

## Scar Prevention Using Laser-Assisted Skin Healing (LASH) in Plastic Surgery

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Received: 18 September 2009 / Accepted: 21 December 2009 / Published online: 28 January 2010  
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### Abstract

**Background** The use of lasers has been proposed for scar revision. A recent pilot clinical study demonstrated that lasers could also be used immediately after surgery to reduce the appearance of scars. The LASH (Laser-Assisted Skin Healing) technique induces a temperature elevation in the skin which modifies the wound-healing process. We report a prospective comparative clinical trial aimed at evaluating an 810-nm diode-laser system to accelerate and improve the healing process in surgical scars immediately after skin closure.

**Methods** Twenty-nine women and 1 man (mean age = 41.4 years; Fitzpatrick skin types I-IV) were included to evaluate the safety and performance of the laser system. The laser dose (or fluence in  $J/cm^2$ ) was selected as a function of phototype and skin thickness. Each surgical incision (e.g., abdominoplasty) was divided into two parts. An 8-cm segment was treated with the laser immediately after skin closure. A separate 8-cm segment was left untreated as a control. Clinical evaluations (overall appearance ratings, comparative scar scale) of all scars were conducted at 10 days, 3 months, and 12 months by both surgeon and patients. Profilometry analysis from silicone replicas of the skin was

done at 12 months. Wilcoxon signed-rank test analyses were performed.

**Results** Twenty-two patients were treated using a high dose (80–130  $J/cm^2$ ) and 8 patients with a low dose ( $<80 J/cm^2$ ). At 12 months in the high-dose group, both surgeon and patients reported an improvement rate of the laser-treated segment over the control area of 72.73 and 59.10%, respectively. For these patients, profilometry results showed a decrease in scar height of 38.1% ( $p = 0.027$ ) at 12 months for the laser-treated segment versus control. Three patients treated with higher doses ( $>115 J/cm^2$ ) experienced superficial burns on the laser-treated segment, which resolved in about 5–7 days. For the eight patients treated at low dosage ( $<80 J/cm^2$ ), there was no significant difference in the treated segment versus the control segment. No side effects were observed.

**Conclusion** This prospective comparative trial demonstrates that an 810-nm diode laser treatment, performed immediately after surgery, can improve the appearance of a surgical scar. The dose plays a great role in scar improvement and must be well controlled. There is interest in LASH for hypertrophic scar revision. LASH can be used to prevent and reduce scars in plastic surgery.

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**Keywords** Wound healing · Heat shock proteins · Heat · Laser · Scar