Vacuum-Cavitation Therapy Versus Liposuction on Lipoedema in Female

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ABSTRACT

This study had been conducted to evaluate the efficacy of the vacuum-cavitation therapy versus liposuction on lipoedema in female. Methods of evaluation (Measurement of the thigh circumference and thigh skin fold), Forty female patients with lipoedema in their thighs, were divided into two groups. Group (A) received the vacuum-cavitation therapy in addition to the routine medical and nursing care as well as the routine physical therapy. Group (B) underwent liposuction in addition to the routine medical and nursing care as well as the routine physical therapy; Measurements were conducted before starting the treatment as a first record and at the end of the third month of treatment as a second (final) record. Results showed that both vacuum-cavitation therapy and liposuction were effective but vacuum-cavitation therapy was more fruitful and beneficial in decreasing lipoedema in females.

INTRODUCTION

Lipoedema or painful fat syndrome is a distinct clinical condition, characterized by bilateral and symmetrical enlargement of the upper and lower leg with tenderness but excluding the feet. Lipoedema occurs almost exclusively in females and no male patient has been reported in the literature. We report on an extremely rare presentation of lipoedema in a male patient. A thorough study based on the case history, physical manifestations, and magnetic resonance imaging (MRI) provided valuable clues for a differential diagnosis. Conservative treatment using weight reduction, compression-stocking application, with vacuum therapy and diuretic therapy was not effective. Tumescent liposuction with postoperative pressure garments provided a satisfactory treatment[7,14,16.].

It is a disproportional obesity that nearly always affects women and is characterized by bilateral, symmetrical, biker's hosiery-shaped fatty swelling of the legs. In several cases, arms are also affected by fatty hypertrophy. Edema usually tends to have an orthostatic prolongation. Up to 11% of women or postpubertal girls may be affected to some degree and it is presumably associated with a genetic background[7,19].

Today, however, a large number of physicians remain unaware of the disease and its symptoms, many lipoedema patients are not correctly diagnosed or effectively treated until after they have endured decades of suffering. Epidemiological statistics on the incidence of lipoedema are not available. An investigation of patients treated at one lymphedema clinic from 1995 to 1996 revealed lipoedema in approximately 15% of the patients treated on an inpatient basis. A similar number (8% to 17%) was reported in surveys carried out in 2003 in four lymphedema clinics in Germany[3,7,14].

Lists of synonyms for lipoedema are the following: Lipalgia, Adiposalgia / Adipoalgesia, Adiposis dolorosa, Lipomatosis dolorosa of the legs, Lipohypertrophy dolorosa, Painful column leg and Painful lipoedema syndrome. Lipoedema is characterized by symmetric lower extremity enlargement secondary to the deposition of fat. Lipoedema is not rare, but it is commonly misdiagnosed as lymphedema, woman with massive lower extremity enlargement that responds to compression therapy. Magnetic resonance imaging of the lower extremities helped to confirm the diagnosis[5,8,13].

Lymphatic disease is quite prevalent and often not well clinically characterized. Beyond lymphedema, there is a broad array of human disease that directly or indirectly alters lymphatic structure and function. The symptomatic and objective presentation of these patients can be quite diverse. Lymphedema is discussed along with chromosomal disorders, lymphangioma, infectious diseases, lymphangioleio-

myomatosis, lipedema, heritable genetic disorders, complex vascular malformations, protein-losing enteropathy and intestinal lymphangiectasia[5,10,14].

Drew the attention to a syndrome consisting of local fat deposits around ankles, wrists and hips (Matronenspeck), erythrocyanosis puellarum crurum and perniosis follicularis which occurs in young women, these women showed menstrual cycle disturbances and were prone to develop striae distensae. Patients with this constitution were often called "Typus Rusticanus", because these girls showed the rosy rural appearance of farmer's daughters. In the early stages of lipoedema, computerized tomography, magnetic resonance imaging and biopsy have demonstrated that oedema is minimal and limb swelling is due entirely too lipomatous hypertrophy and hyperplasia[2,9,20].

Vacuum therapy is a new and successful method for obesity treatment and for reduction of subcutaneous fat and improvement in cellulite appearance by vacuum and massage, it is a safe and more efficacious than exercise alone for reducing subcutaneous fat in the thighs of normal women. At least eight out of 10 women have cellulite in areas such as their thighs, hips and buttocks. Many women resort to cellulite creams, massage therapy or anti-cellulite vacuum treatments to help diminish the "cottage cheese" appearance of the skin[1,4,9,18].

Liposuction is now a standard very effective surgical procedure of low risk. Complications described in the literature, including deaths, are generally the result of failure to observe internationally established guidelines and are sometimes due to the lack of basic medical skills on the part of the surgeon[3,5,7,20].

MATERIAL AND METHODS

Subjects:

Forty female patients who have lower limb lipoedema, their age ranged from 20 to 45 years and they were selected from out-clinics of the teaching hospitals. Patients were not familiar with the technique of the vacuum-cavitation therapy or the liposuction surgical procedure; they were divided equally in number into two groups. They were received the vacuum-cavitation therapy with Starvac Vacuum Massage for the first study group and the liposuction surgical procedure for the second study group. All patients were received the routine medical and nursing care as well as the routine physical therapy.

Instrumentation:

In this study (Starvac Vacuum Massage), which is an advanced apparatus for the application of vacuum-cavitation therapy for the treatment of lipoedema in the lower extremities, vacuum Massage Cellulite Removal appliance combining vacuum suction massage with a "palpating and rolling" technique - innovation dedicated to efficiency. Vacuum Massage Cellulite Removal creates a partial vacuum on the skin surface and sucks up the skin between two mobile rollers located inside a suction cap. The spacing between the Vacuum Massage Cellulite Removal rollers adapts to the fold of the skin. While the Vacuum Massage Cellulite Removal suction cap moves, the skin fold is rolled and massaged, giving the unique "massage-roller-suction" action. Two spreading edges, located front and back of the rollers, increase the lymphatic draining effect, while the two additional rollers at each end of the working surface make it easy to move the suction cap[3,7,11,12].

Procedures

Evaluation:

1-Tape measurement:

An Erchonia body tape measure made in USA was used in measuring the mid- thigh circumference in cm via a plastic tape measurement[7, 12].

2-Skin fold caliper:

The thigh skin fold in cm via a skin fold caliper. It made in Italy which is accurate to +/- one millimeter, tips pivot automatically for parallel measurement, easy to read scale measures skin folds up to 60 millimeters and low friction bearings on all critical pivot points. Accu-measure fitness 3000 is used to assess the change in the thickness of a fold of a skin on abdomen. Measurements were conducted before starting the treatment as a

first record and at the end of the third month of treatment as a second final record[3,11].

Treatment:

The female lie on bed with the two lower limbs exposed and uses gel to cover upper leg before starting the session. Then the machine turned on, select language, Press PB 1 to browse through the languages proposed and select the required one, Press PB 3 to validate your choice. Level 2 choose the type of treatment, Press PB 1 to display the two major types of treatments proposed and select the required One, Press PB 3 to validate your choice.

Level 3 choose the programs family, Press PB 1 to display the programs families under the type of treatment chosen and select the required one, Press PB 3 to validate your choice. Level 4 choose your program, if you wish; you can momentarily stop the program by pressing PB3 again. The program comes to a halt and you just have to press PB3 again to re-start the program, if you wish to stop the program, press PB 5 (STOP).The program is stopped and the screens witches back to the previous one[3,9,20].

Typical lipoedema treatment session:

Duration of the treatment session was 30 to 45 mn.

1) Basic treatment:

- It is composed by a series of 7 strokes to be performed in the order described below.
- The 1st stroke starts below the back part of the superior iliac spine. It follows the iliac spine up to the fore part of the superior iliac spine.
- The 2nd stroke starts from the same point and goes obliquely to the greater trochanter.
- The 3rd stroke start from the gluteal fold goes below the buttocks, through to the greater trochanter.
- The 4th stroke is made of 3 lines following the lumbar sacral iliac fold.
- The 5th stroke starts from the 4th lumbar vertebra and follows obliquely to the iliac crest.
- The 6th stroke is made of a series of lines spaced out between the 4th lumbar vertebra and the 12th dorsal vertebra, each line goes back and forth from the crests.
- The 7th stroke goes from the trunk external part by the 12th rib to meet the 12th dorsal vertebra[3,9,20].

2) Treatment options: 3 to 5 minutes:

- Double suction cups (CC7) Recommended for old & fibrous cellulite types, localized on the thighs and the abdomen .This is a treatment preliminary to the treatment heads treatment stage, allowing a gain in time and efficiency on the areas concerned.
- Start the double suction cups program; apply the 4 double suction cups on the areas to be treated.
- Leave the cups on for about 30 seconds, then take them away and place them on the following zone to be treated.
- Basic suction cups (C4 to C7), recommended for a painful and localized cellulite, accompanied by dermalgia points.
- Start the painful fat removal program and choose the transparent suction cup. Apply the Starvac cream, and then apply the suction cup (which size must be selected according to the area receiving treatment) on the painful area. Once the dermalgia points relieved and the painful sensation taken away, this treatment phase can be suppressed, to be replaced by the treatment head session[3,9,20].

3) Treatment heads: 20 to 25 minutes:

- Apply Starvac cream on the areas to be treated, and then carry out treatment by working in all directions.

4) End of treatment session: 5 to 10 minutes

A massage can be performed with the treatment heads, in order to drain the body from all the elements generated by the action of the lipoedema treatment[3,9,20].

- All patients were instructed to walk one hour per day till the end of the treatment and for a month after to maintain the obtained results.
- Frequency: 2 times per week with 35 to 45 min per the session.

Duration: Total duration time will be three months (until complete effect is obtained)[3,9,20].

Data Analysis:

The thigh circumference measurement (TCM) in cm and the thigh skin fold (TSF) in cm were measured before starting the treatment and after 3 months of treatment in

both the first and second study groups. Collected data were fed into computer for the statistical analysis; descriptive statistics as mean, standard deviation, minimum and maximum were calculated for each group. The t-test was done to compare the mean difference of the two groups before and after application and within each group. Alpha point of 0.05 was used as a level of significance[21].

RESULTS

As shown in table (1) and figure (1), the mean value of the TCM before treatment was (81.66±1.63) cm in the first study group, while after treatment was (70.33±1.24) cm. These results revealed a significant reduction in TCM (P<0.05). But in the second study group, the mean value of the TCM before treatment was (81.63±1.59) cm, while after treatment was (73.11±1.32) cm. These results revealed also significant decrease in the TCM (P<0.05).

Table (1): Comparison of the mean values of TCM before and after treatment in both groups.

	Before treatment		After treatment		t value	P. value	Level of significance
	Mean	SD	Mean	SD			
First study group	81.66	1.63	70.33	1.24	2.14	< 0.05	Significant
Second study group	81.63	1.59	73.11	1.32	2.21	< 0.05	Significant

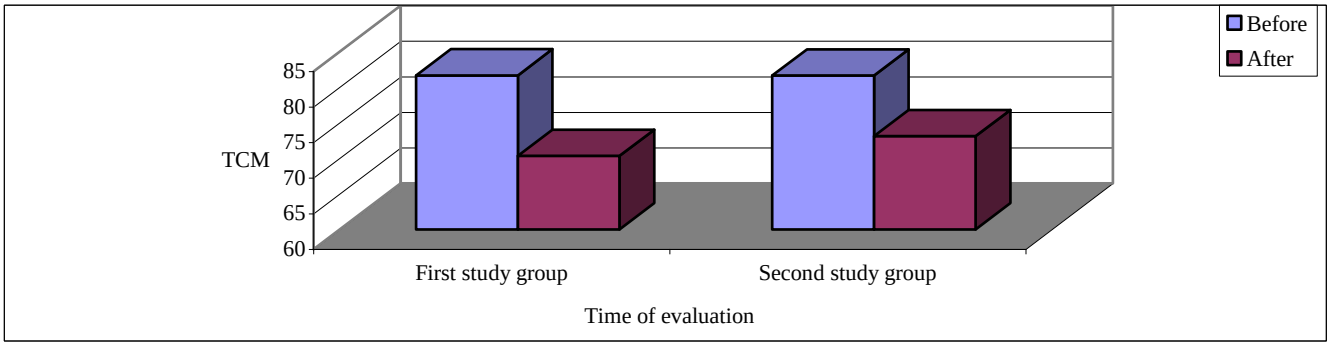

Fig. (1): Mean values of the TCM before and after treatment in both groups.

Also, as shown in table (2) and figure (2), the mean value of the TSF before treatment was (8.55 ±0.55) cm in the first study group, while after treatment was (5.27± 0.49) cm. These results revealed a significant reduction in TSF (P<0.05), while in the second study group, the mean value of the TSF before treatment was (8.62±0.47) cm, while after treatment was (6.18±0.44) cm, these results revealed also significant decrease in the TSF (P<0.05).

Table (2): Comparison of the mean values of TSF before and after treatment in both groups.

	Before treatment		After treatment		P. value
	Mean	SD	Mean	SD	
First study group	8.55	0.55	5.27	0.49	<0.05
Second study group	8.62	0.47	6.18	0.44	<0.05

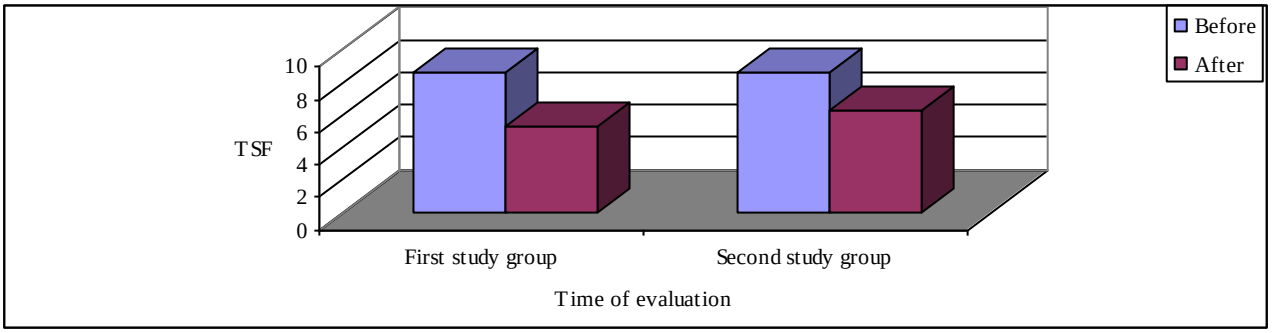

Fig. (2): Mean values of the TSF before and after treatment in both groups.

DISCUSSION

The prevalence of obesity has increased by about 10-50% in the majority of European countries in the last 10 years and currently affects 77% of males living in urban areas of Western Samoa in the pacific, obesity is associated with numerous health complications which range from non-fatal debilitating conditions such as osteoarthritis, to life threatening chronic disease such as coronary heart disease, and from lowered self-esteem to clinical depression. Recent estimates suggest that between 2 to 8% of the total sick care costs in Western countries are attribute to obesity[3,7,16].

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Vacuum therapy is a new and successful method for obesity treatment and for reduction of subcutaneous fat and improvement in cellulite appearance by vacuum and massage; it is a safe and more efficacious than exercise alone for reducing subcutaneous fat in the thighs of normal women. At least eight out of 10 women have cellulite in areas such as their thighs, hips and buttocks. Many women resort to cellulite creams, massage therapy or anti-cellulite vacuum treatments to help diminish the "cottage cheese" appearance of the skin[6,10,13].

The increase in the localized volume of fat, which sometimes occurs within a short period of time without any changes in eating habits, can be responsible. In addition, the long-term protein-rich edema can bring about increased fibrosis of the tissue with lipolymphedema, attested to by swelling of the forefoot. In addition, the Stemmer sign is positive. As already mentioned, this appears to occur more quickly and more frequently in obese patients. The reported incidence of lipolymphedema in specialized lymphedema hospitals varies widely, ranging from 4 % to 23%[17,20].

The findings of the present study showed non-significant differences in the pre-treatment records of the TCM between the mean values of the first study and the second study groups. As well as in the pre –treatment records of the TSF between the mean values of both groups.

Results of the first study group revealed a significant reduction in the mean values of TCM and TSF after application of the vacuum cavitation therapy, when compared against the pre-application results.

Also, significant decrease was recorded between the mean values of TCM and TSF in the second study group after the liposuction, when compared against the pre-application results.

Significant differences showed in the first and second study groups were consistent with those observed and recorded by Akbari et al., 2007[1]; Amman et al., 2001[3]; Barker et al., 2010[4]; Benison, 2004; Brauer et al., 2003; Breu et al., 2008; Chen et al., 2009; Fahlman and Lambert, 2010; Fasshauer et al., 2006 and Feddar et al., 2010[20].

Results of this study support the expectation that application of both Vacuum-cavitation therapy and liposuction had valuable effects on lipoedema in females as evidenced by the highly significant decreases in TCM and TSF. But Vacuum-cavitation therapy was more fruitful than the liposuction.

Conclusion

Both vacuum-cavitation therapy and liposuction had valuable effects on the lipoedema in females as evidenced by the significant decreases in TCM and TSF. But vacuum-cavitation therapy was more fruitful than the liposuction. This study demonstrated that using vacuum-cavitation therapy is more fruitful and beneficial than the liposuction in lipoedema in females.

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الملخص العربي

العلاج بضغط الفراغ مقابل عمليات شفط الدهون على التكتلات الدهنية غير المنتظمة فى السيدات

كان الهدف من البحث هو استكشاف تأثيرات العلاج بضغط الفراغ وعمليات شفط الدهون على محيط الفخذ وطية (ثنية) جلد الفخذ للمرضى الاناث اللاتى تشتكين من تكتلات دهنية غير منتظمة بمنطقة الفخذ والمقارنة بينهما . اشترك في هذه الدراسة أربعون مريضة ممن لديهن تكتلات دهنية غير منتظة بمنطقة الفخذ، وكانت اعمارهن تتراوح من عشرين إلي خمسة و أربعين عاما ، ولقد تم تقسيمهن عشوائيا إلي مجموعتين متساويتين في العدد (مجموعتي اختبار) ، تتلقى الأولى العلاج بضغط الفراغ والثانية تتلقى العلاج بعمليات شفط الدهون . ولقد أظهرت النتائج أن هناك نقص ذو دلاله احصائية عالية في كلا محيط الفخذ وطية (ثنية) جلد الفخذ بعد تطبيق العلاج بضغط الفراغ وعمليات شفط الدهون بمجموعتى الاختبار الاولى والثانية بعد ثلاثة شهور من إجراء العلاجات المذكورة ، وكانت أفضل النتائج بالمجموعة الاولى التي تتلقى العلاج بضغط الفراغ .