

## Role of Low Level Laser Therapy in Adult Thermal Burns

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### Abstract

Thermal energy is essential for human life in modern society. However, a consequence of using thermal energy is burns.<sup>1</sup> Low-level laser therapy (LLLT) is an emerging new modality of treatment in cosmetic surgery and is gaining importance in burns. In this study low level laser therapy was performed to improve outcome of wound healing in adult thermal burns patient.

**Keywords:** Low level laser therapy, Thermal Burns

## INTRODUCTION

Thermal energy is essential for human life in modern society. However, a consequence of using thermal energy is burns. The skin is made of proteins and acts as a barrier, which protects the organism from the outside environment, regulates body temperature, and prevents fluid loss.<sup>1</sup> In a burn injury, this protective barrier is damaged and proper treatment should be provided immediately. The patients and their family are affected in the long run on a physical, psychological, and financial level. Most burn injuries that take place at home are accidental and can be avoided.

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Low level laser (LLL) is also known as cold laser as it does not produce heating effect. LLLT affects wound healing on the basis of photobiomodulation effect. LLLT is claimed to have analgesic, anti-inflammatory effects and stimulates wound healing and remodelling.<sup>2</sup> An animal study has demonstrated effects of LLL over second degree burn wounds at cellular level.<sup>3</sup> However there is no human study for its effects on acute burn wounds. LLLT can be used as an adjunct to the conventional treatment of second degree superficial burn. Low-level laser therapy (LLLT) is an emerging new modality of treatment in cosmetic surgery and is gaining importance in burns; however, the application parameters are still controversial in the literature. In this study weve tried to assess the effect of LLLT in graft uptake and wound improvement in burns patient undergoing skin grafting.

## METHODS AND MATERIALS

This study was conducted in tertiary care centre in department of plastic surgery after getting the department ethical committee approval. Informed consent was obtained for examination and clinical photography. A 16 year old female with 2nd degree

and 3rd degree burns involving the both lower limb from ankle to thigh (Fig. 1) was admitted and had undergone low level laser therapy prior to tangential excision and skin grafting. She received



Fig. 1: Thermal burn injury at the time of admission

## RESULTS

After 3 sessions of preoperative LLLT, wound site healing improved and there was good wound bed preparation. There was good uptake of graft postoperatively, with 3 more sessions of LLLT. without any local adverse effects (Fig. 3). Patient was discharged on postop day 14 at request with complete graft take.



Fig. 3: Post-operative day 14 after 6 sessions of LLLT, tangential excision and skin grafting.

## DISCUSSION

Burn injuries differ widely for different age groups, gender, and body parts involved with differences in hospital stay and outcomes secondary to extent of burns. The healing of second degree superficial burn takes place by epithelialization from epidermal appendages present in dermis.

total 6 sessions of LLLT, 3 sessions (one every 3rd day) prior to and 3 sessions post tangential excision and laser therapy (once weekly).



Fig. 2: Tangential Excision and Skin Grafting

Conventionally these burn wounds are managed by regular dressings. These wounds take around two to three weeks time for complete healing.<sup>4</sup> It may take longer in case of wound infection, sepsis or hypoproteinemia. Various treatment modalities are proposed, including collagen dressings, autologous platelet rich plasma therapy, insulin therapy and low level laser therapy (LLLT) to increase rate of healing and decrease complications in these cases.<sup>5</sup>

In this study we tried to analyse the role of low level laser therapy in a young lady with second and third degree burns and its role in wound healing, promoting tangential excision graft uptake. On post operative day 14 of grafting, recipient site was assessed and graft take was found to be satisfactory

## CONCLUSION

In our study treatment with low level laser therapy prior to tangential excision of the burn wounds and skin grafting of the burn region have shown to have favorable results in our experience managing burns. There was satisfactory graft take & patient was discharged at request with minimal raw area on post-operative day 14.

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