

Selective Lipolysis by Ultrasound: A Dose Response Feasibility Study with a Novel Technology in an In-Vivo Porcine Model

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Objectives:

In-vivo feasibility assessment and dosimetry study with a novel selective ultrasound lipolysis system (Alma Lasers Ltd. Caesarea, Israel).

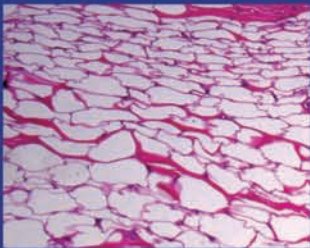
Methods:

Crossbreed (Landers & Large white) domestic female pigs were divided to the following groups: acute, 3 days, 7 days and 14 days. Each animal was marked with grids of treatment areas differ in energy level and duration of treatment. Samples were harvested and histological sections were prepared using H&E stain. Histopathological analysis of the samples was made and effects for each energy level and treatment duration were characterized through the time scale described above.

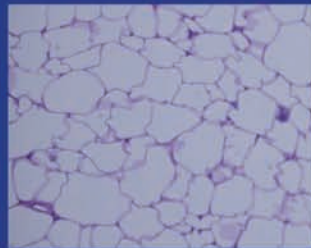
Results:

Well noted effects from membrane alteration through complete lysis were observed in the sub cutaneous fat. A specific parameter combination of power level and treatment duration as well as a unique frequency window enabled a highly selective damage to the adipose tissue with no epidermal and dermal damage

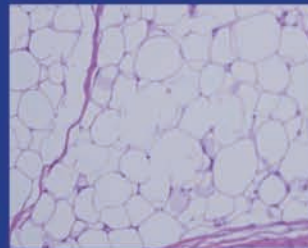
Damages:



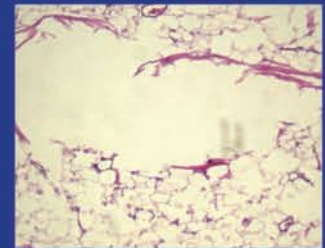
Damaged adipocytes
"condensation" effect



Membrane shape alteration

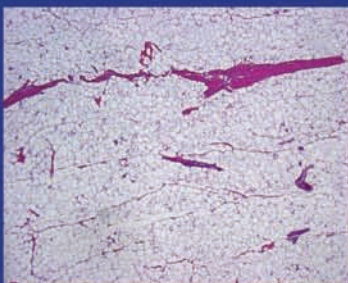


Ruptured adipocytes

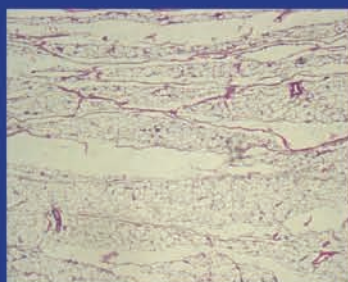


Area of lysis

Control Vs treatment

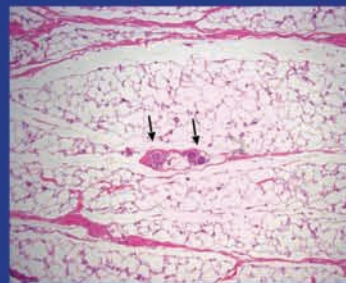


Control: intact adipose tissue

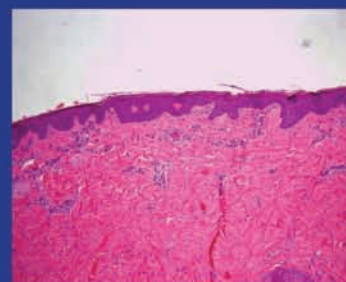


Damaged adipose tissue
post treatment

selectivity



Intact nerve and blood vessels
surrounded by damaged fat tissue



Intact dermis and epidermis post
treatment

Skin appearance



Slight redness immediately
post treatment



Normal appearance post 15 min

Conclusion:

Non invasive selective ultrasound assisted lipolysis is feasible through use of specific parameters composition with no epidermal and dermal damage. This can be performed in a very simple procedure, high efficiency and low complications rate This highly selective ultrasound technology might be a solution for fat remodeling and sculpturing in the human body