

## Application of Laser in Ankyloglossia Release

Babu P.\* , Chittoria R.K.\*\* , Pandey S.\* , Mohapatra D.P.\*\*\* , Friji M.T.\*\*\* , Dinesh K.S.\*\*\*

### Author Affiliation:

\*Senior Resident , \*\*Head,  
\*\*\*Associate Professor,  
Department of Plastic Surgery,  
Jawaharlal Institute of  
Postgraduate Medical  
Education and Research  
(JIPMER) Pondicherry India-  
605006.

### Reprint Request:

**Ravi Kumar Chittoria**, Head,  
Department of Plastic Surgery  
Jawaharlal Institute of  
Postgraduate Medical  
Education and Research  
(JIPMER) Pondicherry India-  
605006.  
E-mail: drchittoria@yahoo.com

### Abstract

Ankyloglossia is a developmental condition wherein there is a short lingual frenulum that causes restricted mobility of the tongue. It results in feeding problems, speech abnormalities and dental caries. Various methods of ankyloglossia release have been used over the years. These procedures can be simple snipping of the band, or release by V Y Plasty or Z Plasty. One of the main problems associated with the release is bleeding from the mucosa leading to obscuration of the surgical field. Sometimes severe hemorrhage from the sublingual veins can lead to respiratory distress. Thus we have described a safe way of ankyloglossia release using the diode laser which provides excellent hemostasis.

Keywords: Ankyloglossia; Diode Laser; Z Plasty.

### Introduction

Ankyloglossia is derived from the Greek words 'agkilos' meaning curved and 'glossa' meaning tongue [1]. It was first described by Wallace [2] who defined it as a condition in which the tongue does not protrude beyond the lower incisor teeth due to a short frenulum linguae often containing scar tissue. It is a developmental condition wherein there is a short, thick and tight frenulum linguae that restricts the movement of the tongue.

The prevalence of Ankyloglossia varies with the population examined from 0.2% to 5% [3]. It can appear sporadically or be associated with various syndromes like Smith-Lemli-Opitz syndrome [4], Orofacial digital syndrome, Beckwith Weidman syndrome, Simpson-Golabi-Behmel syndrome [5] and X linked cleft palate. It has various clinical implications like feeding difficulties in infancy, speech abnormalities and dental caries. Due to the abnormal appearing tongue and associated speech abnormality, older children may develop reduced self esteem.

The condition is classified based on the length of

the free tongue, according to Kotlow's classification [6] into the following classes.

1. Normal range of free tongue > 16mm
2. Class I: mild ankyloglossia = 12-16mm
3. Class II: moderate ankyloglossia = 8-11mm
4. Class III: sever ankyloglossia = 3-7mm Class IV:
5. Complete ankyloglossia < 3mm

Various treatment modalities have been described for the condition. These include simple snipping, frenotomy or frenectomy. The procedure can be performed under local anesthesia or short general anesthesia. The release is usually performed using a scalpel or bipolar cautery. Of late, Erbium or Nd YAG lasers are also being used in its treatment.

One of the problems that occur during ankyloglossia surgery is bleeding from the sublingual veins. This in turn can cause aspiration of blood and respiratory complications intraoperatively. Here we describe a case wherein ankyloglossia release was performed using diode laser which resulted in very minimal bleeding saving precious surgery time and providing a clean surgical field.

## Case Report

A three year old girl child presented to the Plastic Surgery Department in JIPMER, Pondicherry, with the complaints of inability to fully protrude the tongue out since birth and inability to pronounce a few words, noticed by the parents when the child was 2 years of age.

On examination, it was found that the child had a short, thick, tight frenulum on the undersurface of the tongue causing Ankyloglossia (Figure 1). She was able to protrude her tongue out just beyond the lower lip (Figure 2).



**Fig. 1:** Short, thick, tight frenulum noticed on the ventral surface of tongue



**Fig. 2:** Picture showing limited protrusion of tongue

On protrusion of the tongue, a median furrow was noticed on the dorsal surface of the tongue. On asking the child to touch the roof of the mouth with her tongue, she was unable to do so because of the tight frenulum (Figure 3).



**Fig. 3:** Picture showing furrow on the dorsal surface of the tongue

On speech assessment it was found that the patient had difficulty in pronouncing the sounds 'ta', 'da', 'la', 'zha'. Patient did not have any feeding difficulties. The patient underwent routine preoperative assessment and was declared fit for surgery under General anesthesia (GA). She was posted for Ankyloglossia release by Z Plasty under GA. Nasal intubation was done and the throat packed with wet saline gauze. The patient was position in Rose position. A stay suture was taken in the tip of the tongue. The planned incision line was marked on the undersurface of the tongue. A solution of dilute adrenaline was infiltrated on the planned incision line. After ensuring adequate safety measures, the incision for Ankyloglossia release was made with a diode laser probe with power setting of 2W and frequency of 850nm (Figure 4). After the mucosal incision was made it was noticed that the bleeding was very minimal and the surgical field was clear.



**Fig. 4:** Diode laser assisted mucosal incision being made

Further dissection was carried out with scissors and the Z Plasty was done. After ensuring adequate release, the flaps were transposed and sutured (Figure 5).



Fig. 5: Completed procedure



Fig. 7: Post op picture

Postoperatively, the patient did not have any complications. She was discharged on post op day 1. Follow up was carried out for a period of 6 months with no complications noted.

### Discussion

There are many modalities of treatment of ankyloglossia. These range from simple snipping of the band to frenotomy and frenectomy. Among various frenectomy procedures, Z Plasty is said to have the least recurrence and improved articulation compared to the other forms of release. During the release procedure, one common complication faced by the surgeon is bleeding from the mucosal surface. If the bleeding becomes excessive it could compromise the airway of the patient.

The diode laser was introduced into the field of dentistry and oral surgery in the mid 90s. The electric current is the pump source which produces photons which is conducted through a laser active medium.

This laser works at three wavelengths 810, 940, 980 nm. It is small in size, easy to use with a relatively low cost when compared to other lasers which attracts its widespread use [7]. The diode laser has an added advantage of being conveyed through a fiber which serves as the working tip at the end of the hand piece. The use of flexible, length-adjustable optical fiber also enables efficacious irradiation [8].

Using lasers in oral surgery has many added advantages. There is disinfection of the field, precision in the incision made with minimal damage to the surrounding tissue, hemostasis, reduced post op pain and edema thus causing greater post operative comfort to the patient [9]. The laser assisted procedure is very quick to perform sometimes taking just 2 to 3 minutes. It can be done under local anesthesia, sometimes eliminating the need for suturing the wound [10]. Some authors have advocated its use even without the need for needle infiltration of the local anesthetic. However the settings needed to perform the procedure without causing pain to the patient will cause a delay in the total time taken to complete the procedure [10].

### Conclusion

Through this case report we would like to state that diode laser can be used for all patients with ankyloglossia for release by any method. It provides a clean, bloodless field reducing precious time under General anesthesia. Reduced bleeding also decreases the respiratory complications associated with the condition. Hence it is a safe and highly efficacious method of ankyloglossia release.

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