

The Role of Laser Therapy in Scar Management

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Although scars may partially fade with time, the mark they leave behind are a constant reminder of the incident that initially caused the skin injury. Some of our patients are able to embrace these marks as a part of their identity, however, the majority endeavor to hide and treat these unpleasant and sometimes symptomatic cicatrices. Scar formation can have various etiologies of skin injury such as trauma, burn, gun powder, medical and surgical procedures, and occupational accidents which can lead to functional and psychological morbidities [1, 2]. In Texas, we encounter many patients with scars, especially in the veteran and oil field worker population, and we can improve their quality of life by offering a variety of available treatment options.

There are various forms of scars: contracture, depressed (atrophic), flat, keloid, raised (hypertrophied) and stretch marks. Scar formation or fibrosis is a normal physiological healing response that is primarily mediated by proinflammatory cytokines and transforming growth factors. There are six phases of wound healing: (1) rapid hemostasis; (2) appropriate inflammation; (3) mesenchymal cell differentiation, proliferation and migration to the wound site; (4) suitable angiogenesis; (5) prompt re-epithelialization (re-growth of epithelial tissue over the wound surface) and (6) proper synthesis, cross-linking and alignment of collagen to provide strength to the healing tissue [1, 3]. Scars may become painful, itchy or numb as nerve endings are often damaged initially, but these symptoms often improve over time [1, 2, 4].

Educating patients on both injury prevention and proper wound care is paramount. Patients should promptly seek medical attention to minimize scarring – first and foremost by having a

clinician evaluate for primary versus secondary wound healing options. Gently cleaning the wound with soap and water, keeping it moist with an ointment such as petroleum jelly, protecting it from sun exposure and maintaining adequate nutrition with high-quality proteins, Vitamin C and Vitamin D is essential for improving wound healing. The Patient Scar Assessment Scale and Observer Scar Assessment Scale are tools physicians can utilize to evaluate the scar before providing different treatment modalities such as polyurethane or silicone scar reduction patches, silicone gel, oral or topical tranilast (an inhibitor of collagen synthesis), pressure dressing, surgical excision, intralesional corticosteroids, intralesional 5-fluorouracil, cryotherapy, skin needling, subcision and/or laser therapy [2-5].

There are numerous laser systems available that provide successful treatment of different types of scars with various etiologies. The detailed evaluation of individual patient and scar characteristics (location, size and type) is the foundation for prompt therapeutic planning such as non-ablative lasers for mild scars, and ablative lasers for deeper scars with reduced range of motion [6, 7]. There are many factors that are considered, such as the period after injury, depth, color, texture, symptoms, skin phototype, medicine usage and prior treatment to help select the best course of management. After careful assessment, Low-level Laser (LLL), Pulsed Dye Laser (PDL), Q-Ruby, Q-Alex and Q-YAG can be utilized to tackle the scar in multiple sessions [2, 4-6]. Initial treatment focuses on color; however, subsequent attention directed toward configuration of the scar allows the resurfacing process to provide improved skin elasticity, increased vascularization, and overall symptom reduction [2, 4, 6].

It should be noted that scars do not to be new to be considered for laser treatment. A dermatologist with expertise in lasers should be consulted for a careful scar assessment prior to constructing a plan for management. By utilizing intimate knowledge of the latest technology, including lasers, the medical and surgical skills of a licensed dermatologist will effectively provide the most appropriate treatment plan to improve the patient's quality of life.

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