HOW THE EFFECTS OF PHOTOTHERAPY ON THE IMMUNE SYSTEM MODULATE WOUND HEALING

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Together with cutaneous neural fibres, cytokines initiate acute inflammation, an essential part of the healing process. Many of the cytokines are produced by
(a) immune cells of the skin-associated lymphoid tissue (SALT)
(b) blood-borne cells that originate in the bone-marrow and enter the injured tissue.

These and the cutaneous C-fibres are readily accessible to photons and susceptible to their direct effects. The components of the immune system are linked by nerves and vessels, many being located in the dermis. Photons have ready access to cells in transit through the dermal vessels, and may modify the activity of these cells directly. For example, cytokine release can be stimulated. The cytokines can be transported to, and affect indirectly, distant cells and tissues that have not been exposed to photons. Systemic as well as local changes can therefore be produced by the exposure of a wound to phototherapy. Investigations into the direct and indirect effects of phototherapy on the SALT and other components of the immune system will be reviewed. Its cells are affected by cytokines, some of which modulate the activity of specific cells types, while others attract to wound sites defensive immune cells and stem cells that can transform into fibroblasts. Phototherapy can affect the synthesis and release of cytokines and neural activity, modulating wound healing. The importance of treatment parameters and the physiological status of the target cells in determining outcome will be emphasized. The clinical significance of the effects of phototherapy on the control of wound healing will be considered and future research proposed.

Study Design: Materials and Methods: A retrospective case review of clinical features including pain, measured by visual analogue scale (VAS), motor function, measured by range of motion (ROM), and visual outcome, measured by wound area for six patients (n = 6; 5 males, 1 female; mean age = 67).

Results: All patients in the study had chronic ulcers of their lower extremities, persisting in excess of 6 months prior to being subjected to the LiLiT Wound Healing Program. Significant progress with regard to alleviation of pain (mean *VAS* = -5), improvements in motor function (mean *ROM* = +60%), progressive epithelialization (mean wound closure rate = 45% per week) and 100% complete wound closure was achieved. No recurrence of pathology at least one month post cessation of therapy was evident (mean% reduction in wound area = 100%).

Conclusions: The LiLiT wound healing approach achieves consistent, effective and clear endpoints. The program is cost effective, creates no adverse effects and leads to salvage of extremities.

LOW INTENSITY LASER THERAPY APPLICATION IN WOUND HEALING

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Background and Objective: The management of wounds continues to challenge all medical disciplines involved in the process. Utilization of conventional methods is frequently unsuccessful, resulting in subsequent amputation. The need for more effective therapeutic solutions is therefore paramount.

Low Intensity Laser Therapy (LILT) is clinically effective for an extensive number of pathologies. Photon irradiation within a specific therapeutic window initiates a variety of positive physiological responses. This study was conducted to determine the outcomes of the LILT Wound Healing Program, for patients presenting with pain, compromised neurological and physiological function and tissue damage associated with vascular/diabetic ulcerações.

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LOW LEVEL LASER THERAPY APPLICATION IN THE ULCERAS DE DECUBITO AND PERIDAS HEALING

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Background: Low level laser therapy (LLLT) has been widely used to accelerate the wound healing in diabetic patients and patients submitted by pressure ulcers. Purpose: To show the LLLT action in clinical cases of wounds and pressure ulcers.

Study Design: 8 cases of wound or pressure ulcers had been selected, who had received the AlGaAs laser application, wave length of 660 nm, power of 200 mW, fluency of 4.05 cm² and energy per pulse of 1.6 J. The punctual techniques was employed in the middle and edges of the wound and the area evaluation by photographic register.

Results: Patient 01, diabetic, transfemoral amputation, presented 11 cm wound by high pressure, 4 months of evolution and the treatment got the complete closing in 4 sesions, totaling 30 days. Patient 02, diabetic, Charez disease, presented a burn in the 4° and 5° toes and got the wound closing in 55 days of the beginning of the treatnent. Patient 03, diabetic, rheumatoid arthritis, evolution of 6 weeks approximately presented injury in the dorsal region of the foot with 5 cm². Complete closing was submitted to the described protocol per 12 weeks. Patient 04, developed pressure ulcer in the sacral area for remaining 2 weeks restricted to the bed. The ulcer presented a 35 cm² area and depth of 2 cm, been treated by 25 sesions and the complete closing occurred with 55 days. Patient 05, victim of hip fracture, developed a 4 cm² pressure ulcer in the ischium area and evolution of 4 weeks. After 6 applications, totaling 23 days of treatment occurred complete closing of the wound.

Conclusion: We suggest that the LLLT is an efficient tool to accelerate the healing of wounds and ulcers.
A NEW METHOD FOR HEMORRHOIDS SURGERY:
INTRA HEMORRHOIDAL DIODE LASER, DOES IT WORK?
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Objective: To demonstrate a new, painless surgical method to treat hemorrhoids of 2nd and 3rd degree. Background: Hemorrhoids are a matter of concern due to a painful outcome. Endovascular laser therapy for varicose veins is a feasible method that is possible to be used in the treatment hemorrhoids as well. There is no such a method described in the literature, as this is a new approach to hemorrhoids surgical treatment.
Methods: Fourteen patients with 2nd and 3rd hemorrhoids degree were operated. After the piles were identified the laser fiber was introduced into them and the laser beam was released with the proper technique (810 nm, 3 W, frequency of 4 Hz, energy density of 18 J/cm², total energy of 4 to 10 J). Results: The piles were partially reduced immediately and clinical examination 7, 14 and 21 days after surgery showed complete healing in 60.6% (9 patients) and partial resolution in 39.4% (5 patients). In one patient (6.6%) the treatment failed. Pain intensity measured through a numerical (0 to 10) scale was 0.80 ± 1.14. Major complications were burn lesions and residual piles.
Conclusion: The diode laser delivered into small to median hemorrhoidal piles is painless and leads to a partial to complete resolution in a short outcome. Some adjustments must be done to prevent burning and residual piles. It is not a good method for grade IV and big piles. This method opens new possibilities to surgical treatment for hemorrhoidal disease.

BODY CONTOURING WITH A MULTIPLE DIODE LASER SYSTEM
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Background and Objectives: Transmission electron microscopic images have shown the formation of a transitory pore in the adipocyte membrane followed by complete deflation of adipocytes subsequent to laser exposure. The intent of this study was to evaluate the application of a multiple 635 nm and 7.5 mw exit power per diode laser for the application of body contouring of the waist, hips, and thighs.
Study Design/Materials and Methods: The study recruited 16 test subjects for a non-randomized, non-blinded single group study. Each subject received six total treatments with a multiple 635 nm and 7.5 mw exit power per diode laser (EMI manufactured by Erchonia Medical Laser) across a consecutive two-week treatment administration phase; three treatments per week. The laser was applied to the front area of the subject’s abdomen, hips, and right and left thighs for 20 minutes. The same procedure was repeated for the lower back, posterior portion of the hips and right and left thighs. Prior to each treatment, the subjects Body Mass Index (BMI) and circumference in inches of waist, hips, and each of the left and right thighs were evaluated.
Results: Preliminary data has indicated an average decrease in inches of −1.28 inches for the waist, −1.34 inches in hips, and −1.73 inches in the right thigh and −1.50 inch in the left thigh at the end of week two. 87.5% of subjects demonstrated a decrease in waist circumference after two weeks. A similar percentage was observed for the hips and thighs. 75% of subjects had a reduction in circumference of their hips, while 81% of subjects had a decrease in left and right thigh circumference.
Conclusion: These preliminary data suggest that low-level laser therapy can reduce overall circumference of specifically treated regions.