International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 10; Issue 11 (A); November 2021; Page No.25456-25458
DOI: http://dx.doi.org/10.24327/ijcar.2021.25458.5082

Research Article

FREEDOM FOR THE TONGUE WITH LASER- A CASE REPORT

Rohit Srikanthan., Madhumati Singh., Sendhil Kumar*., B S Bhavana Koushik., Nived R and Amith Woody Ashok

Raja Rajeswari Dental College and Hospital, Bangalore

ARTICLE INFO

Article History:
Received 06th August, 2021
Received in revised form 14th September, 2021
Accepted 23rd October, 2021
Published online 28th November, 2021

Key words:
Ankyloglossia, Frenectomy, Diode laser.

ABSTRACT

The tongue is an important oral structure that affects speech, position of teeth, periodontal tissues, nutrition, and swallowing. Frenum is a fold of mucous membrane, usually with enclosed muscle fibres, that attaches the lips and cheeks to the alveolar mucosa and/or gingiva and underlying periosteum. Ankyloglossia or tongue-tie, is a congenital anomaly characterized by an abnormally short lingual frenulum, which restricts mobility of the tongue. Hence, management of ankyloglossia should be considered at any age considering the risk-benefit evaluation. Tongue being highly vascular and mobile structure, laser-assisted lingual frenectomy is the simplest, safest and less traumatic of all the treatment modalities available, with most promising results in minimally invasive oral surgery. Here a case of ankyloglossia in an adult is reported with its management using a diode laser.

INTRODUCTION

The term ankyloglossia is derived from Greek word Ankylos - "crooked", Glossia-"tongue". Tongue tie or ankyloglossia is a developmental anomaly of the tongue characterized by an abnormally short, thick lingual frenum resulting in limitation of tongue movement [2]. Lingual frenum is the thin strip of tissue that runs vertically from the floor of the mouth to the under surface of the tongue. The base of the frenum contains a "V" shaped lump of tissue in the floor of the mouth which houses a series of salivary gland ducts. The two largest ducts are in the centre just in front of the attachment of the lingual frenum and are called Wharton's Ducts. The normal length of free tongue is considered to be 16 mm. Based on the length of free tongue, ankyloglossia can be 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: less than 3 mm. [5] Various surgical techniques have been practiced in treating Ankyloglossia. Conventionally the lingual frenectomy was done with a scalpel only until the electro cautery and the lasers were introduced. The use of electro cautery was superior to scalpel in terms of hemostasis. But the disadvantage with it was the wide zone of necrosis after ablation. In the contrary lasers are known to have several advantages over the other two techniques. The present paper discuss a case report of treatment of ankyloglossia with diode Laser.

Case Report

A 19 year-old male patient reported to the Department of Oral and Maxillofacial Surgery at Raja Rajeswari Dental College and hospital Bengaluru with the chief complaint of pain in the lower front tooth region on examination a grossly decayed lower right incisor that was beyond scope for any restoration was noted. It was decide to extract the tooth and incidentally a short and thick lingual frenum was noted attached to the tip of the tongue restricting his tongue movements in all directions (figure 1), though the patient did not have any specific concerns about the condition he was explained about the importance of doing a lingual frenectomy and the benefits of lasers for the procedure. The medical history proved to be non-contributory in nature. Hence lingual frenectomy with 810nm diode laser under local anaesthesia was planned. Routine blood investigations were advised and found to be normal.

Figure 1 Pre-operative picture

Corresponding author:* **Sendhil Kumar
Raja Rajeswari Dental College and Hospital, Bangalore

Procedure

Safety protocol prescribed by the manufacturer was followed. Safety glasses were worn by the surgeon, patient, and assistant after application of topical anaesthesia, few drops of lignocaine were injected into the lingual the frenum. A silk suture was passed in the mid line grasping sufficient amount of tongue musculature and the pre-operative tongue movements were assessed. A Diode laser (810 nm) was used for the frenectomy procedure (figure 2).

Figure 2 Armamentarium inclusive of diode laser

Figure 3 Intraoperative picture

Figure 4 Post-operative picture of upwards, protrusive and lateral movements

An initiated tip of 300 µm was used with an average power of 1.37 W in a pulsed mode. The diode laser was applied in a contact mode with focused beam for excision of the tissue. The tip of the laser was moved from the apex of the frenum to the base with a brushing stroke cutting the frenum (figure 3). The ablated tissue was continuously mopped using saline dipped gauze piece. This removes of the charred tissue and prevents excessive thermal damage to the underlying soft tissue. The attachment of frenum to the alveolar ridge was also excised to prevent tension on the gingiva. After the ablation was completed from the base of the frenum to the tip of the tongue a blunt finger dissection was done bilaterally along the entire length to further mobilise the tongue. Tongue movements were checked (figure 4). No suturing was done, and the patient was prescribed analgesics and was advised to do aggressive physiotherapy. Review after 1 week showed satisfactory healing and retained tongue movements.

DISCUSSION

Though the ankyloglossia or tongue tie is not a serious manifestation, it may lead to a host of problems including infant feeding difficulties, speech disorders, and various mechanical and social issues related to the inability of the tongue to protrude. [1].

A normal range of motion of the tongue is indicated by the following criteria:

1. The tip of the tongue should be able to protrude outside the mouth; without clefting.
2. The tip of the tongue should be able to sweep the upper and lower lips easily without straining.
3. When the tongue is retruded, it should not blanch the tissues lingual to the anterior teeth; and
4. The lingual frenum should not create a diastema between the mandibular central incisors. [3]

Surgical excision, the mainstay for management of anterior attachment of the lingual frenulum, 1t is associated with swelling and pain in the immediate postoperative phase. [8]

Although the scalpel and electro cautery frenectomies produce good result, they have their own disadvantages compared to laser assisted frenectomy. Apart from pain swelling and discomfort suturing on the ventral surface of tongue at times can cause blockage of Wharton's duct. Surgical manipulations on the ventral part of tongue may also damage the lingual nerve and cause numbness of the tongue tip. [6]

Diode LASERS are compact and portable in design, with efficient and reliable benefits for use in soft tissue oral surgical procedure. Diode lasers have wavelengths ranging from 655 to 980 nm. They provide excellent wound sterilization along with haemostasis and reduced postoperative pain. LASER assisted lingual frenectomy is easy to perform with excellent precision, less discomfort, and short healing time compared to the conventional technique. [1]

The diode laser exhibits thermal effects using the "hot tip" effect caused by heat accumulation at the end of the fibre, and produces a relatively thick coagulation layer on the treated surface. Tissue penetration of a diode laser is less than that of the Nd: YAG laser, while the rate of heat generation is higher. The advantages of diode lasers are the smaller size of the units as well as the lower financial costs. [11]

Thermal ablation means that the energy delivered by the laser interacts with irradiated material by an absorption process, yielding a temperature rise. As the temperature increases at the surgical site, the soft tissues are subjected to warming (37 to 60°C), protein denaturation, coagulation (> 60°C), welding (70 to 90°C), vaporization (100 to 150°C), and carbonization (> 24 200°C). The rapid rise in intracellular temperature and pressure leads to cellular rupture, as well as release of vapour and cellular debris, termed the laser plume. [5, 12]

Blood vessels in the surrounding tissue up to a diameter of 0.5 mm are sealed, thus, the primary advantage is haemostasis and a relatively dry operating field is achieved. The post-operative experience of pain is a complex phenomenon, influenced by

psychological, environmental and physical factors. The pain perception is less as protein coagulum is formed on the wound surface, which serves as a biological wound dressing and seals the ends of the sensory nerves. [1]

CONCLUSION

Ankyloglossia is one of the most misdiagnosed and overlooked congenital abnormalities in the population with prevalence rate of 3.2%, and if untreated can exert a harmful effect on many facets of life. Our patient did know the disability that was be caused by a tongue tie. Frenectomy for this patient has made a lot of difference in improving the functional capabilities of this tongue. Use of lasers has made the surgical procedure more convenient and acceptable to the surgeon as well as the patient.

References

1. Walvekar A, Pai J, Pattanshetty R, Lingual frenectomy with diode laser therapy : A case report, J Multident Res. 2018: 4(1); 34-40.
2. Payasi S, Shukla V, Deep S, Patel P, Siddiqui A, Lingual Frenectomy using 810nm diode laser- A case report; 10.5368/aedj.2017.9.4.2.1.
3. Barot VJ, Vishnoi SL, Chandran S, Bakutra GV. Laser: The torch of freedom for ankyloglossia. Indian J Plast Surg 2014;47:418-22.
4. Iyer VH, Sudarsan S. A Comprehensive Treatment Protocol for Lingual Frenectomy with Combination of Lasers and Speech Therapy: Two Case Reports. Int J Laser Dent 2015;5(1):12-21.
5. Jafri Z, Ahmad N, Sultan N, Bhardwaj A. Diode Laser-assisted Lingual Frenectomy: A Case Series. Int J Laser Dent 2014;4(3):87-90.
6. Suresh S, Sudhakar U, Merugu S, Kumar R. Management of ankyloglossia by diode laser. J Interdiscip Dentistry 2012;2:215-7.
7. Fioravanti,M.;Zara,F.; Vozza, I.; Polimeni, A.; Sfasciotti, G.L. The Efficacy of Lingual Laser Frenectomy in Pediatric OSAS: A Randomized Double-Blinded and Controlled Clinical Study. Int. J. Environ. Res. Public Health 2021, 18, 6112. https://doi.org/10.3390/ ijerph18116112.
8. Puthussery F J, Shekar K, Gulati A, Downie I; Use of carbon dioxide laser in lingual frenectomy; British J Oral Maxillofac Surg 49 (2011) 580–581, doi:10.1016/j.bjoms.2010.07.010.
9. Reddy NR, Marudhappan Y, Devi R, Narang S. Clipping the (tongue) tie. J Indian Soc Periodontol 2014;18:395-8.
10. Lasers: A Futuristic Approach Towards Treating Ankyloglossia - A Systematic Review Namrata Baliga1, Sasikala Mohanraj2, Rajmohan.M3, Sunayana Manipal4, D.Prabu5, Bharathwaj.V.V6. J. Pharm. Sci. & Res. Vol. 11(10), 2019, 3462-3467
11. Lal K, Parthiban J, Sargunar b, Prakash C A, Anand B; Usefullness of Laser in Oral and Maxillofacial Surgery, Biomed Pharm J Vol. 8(Spl. Edn.), 271-277 (Oct. 2015)
12. Ehsan Azma, Nassimeh Safavi. Diode Laser Application in Soft Tissue Oral Surgery. J Lasers Med Sci 2013; 4(4):206-11.
13. Brij Kumar, "The hazardous effects and safety measures of lasers in dentistry: A review," Int J Contemp Dent Med Rev, vol. 2017, Article ID: 010717, 2017, doi: 10.15713/ins.ijcdmr.117.
14. Brandon M S, Strauss R A, Complications of CO2 laser procedures in oral and maxillofacial surgery, Oral Maxillofacial Surg Clin N Am 16 (2004) 289–299.
15. Ana Cla´udia Rocha Prota´sio • Endi Lanza Galva õ • Saulo Gabriel Moreira Falci; Laser Techniques or Scalpel Incision for Labial Frenectomy: A Meta-analysis, J. Maxillofac. Oral Surg. (Oct–Dec 2019) 18(4):490–499 https://doi.org/10.1007/s12663-019-01196-y.

How to cite this article:

Rohit Srikanthan *et al* (2021) 'Freedom For The Tongue With Laser- A Case Report', *International Journal of Current Advanced Research*, 10(11), pp. 25456-25458. DOI: http://dx.doi.org/10.24327/ijcar.2021. 25458.5082

******