

## **Laser Frenectomy - The Cutting Edge in Ankyloglossia Management**

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### **Abstract**

Ankyloglossia is a developmental anomaly of the tongue characterised by a short, thick lingual frenum resulting in limitation of tongue movement.

Herein we present a case of a patient with tongue tie whose chief complaint was speech difficulty that was managed with diode laser frenectomy done under local anaesthesia.

**Keywords:** Ankyloglossia, diode laser, frenectomy, pre prosthetic surgery

### **Introduction**

A frenum is a fold of tissue or muscle connecting the lips, cheek or tongue to the jawbone. Lingual frenulum is attached to the crest of the alveolar ridge and it connects to the tongue, below the tip of the tongue in edentulous patient. In dentulous patient, it is attached to the lingual gingiva, behind the mandibular incisors. This attachment binds the tongue to the lingual surface of the alveolar ridge.

Ankyloglossia, or tongue-tie, can be observed in neonates, children, or adults. The prevalence of ankyloglossia is well established in new born and is seen

in approximately 4%–5% in the new born population with a 3:1 male-to-female ratio.

In our case report, we reported a -year-old male with tongue-tie who complained of difficulty in protruding his tongue, following which he underwent frenectomy procedure under local anaesthesia with laser, without any complications.

### Case report

A 43- years old male patient reported to Oral and Maxillofacial Surgery outpatient department with a chief complaint of difficulty of speech since his childhood. The problem remained unresolved for such a long period due to lack of awareness and social stigma. Intraoral examination revealed partial ankyloglossia (reference figure 1 and 2) and was classified as Class II- moderate ankyloglossia according to Kotlow's assessment. Patient was able to protrude his tongue just beyond the lower incisors but not touching the lower lip. Malocclusion or gingival recession in the lower anterior segment was not observed.

The patient was considered for lingual frenectomy under local anaesthesia to be carried out with diode laser.

The surgical area was anaesthetised with 2% Lignocaine and 1 in 1,00,000 adrenalin, given as local infiltration. A 3-0 silk suture is passed through the midline of the tongue around 2 cm from the tip (traction suture). This is done to hold the tongue up so that the frenum becomes taut (reference figure 3).

Diode laser (reference figure 4 a &b) was used for the frenectomy procedure. The tip was initiated by firing it into a piece of ink paper. An initiated tip of 300 µm diameter at 970 nm wavelength was used with an average power of 2 W in continuous pulse duration. The frenum was released from the apex to its base in a brushing stroke in contact mode (reference figure 5 a & b). The surgical site was simultaneously mopped with a

wet gauze piece to prevent thermal injury to the underlying soft tissue. With the help of the traction suture, the extent of tongue movement was verified (reference figure 6 a & b).

No suturing was done in the surgical site.

Post operatively, the patient was prescribed analgesics for pain control, antibiotic prophylaxis and topical anaesthetic ointment. Active tongue movement exercises were advised.

Follow up done after 1st, 3rd and 5th week and 6 months showed uneventful and satisfactory healing. Initially white soft scab formed in the surgical site (reference figure 7) which progressed to complete healing in 3 weeks. There was a significant increase in tongue mobility (reference 8) and improvement in speech articulation & phonation. Follow up done at 6 months post-surgery showed no relapse (reference figure 9).

### Legend figure



Figure 1: Pre-operative occlusal view.



Figure 2: Pre-operative frontal view



Figure 3: Traction suture done at the tip of tongue



Figure 4 A & B: Laser diode unit

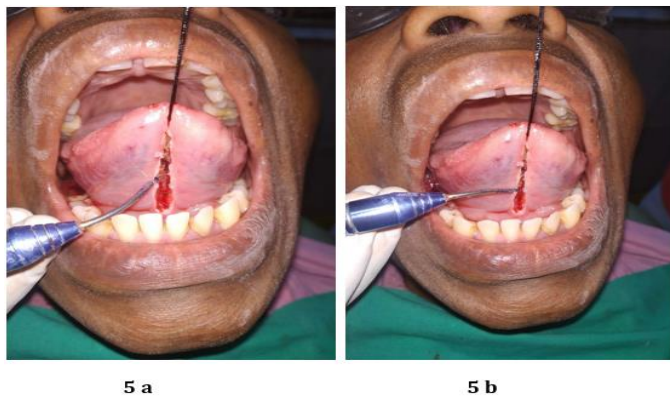


Figure 5a & b: Frenectomy procedure with laser.

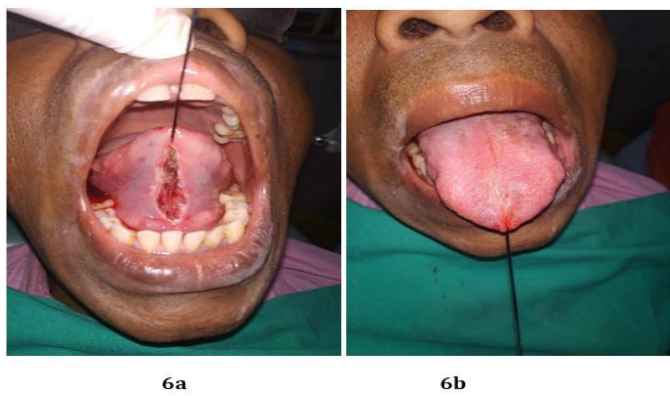


Figure 6 a & b: Verification of tongue movement with traction suture.



Figure 7: One week post treatment showing scab formation.

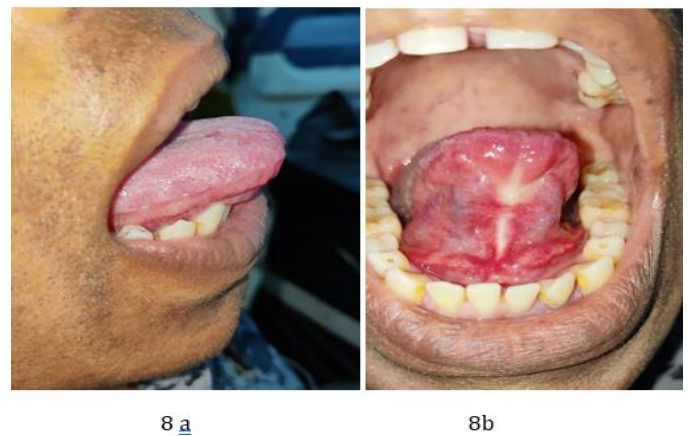


Figure 8 a & b: Follow up done at 5<sup>th</sup> week.

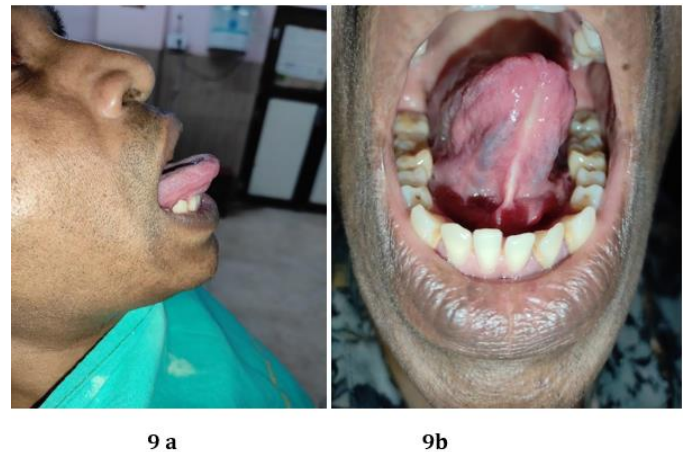


Figure 9 a & b: Follow up done at 6 months.

### Discussion

Ankyloglossia can range in severity from mild cases with little clinical significance to rare examples of complete ankyloglossia in which the tongue is actually fused to the floor of the mouth. [1] According to Kotlow's classification, ankyloglossia is classified as follows:

- Class I: Mild ankyloglossia: 12–16 mm

- Class II: Moderate ankyloglossia: 8–11 mm
- Class III: Severe ankyloglossia: 3–7 mm
- Class IV: Complete ankyloglossia: <3 mm.

Sometimes the frenum extends forward and attaches to the tip of the tongue, and slight clef ting of the tip may be seen <sup>[4]</sup>. Some investigators have speculated that ankyloglossia may lead to the development of an anterior open bite because the inability to raise the tongue to the roof of the mouth prevents development of the normal adult swallowing pattern <sup>[4]</sup>. It also is possible that a high mucogingival attachment of the lingual frenum may contribute to gingival recession, although a clear relationship has not been established <sup>[4]</sup>. It has been suggested that tongue-tie may result in speech defects <sup>[4]</sup>. Usually, however, the shortened frenulum results in only minor difficulties because most people can compensate for the limitation in tongue movement <sup>[4]</sup>.

Yet there are rare examples of patients who have experienced an immediate noticeable improvement in speech after surgical correction of ankyloglossia <sup>[4]</sup>. With the increase in popularity of breastfeeding over the past several decades, clinicians have related tongue-tie with feeding problems, such as nipple pain or difficulty in the baby attaching to the breast <sup>[4]</sup>.

For infants with specific breast-feeding problems, a frenotomy (“clipping” or simple release of the frenulum) can be performed, which has been shown to improve nipple-pain and breastfeeding scores <sup>[4]</sup>.

In children or adults with associated functional or periodontal difficulties, a frenuloplasty (release with plastic repair) may allow greater freedom of tongue movement <sup>[4]</sup>. In young children, it often is recommended that surgery be postponed until age 4 or 5<sup>[4]</sup>.

In recent years laser is being increasingly used in the field of oral and maxillofacial surgeries for its multiple advantages over conventional scalpel.

Laser energy incises tissues more efficiently than scalpel. It generates complete vaporisation and coagulation of blood vessels. It eliminates excessive bleeding in soft tissue procedure and allows increased precision and accuracy and greater improving visualisation on surgical site. It has been found to cause less wound contracture or less scarring and improved healing <sup>[5]</sup>.

Laser wounds can also be left unsutured allowing healing by secondary intention. Hence laser therapy creates less postoperative complications such as swelling and pain <sup>[6]</sup>.

Decreased incidence of wound infection following laser incisions is attributed to the fact that laser beams aid in the action of inactivation of bacterial cells accompanied by alterations of the structure of the cells <sup>[6]</sup>.

### Conclusion

Laser frenectomy is a forerunner among the treatment modalities of Ankyloglossia. Diode lasers at wavelengths between 805 and 980 nm have been reported to be compact, inexpensive, and easy to use in such procedures. Advantages of lasers stand superior compared to traditional scalpels in terms of wound healing, tissue handling, and haemostasis, which ultimately helps to improve patient experience.

### Reference

1. Kotlow’s LA. Ankyloglossia (tongue-tie): A diagnostic and treatment quandary. *Quintessence Int* 1999; 30:259-62.
2. *Oral and Maxillofacial Surgery for the Clinician*, Springer; 1st ed. 2021 edition
3. *Textbook Of Oral & Maxillofacial Surgery* by S. M. Balaji, 3rd Edition

4. Neville, B.W., Dam, D.D., Allen, C.M. and Chi, A.C. (2016) Oral & Maxillofacial Pathology. 4th Edition, WB Saunders, Elsevier, Missouri, 604-605
5. Karu T. Photobiology of low power laser effects. Health Phys 1989; 56:691-704
6. Mahi tab Mahmoud Soliman, Sherifa Moustafa Sabra. The use of Laser as a Treatment Modality for treatment of Impacted mandibular wisdom among patients. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 13, Issue 1, Ver. VIII (Feb. 2014), PP 67-75.
7. Barot VJ, Vishnoi SL, Chandran S, Bakutra GV. Laser: The torch of freedom for ankyloglossia. Indian J Plast Surg 2014; 47:418
8. Pattanshetty et al., Lingual frenectomy with diode laser therapy: A case report.2018;4(1);39-44
9. Bista S, Adhikari K, Saimbi CS, Agrahari B. Diode laser for lingual frenectomy. J Dent Lasers 2018; 12:74-6
10. Chaubal TV, Dixit MB. Ankyloglossia and its management. J Indian Soc Periodontol. 2011 Jul; 15 (3): 270 -2