Ankyloglossia with Cleft Palate in a 6-Year-Old Child: A Rare Case Report

Avninder Kaur[1] Baljeet Singh[2] Neha Kashav[1] Neetika Singh[1]

[1]Department of Paediatric and Preventive Dentistry, Bhojia Dental College and Hospital, Bhud (Baddi), Himachal Pradesh, India
[2]Department of Periodontolgy and Oral Implantology, Bhojia Dental College and Hospital, Bhud (Baddi), Himachal Pradesh, India

Address for correspondence Avninder Kaur, MDS, Department of Paediatric and Preventive Dentistry, Bhojia Dental College and Hospital, Bhud (Baddi) 176052, Himachal Pradesh, India (e-mail: avninder21@yahoo.com).

Dent J Adv Stud 2018;6:126–128

Abstract

Ankyloglossia is a development abnormality in which a child cannot move his/her tongue ahead of mandibular incisors. It can lead to skeletal as well as dentoalveolar changes such as prognathic mandible, posterior open bite, retrognathic maxilla, and midline diastema in lower incisors. Laser frenectomy was performed in this case to relieve the tongue tie. Healing was uneventful.

Keywords
- ankyloglossia
- tongue tie
- laser frenectomy

Introduction

The term *ankyloglossia* is a Greek word "skolios/agkilos" (curved) and "glossa" (tongue).[1,2] A developmental abnormality is commonly known as *tongue-tie* in which the inferior lingual frenum is short and attached at or close to the tongue tip. Wallace in 1963[3] explained tongue-tie as a state in which the child cannot protrude tongue tip ahead of mandibular incisor teeth as lingual frenum is too short.[3] The band of lingual frenum can vary in thickness from thin elastic membrane to a thick white nonelastic tissue.[1] The reported prevalence in the literature varies from 0.1 to 10.7% depending on the population investigated.[1] A higher prevalence has been reported in males compared with females, that is, male-to-female ratio is 2.5:1/3:1.[4,5]

The prime oral and general concern of this congenital abnormality is speech, swallowing, suckling, and poor oral hygiene. The difficulties in articulation of the consonants most often found are "s" and "r." Distorted "s" sound production can be due to lowered positioning of the tongue and difficulty in producing "r" sound. The short lingual frenum restricts the tongue and hinders other sounds. A total closure is required for proper vibration of the sound that is missing in these children. The other sounds altered as due to ankyloglossia are "t, d, l, j, zh, ch, th, and d."[1]

Insufficient palatal support in ankyloglossia leads to atypical swallowing that does not produce a mature swallow. The persistent infantile swallow in ankyloglossia can result in an open bite. As the tongue has limited freedom to move in an upward and backward direction that ultimately leads to the tongue thrust against the anterior body of mandible and leads to skeletal changes, that is, prognathic mandible and posterior open bite. Mandibular prognathism and maxillary hypo-development and cross bite may result from the lowered position and forward and downward pressure exerted by the tongue.[1] In a few patients, a short and hypertrophic lingual frenulum will lead to a midline diastema in mandibular central incisors and can pose complications in removable orthodontics appliances.[6–9] Excessive forces while retrusion of tongue may cause blanching of tissues and gingival recession on the lingual surface.[10]

With respect to suckling, it leads to breastfeeding problems such as soreness, cracked nipples or mastitis of the mother, poor weight gain of the baby, and increased duration of every breast-feeding event.[2] Lack of sweeping action of the tongue, especially in the lower lingual region, may lead to halitosis and periodontal problems. It can also lead to early childhood caries.[2]

This case report arrays the occurrence of ankyloglossia along with the cleft palate in a 6-year-old child who was treated with diode-laser.

Case Report

A 6-year-old girl reported to the Department of Pediatric and Preventive Dentistry of Bhojia Dental College and Hospital, Bhud, Baddi, with a chief complaint of difficulty in speech and inability to move her tongue since childhood. On

received
November 20, 2018
accepted after revision
November 27, 2018

DOI https://doi.org/10.1055/s-0038-1677629
ISSN 2321-1482.

intraoral examination, short lingual frenum and restricted tongue movements were observed, such as protrusion, lateral movements, and inability to touch the palate with the tongue tip (►**Fig. 1**). On protrusion, a bifid or heart-shaped tongue tip was seen. She was diagnosed to be suffering from class III "severe ankyloglossia according to Kotlow's classification, which accounts for the movement of the tongue between 3 and 7 mm. There was absence of recession on lingual side of mandibular incisors. The patient had cleft palate that was surgically repaired 4 years back, at the age of 2 years (►**Fig. 2**).

The treatment options for the correction of ankyloglossia were surgical or laser frenectomy (►**Fig. 3**). Preference was given to laser over surgical excision as less blood loss and better healing were expected with laser. A written consent from patient's parents was obtained after explaining the treatment procedure. Laboratory tests such as complete blood count (CBC) and prothrombin time (PT) were within normal range.

After topical anesthetic spray, field block was given to provide adequate local anesthesia (2% lignocaine hydrochloride with 1:200,000 adrenaline). After induction of local anesthesia (LA), tissue forceps were used to clamp the frenum. A soft tissue diode laser (810 nm) of power 1.8 W was used in the frenectomy procedure. After stripping the fiber-optic wire tip, the tip was initiated by firing it into a piece of cork at 1.8 W in pulsed mode. An initiated tip of 200 µm was used with an average power of 1.8 W in pulsed mode. The diode laser was used in a pulsed mode with focused beam for excision of the tissues. The laser tip was moved from apex to base of the frenum in brushing strokes. The ablated tissue was continuously wiped using wet gauze piece. This takes care of the charred tissue and prevents excessive thermal damage to the underlying soft tissue. Suturing was not done, and only analgesics were prescribed. To facilitate healing, application of vitamin E capsules was recommended. Post-operative instructions were given, and the patient was asked to report after 3 days and 1 week for follow up examination.

Fig. 3 Immediate postoperative.

Fig.1 Preoperative.

Fig. 2 Cleft palate.

At 1-week follow-up, healing was uneventful with "white soft scab" formation and complete healing at 3 to 4 weeks with increase in tongue mobility and no scar formation (►**Figs. 4**, **5**). The patient was put on tongue training exercises. The patient was put on exercises after the surgery with the aim to develop

Fig. 4 Healing after 1 week.

Fig. 5 Healing after 2 weeks.

new muscle movements that were limited before surgery. The self-cleansing areas were encouraged to clean with tongue movements. A few exercises were advised such as upward movement of the tongue toward the nose, downward toward the chin, to touch the anterior teeth in open mouth position, and then close the mouth and push the tongue in left and right cheek area. Time to be spent on these exercises was 4 to 5 minutes, once or twice daily for 3 or 4 weeks.

Discussion

The free tongue is the length of the tongue from base to the tongue tip. Length greater than 16 mm is considered clinically acceptable.[1] Kotlow[11] categorized ankyloglossia into four classes based on the length of free tongue. Clinically adequate movement of the tongue is greater than 16 mm. Class I or mild ankyloglossia shows movement of the tongue between 12 and 16 mm. Class II or moderate ankyloglossia shows tongue movement of 8 to 11 mm. Class III or severe ankyloglossia shows tongue movement of 3 to 7 mm. Class IV or complete ankyloglossia has a tongue movement of less than 3 mm.[12,13] Various treatment protocols for the management of ankyloglossia have been reported in the literature. For class I or mild ankyloglossia, frenectomy, that is, incising the frenum or, frenuloplasty, that is, the surgical alteration of the frenum, can be performed. In classes II to IV cases, frenectomy is performed; that is, the frenum along with its attachments to the underlying structures is removed completely.[2]

Ankyloglossia may or may not be associated with other congenital abnormalities such as cleft lip and cleft palate. The cleft lip and palate can result from any defect during the period of facial development. These are common birth faults in humans with quite high prevalence between 1 in 500 and 1,000 live births.[14] These orofacial clefts can be syndromic or nonsyndromic due to a combination of genetic and environmental factors.[15,16] Genetic factors causing orofacial cleft in humans revealed that normal palatogenesis include genes encoding adhesion molecules such as PVRL1, FGF, BMP, TGF-β, signaling HH pathways, and a long list of transcription factor genes, including TBX22.[14]

Laser surgery was performed in this case to avoid unnecessary blood loss with conventional methods and to achieve hemostasis without sutures. It also reduces the amount of bacteria in the surgical field. By sealing blood vessels and lymphatic channels, postoperative edema is reduced, thus causing less postoperative discomfort to the patient.

Conclusion

Lasers can be used in numerous soft tissue procedures in pediatric dentistry procedures, for example preventive dentistry, gingivectomy, operculectomies, and surgical exposure of the teeth for orthodontic treatment. Frenectomy with laser was done in this case, and the tissues healed well within 2 weeks and with very less operative postoperative pain.

Conflict of Interest
None declared.

References

1 Reddy NR, Marudhappan Y, Devi R, Narang S. Clipping the (tongue) tie. J Indian Soc Periodontol 2014;18(3):395–398
2 Jangid K, Alexander AJ, Jayakumar ND, Varghese S, Ramani P. Ankyloglossia with cleft lip: a rare case report. J Indian Soc Periodontol 2015;19(6):690–6933
3 Wallace AF. Tongue-tie. 1963;2:377–378
4 Harris EF, Friend GW, Tolley EA. Enhanced prevalence of ankyloglossia with maternal cocaine use. Cleft Palate Craniofac J 1992;29(1):72–76
5 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):1–7
6 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(1):e39–e47
7 Meenakshi S, Jagannathan N. Assessment of lingual frenulum lengths in skeletal malocclusion. J Clin Diagn Res 2014;8(3):202–204
8 Suter VG, Bornstein MM. Ankyloglossia: facts and myths in diagnosis and treatment. J Periodontol 2009;80(8):1204–1219
9 Saccomanno S, Antonini G, D'Alatri L, D'Angelantonio M, Fiorita A, Deli R. Causal relationship between malocclusion and oral muscles dysfunction: a model of approach. Eur J Paediatr Dent 2012;13(4):321–323
10 Khan S, Sharma S, Sharma VK. Ankyloglossia: surgical management and functional rehabilitation of tongue. Indian J Dent Res 2017;28(5):585–587
11 Kotlow LA. Ankyloglossia (tongue-tie): a diagnostic and treatment quandary. Quintessence Int 1999;30(4):259–262
12 Chaubal TV, Dixit MB. Ankyloglossia and its management. J Indian Soc Periodontol 2011;15(3):270–272
13 Barot VJ, Vishnoi SL, Chandran S, Bakutra GV. Laser: the torch of freedom for ankyloglossia. Indian J Plast Surg 2014;47(3):418–422
14 Fuchs A, Inthal A, Herrmann D, et al. Regulation of Tbx22 during facial and palatal development. Dev Dyn 2010;239(11):2860–2874
15 Jugessur A, Murray JC. Orofacial clefting: recent insights into a complex trait. Curr Opin Genet Dev 2005;15(3):270–278
16 Gritli-Linde A. The etiopathogenesis of cleft lip and cleft palate: usefulness and caveats of mouse models. Curr Top Dev Biol 2008;84:37–138