BULLETIN OF STOMATOLOGY AND MAXILLOFACIAL SURGERY
Volume 20, Issue 3

DOI: 10.58240/1829006X-2024.3-118

CLINICAL ARTICLE

LASER ASSISTED TONGUE TIE RELEASE:A CASE REPORT

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Received: *Jul 26,2024;* ***Accept:*** *Aug.20,2024;* ***Publish:*** *sep15,2024*

Abstract

Tongue is an essential oral structure that is associated with several functions that directly or indirectly affect the speech, swallowing, nursing, position of teeth in the arch, periodontal structures, nutrition and certain social activities. Ankyloglossia or Tongue tie is a congenital anomaly characterised by short, thick lingual frenum which thereby restricts the movement of the tongue and is associated with infant feeding difficulties, speech disorders, and various mechanical and social issues related to the inability of the tongue to protrude. It is not a serious problem, but it effects the day-to-day activities. Detection of this anomaly in any stage of life and its management improves the quality of life. Considering the high vascularity and mobile structure of the tongue, management using laser is the simplest, safest and less traumatic of all the treatment modalities available with most promising results. This case report discusses management of ankyloglossia using Diode LASER.

Keywords: ankyloglossia, frenum, frenectomy, diode laser.

Introduction

Frenum, a triangle-shaped fold of mucosal tissue connects the lip, tongue and buccal musculature to the alveolar bone in the oral cavity. It keeps a balance between the growing hard and soft tissues during the development of the foetus and limits the movement of the lip, tongue and cheeks. The soft tissue that attaches the underside of the tongue to the floor of the mouth is referred to as the lingual frenum. Tongue is a muscular organ in the mouth, helps in swallowing, speech and feeding. “Ankyloglossia” originates from the Greek words “agkilos” (curved) and “glossa” (tongue). Ankyloglossia or tongue tie is an oral congenital anomaly characterized by the decreased mobility of tongue tip.

The term ankyloglossia was first described in the literature by Wallace in 1963. He defined tongue-tie as a condition in which “the tip of the tongue cannot be protruded beyond lower incisor teeth because of a short frenulum linguae after containing scar tissue”[1] . A normal motion range of tongue is indicated when the tip of tongue is able to protrude outside the mouth without clefting, the prevalence of AG ranges from 0.1%-10.7%.[3] The prevalence in neonates (1.72%–

10.7%) is reported to be higher than in children, adolescents or adults (0.1%– 2.08%)[4].

Both genetic and environmental factors are involved in its aetiology. A n abnormally tongue position can result tongue position can result in mandibular prognathism with maxillary hypo- development due to an excessive anterior thrust resulting in class III malocclusion. Higher tongue position may lead to tongue thrust causing anterior or posterior open bite.

In addition, excessive force during retrusion of tongue can cause blanching of tissues, gingival recession and midline diastema in lower central incisors. Treatment involves a surgical approach, including frenotomy, frenectomy, and frenuloplasty[5]. a conservative approach, such as "wait-and-see" method.

Kotlow's classification of ankyloglossia

According to Kotlow's observation[2], Ankyloglossia can be of the following four types depending on clinically available free tongue (protrusion of tongue):

1. Class I: Mild ankyloglossia: 12–16 mm
2. Class II: Moderate ankyloglossia: 8–11 mm
3. Class III: Severe ankyloglossia: 3–7 mm
4. Class IV: Complete ankyloglossia: <3m

Case description

A 26-year-old male patient reported to the out patient department of Periodontics and Implantology at Drs. Sudha and Nageswara Rao Siddartha Institute of Dental sciences with a chief complaint of limited tongue movement and inability to protrude the tongue. On intraoral examination, he presented with an abnormal lingual frenum attachment which extended from tip of the tongue to the lingual marginal gingiva between mandibular central incisors. Using Kotlow's assessment, the individual was diagnosed with class II ankyloglossia.

Treatment

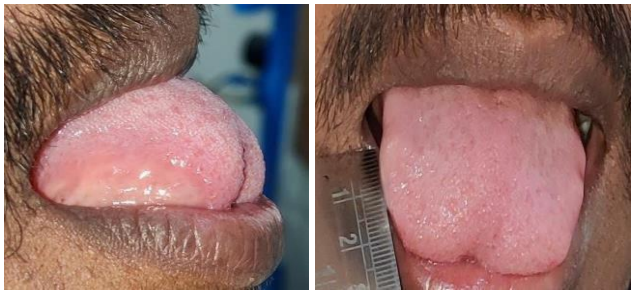
The patient was informed about the treatment procedure and informed consent was obtained. Routine blood investigation report was analysed and was found to be within normal limits.

Surgical procedure

Initially local anaesthesia (2% lignocaine with 1:80,000 adrenaline) was administered to floor of the mouth and tip of the tongue. Tongue traction was done at the tip of the tongue using 3-0 BBS suture and diode LASER (Photon plus Soft Tissue Diode LASER, 0.8W, 980nm) was used to excise the frenum. LASER tip was applied in a brushing stroke from the apex of frenum to the base to cut the frenum .The ablated tissues were continuously wiped with a wet gauze to take care of the charred tissue and protects the underlying tissue from excessive thermal damage.

Protrusive movement of the tongue was evaluated to assess the complete removal of frenum.

There was no bleeding postoperatively. Patient was recalled after 2 weeks and the healing was satisfactory . The tongue showed good healing with several milli metres approximately beyond lower lip post operatively.



Pre-operative: Fig.1 Visible cleft apparent at the tip of the tongue. Fig.2 Tongue protrusion of about 2.7 mm from angle of the tongue

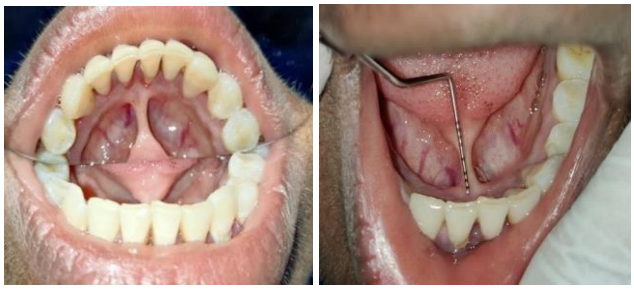
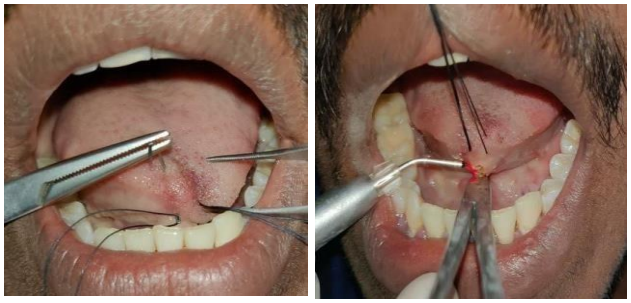


Fig.3 Short, thick band of frenulum restricting the movements of the tongue. Fig.4 frenulum length measuring 10 mm.



Intra-operative :Fig.5 Tongue traction using 3-0 silk suture. Fig.6 Excision of frenum using diodelaser.

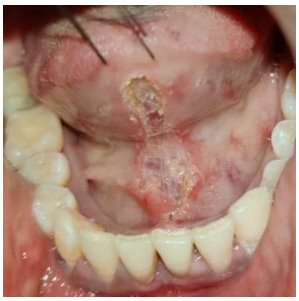
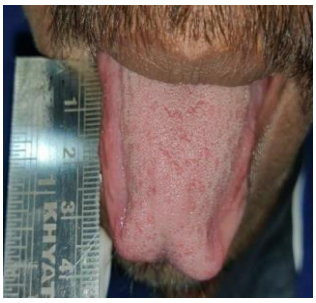
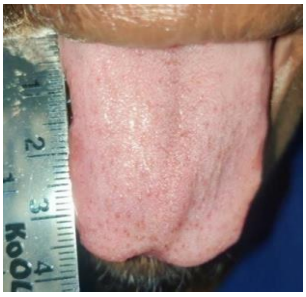
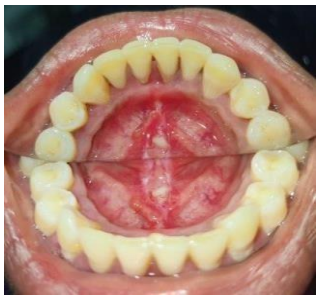
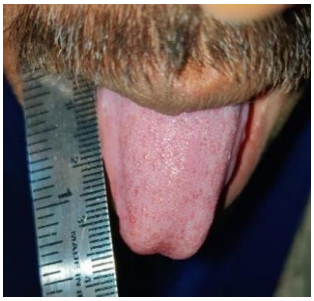
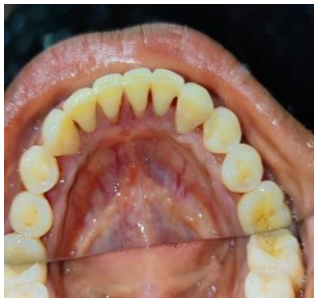



Fig.7 Frenulum release. Fig. 8 Tongue protrusion of about 3.8mm.

Weeks Post-operative : Fig.9 Tongue protrusion of about 3.8mm. Fig.10 Healing surgical site.

2 **Months Post operative: Fig,11.Tongue protrusion of about 3.8 cm. Fig.12 Healed surgical site with no recurrence 2 year post-operative:**

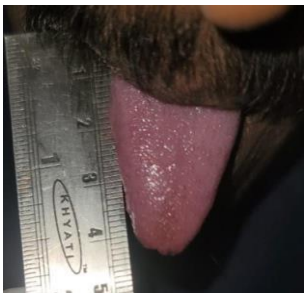
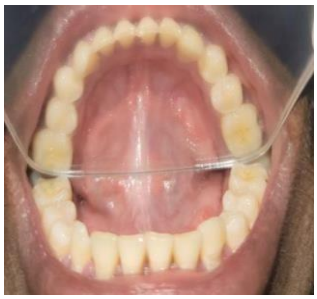



Fig.13.Tongue protrusion of about 4.3 cm Fig.14.Completely healed surgical site with no recurrence

Discussion

Tongue is an accessory organ for speech, deglutition, mastication besides having an influence on occlusion, growth and facial form. A soft tissue attaches the underside of the floor of the mouth to the tongue called as frenulum or frenum.

An abnormally short lingual frenum is seen in some cases which causes difficulty with breast feeding and speech articulation[2]. This condition is called Ankyloglossia or Tongue tie.

In many individuals, ankyloglossia is asymptomatic and may resolve spontaneously or affected individuals may learn to compensate adequately for their decreased lingual mobility. Few individuals may develop speech problems due to limited mobility of the tongue.

Difficulty in articulation are evident for constants like s, z,t,d,l,j,zh,ch,th,dg[6]. Ankyloglossia is also found to be associated with some rare syndromes such as X-linked cleft palate syndrome[7], Kindler syndrome[8] and Vander Woude's syndrome[9].

There are a number of options for the treatment of ankyloglossia which include procedures using scissors[10], scalpel[11] and various LASER's like Diode[12], CO2[13] , Er:YAG[11] etc. Surgical procedures for the therapy of tongue tie can be divided into three procedures.
Frenotomy is a simple cutting of frenulum. Frenectomy is defined as complete excision i.e. removal of whole frenulum.
Frenuloplasty involves various methods to release tongue tie and correct anatomic situation[6].
But the conventional surgery has disadvantages such as bleeding, blockage of Wharton's duct while suturing on the ventral surface of tongue leading to retention cyst, damage to the lingual nerve causing numbness of the tongue tip. In this case, diode lasers was chosen to overcome the disadvantages of conventional surgery.
Diode lasers have several advantages when compared to conventional scalpel surgeries. They are compact and portable in design, with efficient and reliable benefits for use in soft tissue oral surgical procedure. Laser-assisted lingual frenectomy is easy to perform with excellent precision, less discomfort, minimal or no bleeding due to sealing of capillaries by protein denaturation and stimulation of clotting factor VII production, shortened healing time with reduced postoperative bleeding and oedema[14].

Histologically, laser wounds have been found to contain significantly lower number of myofibroblasts[15], resulting in less wound contraction and scarring, and ultimately improved healing, with better postoperative perception of pain and function than with the scalpel technique[16].
The patient was followed at 3 months and 1 year post operatively. The visible cleft at the tip of the tongue was repaired by 1 year and the patient has given feedback of improvement in his speech which was appreciated by his family members.

Conclusion

Ankyloglossia is an undiagnosed or lately diagnosed problem which affects the patient's quality of life in several different ways. Considering the present case, itcan be concluded that management of ankyloglossia using laser is beneficial in terms of patient comfort and clinicians effort compared to the conventional scalpel method.

Declarations
Ethics approval and consent to participate
Not applicable
Consent for publication Not Applicable.
Availability of data and materials
Not Applicable.
Competing interests No conflict of interest.
Funding This research received no external funding

REFERENCES

1. Wallace AF. Tongue tie. Lancet 1963;2(7304):377–378. DOI: 10.1016/ s0140-6736(63)93057-5.

2. Kotlow LA. Ankyloglossia (tongue tie):a diagnostic and treatment quandary. Quintessence Intl 1999;30(4):259–262.

3. Chaubal TV, Dixit MB. Ankyloglossia and its management. Indian Soc Periodontal 2011;15(3):270-272.DOI:10.4103/0972124-X.85673.

4. Suter VG, Bornstein MM. Ankyloglossia: facts and myths in diagnosis and treatment. J Periodontol 2009;80(8):1204-19.

5. Brinkmann S, Reilly S, Meara JG. Management of tongue-tie in children: A survey of paediatric surgeons in Australia. Journal of paediatrics and child health. 2004 Nov;40(11):600-5.

6. Chaubal TV, Dixit MB. Ankyloglossia and its management. Journal of Indian Society of periodontology. 2011 Jul 1;15(3):270-2

7. Moore GE, Ivens A, Chambers J, Farrall M, Williamson R, Page DC, Bjornsson A, Arnason A, Jensson O. Linkage of an X-chromosome cleft palate gene. Nature. 1987 Mar 5;326(6108):91-2.

8. Hacham Zadeh S, Garfunkel AA, Opitz JM, Reynolds JF. Kindler syndrome in two American journal of medical genetics. 1985 Jan;20(1):43-8.

9. Burdick AB, Ma LA, Dai ZH, Gao NN. Van der Woude syndrome in two families in China. Journal of craniofacial genetics and developmental biology. 1987;7(4):413-8.

10. Mir MA, Maurya R, Parkash O, Kaushal G, Rakesh NR. Harmonic Lingual Frenotomy for Ankyloglossia: A Newer Novel Technique. Cureus. 2022 Mar;14(3).

11. Shang J, Han M, Sun J, Xu D, Qu W. Comparative study on the treatment of ankyloglossia by using Er: YAG laser or traditional scalpel. Journal of Craniofacial Surgery. 2021 Nov 1;32(8):e792-5.

12. Mezzapesa PP, Lepore G, Acella V, De Giglio N, Favia G. Clinical outcomes of diode laser treatment of ankyloglossia in children and young adults: a report of two cases. Cureus. 2020 Mar;12(3).

Treatment of ankyloglossia with carbon dioxide (CO2) laser in a pediatric patient. Journal of lasers in medical sciences. 2013;4(1):53.

13.Chiniforush N, Ghadimi S, Yarahmadi N, Kamali A. Treatment of ankyloglossia with carbon dioxide (CO2) laser in a pediatric patient. Journal of lasers in medical sciences. 2013;4(1):53.

14.Pirnat S. Versality of an 810 nm diode laser in dentistry: An overview. J Laser Health Acad 2007;4:1-9.

15.Zeinoun T, Nammour S, Dourov N, Aftimos G, Luomanen M. Myofibroblasts in healing laser excision wounds. Lasers Surg Med 2001;28:74-9.

16.Haytac MC, Ozcelik O. Evaluation of patient perceptions after frenectomy operations: A comparison of carbon dioxide laser and scalpel techniques. J Periodontol 2006;77:1815-9.