

Low Level Laser For Erosive Lichen Planus: Case Series

Dr. Basavaraj T Bhagawati¹, Dr. Nitin Khuller², Dr. MK Sunil³, Dr. Ashna⁴, Dr. Nitika Gupta⁵, Dr. Rahul Kantor⁶

¹Professor and Head, Department of Oral medicine and Radiology, Dasmesh Institute of Research and Dental Sciences Faridkot, Punjab.

²Professor & Head, Department of Periodontology & Oral Implantology, Dasmesh Institute of Research & Dental Sciences, Faridkot, Punjab.

³Principal, Dasmesh Institute of Research and Dental Sciences Faridkot, Punjab.

⁴Post Graduate Student, Department of Oral Medicine and Radiology, Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab.

⁵Post Graduate Student, Department of Periodontology & Oral Implantology, Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab.

⁶Lecturer, Department of Oral Medicine and Radiology, Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab.

Corresponding Author

Dr Basavaraj T Bhagawati, Professor and Head, Department of Oral medicine and Radiology, Dasmesh Institute of Research and Dental Sciences Faridkot, Punjab

Mail id: drbasavaraj@yahoo.com

ABSTRACT

Background - Erosive oral lichen planus (OLP) is a chronic immune-mediated inflammatory disorder that is characterised by painful red and ulcerative lesions that significantly impair oral function and reduce quality of life. Topical corticosteroids are the mainstay of treatment, but prolonged use is associated with adverse effects and relapses. Low-level laser therapy (LLLT) has been suggested as a possible non-invasive alternative because of its anti-inflammatory, analgesic and bio-stimulating properties.

Case Presentation: We present two female patients, 50 and 62 years old, with symptomatic erosive oral lichen planus with severe burning sensation (VAS 9/10). Both patients received initial treatment with standard pharmacologic therapy, including topical corticosteroids, antioxidants and supportive drugs, with only partial relief of symptoms. Low-level laser therapy (100 mW, 660 nm) was introduced weekly during the initial treatment phase, but it caused temporary symptom exacerbation and was stopped. Both patients received weekly 660 nm low-level laser therapy for 4 weeks, with topical anaesthetic, after 2 months recurrence, and complete clinical resolution with significant pain reduction and lesion eradication was achieved. No recurrence was observed at 7-month follow-up and the residual burning sensation was decreased to VAS 1/10 and 2/10 respectively.

Conclusion: The present cases show that 660 nm low level laser therapy is a safe and effective treatment option for erosive oral lichen planus with significant pain relief, faster lesions healing and longer remission period with no adverse effects.

Keywords: Diode laser; Erosive oral lichen planus; Low-level laser therapy; Photo-biomodulation; Pain management.

INTRODUCTION

Oral Lichen Planus (OLP) is a persistent, unknown origin inflammatory condition that impacts the skin and mucous membranes, marked by an autoimmune response against keratinocytes facilitated by T cells [1]. The pathology demonstrated an incidence exceeding 1% of the population [2]. OLP influences middle-aged individuals of both genders, with a minor prevalence in females [3]. The cause remains unidentified; however, certain elements are correlated with it, including genetic variables linked to certain HLA, HCV, dental materials, pharmaceuticals, and infectious agents [4-6]. Clinically, oral lichen planus may manifest as reticular (including Wickham striae), plaque, papule, atrophic, erosive, and bullous forms. OLP is linked to various systemic illnesses. This affects the therapy used to alleviate the manifestations of the illness [7,8].

Keratotic (white) and non-keratotic (atrophic/ulcerative/erosive) forms have been identified in the oral cavity. Keratotic lesions typically present without symptoms and require no treatment, whereas red lesions necessitate intervention due to associated symptoms such as pain and burning, in addition to their potential for malignancy. Numerous therapeutic approaches are employed; nevertheless, localised corticosteroids continue to be the primary intervention, with favourable results in alleviating pain and burning sensations. The medication ought to be administered sporadically, and systemic treatment might be necessary. Negative consequences encompass mucosal atrophy, candidiasis, adrenal suppression, gastrointestinal disturbances, hypertension, and hyperglycemia.[9] Nevertheless, in certain patients, symptoms may persist without alleviation, and the rate of recurrence remains elevated. Consequently, effective therapies such as LLLT have been implemented for the management of erosive oral lichen planus with few adverse effects. The impacts of LLLT on tissues encompass vasodilation, improved blood circulation, lymphatic drainage, activation of neutrophils, stimulation of fibroblasts, and modulation of pain threshold.[10] Additional consequences include the accumulation of prostaglandins (PGE2), immunoglobulins, and lymphokines, as well as β -endorphins in tissues, leading to diminished inflammation, immunological response, and pain.[11-12] Numerous low-level laser therapies (LLLTs) are employed to address oral lichen planus (OLP) within the wavelength spectrum of 600-1100nm, utilising diverse

intensities, power levels, durations, and session counts. This case series presents two instances of erosive lichen planus that were managed using a 660 nm laser.

CASE DESCRIPTION

Case 1- A 50-year-old woman presented with a 3-year history of progressively worsening oral burning sensations made worse by spicy foods and impaired lip mobility. She'd been seeing a therapist about her depression for six years.

Clinical findings: Red bilateral patches with white keratotic streaks on buccal mucosa and generalised desquamative gingivitis. Negative for lymph nodes on assessment. The intense burning sensation was graded as severe (VAS 9/10) and therefore a provisional diagnosis of erosive oral lichen planus was made.

Therapeutic approach: First treatment was topical clobetasol four times daily, choline salicylate with lidocaine gel for two weeks, antioxidant supplementation (Cap SM Fibro) for one month and amoxicillin 500 mg three times daily for three days.

Follow-up: At two weeks, symptoms improved slightly (VAS 7/10) and low-level laser therapy (LLLT; 660 nm diode laser, 100 mW, once a week) was initiated. During the second follow-up the symptoms increased (VAS 8/10) and the LLLT was suspended, while the pharmacological treatment was continued. One week later symptoms were markedly improved (VAS 4/10) and topical corticosteroids were slowly tapered.

Two months later, the patient relapsed with similar intensity (VAS 9/10). This time therapy started with low level laser therapy twice weekly for 4 weeks, with a topical anaesthetic. Significant improvement resulted in complete clinical recovery at the end of 4 weeks.

The patient was followed for 7 months without pharmacological intervention, without relapse and with negligible residual symptoms (VAS 1/10).



Intraoral picture on arrival follow up



LLLT procedure done



intraoral picture during

CASE 1

Case 2 - A 62-year-old female reported a 3-year history of burning sensation on the tongue, which was aggravated by the intake of hot and spicy foods. The pain was of sudden onset, intense, intermittent, non-radiating and relieved spontaneously without pharmacotherapy .

Clinical findings- Revealed bilateral lateral borders of tongue showing diffuse non removable white lesions with smooth surfaces and indistinct margins. The lesions were painless, non-ulcerative, and without induration. The burning sensation was severe in intensity (VAS 9/10).

Therapeutic approach: The initial treatment included the administration of antioxidant supplementation (Cap Oxitard, twice daily for 2 weeks) and topical triamcinolone acetonide (Kenacort), three times daily for 2 weeks.

Follow-up: After 2 weeks, only slight improvement in symptoms was reported (VAS 8/10) and weekly low-intensity laser therapy (LLLT; 660 nm diode laser, 100 mW) was started. The symptoms increased after one session (VAS 9/10), and LLLT was discontinued. Pharmacological treatment was maintained. After 2 weeks, the burning sensation and discomfort decreased (VAS 5/10) and the use of topical steroids was gradually reduced.

Two months later the patient developed a recurrence of similar intensity (VAS 9/10). The patient received low-level laser therapy twice a week, in addition to a topical anaesthetic for four weeks, and had complete resolution of the lesion and associated symptoms.

The patient was followed for 7 months without pharmacological therapy without recurrence and with a slight residual burning sensation (VAS 2/10).



Intraoral picture on arrival
follow up
CASE 2



LLLT procedure done



intraoral picture during

DISCUSSION

Erosive/ulcerative oral lichen planus is a potentially precancerous lesion that may disrupt eating or speaking. Corticosteroids, while the primary therapy option, are not fully endorsed due to their adverse effects. Diphenhydramine or alternative local anaesthetics may be utilised alongside corticosteroids and antifungal medications to treat Candidiasis. This combination of medications diminishes patient adherence. [13]

LLLT represents a contemporary advancement in medical and dental therapies, particularly concerning mucocutaneous lesions like OLP [14,15]. Passeron et al. utilised the 308 nm-excimer laser to address erosive OLP in four patients who had previously had therapy failures. Twelve sessions were participated in over a span of six weeks, utilising energy levels between 50 to 200 mJ/cm². One patient achieved partial remission, two were unresponsive, and the other patient suffered a worsening of symptoms. The discomfort or tenderness was not assessed [16]. In the research conducted by Kollner et al., 75 to 150 mJ/cm² of 308 nm excimer laser power was administered to OLP lesions three times weekly, for a maximum of 32 sessions. One patient exhibited remission following 12 sessions, with no indications of relapse during the four-month follow-up period. A different patient had relative improvement following nine sessions, but relapsed one month thereafter. Four patients were categorised as relative non-responders, whereas two patients were classified as absolute non-responders. Conversely, the 308nm excimer laser produces ultraviolet B (UV-B) radiation, which penetrates tissue to a depth of under 0.3mm. The UV-B excimer laser may be a carcinogen. Moreover, erythema, erosion, and discomfort are likely adverse reactions associated with its application. [17]

This case series demonstrates that 660 nm low-level laser therapy (LLLT) may provide significant symptomatic and clinical improvement in patients with erosive oral lichen planus (OLP). Both patients presented initially with intense burning sensations (VAS 9/10) with slight improvement with standard pharmacological treatment. Of note, LLLT was discontinued following a brief period of symptom exacerbation in the initial treatment phase. However, the main treatment of low-level laser therapy biweekly for four weeks after the lesions reoccurred resulted in complete clinical resolution, significant reduction of pain, and no recurrence during the 7-month follow-up.

The main advantages of this case series were: usage of standardised laser parameters (660 nm diode laser, 100 mW), standardised assessment of pain by means of Visual Analogue Scale, and extended follow-up without the need of pharmacological maintenance therapy. However, the study has several limitations, including small sample size, lack of histopathological validation and control group, and difficulty in generalising the findings. Further larger randomised controlled trials are needed to compare various wavelengths, energy densities, treatment regimens and combinations with traditional therapies, to formulate standardised clinical protocols.

CONCLUSION

In conclusion, erosive (ulcerative) oral lichen planus can be treated by 660 nm low level laser to decrease the pain and the soreness with no side effect. Further research with more participants and statistical analyses is necessary to evaluate LLLT as a novel therapeutic approach for OLP.

REFERENCES

1. Shavit E, Klieb H, Shear NH. Oral lichen planus: a novel staging and algorithmic approach and all that is essential to know. F1000Research. 2020 Mar 24;9:F1000-aculty.

2. González-Moles MÁ, Warnakulasuriya S, González-Ruiz I, González-Ruiz L, Ayén Á, Lenouvel D, Ruiz-Ávila I, Ramos-García P. Worldwide prevalence of oral lichen planus: A systematic review and meta-analysis. *Oral diseases*. 2021 May;27(4):813-28.
3. Mameli A, Murgia MS, Orrù G, Casu C. Extended erosive oral lichen planus treated with a very low-level laser therapy: A case report. *The Open Dentistry Journal*. 2020;14(1):687-91.
4. Cigic L, Gavic L, Simunic M, Ardalic Z, Biocina-Lukenda D. Increased prevalence of celiac disease in patients with oral lichen planus. *Clin Oral Investig* 2015; 19(3): 627-35.
5. Gerayli S, Meshkat Z, Pasdar A, et al. The association between oral lichen planus and hepatitis C virus infection; A report from northeast of iran. *Jundishapur J Microbiol* 2015; 8(4)e16741
6. Fortuna G, Aria M, Schiavo JH. Drug-induced oral lichenoid reactions: A real clinical entity? A systematic review. *Eur J Clin Pharmacol* 2017; 73(12): 1523-37.
7. Issa Y, Brunton PA, Glenney AM, Duxbury AJ. Healing of oral lichenoid lesions after replacing amalgam restorations: A systematic review. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004; 98(5): 553-65.
8. Al Robaee AA, Al Zolibani AA. Oral lichen planus and hepatitis C virus: Is there real association? *Acta Dermatovenerol Alp Panonica Adriat* 2006; 15(1): 14-9.
9. S.V. Suman, Nagajyothi Peta, Vijaykumar Bokkasam, Sathish Babu. D, Sunil. Y.V, Yamini Puchalapalli. Management of pain in erosive lichenplanus using low level lasertherapy (LLLT): a report of two cases. *International Journal of Contemporary Medicine Surgery and Radiology*. 2019;4(3):C223-C226.
10. Cavalcanti TM, Almeida –Barros RQ, Catao MH, Feitosa AP, Lins RD. knowledge of the physical properties and interaction of laser with biological tissue in dentistry. *An Bras Dermatol* 2011; 86 (3): 955-960.
11. Derikvand N, Ghasemi SS, Moharami M, Shafiei E, Chiniforush N. Maanagement of oral lichen planus by 980nm diode laser. *J Laser Med Sci* 2017; 8 (3):150 154.
12. Jajaram HH, Falaki F, Mahdavi O. A comparative study of low intensity laser versus topical corticosteroids in the treatment of erosive – atrophic oral lichen planus. *Photomed Laser Surg* 2011;29 (3):421-425.
13. Mahdavi O, Boostani N, Jajarm HH, Falaki F, Tabesh A. Use of Low Level Laser Therapy for Oral Lichen Planus: Report of Two Cases. *J Dent Shiraz Univ Med Sci*, Dec. 2013; 14(4): 201-204.
14. Walker MD, Rumpf S, Baxter GD, Hirst DG, Lowe AS. Effect of low-intensity laser irradiation (660 nm) on a radiation-impaired wound-healing model in murine skin. *Lasers Surg Med* 2000; 26: 41-47.
15. Lagan KM, Clements BA, McDonough S, Baxter GD. Low intensity laser therapy (830nm) in the management of minor postsurgical wounds: a controlled clinical study. *Lasers Surg Med* 2001; 28: 27-32.
16. Passeron T, Zakaria W, Ostovari N, Mantoux F, Lacour JP, Ortonne JP. Treatment of erosive oral lichen planus by the 308 nm excimer laser. *Lasers Surg Med* 2004; 34: 205.
17. Kollner K, Wimmershoff M, Landthaler M, Hohenleutner U. Treatment of oral lichen planus with the 308 UVB excimer laser – early preliminary results in eight patients. *Lasers Surg Med* 2003; 33(3): 158-160.