Laser Assisted Skin Closure (LASC) Accelerates Healing

Laser treatment of surgical incision resulted in accelerated and stregthened wound closure with indiscernible relulting scar.

Laser assisted skin closure (LASC) by using a 815-nm diode-laser system accelerates and improves wound healing.

Lasers Surg Med. 2001;28(2):168-75.

Capon A, Souil E, Gauthier B, Sumian C, Bachelet M, Buys B, Polla BS, Mordon S.

UPRES EA 2689 INSERM IFR 22, Pavillon Vancostenobel, University Hospital, 59037 Lille, France.

Background and Objective:

This study aimed to evaluate a 815-nm diode-laser system to assist wound closure to accelerate and improve healing process.

Study Design/Materials and Methods:

A total of 25 male hairless rats (mutant OFA Sprague-Dawley rats, IFFA-CREDO, L'Arbresle, France) with four dorsal skin incisions were used for the study. For each wound, the good apposition of the edges was obtained with buried absorbable suture. In the laser group, the laser beam was applied spot by spot through a transparent adhesive dressing along two incisions with the following parameters: 1.5 W; 3 seconds; spot diameter, 2 mm; fluence, 145 J/cm(2). Both control wounds were closed with conventional suture techniques. The duration of the closure procedure was noted for each group. Clinical examination, histologic study, and measurement of tensile strength were performed at 3, 7, 15, and 21 days after surgery. Determination of activation of heat shock protein 70 (Hsp70) through immunocytochemistry was performed at days 1 and 7.

Results:

LASC was 4 times faster to process than conventional suture: 1 minute 49 +/- 20.6 seconds vs. 7 minutes 26 +/- 62.2 seconds. In the laser group, healing was accelerated resulting in a more indiscernible scar than in the control groups. Histologic aspect was better with earlier continuous epidermis and dermis and a thinner resulting scar. Tensile strength was 30 to 58% greater than in control groups at 7 and 15 days ($P < 0.001$). Expression of Hsp70 was markedly induced in skin structures examined after laser exposure.

Conclusions:

This study shows the ability of the 815-nm diode-laser system to assist wound closure leading to an acceleration and an improvement of wound healing with indiscernible resulting scar. The mechanisms of this phenomenon are still unclear but further investigations are in progress to attempt to explain them.

PMID: 11241526 [PubMed - indexed for MEDLINE] © 2001 Wiley-Liss, Inc.