AESTHETIC AND COSMETIC DERMATOLOGY (LASERS SEPARATE CATEGORY)

A NOVEL, NON-INVASIVE IMAGING SYSTEM TO CHARACTERIZE METABOLIC CHANGES IN SUBCUTANEOUS ADIPOSE TISSUE AFTER CRYOLIPOLYSIS

M Juhasz [1] - A Leproux [2] - A Durkin [2] - B Tromberg [2] - N Mesinkovska [1]

University Of California, Irvine, Department Of Dermatology, Irvine, United States [1] - University Of California, Irvine, Beckman Laser Institute, Irvine, United States [2]

Background: Cryolipolysis is a non-invasive, body contouring technique. There are no reliable, quantitative techniques to characterize adipose tissue after treatment. Diffuse optical spectroscopic imaging (DOSI) is a novel, non-invasive imaging technology that visualizes adipose tissue metabolic activity in healthy and pathologic states. We present the first case series using DOSI to visualize and characterize metabolic changes in adipose tissue pre- and post-cryolipolysis.

Observation: Female volunteers were treated with lower abdominal cryolipolysis (-11 oC, 35 minutes) followed by massage. The treatment areas were mapped in a 2x2 cm grid pattern for DOSI measurements, with data collected pre- and post-treatment up to 90 days. Raw data was transformed into three-dimensional surface images (i.e. heat maps), corresponding to treated areas, using a linear mixed effects model. Pre-treatment optical signals are consistent with healthy adipose tissue. Immediately post-treatment, acute metabolic changes, such as increased deoxyhemoglobin and water content, suggest injury and subsequent inflammation. During tissue recovery, the metabolic profile begins to return to normal, but never reaches baseline suggesting a fundamental change in tissue architecture and functionality.

Key Message: DOSI is evolving as a tool to non-invasively characterize metabolic changes in adipose tissue and can successfully characterize changes after cryolipolysis. This ability to monitor tissue response may help identify patients at risk for paradoxical adipose hyperplasia. Other uses of DOSI include optimizing clinical parameters, determining optimal post-procedure mechanical manipulation, and utility of adjuvant techniques to maximize cryolipolysis outcomes. Future directions include using DOSI to determine efficacy of heat, mechanical, ultrasound and radiofrequency modalities of lipolysis.