A Prospective Clinical Study of Noninvasive Cryolipolysis™ for Subcutaneous Fat Layer Reduction

Interim Report of Available Subject Data

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Abstract

Background: Published animal studies[1] and unpublished controlled human studies[2] have demonstrated that cryolipolysis (cold-induced apoptotic fat cell death) is safe, well tolerated, and capable of reducing the thickness of the subcutaneous fat layer without damage to the overlying skin or associated structures.

Objective: The objective of this study was to evaluate cryolipolysis for fat layer reduction from the flanks (love handles) and back (back fat pads) when used by clinicians in an environment representative of routine clinical practice.

Methods: This multi-center, prospective, non-randomized, IRB-approved study enrolled male and female subjects >18 years of age with clearly visible fat on the flank or back appropriate for treatment with cryolipolysis. Cooling was applied by a prototype device to the treatment area using pre-programmed treatment profiles that control the rate of heat extraction and duration of treatment. A contralateral untreated area (e.g., the opposite flank or portion of the back) was maintained as a control. Efficacy was evaluated by ultrasound measurement of fat layer reduction, comparison of pre and post-treatment photographs and physician assessment.

Results: Based on interim results from 32 subjects, photographic, ultrasound and physician assessment confirm that cryolipolysis results in a visible contour change in a majority of subjects. Ultrasound measurements taken on a subset of 10 subjects demonstrated a fat layer reduction in 100% of these subjects with an average reduction of 22.4% at four months post-treatment. Subjects presenting with modest fat bulges had the best cosmetic results. There were no device related adverse events reported.

Conclusions: Selective cryolipolysis results in reductions in subcutaneous fat volume without damage to the surrounding tissues. While all subjects for whom ultrasound images were obtained showed a significant reduction in fat layer, cosmetic improvement was more readily observed in subjects with modest fat bulges. Further studies of fat reduction effects in other anatomical areas with optimized treatment parameters are warranted.

Introduction

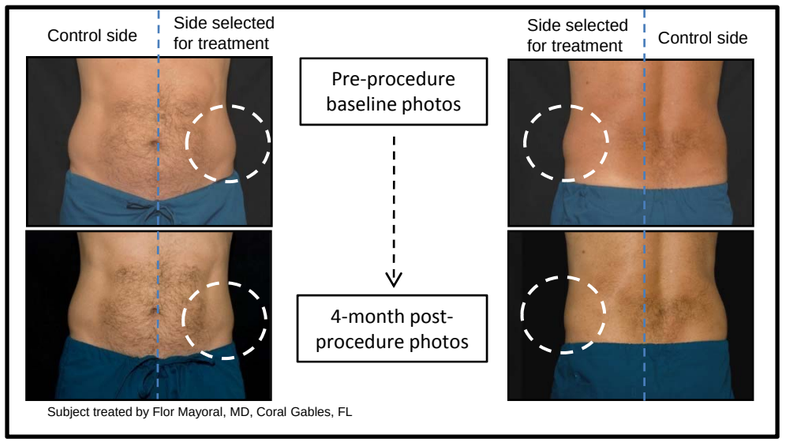
Early pilot human clinical studies have demonstrated that a novel non-invasive cooling device is a promising method of reducing fat layer on select subjects with minimal side effects.[2] This multi-center study evaluates the reproducibility of results in a larger population of subjects in established aesthetic practices. Love handle and back fat subjects were treated. This interim report is limited to the first 32 subjects enrolled (i.e. love handle) for whom adequate time had elapsed for post-treatment and results were available for analysis.

Methods

12 sites are enrolling subjects in this study. Each subject is assessed for inclusion in the study based on inclusion criteria provided by study sponsor. In addition to the protocol inclusion and exclusion criteria, investigators have been provided pictorial examples of "ideal" subjects for treatment. Those are described as subjects with discrete bulges of fat in the love handle or back fat areas and excluded obese or subjects who had general or amorphous fat. Initial treatments on love handles were done at CIF 33 (-64 mW/cm^2) for 60 minutes per application site. The larger love handle or back fat area is treated, with the contralateral side remaining untreated and for use as a control throughout the study (Figures 1 and 2). Treated areas are evaluated with pre-procedure and 4-month follow-up photographic images which are assessed to determine the level of fat layer reduction in the treated areas. Investigators and subjects provide input on procedure effectiveness and subject comfort. Ultrasound images are taken at baseline and at follow-up on a subset of subjects to measure change in fat layer thickness.

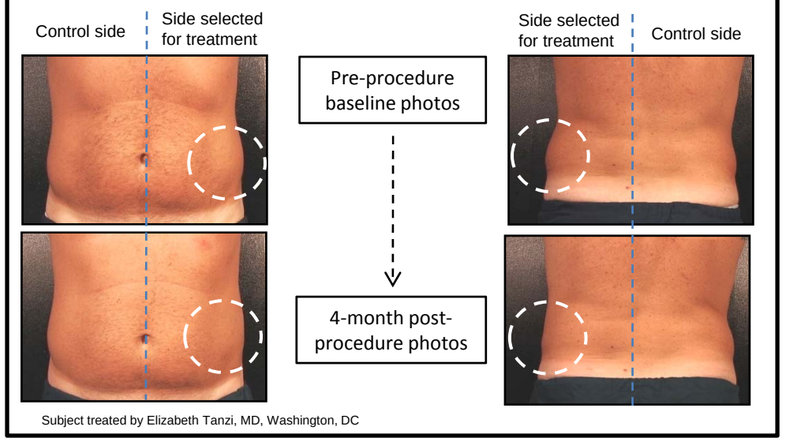
Results – Photographic Assessment

Figure 1: Pre-treatment (top) and 4-months post-treatment (bottom) photographs of Subject LH MAY004 indicate significant fat layer reduction at treatment site on subject's left side compared to control side on subject's right side per investigator and subject assessment. Subject had no weight change during 4 month period.



Subject treated by Flor Mayoral, MD, Coral Gables, FL

Figure 2: Pre-treatment (top) and 4-months post-treatment (bottom) photographs of Subject LH TAN005 indicate significant fat layer reduction at treatment site on subject's left side compared to control side on subject's right side per investigator and subject assessment. Subject had no weight change during 4 month period.



Subject treated by Elizabeth Tanzi, MD, Washington, DC

Reference

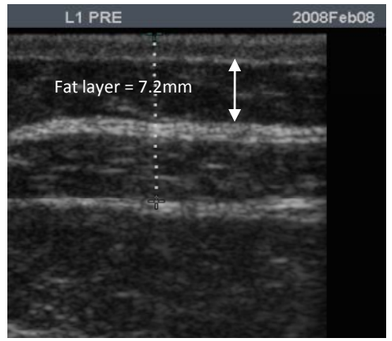
[1] Manstein D, Laubach H, Watanabe K, Anderson R. A Novel Cryotherapy Method of Non-invasive, Selective Lipolysis. *Lasers in Surgery and Medicine* 2008; 40:S20 p104.

[2] Zeltiq data on file.

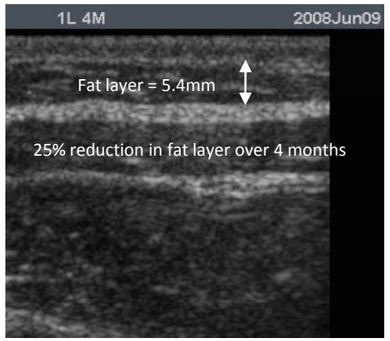
Results – Ultrasound Assessment

Pre-procedure and four-month follow-up ultrasound images are available on 10 subjects. The follow-up ultrasound images indicate an average fat layer reduction in the treated areas of 22.4%. This result provides objective evidence of device efficacy with the initial energy extraction rates of this study.

Pre-procedure baseline ultrasound image



4-month post-procedure ultrasound image



Subject treated by Roy Geronemus, MD, New York, NY

Results – Subject Selection

Subject selection is a strong factor in determining investigator assessment of cosmetic efficacy. 27 of 32 (84%) subjects assessed by investigators had improvement in the area treated. Of the 5 that did not show improvement, 4 were judged to not fit the selection criteria of "discrete bulges of fat". When excluding the non-responders that did not meet the "ideal" subject selection criteria, then 27 of 28 (96%) of those subjects had discernable efficacy.

Results – Subject Discomfort Assessment

Subjects provided feedback about the level of discomfort they felt during the procedure. 30 of 32 subjects (94%) indicated they had either no discomfort during the procedure or felt a level of discomfort no greater than what they expected. 100% of the subjects who felt some level of discomfort during the procedure indicated they would have the procedure again. Other than infrequent reports of transient bruising, the procedure was very well tolerated by subjects.

Conclusions

This interim report on the initial 32 subjects enrolled in this study shows promising results with conservative treatment parameters in love handles. Subsequent subjects treated with optimized parameters in other peripheral areas have not yet completed the study. The completed study will include back fat subjects and subjects treated with such optimized energy settings and shorter treatment times.

Financial Disclosure: All investigators received compensation for study participation. Drs. Burns, Coleman, Dover, Fitzpatrick, Geronemus, Kilmer, Tanzi and Zelickson are paid members of the Zeltiq Advisory Board

The Zeltiq non-invasive cooling device is not cleared for use by FDA for lipolysis; it is limited by United States law to investigational use.