
Treatment of Localized Adiposities Through the Combined Use of Lipocryolysis and Biological Detergents

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To cite this article:

Pablo Naranjo García, Rodolfo López Andrino, Hernán Pinto. Treatment of Localized Adiposities Through the Combined Use of Lipocryolysis and Biological Detergents. *Journal of Surgery*. Special Issue: Breakthroughs in Aesthetic Medicine.

Vol. 3, No. 1-1, 2015, pp. 25-27. doi: 10.11648/j.js.s.2015030101.18

Abstract: During the past decade, various techniques have been used for the non-surgical treatment of localized adiposities (flanks, hips, abdomen). They can be classified into two groups: lipolytic techniques promoting the release of triglycerides from adipocytes and adipocytolytic techniques promoting adipocyte destruction. The first group includes a significant number of procedures but the second comprises very few techniques: lipocryolysis, high-power focused ultrasound, and injection of biological detergents. This paper assesses the results of combined application of detergent injections and lipocryolysis during a single treatment session on the flanks.

Keywords: Lipocryolysis, Biological Detergents, Localized Adiposity, Lipodystrophy, Adipocytolysis

1. Introduction

The term “localized adiposity” (LA) refers to the presence of unwanted excess adiposity in localized areas of the body which cannot be removed with diet or exercise. LA is different from overweight and cellulite, although it can often be associated with these conditions. The areas of the body most commonly affected by these imperfections are the abdomen, the flanks, the trochanter area (hips), the double chin, the inner thighs and the inner knees. Lipocryolysis was first used in the 21st century and has evolved significantly during the past 10 years [1,2,3,4,5]. On the other hand, biological detergents have been used for almost 50 years [6,7,8,9]. However, although each method has evolved differently, both are currently essential tools in aesthetic medicine practices worldwide. A significant number of studies currently show that both the injection of biological detergents and the application of lipocryolysis are very useful and safe methods for the treatment of localized adiposities [10]. There are no records of joint application of a detergent and lipocryolysis, although their combined use empirically produces more satisfactory results in the reduction of LAs. Based on their proven safety [10] and the great number of treatments which have been performed with these two methods individually, it seems that their combination is

meant to be.

2. Material and Methods

This paper assesses the results of combined application of detergent injections and lipocryolysis during a single treatment session on the flanks. Combined treatment is routine at the Clínica Elite Láser in Madrid. In order to be able to assess the combined effect of lipocryolysis and detergents, the application of lipocryolysis on the left flank was postponed. Thus, the right flank where both treatments were applied was compared to the left flank, where only the detergent was applied.

All patients who started treatment for the reduction of localized adiposities in their flanks between December 10 and December 20, 2014, at the Clínica Elite Láser in Madrid were consecutively recruited provided they satisfied the following inclusion criteria: age between 25 and 50; no systemic pathologies; body mass index below 27; subcutaneous adipose panicle at least 1.8 cm wide as measured by ultrasound; treatment surface up to 10 cm²; not pregnant or nursing; not allergic to sodium dehydrocholate or lidocaine; no diagnosis of Reynaud’s disease or essential cryoglobulinemia; no dermatitis; and not having undergone similar procedures on the flanks within three months. The sample included ten volunteers ($n=10$). The Declaration of Helsinki for ethical

principles in medical research with human subjects has been followed.

Treatment was performed with Aqualyx® solution, Ghimas S.p.a, Casalecchio di Reno, Italy (specifications according to the insert) and with the Cooltech® lipocryolysis machine, High Technology Products, S.L., Barcelona, Spain. On the left flank, which served as a control, only the injectable solution was used, while the right flank also underwent a 10-minute lipocryolysis session after the detergent had been applied. The official treatment protocols were followed for both techniques. Half a vial (4 ml) of Aqualyx® was injected with a Lipoinject® cannula (25G, 0.5 x 70 mm long) in each area to be treated using the Intralipoterapia® technique. Then, 70 minutes of Cooltech® treatment at a sustained temperature of -8°C and a suction pressure of 220 mBar were applied on the

other flank. In order to prevent superficial cold burns from the lipocryolysis machine, a 28x30 cm CoolPad® anti-freezing membrane was applied with a thin layer of CoolGel® anti-freezing gel. At the end of treatment, the area was softly massaged during 10 minutes in order to restore its pre-treatment appearance.

The reduction of the volume of localized adiposities in the flanks was assessed approximately 1 month after treatment. A 4-13 MHz linear probe ultrasound machine (MyLab Class C, Esaote SpA) was used to measure SPA thickness in the flank area at the point of greater relief, using as reference the height with respect to the floor, with the patient's feet together, no shoes and arms crossed. All treatments were performed by the same physician, and all ultrasound assessments were made by the same specialist.

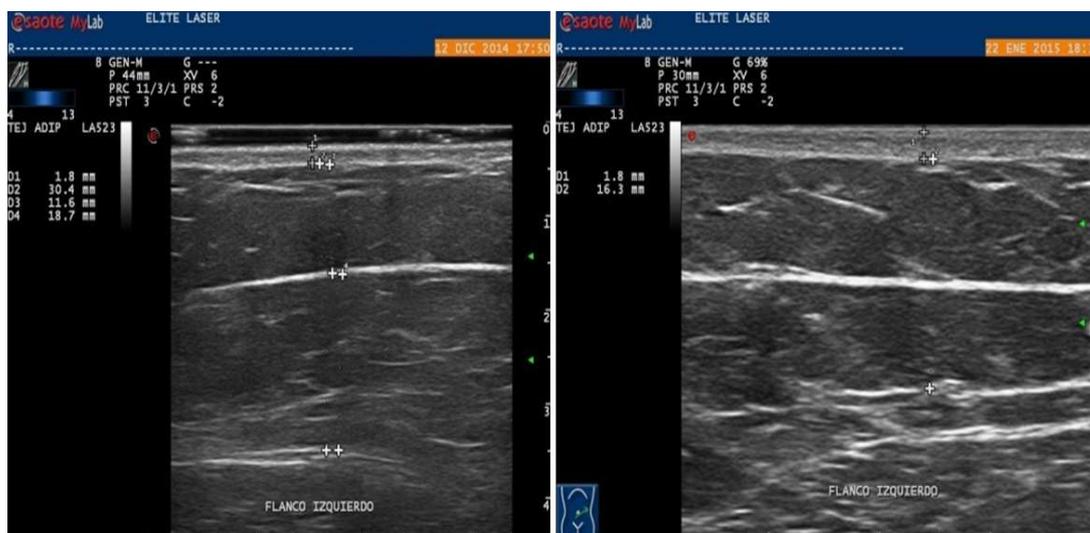


Figure 1. Mode B ultrasound. Left flank treated with Aqualyx®. 30.4 mm SPA before treatment (left) and 16.3 mm SPA one month after treatment (right).

3. Results

Table 1 shows pre treatment left and right flank thickness. The mean thickness was 35.87 mm (11.03) in the left flank and 41 mm (14.22) in the right flank. As foreseeable, the flanks are similar ($p=0.396$).

Treatment of the left flank reduced the thickness of the

adipose panicle from 35.87 mm (11.03) to 25.02 mm (9.66). The difference is statistically significant ($p=0.035$) and represents a 30.3% reduction. Treatment of the right flank reduced the thickness of the adipose panicle from 41 mm (11.03) to 23.85 mm (9.15). The difference is statistically significant ($p=0.005$) and represents a 41.8%.

Table 1. SPA thickness (mm). P: patient.

| P | Left Flank PRE (Aqualyx) | Left Flank POST (Aqualyx) | Right Flank PRE (Aqualyx + Lipocryolysis) | Right Flank POST (Aqualyx + Lipocryolysis) |
|----|--------------------------|---------------------------|---|--|
| 1 | 30.4 | 16.3 | 38.9 | 18.5 |
| 2 | 23.8 | 16.4 | 20.2 | 12.5 |
| 3 | 28.8 | 24.9 | 30.0 | 23.0 |
| 4 | 39.3 | 37.3 | 51.7 | 44.6 |
| 5 | 54.2 | 42.4 | 56.7 | 24.9 |
| 6 | 52.8 | 17.0 | 68.3 | 22.9 |
| 7 | 27.7 | 25.5 | 31.5 | 24.6 |
| 8 | 26.5 | 14.0 | 33.4 | 13.1 |
| 9 | 35.2 | 32.1 | 38.1 | 30.7 |
| 10 | 32.9 | 24.3 | 41.2 | 23.7 |

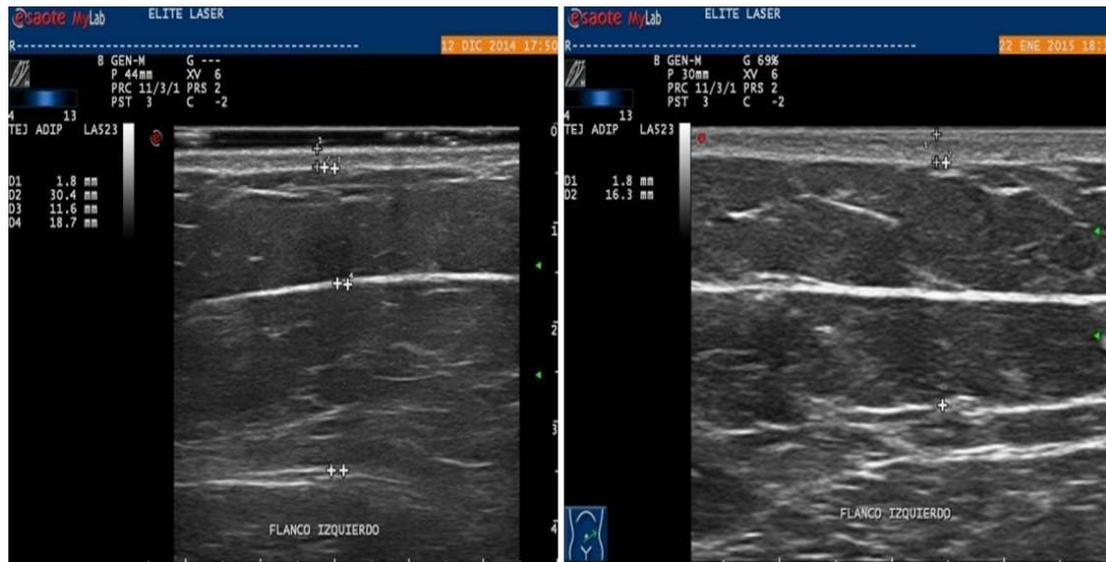


Figure 2. Mode B ultrasound. Right flank treated with Aqualyx® and lipocryolysis. 38.9 mm SPA before treatment (left) and 18.5 mm SPA one month after treatment (right).

4. Discussion

Treatment of localized fat accumulation with Aqualyx® is common at many aesthetic medicine centers. The Intralipotherapy® protocol limits the risk of side effects both at SPA level and at epidermis level, helping reduce SPA thickness in the treated area in a harmonious way [10]. With respect to lipocryolysis, it works based on the fact that adipocytes are more susceptible to cold than other tissues (such as muscle, nerves and skin) and that adipocyte death (apoptosis) can be programmed by inducing controlled percutaneous cold. Thus, intra-adipocyte lipids are crystallized and lead to apoptosis when they interact with the cell membrane.

The application of lipocryolysis combined with the detergent improves LA reduction results approximately by 25% (from a 30.3% to a 41.8% reduction). These results can be explained not only by the compounded adipocytolytic effect of both techniques, but also by the vasoconstrictor synergy: edema of the SPA due to infiltration and vasoconstriction due to the suction of lipocryolysis. The results assessed in these 10 cases suggest that the combination of both techniques may increase the individual effectiveness of detergents and of lipocryolysis in the treatment of LAs. These results should be contrasted with those of future studies including a greater number of patients.

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