

# THE WONDERLIGHT: PHOTOBIMODULATION IN THE MANAGEMENT OF RECURRENT APHTHOUS STOMATITIS

## ABSTRACT

One of the most vague and confusing mucosal conditions in general practice is Recurrent aphthous stomatitis otherwise called canker sores, characterized by painful multiple recurrent ulcers of the oral mucosa. Not only is the etiopathogenesis of RAS unclear, the management of the same remains to be confusing for a general practitioner. The usual modalities of treatment are topical analgesics and anti-inflammatories as well as topical corticosteroids with varied results. The ulcers invariably return. Systemic correlation of the condition is a must. In this paper we attempt to show the effectiveness of Low Level Laser Therapy/ LLLT as an effective management tool in a female patient.

**Key words:** Aphthous ulcers, Diode Lasers, Menstrual cycle, Photobiomodulation

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## INTRODUCTION

Recurrent aphthous stomatitis is a debilitating disease of the oral mucosa affecting not only the physical health but causing psychological stress as well. Repeated occurrence of the same condition hugely effects the life style of the patient. Aphthous ulcers are the most common ulcerative lesion of the oral mucosa effecting almost 25% of the general population.<sup>1</sup> The term aphthae is derived from a Greek work aphthi meaning 'to set on fire'<sup>2</sup> which aptly describes what the patient feels in this condition.

Recurrent aphthous stomatitis as the name suggests is a condition characterized by recurrent bouts of multiple aphthous ulcers in the oral mucosa. The ulcers are oval/round, small in size and extremely painful. The exact etiology still remains unknown although a number of predisposing factors seem to contribute to the pathogenesis of this condition.<sup>3,4</sup> It is commonly seen in female patients falling in the age group of 10-40 years.<sup>5,6</sup> It has also been said that this condition is commonly seen in individuals belonging to the higher socio-economic levels.<sup>7</sup> The most common predisposing factors include hormonal changes, stress, trauma, drugs, nutritional deficiency, food allergies, tobacco and gastrointestinal disorders like Celiac disease, Cronh's disease, and ulcerative colitis.

RAS presents itself in mostly on non-keratinized mucosa but it is occasionally seen on keratinized mucosa as well<sup>8</sup>. Clinically RAS is characterized by well defined round/oval shaped small multiple ulcers surrounded by erythematous halo and covered by fibrous coating. Three main types of RAS can be distinguished clinically: Minor RAS (Mikulicz's

disease), Major RAS (Sutton's aphthae), Herpetiform aphthae.<sup>9</sup>

## CASE REPORT

A 40 year old female patient came to our center with reluctantly complaining of multiple ulcers in her mouth since 10 years. She was not a cooperative patient, thinking these ulcers are a part of her life. She has visited a number of doctors over the past and has tried topical anesthetics, topical corticosteroids, oral corticosteroids to no avail. She visited our center on the insistence of her husband. She gave a history of recurrent painful ulcers all over her lip, under her tongue, floor of the mouth and gingiva which stays for more than 2 weeks and slowly heal followed by pain-free period of around a week. The ulcers start to appear again. This cycle revolves around her menstrual cycle with the peak painful time being a few days post-menstruation.

The ulcers are associated with inability to eat even slightly spicy food, weight loss and mood swings. She was finding it difficult to brush even with a soft bristled tooth brush.

On examination multiple small pale ulcers with an erythematous halo seen on the mucosal surface of lower lip, lateral border of the tongue and floor of the mouth.

Marginal gingivitis was seen with presence of calculus.

Mandibular anterior segment shows inflamed gingiva involving the attached gingiva.

This was her fist visit to our center 5 days after her menstrual cycle.

The pain was measure using the Visual Analogue scale. (Figure 1)

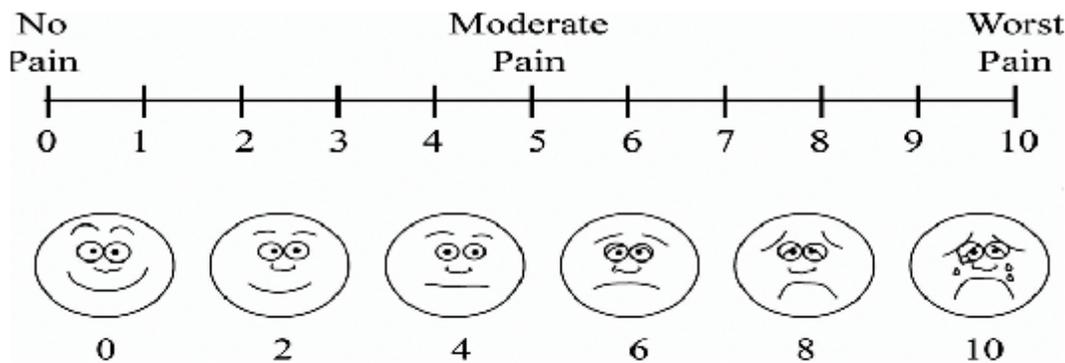


Figure 1: VAS used to quantify the pain.



Figure 2



Figure 3

The ulcers on her lower lip (Figure 2,3) were reported to be most painful with a VAS score of 8.



Figure 4



Figure 5

The rest of the ulcers (Figure 4,5) had a score of 4-7 with ulcers on the floor of the mouth and lateral border of the tongue (Figure 6,7,8) being 7.



Figure 6



Figure 7



Figure 8

The patient gave a score of 5 for mandibular anterior gingivitis.

Since the patient had already undergone most of the conventional mode of treatment, we decided to manage the symptoms using Diode laser with 980nm wavelength in the Low Level Laser Therapy/Biomodulatory mode.

The ulcers were irradiated with 3Joules per cm square every alternate days for a week. Total of 3 sessions were given during the first week. Reduction in symptoms as well as the intensity of the inflammation was seen after the 2nd session itself.

Supragingival scaling was done which was well tolerated.

4th session onwards the ulcers were irradiated once in 3 days for 3 sessions. By then the number of ulcers had significantly reduced. The patient was on her first day of the next menstrual cycle by then.



Figure 9



Figure 10

There was no increase in number of ulcers seen after the laser session. (figure 9,10)

The patient rated the pain score on VAS as none of the ulcers having a score of more than 2.

The mandibular anterior gingiva still appeared inflamed (Figure11) but the patient was comfortable with no issues during brushing



Figure 11

her teeth. The patient was pain free for most of the days during the next one month with mildly painful ulcers 3-4 in numbers at any given time.

The patient was motivated by her spouse to undergo the treatment and once the patient reached a comfortable stage she stopped her laser sessions. If continued complete eradication of the condition could have been possible.

No other medication; topical or otherwise was prescribed during the laser sessions.

## DISCUSSION

Low Level Laser Therapy, also called Photobiomodulation, is an extremely useful light therapy which uses low intensity light to cause cellular level changes in the tissues. It acts by causing photo chemical changes in the tissues rather than thermal changes.<sup>10</sup>

In RAS, the immune response is triggered against factors any of the predisposing factors and thereby initiate an abnormal cascade of cytokine response. Both humoral as well as acquired immune system appear to be

activated. The main cells which play a role in the development of ulcers are cytokines especially IL-2,IL-12,TNF-a which in turn cause the secretion of IgE.<sup>8</sup> TGF-b secreted by T-regulatory lymphocytes also appear to play a role.

Once the immune response is altered, the concentration of NK cells, B lymphocytes increases along with disruption of CD4: CD8 ratio. This in turn results in all the inflammatory symptoms seen in RAS.

In this case we used a 980nm diode laser in 0.1W power. How did this help in improving the symptoms associated with RAS? Lasers have been proved to reduce pain associated with inflammation by lowering the levels of IL-1, TNF-a, prostaglandins etc.<sup>11</sup> It also increases the production of ATP in the mitochondria and changes the capillary hydrostatic pressure there by reducing edema.

Lasers at the appropriate dosage cause reversible changes in the voltage-gated Na-K channels which reduces the pain in RAS. (11) Multiple exposure to the low intensity light is required to bring about long lasting results.

Being a vague and generally confusing condition, management of RAS is tricky. LLLT is an excellent mode of managing the symptoms, if not the predisposing factors, which ultimately results in better life style.

Low level laser have a plethora of applications in dentistry, right from wound healing post extraction/surgery, correction of neurological conditions to TMJ pathologies. The future lies in the hands of dental lasers.

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