

ENHANCED TISSUE RETRACTION WITH A NOVEL LIPID- AND WATER-SELECTIVE DEVICE FOR LASER-ASSISTED LIPOSUCTION

Robert Weiss, Brooke Seckel, Sean Doherty,
Margaret Weiss, Karen Beasley
*Maryland Laser Skin&Vein Institute, Hunt Valley, MD; Emerson
Hospital, Concord, MA*

Background: A novel system emitting 924 nm and/or 975 nm light for smooth photo-thermal heating of lipids and connective tissue was developed. The mechanism of action is selective heat induced liberation of lipids from the adipocytes with coagulation of surrounding tissue.

Study: A 924/975 nm laser system coupled to a specially designed light guide was evaluated and compared with a 1064 nm laser device using a standard 500 micron fiber. Studies included H&E and NBTC staining following ex vivo treatment of porcine tissue. Surface and subcutaneous temperatures were recorded. Clinical evaluation consisted of an initial 6 subjects who underwent laser assisted liposuction on upper arms, abdomen and thigh regions. General anesthesia with wet technique was utilized at one site (MA) and tumescent techniques at another (MD). Self-assessment and clinician assessments were conducted at 3 months. One subject underwent 924/975 nm lipolysis versus standard liposuction.

Results: A channel of damage was induced by the 924/975 nm device (average $\Delta T \sim + 10-15$ C) with a central gap resulting from liberation of lipid from disrupted adipocytes ($\sim 1.5-2$ mm diameter vacuole) surrounded by a ring of non-viable adipocytes and coagulated connective tissue (thickness 2-3 mm). The 1064 nm device caused significantly less fat and connective tissue damage (0.3-0.75 and 0.3-0.5 mm, respectively). Tissue excised 6 weeks revealed histocytic infiltration along the channels on the 924/975 device side but no inflammation on the standard liposuction alone side. The aspirate post 924/975 nm treatment was highly emulsified with a translucent oily surface layer ($\sim 5\%$ vol.) unlike that seen on the standard liposuction alone side. Significant tissue retraction and skin smoothness were observed both immediately and at 3 months in the clinical evaluation cohort with 924/975 nm treatment.

Conclusion: A novel 924/975 nm laser device induces a unique damage profile leading to prolonged healing and tissue remodeling. Clinical results indicate significant skin retraction and smoothness.