FRENECTOMY USING DIODE LASERS: A CASE REPORT

Amna Nauman Khan[1], Nauman Rauf Khan[2], Hira Butt[3], Fatimah Imran[4], Syeda Maryam Fatima[5], Laiba Amer[6]

Correspondence

[3]Hira Butt, Demonstrator, Department of Oral Pathology, College of Dentistry, Sharif Medical and Dental College, Lahore
: +92-336-7160357
: hira.ah.butt@gmail.com
[1]Professor, Department of Community and Preventive Dentistry, College of Dentistry, Sharif Medical and Dental College, Lahore
[2]Professor, Department of Oral Pathology, College of Dentistry, Sharif Medical and Dental College, Lahore
[4]House Officer, International Islamic Dental Hospital, Islamabad
[5]General Dental Practitioner, Lahore
[6]General Dental Practitioner, Lahore

How to cite this article

Khan AN, Khan NR, Butt H, Imran F, Fatima SM, Amer L. Frenectomy Using Diode Lasers: A Case Report. J Gandhara Med Dent Sci. 2023;10(3): 93-95
https://doi.org/10.37762/jgmds.10-3.429

ABSTRACT

OBJECTIVES

Lasers are used in almost every aspect of dentistry, be it surgeries, restorations, periodontal procedures, and even aesthetic dentistry. One certain area that requires extra emphasis and importance is the laser-assisted frenectomy. Frenectomy, as the name suggests, is the excision of frenum attachment to the underlying bone. Frenectomy is carried out in the mandible as well as the maxilla. This is a case of a patient undergoing orthodontic treatment who also required a frenectomy, and to minimize the postoperative pain and swelling, the procedure was carried out using a diode laser rather than the conventional surgical procedure.

KEYWORDS: *Diode Lasers, Frenectomy, Maxilla*

INTRODUCTION

With recent advancements and research in almost every field, many new techniques and methods have been introduced in dentistry too. Lasers are the most famous among new techniques, which have replaced invasive scalpel and blade surgeries. Lasers are used in almost every aspect of dentistry, be it surgeries, restorations, periodontal procedures and even aesthetic dentistry. One certain area that requires extra emphasis and importance is the laser-assisted frenectomy. Frenectomy, as the name suggests, is the excision of frenum attachment to the underlying bone. Frenectomy is carried out in the mandible as well as maxilla.[1] Lasers are not only used in frenectomy but also in gingivectomy, incisional and excisional biopsies etc.[1,2] In many cases, a frenectomy is mandatory, especially when an abnormal frenum interferes with function.[1] The most common finding is a maxillary labial frenum, especially in children. Previously frenectomy was carried out using scalpels and blades. However, many disadvantages have been observed with the use of scalpels. For example, delayed healing, excessive blood loss and postoperative pain and swelling.[3] With the conventional technique and use of sutures, it was seen that the discomfort caused by plaque and calculus after the treatment was immense.[4] Secondly, among almost all studies and research, it has been observed that patients treated with the scalpel technique faced problems such as scarring, postoperative swelling, delayed wound healing and even intraoperative pain.[5] Conventional treatment involves a surgical procedure which naturally makes use of anaesthesia. Dental phobia among children is a difficult situation to deal with. Hence, lasers without anaesthetic needles have made such procedures both dentist and patient-friendly.[6]

CASE REPORT

A 17-year-old patient at the end of her orthodontic treatment was concerned about her gummy smile. She also had a gingival swelling in the lower anterior segment. Furthermore, she had a high labial frenum attachment. It was decided to go for a gingivectomy and frenectomy with the help of a laser (Diode Lasotronix 980nm). The pre-operative intraoral picture of the patient is shown in Figure 1.

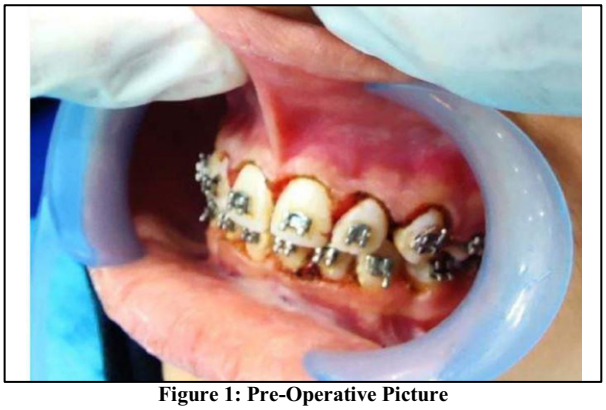

Figure 1: Pre-Operative Picture

As the local anaesthetic, half a cartridge of lidocaine 2% (epinephrine 1: 80,000) was infiltrated in the base of the frenum and partly in the vestibule. After the patient confirmed the complete lack of sensation, the treatment was initiated. First, the laser tip was initiated. To allow optimal access, the patient's upper lip was retracted upwards by an assistant using a retractor. Diode laser fibre tip at power 3W, energy 90J, pulse time 100 microseconds, aiming beam 10% and duration 30 seconds was then used to remove the frenum tissue through a gentle touching motion from the base to the top without applying any pressure as shown in figure 2.

Figure 2: Immediately After Treatment

The patient was then recalled for postoperative evaluation on days 3, 9 and 10. The patient reported having minimal pain and swelling post-op, and clinical examination revealed healed tissue, as shown in Figures 3,4 and 5.

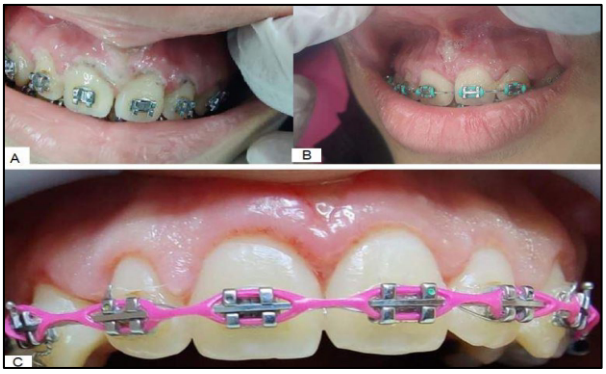

Figure 3: Postoperative Follow-Up (A) day 3 (B) day 9 (C) day 10

DISCUSSION

Diode lasers also help in controlling bleeding, pain and swelling.[7] According to several types of research on diode laser and its postoperative effects, it was observed that patients had a positive response as only topical anaesthesia was used. They are also used widely because of their smaller size and cost effectiveness.[8] Laser surgery is a widespread surgeon's favourite these days. Labial frenectomy is a common procedure as it provides better results during and postoperative than blade surgery.[3] Diode lasers have found their way even in the field of orthodontics, where abnormal frenal attachments are a hindrance to tooth movement.[9] Hence, diode lasers are a good method for frenectomy, providing a better postoperative response and minimizing the use of sutures, anaesthesia and, therefore, patient discomfort even during treatment.[9] Using a scalpel left behind a scar at the incision site, which interfered with periodontal health and esthetics; however, with a diode laser, the healing mechanism is clean and faster.[10] Patients treated with Nd: YAG laser showed better chewing and speech post operatively.[3,11] Also, research has shown better results regarding pain, discomfort, chewing and speech after a laser surgery.[3] Another study on Er, Cr: YSGG laser showed better healing results. Although Er: YAG is specifically used for removing hard tissues, it is effective even for soft tissue surgery.[12] Hence it has been observed and documented that Er: YAG laser frenectomy is also preferred over scalpel and blade surgery as it is less time-consuming and involves less bleeding.[13]

CONCLUSIONS

Diode laser provides a bloodless and clear intra-operative field. Diode laser frenectomy is a safe approach for orthodontic patients as it minimizes postoperative pain, swelling and discomfort.

CONFLICT OF INTEREST: None

FUNDING SOURCES: None

REFERENCES

1. Yadav RK, Verma UP, Sajjanhar I, Tiwari R. Frenectomy with conventional scalpel and Nd: YAG laser technique: A comparative evaluation. J. Indian Soc. Periodontol.. 2019 Jan;23(1):48.
2. Andreadis D, Lazaridi I, Anagnostou E, Poulopoulos A, Panta P, Patil S. Diode laser assisted excision of a gingival pyogenic granuloma: A case report. Clin Pract. 2019 Aug 27;9(3):1179.
3. Protásio AC, Galvão EL, Falci SG. Laser techniques or scalpel incision for labial frenectomy: a meta- analysis. J Maxillofac Oral Surg. 2019 Dec;18(4):490-9.
4. Patel RM, Varma S, Suragimath G, Abbayya K, Zope SA, Kale V. Comparison of labial frenectomy procedure with

conventional surgical technique and diode laser. J. Dent. Lasers. 2015 Jul 1;9(2):94.
5. Xie L, Wang P, Ding Y, Zhang L. Comparative frenectomy with conventional scalpel and dual-waved laser in labial frenulum. World j. paediatr. surg.. 2022 Jan 1;5(1):e000363.
6. Cordisco MR. An update on lasers in children. Curr. Opin. Pediatr. 2009 Aug 1;21(4):499-504.
7. Elanchezhiyan S, Renukadevi R, Vennila K. Comparison of diode laser-assisted surgery and conventional surgery in the management of hereditary ankyloglossia in siblings: a case report with scientific review. Lasers Med Sci. 2013 Jan;28(1):7-12.
8. Fritsche H, Ferrario F, Koch R, Kruschke B, Pahl U, Pflueger S, Grohe A, Gries W, Eibl F, Kohl S, Dobler M. Direct diode lasers and their advantages for materials processing and other applications. InHigh-Power Laser Materials Processing: Lasers, Beam Delivery, Diagnostics, and Applications IV 2015 Mar 9 (Vol. 9356, pp. 92-97). SPIE.
9. Sobouti F, Dadgar S, Salehabadi N, Moallem Savasari A. Diode laser chairside frenectomy in orthodontics: A case series (DIODE LASER FRENECTOMY: CASE SERIES). Clin. Case Rep. 2021 Aug;9(8):e04632.
10. Haytac MC, Ozcelik O. Evaluation of patient perceptions after frenectomy operations: a comparison of carbon dioxide laser and scalpel techniques. J. Periodontol. 2006 Nov;77(11):1815-9.
11. Calisir M, Ege B. Evaluation of Patient Perceptions after Frenectomy Operations: A Comparison of Neodymium-Doped Yttrium Aluminum Garnet Laser and Conventional Techniques in the Same Patients. Niger. J. Clin. Pract. 2018;21(8):1059-64.
12. Sarmadi R, Gabre P, Thor A. Evaluation of upper labial frenectomy: A randomized, controlled comparative study of conventional scalpel technique and Er: YAG laser technique. Clin. Exp. Dent. Res. 2021 Aug;7(4):522-30.
13. Sarmadi R. Er: YAG laser in dentistry. Patients experiences and clinical applicability.

CONTRIBUTORS

1. ***Amna Nauman Khan -*** *Concept & Design; Data Acquisition; Supervision*
2. ***Nauman Rauf Khan –*** *Concept & Design; Data Acquisition; Supervision*
3. ***Hira Butt****- Drafting Manuscript; Critical Revision; Supervision; Final Approval*
4. ***Fatimah Imran****- Drafting Manuscript*
5. ***Syeda Maryam Fatima -*** *Drafting Manuscript*
6. ***Laiba Amer****- Drafting Manuscript*

LICENSE: JGMDS publishes its articles under a Creative Commons Attribution Non-Commercial Share-Alike license (**CC-BY-NC-SA 4.0**).
COPYRIGHTS: Authors retain the rights without any restrictions to freely download, print, share and disseminate the article for any lawful purpose.
It includes scholarlynetworks such as Research Gate, Google Scholar, LinkedIn, Academia.edu, Twitter, and other academic or professional networking sites.