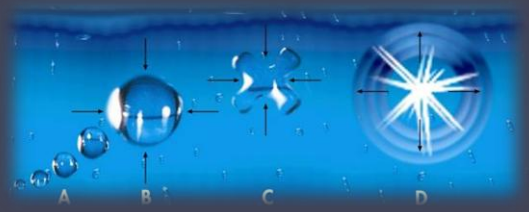
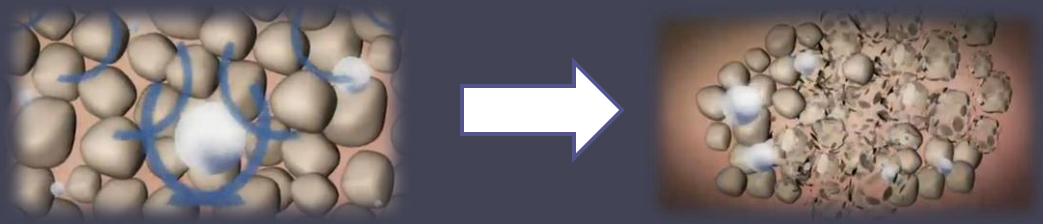
Evaluation of ultrasound-assisted subcutaneous fat reduction in abdominal area

Ultrasound waves develop millions of micron bubbles



The bubbles are exploded due to repeated cycles of enlargement and shrinkage

This process leads to disruption of the adipose cell walls



Lymphatic drainage transfers the adipose droplets to the hepatobiliary system, where they metabolize and excrete

This process is labeled:

CAVITATION

OBJECTIVES

This study was performed to evaluate:

Short term efficacy

Long term efficacy

Patient satisfaction

of Low- Frequency Ultrasonic Lipolysis

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MATERIALS & METHODS

SAMPLE STUDY

Table 1. *Basic Characteristics of Patients*

Parameter	Value
Total Number	28
Age (years)	
Mean± SD	37.8 ± 8
Min-Max	24-53
Male/ Female Ratio	1/27

Inclusion Criteria: Local abdominal obesity

Exclusion Criteria:
- Liver/renal failure
- Autoimmune disease
- Malignancy
- Pregnancy/lactation
- Local metal prosthesis/pace maker
- Anticoagulating medication

MAIN STUDY PROCEDURE

Med Contour system (General Project, Florance, Italy)

Cavitation + Vacuumedrainage : Weekly (Maximum of 8 sessions)

1. No pre-operative preparation was needed

2. Pre-operative vacuum drainage:

One Minute: bilateral inguinal and retroclavicular (Terminus) lymphatic drainage

3. Lipolysis procedure:

Double transducer hand piece

Frequency: 20 -60 kHz (depending on the adipose tissue caliper)

Power: 0.5 -3 w/cm^2 *(depending on patient's temperature toleration)*

Total time: 30 to 45 minutes

3. Post-operative vacuum drainage:

Total time: Six minute

Drainage in the way of abdominal lymphatic flow to the epigastric and inguinal lymph nodes

An additional vacuum session for 15 to 30 minutes was performed three days later

4. Post-operative recommendation:

Limited consumption of simple carbohydrate foods for three days after each session

ASSESSMENTS

Measurement: Abdominal circumference

The mean value of three fixed points of the largest abdominal circumference and 4 to 7 cm above and under it were measured

Variables:

- ❖Per-session circumference reduction
- ❖Post- treatment circumference reduction
- ❖Follow-up circumference reduction
- ❖Patient satisfaction at the end of treatment & follow-up visit

RESULTS

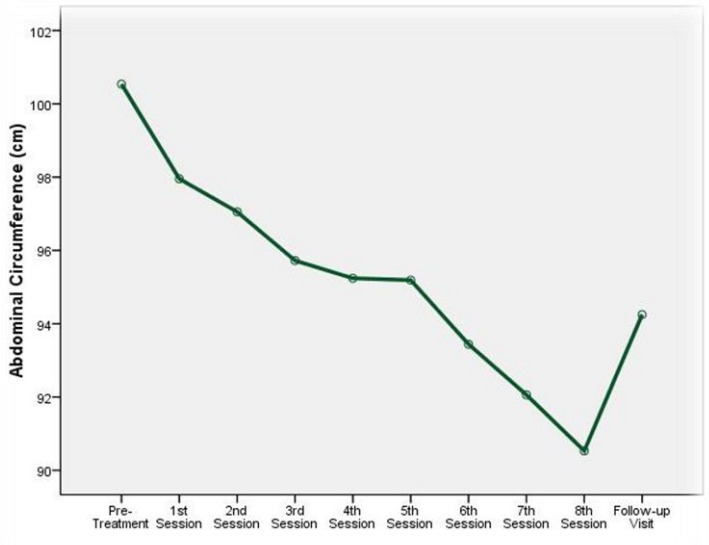


Figure 1. *Trend of abdominal circumference reduction in different sessions of treatment and follow-up visit*

No correlation was found between

- ❖Age & Circumference reduction
  r=0.015 , p= 0.954
- ❖BMI & Circumference reduction
  r=0.378 , p= 0.134
- ❖Pre-treatment circumference & Circumference reduction
  r=0.350, p= 0.068

Total per-session circumference reduction

Mean : 1.89 cm
95% CI: 1.63 – 2.02 cm
Min: 0.34 cm
Max: 1.48 cm
P< 0.001

Circumference reduction at the end of treatment sessions

Mean: 8.21 cm
95% CI: 6.38 – 10.04 cm
Min: 2.25 cm
Max: 14.75 cm
p<0.001

Circumference reduction at the 3-month follow-up visit

Mean: 7 cm
95% CI: 3.17 – 10.8 cm
Min: - 8.25 cm
Max: 30 cm
p<0.001

RESULTS

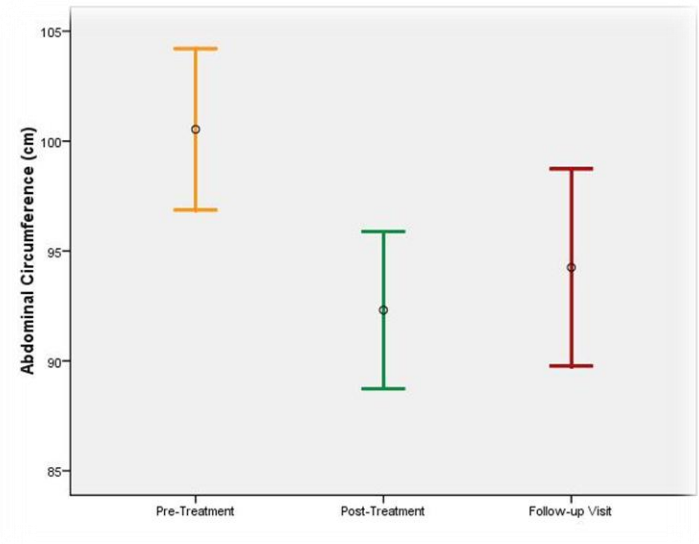


Figure 2. *Comparison of pre- to post treatment & follow-up visit abdominal circumference*

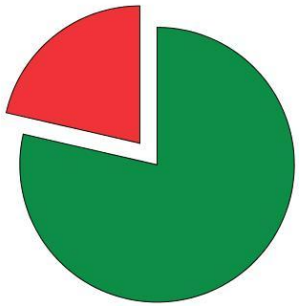
Partial reversal at the 3-month follow-up visit

18 Cases (64.3%)

PATIENT SATISFACTION

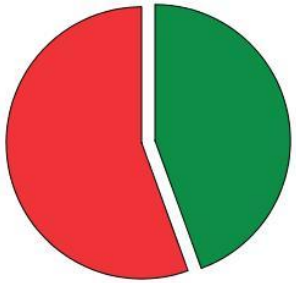
❖At the end of treatment sessions

Positive satisfaction: 16 (76.2%)
Negative satisfaction: 5 (23.8%)



❖At the 3-month follow-up visit

Positive satisfaction: 9 (42.9%)
Negative satisfaction: 12 (57.1%)



DISCUSSION

Study	Year	Area	Design	Results	Conclusions
Moreno-Moraga[1]	2007	abdomen, inner & outer thighs, flanks, inner knees & breasts (males only)	Three treatments with1-month intervals	Circumference was reduced by a mean of 3.95 ±1.99 cm	❖This study shows high efficacy and safety of focused ultrasound ❖Multiple treatments combined with appropriate patient and treatment area selection can produce dramatic improvements in body shape
Shek[2]	2009	Abdomen	Three treatment sessions with 1-month interval	❖Objective measurements by ultrasound, abdominal circumference and caliper did not show significant difference after treatment ❖The overall patient satisfaction was poor	It is not an effective approach for body contouring
Fatemi[3]	2009	abdomen & waist	One treatment session with 1-year interval	Average per-session circumference reduction: 4-5 cm	It seems to be a safe and effective technique for nonsurgical body shaping

CONCLUSION

❖ The low frequency ultrasonic lipolysis appears to be an effective method for reduction of abdominal fat

❖ Long term follow-up shows some partial reversal

❖ Patient satisfaction was high at the end of treatment, but reduced to moderate satisfaction at 3-month follow-up visit

[1] Moreno-Moraga J, Valero-AltÃ©s T, Riquelme AM, et al. Body contouring by non-invasive transdermal focused ultrasound. Lasers Surg Med 2007 ;39(4):315-23.
[2] Shek S, Yu C, Yeung CK, et al. The use of focused ultrasound for non-invasive body contouring in Asians. Lasers Surg Med 2009;41(10):751-9.
[3] Fatemi A. High- intensity ultrasond effectively reduces adipose tissue. Smin Cutan Med Surg 2009; 28(4):257-62.