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Use of Ultrasound-Assisted Liposuction for the Treatment of Breast Hypertrophy, Surgical Clinical Prospective Study on 45 Cases

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Breasts are a very important part of the woman's body. They have always been considered as a zone impregnated with sensuality and are inevitably associated with feminine harmony and beauty. There is No ideal breast size and beauty standards vary greatly from one person to another. In any case, the most important thing is that the woman feels at comfort with her breasts, that she feels in balance with her body and if that is not the case to seek a medical solution.

Breast hypertrophy (very large breasts) is usually a big problem for patients. Besides the alteration of the body contour and the psychological disorders that this entails with the body image, its self-esteem and that affects its quality of life, on the other hand in many occasions it generates back pain with numbness of arms and hands, these last associated with the pressure exerted by the bra straps on the shoulders. At other times, skin irritations occur from rubbing and moisture [1].

Breast reduction is a surgical intervention that aims to correct breast hypertrophy (decrease the volume and weight of the breast) by carrying out a series of surgical incisions that will remove the excess tissue and sagging of the breasts. This way it can place the breasts in a more harmonious position with the rest of the body and you get an excellent look but aesthetically the scars remain.

Breast hypertrophy (large breasts) is the result of a significant increase in the volume and weight of the breasts either post-puberty, pregnancy, or because of age.
The normal breast usually weighs between 250 to 400 grams. From this value we can observe:
Mild hypertrophy: Between 400 and 600 gr
Moderate hypertrophy: between 600 and 800 gr
Severe hypertrophy Mastoplastia: between 800 and 1400 gr
Gigantomastia: More than 1500 gr

Types of gigantomastia

Gigantomastia can be divided into some subtypes.
Subtypes of gigantomastia include:

- Gestational or pregnancy-induced gigantomastia.
- Puberty-induced or juvenile gigantomastia
- Medication- or drug-induced gigantomastia.
- Idiopathic gigantomastia

(Modification of the classification of Lalardrie and Jouglard) [2].

Still existing this and many other classifications, over time we have conclude that a hypertrophy is all that size of breasts that unlike the patient. This distress can be because of the aesthetic aspect, alteration of the body imagen, psychologic problems, difficulties with the self-esteem or the pain generated by the weight.

- Reduction Mastoplasty (RM) offers substantial symptomatic relief for patients with hypertrophy of the breast and results in significant improvement in the patient's quality of life. There are studiesthat demonstrates how the surgeon must take in consideration, upper- and lower-back pain, painful bra strap grooves, teasing, and poor self-image before deciding which patient to treat [3].

Physical sign/symptom [4].

Numerous investigations have demonstrated improvement in physical and psychological symptoms after RM [5]. The option for reduction mastoplasty could be the surgical open mastopexy (different techniques) or the use of the liposuction. Nowadays we use the Ultrasonic assisted liposuction UAL for our procedures.

Despite all the surgical techniques that have been developed to treat breast hypertrophy is our criterion that still the sequel of scars leaves a physical and psychological sequel in patients [6]. It is for this reason that we propose the UAL treatment in the medium and large mammary hypertrophy. We started doing that procedure in 2008. Our intention or justification: it is decrease the psychological impact of the scars that remain of the open reduction or excisional, on the other hand demonstrate that there is no evidence in the studies of radiology (US and mammography) that a procedure was performed compared to the open reduction.

Ultrasonic liposuction was introduced by Zocchi, in Italy, in 1992 as an alternative to conventional blunt cannula suction [7]. This technique is based on the application of ultrasounds to the fattytissue to be aspirated, resulting in both thermal effects and mechanicaleffects to the surrounding adipocytes. These mechanical oscillationspass through the probe that emits the waves from its tip. The thermaleffects play a role in fat dissolution and must be dissipated by tissueinfiltration.

In this way, Zocchi tried to make aspiration easier and to preservethe neurovascular structures, which can be destroyed by the cannulas.

Zocchi detailed what he believed were the advantages of Ultrasonictechnique over traditional liposuction: "*a more selective destruction ofthe undesired tissue while preserving surrounding higher-densitystructures; elimination of the "fluid part" of the adipose tissue (fattyacids), leaving the adipocyte wall and intercellular substance to create asmooth skin surface; skin contraction secondary to stimulation of thedermis by ultrasonic energy; correction of cellulite; once the fat isdissolved with ultrasound, the procedure requires less physical exertionon the part of the surgeon*" [7,8].

The first publication about the use of reduction female breast enlarged was published for A.Di Giuseppe when he said "*Ultrasound-assisted lipoplasty for reduction of fatty breasts and fixation has been found to be a safe technique with promising aesthetic results when it is applied in selected patients and performed by a surgeon with expertise with ultrasound-assisted body contouring*" [9].

Each patient was evaluated preoperatively with mammograms for correct assessment of the nature and consistency of the breast tissue. Only patients with fibrofatty and fatty breast parenchyma were selected for breast reduction and fixation with ultrasound-assisted lipoplasty. Patients with suspect mammograms (calcification) and a strong family history of breast cancer were not considered.

Another option are the Liposuction combined with traditional resection mammoplasty allows volume reduction before excision and refining the results after the reconstruction with an easier surgical procedure and better aesthetic results [10-11].

We decided use only the UAL

Linked to the breast tissue treated only with conventional lipectomy, a stronger destruction of the cellular structure of adipocytes could be noticed with the UAL. The destruction was visible even in areas more distant from the aspiration channel. In contrast, the breast tissue was generally intact, no signs of ultrasonic-induced cellular destruction were visible. Near the direct mechanical destruction of the fat tissue by the probe, no further alterations of the cellular integrity of the glandular parts were visible. In conclusion our results indicate that UAL is also a safe technique for use in breast surgery [12].

The introduction of VASER (vibration amplification of sound energy at resonance) technology has enabled the application of lipoplasty techniques to the superficial fat layers. Superficial fat layers mean best retraction of the connective tissue and skin [13].

Superficial UAL allows (through minimal skin incisions) the utilization of 2,2 mm. solid titanium probes to fully undermine the subcutaneous tissue, thus allowing excellent skin retraction. Deeper planes are treated with 2,9 mm or 3,7 mm probes for faster emulsification. Grooved probes increase efficiency of the system.

The VASER System represents a major advance in the application of ultrasonic technology to cosmetic procedures. Combined with precision fluid management, controlled and selective tissue emulsification, a solid grooved probe design and patented cannula, minimize trauma to the tissue matrix.

The latest generation of ultrasound technology - known as the VASER System - ***fragments fatty tissue before it is removed.***
Benefits of VASER LipoSelection® include:

- Controlled ultrasound energy selectively fragments fat, leaving nerves, blood vessels and connective tissue largely intact.
- Patented grooved probes disperse energy to maximize efficiency in various types of fatty tissue, from delicate to fibrous.
- Patients report low to minimal pain

The internal ultrasonic technology
It uses high frequency sound waves to emulsify and break the fat. A titanium probe emits vibrations at a very short distance of 36.000 cycles/second.
The power of the tip is released through the grooves at the end of the probe.
The force of tension of the material determines which is destroyed and which is not. (Tension gradient)

UAL allows safe and efficient harvesting of the mesenchymal stromal cellular fraction of adipose tissue and that cells harvested via this method are suitable for cell therapy and tissue engineering applications [14].

The VASER-assisted lipoplasty method demonstrated a 53% improvement in skin retraction per cc of aspirate removed relative to the traditional SAL method and an average reduction of 26% in blood loss compared to SAL [15].

Study

For three years 45 patients were under this type of surgery and we have a follow up of three years.

Advantages

Less effort and time applied by the surgeon, Minimal trauma to breast tissue, no visible scars, important breast lift, reduced breast volume, reduced psychological impact, less bleeding, no wounds, no sutures, less recovery time, less effort and time applied by the surgeon

Disadvantages

Limited to patients with excess adipose tissue, less breast size reduction than open reduction, glandular hypertrophy, Impossibility to move the nipple-areola complex. (Elevation), impossibility to decrease the size of the areola

Before this procedure is carried out, the patient must have a complete medical diagnosis: including clinical history, physical examination, blood tests, and, in particular. A 4d ultrasound and mammography to verify that the patient has nodules or suspicious images and to determine whether adipose tissue or breast tissue is the cause of the patient's mastoplastia [16]. In our protocol for all the patients before the clinical examinations, then the mammography and in cases of doubts the 4D ultrasound

We used 4D Ultrasound for exclusion criteria, determine:

1. Volume of fatty tissue Vs. breast tissue; I chose only patients with predominance of fatty tissue for better esthetic results.
2. For the exclusion of patients with suspicious images like nodules, tumors, fibrocystic disease.

Anesthesia

We usually use conscious sedation with local tumescent anesthesia [17]. In a few cases we should use general anesthesia, in every case the anesthesiologist oversees the patient's control.

We use oral sedation, (30 - 60 minutes before the procedure) with Lorazepam 2 mg and Dimenhydrinate-50 mg,

If is necessary we use EV sedation (under anesthesiology control), with Midazolam 15 mg / ml and fentanyl 0.05/ml. in few cases we need used Propofol 1% [18].

Advantages of the use local tumescent anesthesia ambulatory, less bleeding, no pain, after surgery, fast recovery, lower cost, less use of narcotics

Local anesthetic tumescent is infiltrated

Approach Route Probe and cannula entry points

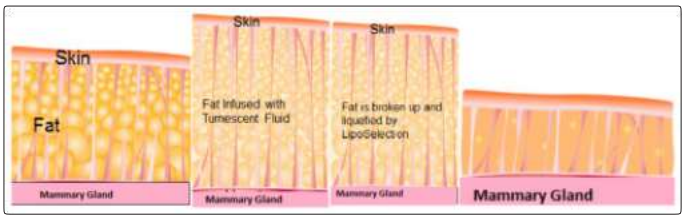
Normally we use 2 to 4 entrance holes one through the sub mammary crease, 2 through the areola and in certain cases one through the anterior axillary line.

The internal ultrasonic technology

It uses high frequency sound waves to emulsify and break the fat. A metal probe emits vibrations at a very short distance of 36.000 cycles/second. The power of the tip is released through the grooves at the end of the probe.

15 minutes after completing the tumescent infiltration, Emulsification It is made with a 2-ring 3.7 mm ultrasound probe; 70-80% power setting in continuous mode.

The adipose tissue is emulsified using an internal ultrasound probe It is important to pay attention to the use of the skin protector where the ultrasonic probe is inserted to prevent skin injuries



Total emulsification time for each breast is 30min.

It is possible to see how the emulsified adipose tissue comes out through the holes

The emulsified fat and the anesthetic tumescent infiltrated solution is vacuumed with 3mm Roma cannula to a 20% suction power.

We used a special design 3 mm cannula

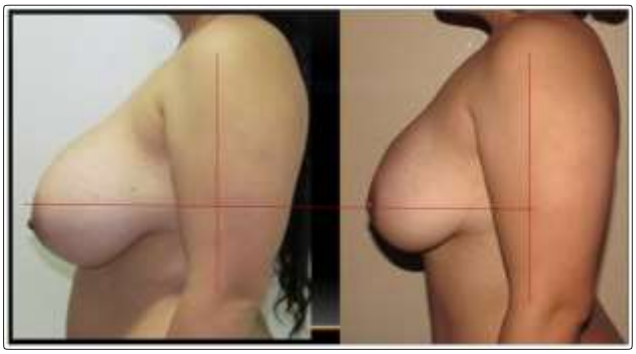
We perform a gentle aspiration through all the boarding holes

The elevation of the nipple-areola complex was 5, 5cm

10 days post op

10 days post op

No retractions visible by the healing process, aesthetically conserved



Without visible scars or sequels of necrosis, we minimize the psychological impact

Breast reduction with UAL Breast reduction with excisional Morphology conserved technique sequalae of necrosis and deformity by scarring Complications over 45 patients with a follow up of three years

infection…..0
hematoma…0
skin necrosis..0
seroma…….1
Burns skin….1

little burns in the neeple

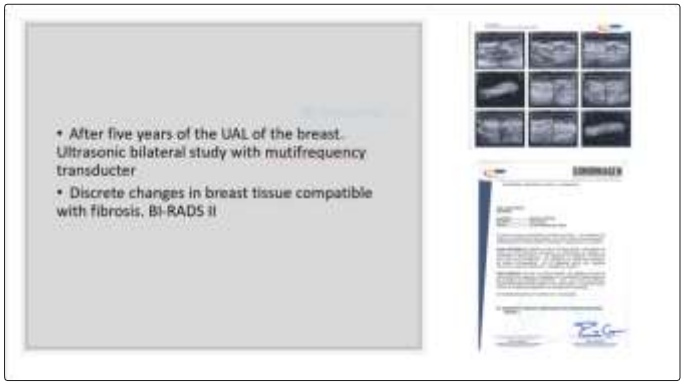
Conclusions

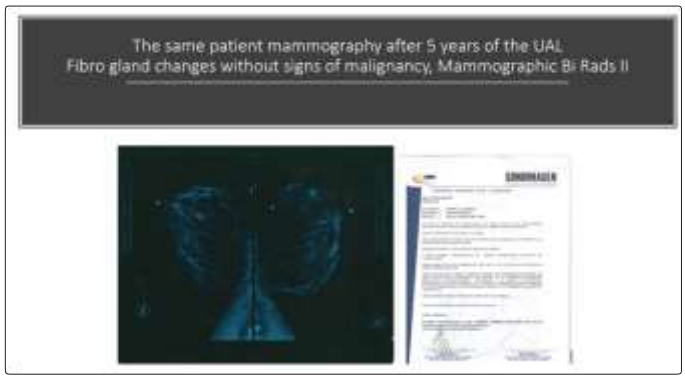
Our patients have had significant and satisfactory results. There is so little trauma to breast tissue that studies andthe mammography's usually appear normal (BIRADS I) after breast reduction with ultrasound assisted lipoplasty [19,20].

Study inside the normal parameters.

Reduction mammaplasty can alleviate the psychological impact of symptomatic macromastia. We have no doubt that this type of surgery, when indicated, provides physical and psychological relief to patients [21].

The results of this study indicate significant improvements in health-related QOL at 4 months after breast reduction in a population of patients with macromastia. The authors also demonstrate excellent responsiveness of the BRASS [22].





Reduction mammaplasty was significantly associated with improvements in health-related quality of life and breast-related symptoms of adolescent or adult patients, with measurable improvements in physical and psychosocial well-being evident by 6 months postoperatively and still demonstrable after 3-years. More when it is obtained through a surgical procedure that leaves no visible scars and Idoneal hands provides good clinical and aesthetic results. These principally do not vary by BMI category or age. Patients and providers should be alert of the potential positive impact that reduction mammaplasty with UAL can provide women with symptomatic macromastia [23].

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