

INSTITUTO MÉDICO LÁSER

ULTRASHAPE: ULTRASONIC TRANSDERMAL LIPOLYSIS

J. MORENO MORAGA, T. VALERO ALTES, AND A. MARTINEZ-RIQUELME

Greater demand within body aesthetic medicine for non-invasive procedures has motivated researchers to develop new techniques to replace traditional treatments for body contouring.

Until now, the only way to improve body silhouette by removing local fat stores was liposuction through surgical means. A new non-invasive procedure based on the emission of ultrasound (Ultrashape: Contour I) has been recently developed that destroys adipocytes. Those problems gave rise to the development of a new device (Ultrashape Contour I, Ultrashape Ltd. Tel Aviv, Israel) that is able to remove fat stores with the same efficacy as liposuction but avoiding invasive technique and its associated problems.

Ultrasound use in medicine can be two-fold: first, as a diagnostic method (p.e. ultrasonography) or as a therapeutic approach. Ultrashape emits focalised ultrasound waves which, by mechanical effect, breakdown the adipocyte membrane with no damage to neighbouring structures.

The Ultrashape Contours I device comprises several subsystems: transducer, video tracking and guidance system, together with console and stands. The transducer delivers a focused ultrasound beam and provides real-time optical and acoustic feedback on treatment via a special computerised tracking system with a built-in control that constantly verifies the transducer's position, ensuring adequate acoustic contact and temperature control during the treatment. The real-time tracking system with specific pre-set ultrasound parameters ensures that the pre-selected target area is homogeneously covered, avoiding treatment of any point twice; the tracking system records and synchronises body position in real-time enabling the patient to move. The system console houses the power unit, ultrasound generator, cooling system and the computer that controls the overall parameters. The stand contains the tracking system based on a video camera, the control panel, lighting system and the screen.

The aim of our study is to present the results achieved with Ultrashape, during the first months of operation at Instituto Médico Láser, applying different sessions in the same area to each patient, with subsequent analysis of the final aesthetic outcome afforded by the technique.

Material and methods

Patients

Patients attending the clinic during a two-month period for focal fat stores treatment were asked to participate in the study with Ultrashape Contour I. 30 patients accepted to participate, 22 women and 8 men, mean age: 37 years. Treated areas were: pseudoginecomastia, abdomen, flunks, trochanter region, internal side of the thighs, and knees (Table 1).

Areas with large tattoos or extensive scarring were excluded from this study.

Targeting areas for treatment were those desired by patients, with at least 2 cm of thickness measured by calliper. Patients with active thyroid disease or immunological disease were also excluded from treatment. All patients had a photograph of the area to be treated taken at each session pre and postoperatively using the Siemens® photographing system. Patients also had a liver ultrasound at the beginning and at the end of treatment. Cholesterol, HDL-cholesterol and triglycerides values were also determined prior to treatment.

All cases received 3 sessions per treated area at one month interval between each session.

Photographs of the patients standing up before and after the treatment were also taken.

Special care was applied to the topographical design of the targeted areas, following a circular pattern, as done in standard surgical liposuction procedures (figure 1). Excentric drawings were performed with overlapping only at the site of greatest projection of the fat tissue. Also, the patient was placed in the Ultrashape bed to avoid treated areas from being in tension because of protrusion of a prominent bone (mainly on the thighs).

None of the patients underwent other slimming or aesthetical procedures (endermologie®, mesotherapy, radio-frequency, etc.) during the study. However, they were instructed to follow a healthy way of life with a reduced- saturated fat balanced diet.

Results

Mean reduction in fat thickness after each session was 7 mm in cases with less adipose tissue thickness and 18 mm in patients with more than 35 mm of the initial thick fat layer.

(Table II and III and Fig. 2 and 3). None of the patients had a reduction in fat thickness below 5 mm.

Body contouring results were considered satisfactory at the end of the treatment (figures 4 to 13). It is worth noticing that in the male photograph corresponding to fig. 4 and 5, an additional session greatly improves the aesthetic outcome. Photographic analysis points in nearly all patients to the benefit of an additional session to refine the contour and emulate as much as possible the results of a traditional surgical liposuction.

No severe adverse events were reported during and after the completion of the treatment. Before and after liver ultrasonography showed no significant changes in intrahepatic fat deposits. After images did not suggest a steatosis component in any patient (figures 14 and 15).

Statistical assessment of laboratory values did not show significant alterations before and after the treatment in terms of cholesterol, HDL and triglycerides (Table IV).

No significant changes in patient weight were observed before and after the treatment.

Tolerance was excellent in all patients, although 3 to 5 painful impulses were registered per treated area. One case presented first degree burns in the area (3 impulses) due to a probable decrease in the contact oil layer that resolved in 3 weeks. After the sessions, patients did not show paresthesia, haematoma, or other alterations. Patients were able to resume daily activities without problems immediately after surgery.

Discussion

Ultrasound mechanical effect of Ultrashape® Contour I over adipocytes, causing membrane disruption and triglycerides release into interstitial space, has been proven sufficiently efficient in our analysed patients. All cases experienced fat volume reductions with noticeable aesthetic results in three sessions, similar to those obtained after conventional surgical liposuction. Nevertheless, one supplementary session would be the most adequate course of action in most patients to completely reshape body contour.

Changes in body contour are superimposable to those achieved in traditional surgical liposuction, with the advantage of enhanced results through an additional session in many patients, keeping in mind the elevated cost of treatment.

Demand for this technique to treat fat stores has grown drastically in recent years, since it is painless, requires no anaesthesia or the use of elastic compression.

Stability of lipid profile during treatment and absence of fatty liver disease proved that Ultrashape is a safe technique with no adverse physiological effects.

Unchanged patient weight allows us to confirm that the fat volume reduction is a direct result of the loss of fat content due to the action of the treatment.

It can thus be concluded that Ultrashape Contour I is an efficient, well-tolerated and safe non-invasive technique for body contouring, and may be considered an alternative to conventional liposuction. We are also of the opinion that although results can be enhanced, the results obtained are highly satisfactory for the patient.

TABLES AND FIGURES

Table I. Sex distribution of areas treated by Ultrashape

Areas	Females	Males
Mean age 36,46	37,04	36,22
Abdomen	6	4
Outer thighs	10	0
Flanks	2	1
Inner Knees	2	0
Inner thighs	2	0
Pseudo-gynaecomastia	0	3

Table II: Fat reduction in the 5 groups of patients distributed according to initial thickness:

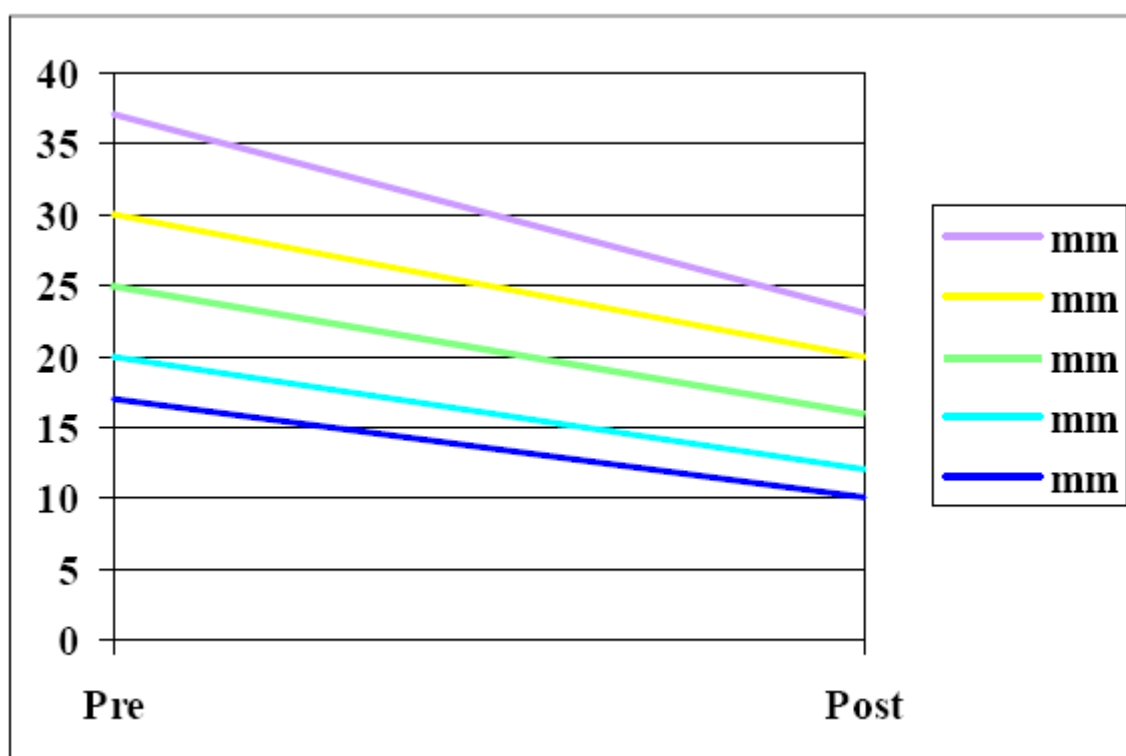


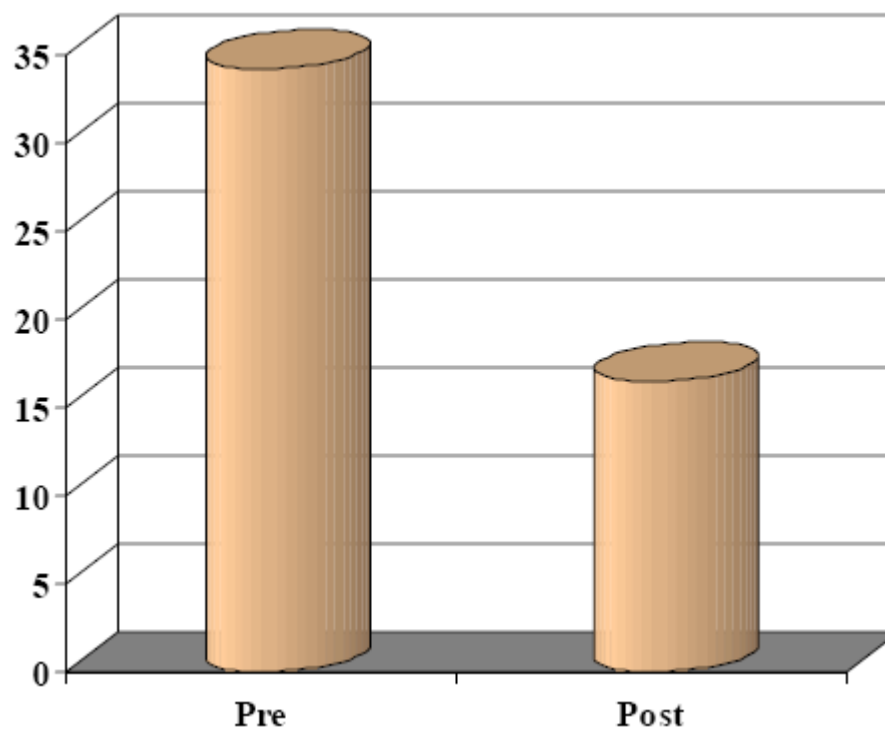
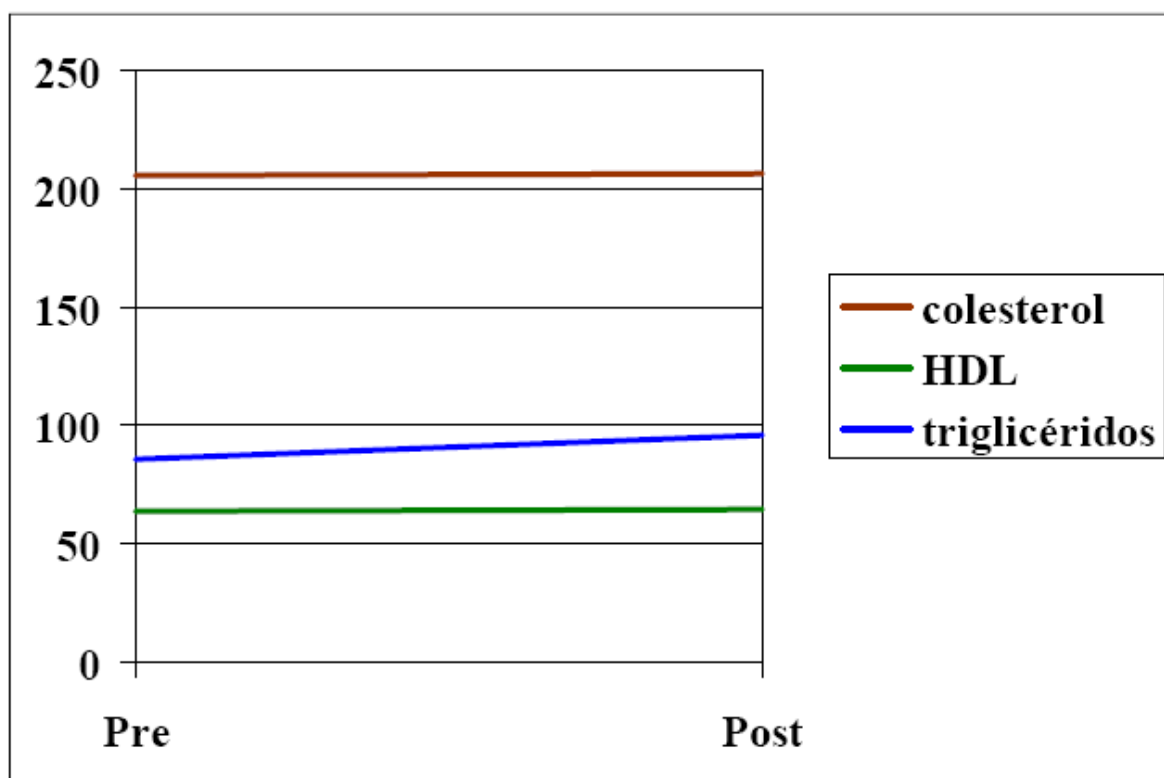
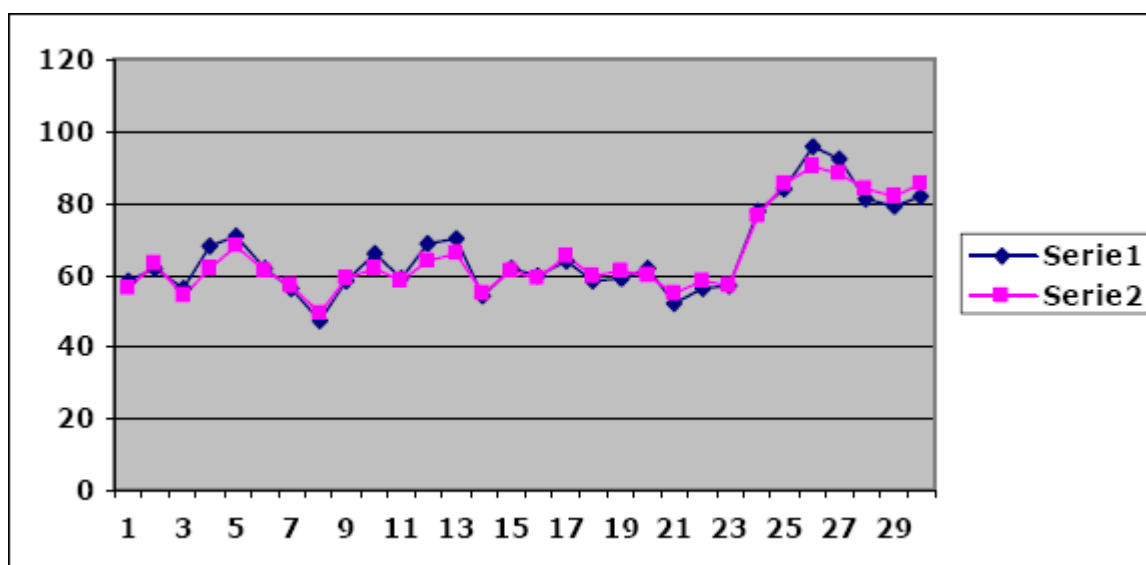
Table III: Mean fat reduction per session in the whole patient sample**Table IV. Variance in laboratory values in this patient series ($p > 0.5$)**

TABLE V. Patient body weight distribution (series 1= pre; series 2= postoperatively).



LIST OF FIGURES

Figure 1. Consecutive design for the three Ultrashape sessions in thighs. There is a confluence of the three sessions over the maximum fat point.

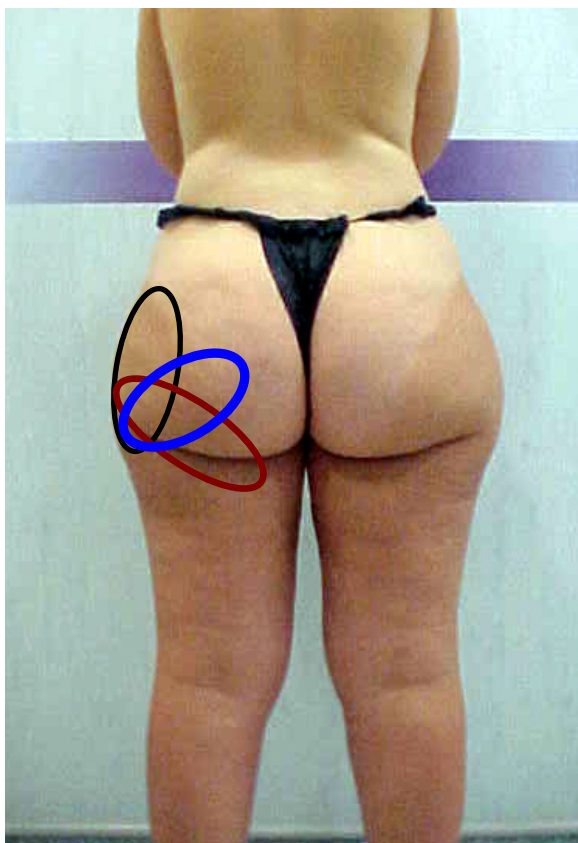


Figure 2 and 3. Infraumbilical abdominal ultrasound view baseline (left). Before and after treatment.

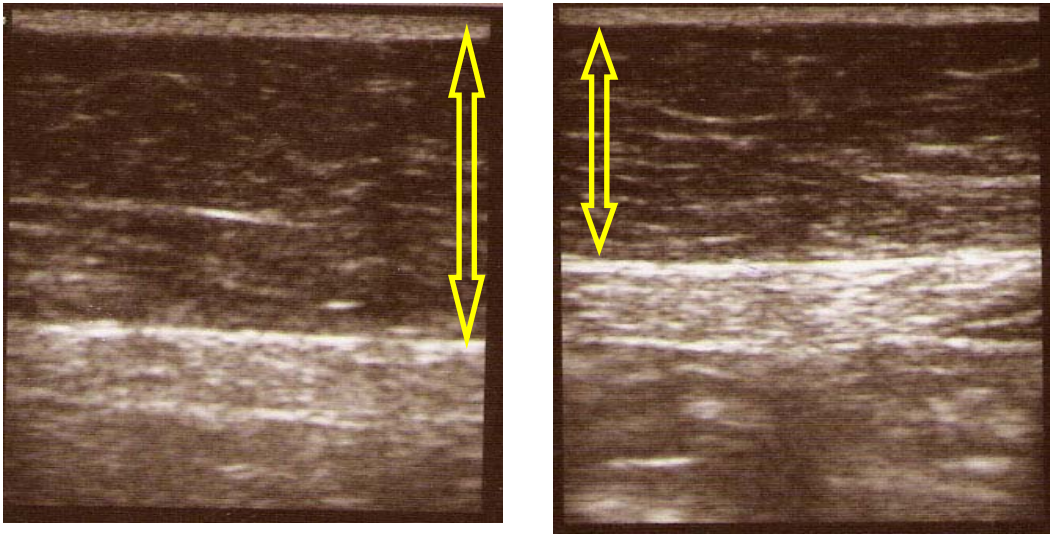


Figure 4 and 5. Pseudo-gynaecomastia in male. One additional session in right breast would be convenient for better results

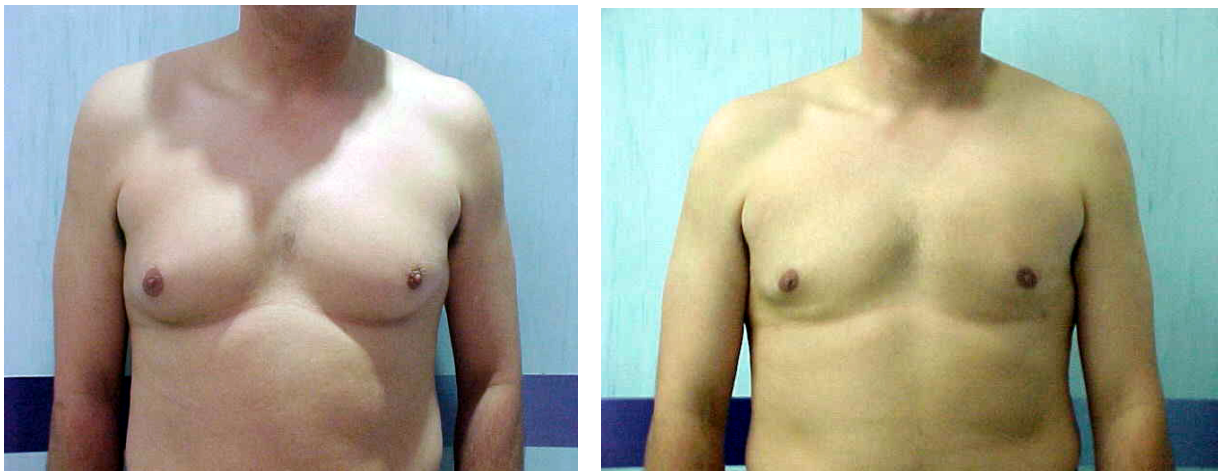


Figure 6 and 7. Abdomen before and after treatment with Ultrashape sessions

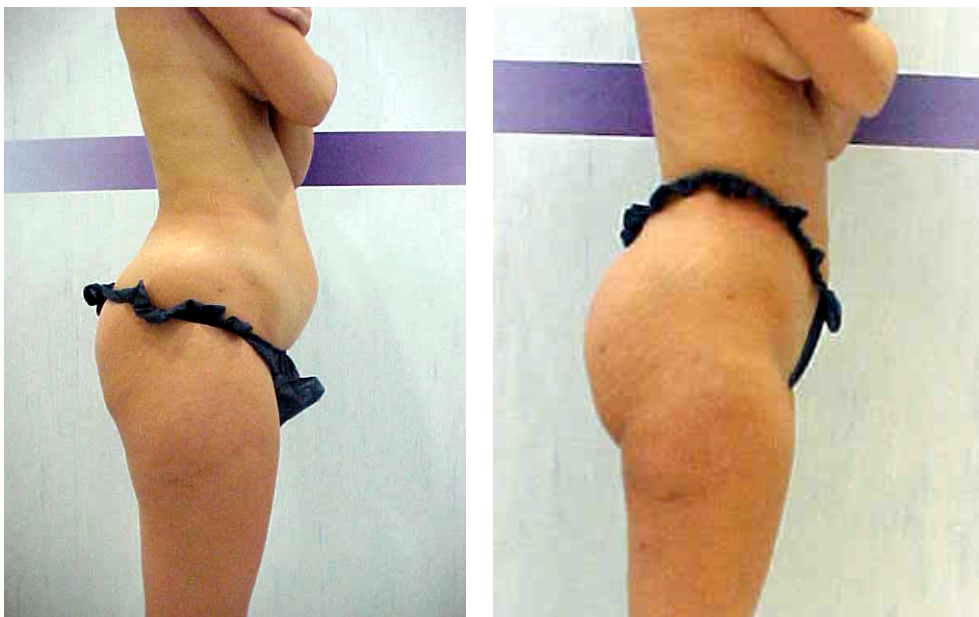


Figure 8 and 9 Outer thigh area baseline and after Ultrashape treatment. Back view.

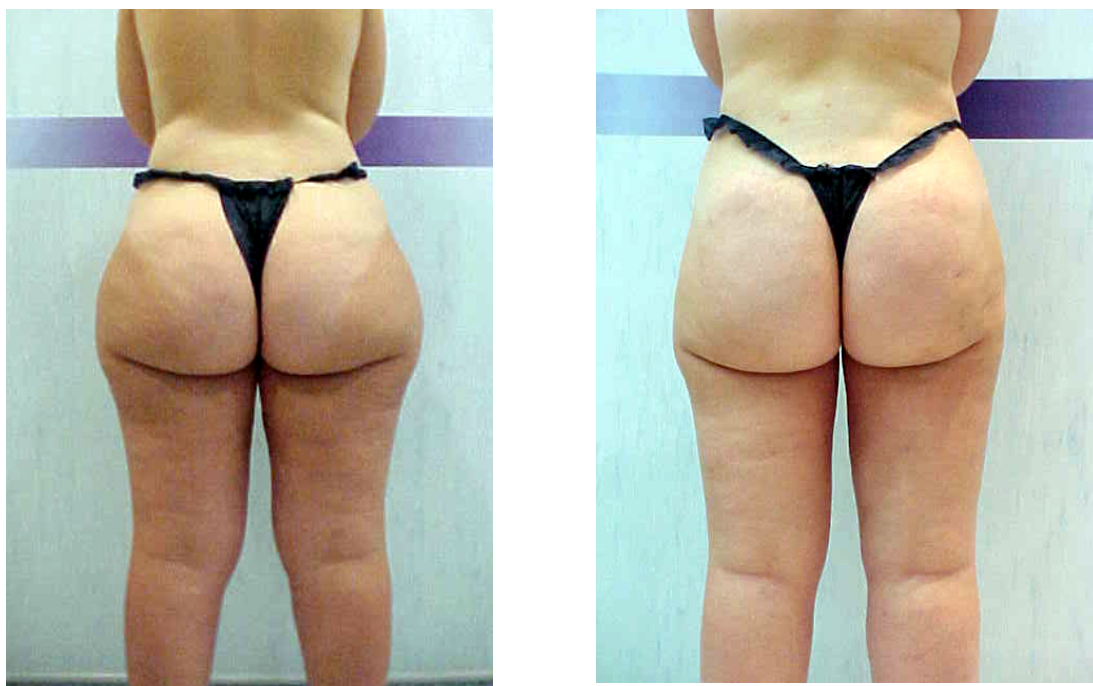


Figure 10 and 11. Front view of patient. Before and after photos.



Figure 12 and 13. Another case of thigh treatment. Frontal view. Before and after.



Figure 15 and 15. No cases of fatty liver disease were observed during Ultrashape treatment.

