

Laser Application for Management of Traumatic Ulcers Following Local Anesthesia in Children

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Abstract

Prolonged local anaesthesia in soft perioral tissues may sometimes lead to accidental lip biting in small children forming a traumatic ulcer. Healing of such ulcers has been reported to enhance with treatment using low level laser therapy (LLLT). This case report describe two cases of traumatic ulcers due to lip bite following inferior alveolar nerve block caused during post anaesthesia period that were treated by LLLT. It resulted in better healing and lower pain, thus helping in healing and repair of the tissue.

Keywords – Children, Low level light therapy, oral ulcer

Introduction

Traumatic ulcers are common lesions having yellowish white necrotic pseudo membrane with borders that are raised and erythematous.^[1] College et al ^[2] found that 13% of children from 2 to 18 years experienced soft tissue trauma following unilateral or bilateral mandibular nerve block anesthesia. The incidence of soft tissue trauma was 18% among children < 4 years of age, 16% in 4-7 years, 13% in 8-11 year old children, and 7% in ≥ 12 years of age. This report presents two cases of lip bite injury following inferior alveolar nerve block treated with low level laser therapy (LLLT).

CASE 1: A 10-year-old boy reported to the Department with decayed teeth. The right mandibular primary second molar was found to be grossly carious and showed furcation involvement therefore extraction was planned for the tooth following inferior alveolar nerve block. The patient was sent with appropriate postoperative instructions. The following day, the patient reported with swelling of the right lower lip with a large traumatic ulcer of the size of 1.5 by 1 cm. (Fig 1) The child had bit on his lower lip during the post extraction period owing to the peculiar feeling of numbness and tingling sensation which resulted in the traumatic ulcer.

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Figure 1: Preoperative for Case 1

CASE 2 : An 8 year old boy reported to the Department with pain in carious, left mandibular first and second primary molars. Intraoral periapical radiograph were taken and based upon the clinical and radiographic interpretations, pulpectomy for 74 and extraction of 75 was planned. Inferior alveolar nerve block was given with 2% lignocaine with vasoconstrictor in the concentration of 1:100000 and the procedures were carried out. The patient came the next day with pain on the lower lip and left buccal mucosa due to the formation of traumatic ulcer 5mm by 15 mm in size. (Fig 2)



Figure 2: Preoperative for Case 2

For both the cases, a diagnosis of traumatic ulcer secondary to lip biting due to local anaesthesia

was made. It was decided to treat the ulcer with soft tissue Diode laser (Picaso, 810+ 10 nm) (Fig 3) with LLLT aimed at alleviating the pain and achieving epithelization of the wound .



Figure 3: Picaso Laser

The treatment consisted of multiple sittings. The application of the Laser was done in the non-contact mode with a distance of 2-3 mm between the Laser tip and the ulcer surface. The laser beam was applied in a continuous, circular motion, so as to cover the entire ulcer surface. Each sitting consisted of four sessions of low level laser application, lasting forty five seconds each with a gap of thirty seconds between each application, for a total laser application time of about five minutes per visit. These precautions were taken to prevent overheating of the adjacent tissues, which can lead to necrosis. The LLLT was carried out on four consecutive days after which the ulcer was found to be approximately healed. (Fig 4).



Figure 4: Postoperative healing after laser treatment for Case 1

There was absence of pain and erythema after the fourth day and complete healing occurred in one week. (Fig 5)



Figure 5: Postoperative healing after laser treatment for Case 2

Discussion

Local anaesthesia blocks last longer than infiltration and soft tissue anesthesia lasts longer than pulpal anesthesia.^[3] Soft tissue anaesthesia may be present for up to 3-5 hours after local anaesthesia administration giving rise to minor soft tissue traumatic injuries.^[4] The most common area of trauma is the lower lip and to a lesser extent the tongue, followed by the upper lip seen in pediatric patients.^[5]

Patients with traumatic ulcers are prescribed medication depending on the severity of the disease. In mild cases topical protective emollient such as orabase is advised whereas in severe cases topical corticosteroids preparation are helpful.^[1]

De souza et al, showed that healing of aphthous ulcers following low level laser application was achieved in four days by once daily application. Also, the pain intensity was relieved after the first laser application itself.^[6] Lalabonova H used low energy laser irradiation (LELT) in treating traumatic ulcers of oral mucosa and he found that pain was rapidly managed with the usage and epithelization of the ulcers was accelerated thus eliminating the use of drugs.^[7] Agarwal H et al assessed clinically the efficacy of LLLT on recurrent aphthous ulcers for reduction of pain, lesion size, and healing time and concluded that LLLT is an effective modality for the treatment of aphthous ulcers as it lessens the healing time, and also provides immediate pain relief.^[8]

Similar such findings were reported in the present cases where there was reduced pain, size of the lesion and erythema after the very first sitting. The bio stimulating effect of lasers accelerates the process of regeneration with predominating analgesic effect by causing alteration of the electrical activity in the nerve cells ^[8], anti-inflammatory effects and accelerates healing in inflamed and oedematous tissue .

Several authors ^[9,10,11] conducted similar studies using LLLT in the treatment of Aphthous Ulcers and stated that LLLT lead to spontaneous reduction of symptoms leading to decreased healing time, pain intensity, size, and recurrence of the lesion in patients with RAS with greatest clinical effectiveness .

LLLT has been found to act on mitochondria, thus enhancing the synthesis of ATP and promoting tissue repair.^[12] It also has neuropharmacologic effects and cause release of a range of neurochemicals including histamine, serotonin and acetylcholine that produce an analgesic effect and anti-inflammatory effects^[13] It has been

observed that LLLT decreases the permeability of the lymph vessels and can also stimulate lymph vessel collaterals.^[14]

The present case reports shows that lasers are effective, rapid, simple and bloodless procedure although the routine treatment includes anti-inflammatory like corticosteroids, amlexanox and metalloprotease inhibitors and/or symptomatic therapy. Present case report show the effectiveness of lasers, though its disadvantages must be kept in mind i.e. it's a sensitive procedure. During laser procedure safety of the skin & eyes and control of temperature to prevent the damage to adjacent tissues should be taken into account.

Conclusion

It can be said from the outcome of above mentioned two case reports that laser is a good tool to treat traumatic ulcers and may reduce psychological trauma and fear during the dental visit.

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