

**Use of 980nm Diode laser for lingual frenectomy: A case report**

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**Summary:**

Frenum is a soft tissue attachment of the labial, buccal and lingual mucosa to the jaw bones. Abnormalities in development of this soft tissue fold may present as a very short lingual frenum limiting the mobility of tongue. This condition is termed as ankyloglossia or tongue tie. Surgical technique is used to reposition the frenum and correct the functional impairments caused by ankyloglossia. This case report presents a 30 years old male patient with impairment of speech due to short lingual frenum. 980 nm diode laser was used for frenectomy which showed minimal pain and healing with no complications. Surgical procedures like frenectomy and biopsy of oral lesions can be effectively carried out using Diode laser.

Keywords: Diode Lasers, Ankyloglossia, tongue tie

**INTRODUCTION:**

Ankyloglossia is a congenital abnormality presenting with a very short lingual frenum. The word ‘ankyloglossia’ originates from the Greek words “agkilos” means “curved” and “glossa” means “tongue”. Ankyloglossia is defined as “limited normal movement of the tongue chiefly due to an abnormally shortened [frenulum](https://www.merriam-webster.com/dictionary/frenulum#medicalDictionary)”.[[1]](#endnote-1)

The tongue is a muscular organ and performs variety of functions most importantly speech and deglutition. Patients with ankyloglossia present with multiple problems ranging from feeding difficulties in infants to difficulty in speech and social problems to the patients. Infants present feeding difficulties, mouth breathing and malaligned teeth. Limitation of tongue movements produces lisping and improper pronunciation of words during speech.

Ankyloglossia is managed according to severity of symptoms. In moderate to severe ankyloglossia surgical intervention is indicated. This is achieved by incising the mucosa and fibrous attachments using a scalpel and blade followed by primary closure. Lasers have the ability to perform very precise incision without excessive bleeding. Moreover, the need for suturing to achieve hemostasis is minimal. The need for local anesthetics and post op medications is greatly reduced owing to the minimally invasive surgical procedure performed by lasers. This article presents a successful case of lingual frenectomy in an adult patient with severe ankyloglossia.

**AIMS:** This case report presents an advanced technique for minimally invasive surgical correction of ankyloglossia with predictable functional results and improved mobility of tongue. The aim of this study was to show the application of 980nm diode laser for frenectomy procedure and evaluate the healing phase.

**CASE REPORT:**

A 30years old man presented with complaint of impaired speech and pronunciation since childhood. The patient was otherwise healthy and had significant medical history or systemic diseases. On clinical examination it was observed that tongue movement was severely restricted and a very short lingual frenum was present. Frenal attachment was close to the tip of tongue and it was causing the functional problem of speech limitation. Patient was assessed for ankyloglossia and “free tongue length” was measured according to Kotlow et al criteria.[[2]](#endnote-2) It was diagnosed as Class III ankyloglossia with free tongue length of 6mm.

Surgical procedure of frenectomy was planned using a 980nm diode laser. Informed consent was obtained from the patient. Topical anesthesia was applied with Lignocaine spray for 2 minutes. Eye safety measures were taken. Diode laser (Lasotronix Smart, Poland) was used in contact mode at 1.5-Watt power settings in continuous mode. A 300µm optic fiber was used in controlled movements excising the lingual frenum and fibrous attachments till sufficient tongue movement was appreciable. Immediate evaluation for improvement in range of tongue movement was observed. No sutures were needed as there was no bleeding intraoperatively. Postoperative instruction were given to the patient and follow-up visits were scheduled at 1week, 1 month and 3 months postoperatively.

**RESULTS:** Lingual frenectomy was completed in a minimal time and under topical anesthesia. There was excellent hemostasis and no suturing was required.

**DISCUSSION:**

Ankyloglossia or tongue-tie is a congenital anomaly where the lingual frenum is very short and is attached closer to the tip of tongue.[[3]](#endnote-3) This condition varies in severity with no functional impairments in mild cases to severe ankyloglossia presenting with feeding difficulties in infants, speech and articulation difficulties as well as periodontal and malocclusion problems in children and adults. The exact etiopathogenesis of ankyloglossia remains unclear; it may present solely as a localized anomaly or in association with other craniofacial anomalies.[[4]](#endnote-4) Correction of this condition is necessary in such cases to relieve these symptoms.

Tongue performs three functions i.e. speech, deglutition and mastication. In adult deglutition occurs when teeth come into occlusion and the anterior part of tongue is pressed against anterior hard palate creating a vacuum. With limited tongue mobility this function gets impaired.

## Ankyloglossia was also found associated with certain rare syndromes Van der Woude syndrome[[5]](#endnote-5), X-linked cleft palate syndrome, Opitz syndrome[[6]](#endnote-6), Kindler syndrome[[7]](#endnote-7) and Floating‐Harbor syndrome[[8]](#endnote-8). However, majority of ankyloglossia cases occur individually without any systemic manifestations.

Speech impairment is a major issue faced by adult patients with tongue tie as observed in this case. Difficulty is articulation is evident during pronunciation of consonants and sounds “s, z, t, d, n, l, j, ch, zh, th, dg”.[[9]](#endnote-9) Maximum difficulty is encountered in lingual-alveolar sounds (particularly /l/) and interdental sounds (voiced and voiceless /th/) because the tongue needs to be maximally raised and tip must touch the anterior palate for correctly pronouncing these sounds.[[10]](#endnote-10)

In present case, our patient had difficulty in pronouncing above mentioned along with spillage of saliva during speech, since childhood. However, patient sought treatment at this age when he started having social concerns. After careful evaluation, frenectomy was planned and physical impairment was relieved.

Diode laser is a very useful tool for minimally invasive surgical procedures. The significant benefits with laser procedures include, 1. Minimal or no intraoperative bleeding providing excellent vision of operative field, 2. Little need for local anesthetics, 3. Superior healing, 4. No postoperative pain or discomfort.

Patient was educated to modify the deglutition and speech pattern following frenectomy. The postoperative training included, repeatedly practice speaking the syllables that were difficult to pronounce by reading out loud, secondly it was advised to protrude the tongue maximally out of mouth and try to touch the tip of nose and chin. These exercises were advised for 2 weeks postoperatively to train the tongue muscles for the new movements that were previously restricted

In conclusion Diode laser proved superior to the conventional surgical incision. There was minimal morbidity and immediate hemostasis was obtained thus proving effective for this procedure. High level of patient comfort and excellent healing postoperatively makes Diode laser an effective tool for this procedure.

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