower anterior teeth and correction of speech impairment. Labial frenectomy in the upper arch was performed at the end of the treatment and adequate healing was allowed before placement of fixed lingual bonded retainers for upper and lower arch.

4 | DISCUSSION

Ankyloglossia may exhibit mild, moderate or severe symptoms or no symptoms at all, due to natural compensation. In this case the patient had moderate symptoms such as speech defects and lower anterior crowding and no age-related compensation due to growth was expected.[1] This patient benefited from surgical intervention that is lower lingual frenectomy. As the patient is 20 years old frenectomy was chosen over other surgical intervention procedures like frenotomy and frenuloplasty. Frenotomy is the treatment of choice for ankyloglossia in infants and frenuloplasty is preferred for the patients of greater than 1 to 2 years of age.[10] It was confirmed that the speech defect in this patient was not due to any underlying malocclusion as there was no open bite which causes lisping (defect in s,z), no Angle's Class 2 division 1 malocclusion which causes problem in bilabial sounds (p, b, m) and no tongue thrusting was present. Mild anterior spacing was present but the case was examined to rule out for altered pronunciation of lingualveolar phonemes (s, z) and linguopalatal phonemes (j, sh, ch).

FIGURE 2 Lateral cephalogram.

There is evidence that ankyloglossia may be a pathology that is genetically transmissible.[1] A larger percentage of dysglossia was caused by disturbance in pronounciation with the Polish sound "r" than by disturbance with "r" /r/, "s" /s/, and "sz" /l/ taken together, and the least frequent isolated issue was associated with pronunciation disorders of "s" /s/, "sz" /l/. There were more issues with the isolated "r" /r/ sound in higher classes of ankyloglossia.[2] The Kotlow classification is among the most widely used schemes for the categorization of ankyloglossia. The Ruffoli classification also validates Kotlow's initial anatomical classification criterion, which states that a free tongue has a frenulum within the normal range if its measurement is equal to or greater than 16 cm.[6]

FIGURE 3 Orthopantomogram showing absence of any underlying pathology.

In an intriguing examination of a population of 9 to 17-year-old, the lingual frenulum has reached the full growth stage and is examined in relation to orthodontic problems like crowding and lower anterior relapse in the study by Bai et al.[11] When required, lingual frenectomy should be done at the beginning of orthodontic treatment in order to correct ingrained muscle patterns and prevent treatment outcomes from being adversely affected. This method will assist the patient in creating new muscle patterns while receiving orthodontic treatment.[5] In the study by Ghayoumi-Anaraki et. al, tongue-tie was diagnosed in 72 out of 483 studied children (14.9%).[12] Compared to children without speech sound disorder (SSD), it was discovered that these 72 children produced the /t/ sound in initial position and the /s/, /z/, and /l/ sounds in initial and final positions. It would seem that careful consideration should be given to any surgical intervention on the

lingual frenulum intended only to enhance speech.

5 | CONCLUSION

Ankyloglossia is primarily related to speech problems in an adult patient. History and a thorough clinical examination is necessary to make proper diagnosis and hence the treatment. Furthermore, it is important that the ankyloglossia is also related to mandibular anterior crowding. Hence, lingual frenectomy at the start of orthodontic treatment will help in relieving the crowding faster.

Acknowledgements

Nil

Conflict of interest

The authors have no conflicts of interest to declare.

Supporting Information

Additional supporting information may be found at the journal's website.

References

1. Chaubal TV, Dixit MB. Ankyloglossia and its management. J Indian Soc Periodontol. 2011;15(3):270-272. doi:10.4103/0972-124X.85673.
2. Dydyk A, Milona M, Janiszewska-Olszowska J, Wyganowska M, Grocholewicz K. Influence of Shortened Tongue Frenulum on Tongue Mobility, Speech and Occlusion. J Clin Med. 2023;12(23):7415. doi:10.3390/jcm12237415.
3. Melong J, Bezuhly M, Hong P. The effect of tongue-tie release on speech articulation and intelligibility. Ear, Nose & Throat Journal. 2021;14:1-5. doi:10.1177/01455613211064045.
4. Baeza C, Genna CW, Murphy J, Hazelbaker AK, Kaplan M, Martinelli R, et al. Assessment and classification of tongue-tie. Clin Lact (Amarillo). 2017;8:93–8. doi.org/10.1891/2158-0782.8.3.93.
5. Northcutt ME. The lingual frenum. J Clin Orthod. 2009;43(9):557-65.
6. Frezza A, Ezeddine F, Zuccon A, Gracco A, Bruno G, De Stefani A. Treatment of Ankyloglossia: A Review. Children. 2023;10(11):1808. doi:10.3390/children10111808.
7. Colombari GC, Mariusso MR, Ercolin LT, Mazzoleni S, Stellini E, Ludovichetti FS. Relationship between breastfeeding difficulties, ankyloglossia, and frenotomy: A literature review. J Contemp Dent Pract. 2021;22:452–461.
8. Suter VG, Bornstein MM. Ankyloglossia: Facts and myths in diagnosis and treatment. J Periodontol. 2009;80:1204–1219. doi:10.1902/jop.2009.090086.
9. Kupietzky A, Botzer E. Ankyloglossia in the infant and young child: Clinical suggestions for diagnosis and management. Padiatr Dent. 2005;27:40–46.
10. Lalakea ML, Messner AH. Frenotomy and frenuloplasty: If, when, and how. Operative Techniques in Otolaryngology-Head and Neck Surgery. 2002;13(1):93-7. doi.org/10.1053/otot.2002.32157.
11. Bai PM, Vaz AC. Ankyloglossia among children of regular and special schools in Karnataka, India: A prevalence study. J Clin Diagnostic Res. 2014;8:36–38. doi:10.7860/JCDR/2014/8267.4485.
12. Ghayoumi-Anaraki Z, Majami F, Farahnakimoghadam F, Karbaf Barbari SMZ, Tahmasebifard N, Sarabadani J. Prevalence of tongue-tie and evaluation of speech sound disorder in young children. Clin Arch Commun Disord. 2022;7(3):125–30. doi:10.21849/cacd.2022.00787.

How to cite this article: Joneja P, Patil N, Sharma R. Ankyloglossia-Related Speech Articulation Correction in Orthodontics: A Case Report. Int J Orofac Res. 2024;8(1):7-10. https://doi.org/10.56501/intjorofacres.v8i1.996