

# Liposuction Assisted by Ultrasonic Homogenization Emulsifier

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## Abstract

**Objective:** The authors report on the use of the homogenized ultrasonic emulsifier to improve the body contour of a wide variety of patients.

**Background:** The introduction of homogenized ultrasonic emulsifying technology has allowed the application of lipoplasty techniques.

**Keywords:** liposuction, ultrasonic, homogenization, emulsifier.

## INTRODUCTION

Liposuction techniques have improved through the experience of the most experienced surgeons, wanting to achieve before, decrease the volume of fatty tissue in a given area, subsequently, shaping some areas to achieve better contours as a sign of beauty, enhance the beauty of the aesthetic contour appropriate to trends and fashions such as thinning of the crotch, lower waist circumference or arms with very diminished views and currently marked imitable musculature to give the patient the sporting effect; Liposuction assisted by (homogenized ultrasonic emulsifier) ultrasound has managed to incorporate a method for using thinner cannulas, less trauma to tissue other than fatty tissue, more refinement by shortening the space between dermis and subdermal tissue by further decreasing the amount of adipose tissue without injure the subdermal plexuses reaching contours or sculptures not previously attainable in human models.

The ultrasonic emulsifier homogenizer is a device designed to emulsify by means of ultrasonic vibration; reducing the size of the particles to distribute them

evenly and thus perform the effects of homogenization, dispersion and emulsion.

The system vibrates at 39 kHz (39,000 pulse per second), converting electrical energy to mechanical ultrasound waves thanks to sonotrodes.

## MATERIAL AND METHODS

The techniques achieved by traditional liposuction may be adapted to the use of an ultrasonic assistant, denoting greater safety and less likelihood in visible irregularities, the appearance of post-operative fibrosis, the surgeon's effort to treat areas where liposuction was previously done, bleeding, bruises, dermal lesions, among others.

In the liposuction of the upper limb it confers an important security in the treatment of the circumference of the arm with great ease of elimination of adipose tissue being squeezed and not aspirated, likewise, after a traditional liposuction, the ultrasonic assistant can regularize the tissue allowing greater retraction and avoiding irregularities that are perceived to muscle tension. (Fig.1)



**Fig 1**

In jowl liposuction it is possible to treat only with the ultrasonic assistant without performing subsequent liposuction by performing a manual scan for the removal of emulsified tissue. (Fig.2)



**Fig 2**

The face is a field where the ultrasonic assistant is of great importance, since it can be maintained in the subcutaneous space with a thinner cannula, performing an ultrasound stimulation, emulsifying the tissue to be treated and obtaining better retraction, helping to tunnel and dissect ultrasonically the skin prior to surgery of rithoplasties or advances of tissues and flaps.

The abdomen can only be treated with emulsification in conventional tummy tuck, reducing the restricted areas for liposuction, allowing the contour to be improved without removing vascular supply. (Fig.3)



**Fig 3**

In the case of modeling diseases, it has a great impact on the removal of the endured tissue with the need to concentrate the energy in the spaces that contain the model using great power to later be extracted by traditional liposuction. (Fig.4)



**Fig 4**

Advantages with ultrasound-assisted liposuction

- Less edema at initial trauma.
- Less injury to structures other than fatty tissue.
- Better and faster recovery.
- Less pain and edema.
- Virtually no bruising.
- Less exhaustion to the surgeon.
- Preservation of the superficial vascular plexus.
- During the time of use of the ultrasonic assistant it allows to give latency to the infused solutions to generate the major effects of vasoconstriction and tumescence.

### **PATIENT SELECTION**

Liposuction was performed as a primary procedure to improve body contouring, to tighten relaxed skin and supporting structures. The candidate for a lipoaspiration was the relatively normal weight individual who possessed excess fat in certain areas of the body. The procedures were performed under general anesthesia or by regional blockages and sedation depending on the region to be treated and the patient's preference.

### **Technique**

#### ***Considerations of its Use***

- Use with 1: 1 or 2: 1 technique
- Time is defined according to the amount of tissue, the perception by the surgeon's hand and the treated area.
- Movement "sway" slower than in the management of liposuction.

- Continuous movement, never static.
- Deep planes towards the surface.
- Anatomical management of each area to be treated
- Never stop feeling the tip of the ultrasonic cannula.

It is a more gentle technique with the manipulation of the tissues and that allows to extract the fat in a more atraumatic way, this is without passing the cannula so many times, without producing so much bleeding, inflammation and bruising.

The technique comprises three phases:

1- Infiltration. A solution is injected into the fat areas before removing the fat. The liquid is a mixture of saline, lidocaine and epinephrine. The fluid helps to eliminate fat easily, helps reduce blood loss and provides anesthesia before and after surgery and also helps reduce bruising.

2- Emulsification. Because the heat generates, it promotes the production of collagen that enriches the elasticity of the skin. This is one of the reasons why emulsification can be used in middle-aged people, since the chances that the skin has a greater chance of recovery are good, as well as that the skin has a better appearance after Surgery.

3- Evacuation and contouring. By moving the cannula in and out repeatedly, the fat is released and then aspirated. Although the lipoaspiration is performed in two planes, the greatest intensity of the lipoaspiration is done in the deep plane with a cannula 4 and in the superficial SMAS plane with cannula 3, for better contouring of the skin. (Fig.5)



Patient Pre. trans and 3 months Post

Fig 5

**RESULTS**

200 patients were treated by three different surgeons.



Comparison of tissue extracted with LAUH vs with traditional liposuction. The amount of emulsified decanting vs. lipoaspiracion is approximately 190ml vs 550ml approximately and respectively.



LAUH lipo, abominoplasty with breast augmentation A) PreOp. and B) 20 days Post OP.

LAUH lipo, abominoplasty A) PreOp. and B) 30 days Post OP.

### COMPLICATIONS

Its drawbacks would be that it can cause thermal burns, it is slower than conventional, requiring a longer surgical time and above all that the effects of the energy generated by ultrasound is not limited only to fat, the role they could have favoring being discussed demyelization of peripheral nerves.

The ultrasound-assisted liposuction technique requires maintaining adipose tissue with a large amount of an aqueous medium in order to dissipate the powerful ultrasonic effect and achieve the cavitation effect that emulsification will achieve in adipose tissue, which is why it is important that the constant and correct measurement of infiltrated volumes, temperature, oximetry, urinary expenditure are necessary.

The technique of ultrasound-assisted liposuction confers advantages over many other technologies that assist in liposuction, however, the use of an instrument with great capacity for cavitation and dissection should be used by a surgeon who is skilled in the art of liposuction because its Features give it ease for penetration of abdominal spaces, its ultrasonic vibrational power increases heat so that lack of movement can cause harmful thermal effect to the subdermal and dermal tissue.

Most of the expected complications should be identified separately, taking those that are due to the technique of extraction or liposuction and that due to the use of the ultrasonic instrument.

Irregularities, lesions of superficial vascular plexuses, bruises, loss of continuity of the skin, can be classified as a misuse of the aspiration cannula from its placement according to the depth, as well as the placement of the holes towards the subdermal part in an already devastated tissue of adipose tissue. The presence of seromas, burns, hydro-electrolyte imbalances or metabolic disorders due to infused volume considerations, may be due to excessive use of the ultrasonic instrument, the immobility of the cannula depending on the function and poor management technique of the tip of the ultrasonic emitter. The complex metabolic disorders that derive from volume management will have to be constantly assessed and treated during and after surgery, taking into account that the infiltrated volume will be maintained longer in a third space during ultrasonic emulsification, than the resulting tissue Emulsified and aspirated will

contain less liquid than in the traditional technique, the amount of anesthetic used and the consideration of its use in techniques under regional anesthetic block. It is common to think of the presence of seroma in the patient of ultrasound-assisted liposuction due to the emulsification that has been performed, together with the closure of the approaches that must be kept open or to think about the placement of drains that allow their exit. Compression garments for the postoperative period should be worn 24 hours with a single removal for important physiological needs, while maintaining the compression of the treated tissues avoiding the collection of liquid in uncompressed spaces.

Burns, loss of continuity of the skin or infections present, should be treated by the surgeon with the expertise and experience required by each injury and individualizing the treatment according to its extent, severity or severity of the pathogen.

### CONCLUSION

Ultrasonic emulsifying liposculpture has managed to incorporate a method to use thinner cannulas, less trauma to tissue other than fatty tissue, more refinement by shortening the space between subdermal tissue.

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