

LINGUAL FRENECTOMY: A COMPARISON BETWEEN LASER AND SURGICAL TECHNIQUE

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ABSTRACT:

Aim: A frenectomy (also known as a frenulectomy, frenulotomy or frenotomy) is the removal of a frenulum, a small fold of tissue that prevents an organ in the body from moving too far. It can refer to frenula in several places on the human body. It is related to frenuloplasty, a surgical alteration in a frenulum. Incorrectly produced speech sounds, the presence of dentofacial alterations and acquired functional adaptations may be due to a short and inadequate lingual frenum. When frenectomy is indicated, it should be performed as early as possible to prevent functional alterations.

Materials and methods: This study presents the effectiveness of scalpel and laser lingual frenectomy on phonetic function as well as an assessment of patient comfort for both techniques. 10 patients with a tongue tie were selected for this study, (Group A) 5 patients underwent scalpel frenectomy and (Group B) 5 underwent laser frenectomy. The speech for both the groups was recorded at baseline, after procedure, 7 days and 1 month. The Speech Scale by Sherryl Gottwald from New Hampshire USA was used to analyse speech in the study and the Numeric Rating Scale (NRS-11), an 11-point scale for patient self-reporting of pain.

Results: According to the Speech Scale used the clarity of speech had improved with both the Scalpel technique as well as the Laser technique. However the patient comfort and healing of the site was significantly better in patients who underwent the Laser technique.

Conclusion: Speech in both the groups had improved significantly and the pronunciation of words like 't,d,n' was seen to be more clear. The patient was more confident and comfortable with his/her speech as assessed by the Speech Scale. However the group B showed a better patient acceptance in terms of operating and post operative comfort as assessed by the Numeric Rating Scale.

Keywords: Lingual Frenectomy, Laser, Surgical Technique

INTRODUCTION:

Perhaps, not many subjects in medicine and dentistry have aroused as much controversy, as have been surrounded by so much superstition, or have created as much concern among the lay public as the tongue tie. Even today the controversy has not subsided, and although the subject is approached

much more rationally than previously, one still finds a physician or dentist who clips every prominent lingual frenulum, while many of their colleagues strongly advocated no surgery at all, even in more severe cases of tongue tie.

Ankyloglossia originated from the Greek word 'agkilos'(curved) and 'glossia'(tongue) [3]

Wallace in 1960's defined tongue tie as a condition in which the tip of the tongue cannot be protruded beyond the lower incisor teeth because of short frenulum linguae, often containing scar tissue.[17]

(Lawrence A Kotlow's, Quintessence international 1990) four classes [1]

Class I: mild ankyloglossia (12 to 16 mm)

Class II: moderate ankyloglossia (8 to 11mm)

Class III: sever ankyloglossia (3 to 7mm).

Class IV: complete ankyloglossia (less than 3mm).

Treatment:

Inclusion criteria:

- Patients with Class IV(Kotlow's) tongue tie.
- Age 25-35 years
- Difficulty in tongue movement
- Unclear speech especially words like 't,n, d'

Exclusion criteria

- Patients having any systemic disorders
- Pregnant and lactating mothers.
- Patients on antibiotics for the past 6months.

- Smokers and Alcoholics.

Group A: 5 patients, tongue tie was detected, patient was unable to protrude the tongue out, Class IV(Kotlow's) [1].

Speech was recorded on video and on the Speech scale for each patient before surgery.

After informed consent patient has undergone frenectomy procedure with 2% lignocaine and 1:80000 adrenaline by using a scalpel method, infiltrate was given at the base of the tongue and into the frenum.

Initially hemostat was inserted to the bottom of lingual frenum at the depth of the vestibule and clamp into position following to incision at the superior and inferior to it.in this way the diamond shaped frenum is detached. After this with the help of hemostat release the muscle fibres associated with tongue and frenum to achieve good tension free closure of the wound edge. A closure of wound is done with the help of(3-0) silk braided, to achieve primary closure. antibiotics and analgesic was prescribed for 3 days. The pain during surgery was recorded on the numeric rating scale.

Postoperative instruction was given.suture was removed after one week. Healing was uneventful.

Tongue exercised and speech therapy was adviced.

Group B:5 patients, tongue tie was detected, patient was unable to

protrude the tongue out, Class IV (Kotlow's)1.

Speech was recorded on video and on the Speech scale for each patient before surgery.

After informed consent patient has undergone frenectomy procedure with the help of diode laser topical 2% gel Pulse mode with 1.2W was used.

The tip was moved from the apex of the frenum to the base in a brushing stroke cutting the frenum. after 2-3 brushing strokes charring on the frenum and the tip of laser was wiped with wet gauze. Muscle attachment was also removed to avoid tension on the gingival.

Suture was not given. The pain during surgery was recorded on the numeric rating scale.

Analgesic was prescribed and postoperative instruction and exercise was given.

Recalled after 3 days. Healing was uneventful.

Advantages of laser over scalpel.^[6]

Soft tissue cutting efficient, with no bleeding giving a clear operative field.

There was no need to use suture.

Less time consuming.

Contraction and scarring were decreased or eliminated.

Despite the initial slowness of healing process, the complete and final recovery was faster.

No need of postoperative care and antibiotics.

Reduce postoperative bleeding and edema. .

DISCUSSION:

Although the scalpel technique gives predictable results. It has a few drawbacks compared to laser-assisted frenectomy.

1. The suturing on ventral surface can at times lead to blockage of wharton's duct causing submandibular swelling.^[6]

2. Surgical manipulation in the ventral tongue region may also damage lingual nerve and results in numbness of tongue tip.¹¹

3. Sutures can also cause contamination by a 'wicking effect' ^[12], causing secondary infection. This makes it necessary to prescribe postoperative antibiotics.

Laser assisted lingual frenectomy is very easy to perform. The patient hardly noticed any discomfort and there was no bleeding.

In all cases we used 940nm diode laser because it has maximum absorption by hemoglobin and oxyhemoglobin compared to 810 nm. ⁽¹⁰⁾

We used pulse mode, as continuous wave mode cause a rapid rise in temperature in target tissue. It provides

time for the tissues to cool down and prevent the collateral tissue damage incident to excessive heat production.^[13]

Due to laser there was no bleeding due to combination of sealing of small vessels, tissue protein denaturation and stimulation of factor VII production in clotting ^[15]. There was no need to suture, as there is complete homeostasis and improved wound healing.^[16]

The laser sterilization of surgical wound reduces the need for postoperative care and antibiotics.⁽⁵⁾ The second case who underwent laser frenectomy reported that he did not need analgesic beyond 24hr postoperatively. Both the patient underwent speech therapy for correction and improvement of speech.

CONCLUSION:

In fact it is given in Bible in mark 7.35, it saysand the bond that tied his tongue was loosened and he talked plainly.^[7]

The most important articulation for speech is the tongue, during speech the amazing range of movement the tongue can make including tip elevation, goorving & protrusion.

Patient was happy about the improvement in his tongue movement for his ability in easy swallowing the food and especially pronouncing words containing 't,d,n,' which he could not do till then with ease which directly contribute for improvement of his self esteem.

This case report clearly shows that laser has an advantage over conventional scalpel method lingual frenectomy, as it prevents bleeding and swelling and is associated with minimal or no postoperative pain.

We should consider integrating diode laser in soft tissue surgical procedure for benefit and comfort of patient.

REFERENCES:

1. Lawrence A.kotlow,ankyloglossia;a diagnostic Quandary,Quintessence international 1999,30;259-262.
2. Tanay Chaubal,Mala Dixit,Ankyloglossia and its management,Indian society of Periodontol.2011;vol 15;270-272.
3. Suter VG,,Bornstem MM ,Ankyloglossia;facts and myths in diagnosis and treatment. j. periodontal 2009 aug 80(8);1204-19.
4. The effect of ankyloglossia on speech in children,Otolaryngol head neck surg.2002,dec.
5. Ankyloglossia does it matters?;Pediatrics clin.north Am.2003,April 50(2)
6. Advantages of diode laser over surgical blade in management of ankyloglossia;case report Yogesh Boshia,Mona Shah in journal of laser application ,2010.
7. Journal of research & advancement in dentistry ,2014;Ramanarayana,Boyapati

- ,Kiran Reddy.ASHA.org December 27,2005 feature by Ann W kummar.
8. American academy of Otolaryngology head and neck surgery, fact sheet.
 9. Fletcher SG, meltrum JR, j. speech hearing res. 1968.
 10. Biolase.com: http://www.grane.cz/admin/upload_admin/grane_08419114528.pdf
 11. Yang Hun-Mu, Woo, Yong-J, Won, Sung Yoo, Kim , Da, -Hye, Hun Kyung-Seok, Hee Jin, j cranio fac. surg 2009;20;1359-1362.
 12. Takei H, Caranza F, The periodontal flap in: Newman M, Takei H, Klokkevold P (eds) Caranza's clinical periodontology ed 10, philadelphia, saunder: 2009, 926-936.
 13. Kotlows , Laser in pediatric dentistry, dent clin north Am, 2004;48;889-922.
 14. Morden S, Begu S, Buys B, et al, Study of platelets in vivo after endothelial stimulation with laser irradiation using fluorescence in trivital videomicroscopy and PEGylated liposomes staining microvasc 2002,64;316-325.
 15. Pick RM, Picaro, BC silberman C J; The laser gingivectomy; The use of co2 laser for the removal of phenytoin hyperplasia; j periodontol 1985,56;492-496.
 16. Pirnat S, versatility of 810nm diode laser in dentistry; An overview, j. laser health acad, 2007;4,19.
 17. Wallace AF, Tongue tie; Lancet 1963;2;377-8.

FIGURES:

Group A Conventional Scalpel Technique



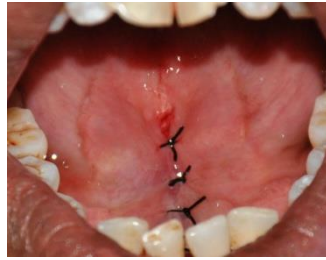
Kotlow's class IV



Lateral view



After surgery



Interrupted sutures

Group B- Laser Technique



Heart shaped tongue

Kotlow's class 4



Less than 3 mm

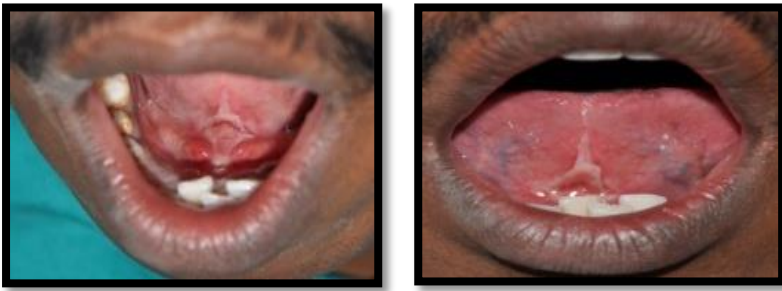
After surgery

Postoperative Healing. After 7 day

Group A

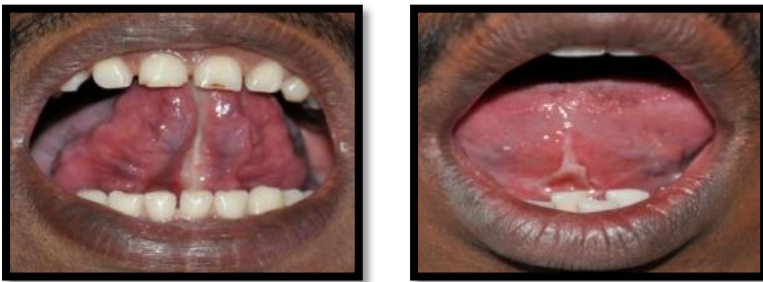


Group B



After 1 month

Postoperative healing



Group A

Group B

Speech rating scale

Case1- Group A

Case 2- Group B

(Sherryl Gottwald from New Hampshire,USA)

1, HOW COMFORTABLE WERE YOU WITH YOUR TALKING?

1 2 3 4 5 6 7
 EXTREMELY COMFORTABLE EXTREMELY UNCOMFORTABLE

	Scores Before surgery	Scores After surgery
Case 1	3	3
Case2	5	3

1, HOW CONFIDENT WERE YOU WITH YOUR TALKING?

	1	2	3	4	5	6	7	
Extremely confident								Extremely anxious
Case 1				3				3
Case 2				5				4

3. HOW SUCCESSFUL DID YOU FEEL WITH YOUR TALKING?

	1	2	3	4	5	6	7	
EXTREMELY SUCCESSFUL								EXTREMELY UNSUCCESSFUL
Case 1				3				
Case 2				3				

Numeric Rating Scale

The Numeric Rating Scale (NRS-11) is an 11–point scale for patient self-reporting of pain.

Rating	Pain Level
0	No Pain
1–3	Mild Pain
4–6	Moderate Pain
7–10	Severe Pain

Average values of numeric rating scale

	During surgery	7 days postoperative	1 month postoperative
Group A	5	4	1
Group B	2	1	0