




ORIGINAL ARTICLE

Efficacy of Endolift laser for arm and under abdomen fat reduction

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Abstract

Background: Noninvasive laser for body fat contouring is a quickly growing field in the cosmetic dermatology. Surgical options carry disadvantages, such as the usage of anesthetics, swelling, pain and long time for recovery, so there is a growing public request for the techniques with fewer side effects and shorter recovery periods. Several new noninvasive body contouring ways have been advanced such as, cryolipolysis radiofrequency energy, suction-massage, high-frequency focused ultrasound, and laser therapy. Noninvasive laser improves the body's appearance by the elimination of excess adipose tissue, specifically in areas in which fat perseveres in spite of diet and exercise.

Methods: In this study the efficacy of Endolift laser was evaluated for reduction of excess fat in the arms and under abdomen. Ten patients with excess fat in the arms and under abdomen were enrolled in this study. The patients were treated by Endolift laser in the arms and under abdomen areas. The outcomes were evaluated by two blinded board certified dermatologists and by patients' satisfaction. The circumference of each arm and under abdomen was measured using a flexible tape measure.

Results: The results showed reduction in the fat and circumference of arms and under abdomen after treatment. The treatment was considered as effective methods with high patient satisfaction. Also no severe adverse effects were reported.

Conclusion: Endolift laser can be a good alternative to surgical body fat contouring due to its efficacy, safety, minimal recovery time, low cost. Also Endolift laser does not require general anesthetics.

KEYWORDS

abdomen, arms, body contouring, endolift laser, fat reduction

1 | INTRODUCTION

Recently many peoples suffering from overweight and want to be thin, based on the increasing interest in health and beauty. Body

fat contouring has progressed after the first reports of lipoplasty in 1921.¹ Previously, only liposuction was available for fat reduction, which is a main component of body contouring. Although liposuction is one of the most popular surgical treatments for fat reduction,

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its severe complications are very worrying for patients. Liposuction needs anesthesia and is usually accompanied by many surgical risks like pulmonary embolism, which leads to a fatal result. These unpleasant features have changed the demand for effective and noninvasive treatments with a lower cost, short recovery time and minimal risks. A number of diverse treatment routes are now available, that allow for customized treatment that fits to the patient's personal favorites, body type and body goals. In current years, noninvasive body contouring techniques have developed as an increasingly popular area of cosmetic in the aesthetic cosmetic industry.² Laser therapy is a novel noninvasive technique that can lyse excess fat without the adverse side effects related to surgical procedures like liposuction.³⁻⁷ This technology can also be used to tighten the skin.⁸ The use of lasers in the unwanted fat reduction was reported in the early 1990s.⁹ In a split study, patients treated with standard liposuction on one side of the body and laser-assisted liposuction on the contralateral side and they reported that their results did not show a statistically significant difference between the two sides.⁹ The usage of lasers for adipose tissue removal has been noticed in recent years with reports of low-level laser device.^{10,11} In recent study we evaluated the efficacy of Endolift laser in the reduction of arm and under abdomen fat.

2 | METHODS

2.1 | Study subjects

The study enrolled 10 patients including women and men aged 25–55 years. Reasons for exclusion from participation in this research study comprised; prior cardiac surgery; chronic illness, like cardiovascular disease and diabetes mellitus, cancer, medical conditions that cause weight variations, swelling, or edema; pregnancy, breast feeding, prior surgical procedure for sculpting of the arms or weight loss like mesotherapy for local slimming, the use of fillers for local slimming, use of other devices like cool sculpting, trusculpt, slimming massages, local slimming RF; wounds, active infection, or external trauma in the treated areas; defect in the coagulant system or take anticoagulant drugs, sensitivity to the injectable lidocaine, have not received any slimming or low calorie diets as well as an intense physical activity program, mental or hormonal illness that needs some drugs which cause cellulite and fat tissue in the body.

2.2 | Intervention

The 1% lidocaine was used as a common local anesthetic. Patients underwent Endolift laser for one session. Endolift™ (LASEMAR1500TM machine, Eufoton s.r.l.) was used in this research study. The Endolift laser with the power 5–8 Watt, pulse 50–50, and fiber 400–600 μm was performed for each patient. The number of treatment sessions

was between one and three sessions depending on the amount of adipose tissue, cellulite, age of the patients and the area of interference. This technique does not need general anesthesia and also recovery time. The patients were followed up for 2 and 3 months after treatment.

2.3 | Ethics and study assessments

Informed consent was obtained from all the patients. Baseline patient's demographic information was gained and recorded in special questionnaires. The circumference of each arm and under abdomen was measured using a flexible tape measure. The arm and under abdomen circumference were measured at baseline, 2 and 3 months after treatment. Also, the outcomes of the Endolift technique for reduction of arms and under abdomen fat were evaluated by three blinded dermatologists and by patients' satisfaction. Patients satisfaction was evaluated by body image satisfaction (questionnaire: Satisfaction with body image scale (SWBIS), Score: 22–110, 66 = Moderately satisfied, <66 well satisfied, >66 No satisfied). Blinded dermatologists noted other changes in existing skin condition like, cellulite, and skin elasticity and quality following treatment. All study assessments were done at baseline, and 2 and 3 months after treatment. In addition, digital images of the treated areas were taken before and 3 months after treatment. The adverse effect for each subject were documented daily.

2.4 | Statistical analyses

The data were analyzed by SPSS program version 22.0. Data were summarized using mean ± SD (standard deviation). The obtained results were analyzed by *t*-test and analysis of variance (ANOVA). A value of *p* < 0.05 was considered statistically significant.

3 | RESULTS

3.1 | Arm and under abdomen circumference

Among the patients undergoing Endolift treatment, 7 (70%) achieved a ≥1.5 cm decrease in arm circumference and 8 (80%) ≥2 cm in under abdomen circumference at the 2 months post-treatment assessment (*p* < 0.01) (Figures 1 and 2). The treated patients (80%) showed a 2 cm reduction in arm circumference and a 3 cm reduction in the under abdomen circumference 3 months after the Endolift laser procedure (for each, *p* < 0.01) (Figures 1 and 2). There was a significant decrease in arms circumference between baseline and 2 months (*p* < 0.01) and between 2 and 3 months after treatment (*p* < 0.01) (Figure 1). Similarly, for the under abdomen, there was a significant reduction in circumference between baseline and 2 months and between 2 and 3 months after treatment (*p* < 0.01) (Figure 2).

3.2 | Subject satisfaction and physician assessments

The subjective measurements showed that a significantly greater number of patients were well satisfied with their results for arm ($N = 7$ after 2 months (Table 1 and Figure 3) and $N = 8$ after 3 months (Table 1 and Figure 3; $p < 0.05$) and under abdomen ($N = 7$ after 2 months (Table 2 and Figure 4) and $N = 8$ after 3 months ($p < 0.05$; Table 2 and Figure 4)) and believed that the acceptable effects of the Endolift laser procedure met their expectations. The patients did not

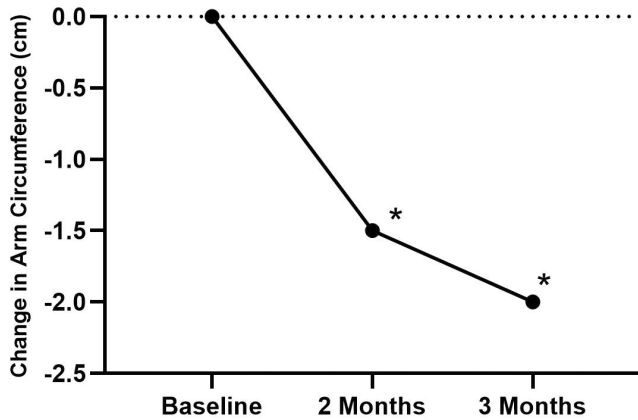


FIGURE 1 Arm circumference was significantly decrease 2 and 3 months after treatment. * $p < 0.01$.

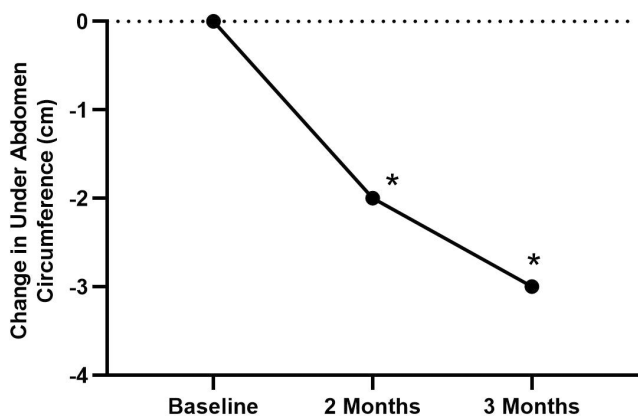


FIGURE 2 Under abdomen circumference was significantly decrease 2 and 3 months after treatment. * $p < 0.01$.

report any adverse side effects. Also physician satisfaction is shown in the Table 3. As shown in the table, after treatment a significant difference in satisfaction was observed ($p < 0.05$).

4 | DISCUSSION

In this study Endolift laser was used for arm and under abdomen fat reduction. The results of this study showed acceptable efficacy

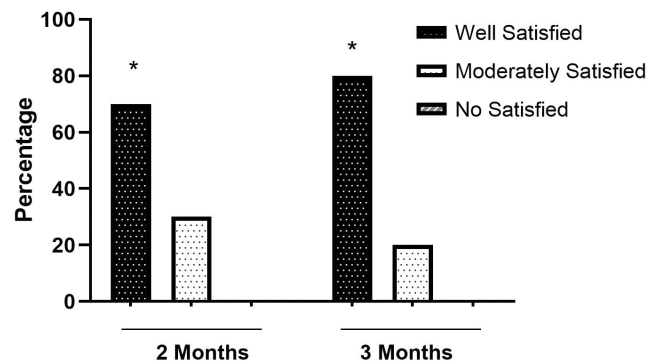


FIGURE 3 Significantly more subjects were satisfied with their results in arm fat reduction after Endolift laser therapy. None of the treated subjects indicated any level of dissatisfaction. * $p < 0.05$.

TABLE 2 Patient satisfaction for under abdomen treatment 2 and 3 months after Endolift laser treatment. The value of $p < 0.05$ was considered as statistically significant.

	Valid	Frequency	Percent	p Value
After 2 months	No satisfaction	0	0	<0.05
	Moderately satisfied	3	30	
	Well satisfied	7	70	
	Total	10	100	
After 3 months	No satisfaction	0	0	<0.05
	Moderately satisfied	2	20	
	Well satisfied	8	80	
	Total	10	100	

	Valid	Frequency	Percent	p Value
After 2 months	No satisfaction	0	0	<0.05
	Moderately satisfied	3	30	
	Well satisfied	7	70	
	Total	10	100	
After 3 months	No satisfaction	0	0	<0.05
	Moderately satisfied	2	20	
	Well satisfied	8	80	
	Total	10	100	

TABLE 1 Patient satisfaction for arm treatment 2 and 3 months after Endolift laser treatment. The value of $p < 0.05$ was considered as statistically significant.

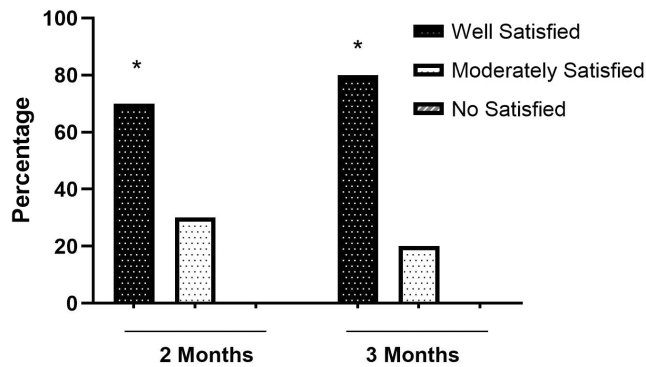


FIGURE 4 Significantly more subjects were satisfied with their results in under abdomen fat reduction after Endolift laser therapy. None of the treated subjects indicated any level of dissatisfaction. * $p < 0.05$.

TABLE 3 Physician assessment after treatment. The data were shown as Mean \pm SD.

Physician satisfaction (%) (Mean \pm SD)	Endolift laser treatment		<i>p</i> Value	
	Arm	Under abdomen		
Physician 1	Second month	70 \pm 10.1	75 \pm 9.0	<0.05
	Third month	80 \pm 9.1	85 \pm 7.2	
Physician 2	Second month	71 \pm 6.2	73 \pm 8.1	<0.05
	Third month	83 \pm 5.1	85 \pm 6.2	

of Endolift laser in the reduction of the fat in the treated areas. Lipolysis procedures like, cryolipolysis,¹² radiofrequency,¹³ ultrasound,¹⁴ and lasers^{15,16} are now being performed worldwide as alternative techniques to eliminate fat in unwanted regions with more safety profile in compare to liposuction or other surgical techniques.^{15,16} Laser therapy has been reported to be a safe and effective healing route for some clinical applications such as osteoarthritis,¹⁷ rheumatoid arthritis acute pain,¹⁸ and neck pain.¹⁹ It has also been revealed to decrease the time of wound healing.^{20,21} More recently, it has been informed that Laser therapy can be used as a technique for performing noninvasive body fat contouring.^{3,22,23} Lasers were used for adipose tissue reduction in recent years.^{10,11} Neira et al.²⁴ informed that after external application of a 635 nm 10 mW diode laser waved the adipose cells were damaged. In the Badin et al.²⁵ study they reported a higher energy 1064 nm Nd:YAG laser system (maximum 6 W) utility in the upper thigh upper abdomen, and periumbilical region. In the study of Martins et al. they reported that noninvasive low-level laser therapy is painless, safe, and effective in decreasing abdominal subcutaneous tissue.⁶ In other study the efficacy of noninvasive 1060 nm diode laser was evaluated for abdomen fat and they informed 1060 nm based laser treatment is effective and safe procedure for reduction of the fat contour in the abdomen.¹⁶ Recently Endolift laser was used to treat several skin disorders.²⁶⁻²⁹ Also

Endolift laser was used for jowl fat reduction.³⁰ Histologically, coagulation of small vessel and adipocyte rupture were obvious after laser treatment. Also, degeneration of collagen and reformation of the reticular dermis were seen.³¹ Endolift laser for fat reduction has many advantages including quick recovery time, excellent patient tolerance, dermal tightening. The important point is that Endolift laser does not need general anesthesia and the small volume of tumescent is used. Endolift laser is related to a fast recovery due to minimal mechanical disruption with the fiber in the range of millimeter. It is an effective and noninvasive choice for people who want to avoid more perceived "aggressive" techniques. It may also be useful in areas that are not appropriate for liposuction or for areas that have previously undertaken liposuction and need additional sculpting. With increasing interest in methods needing little recovery and less downtime, the results of this study suggest that Endolift laser is an effective method for arms and under abdomen fat reduction. And is a good alternative for patients who do not want the risks, side effect, anesthesia or costs related to surgery.

5 | CONCLUSION

Endolift laser was significantly effective for reduction of arm and under abdomen fat reduction.

Patient assessments were significantly positive. This technique does not need general anesthesia and recovery time. No adverse effects were reported by any patient during the study.

6 | STUDY LIMITATION

The small cohort can be considered as limitation of this study. Our future consideration is the further research with larger sample size.

AUTHOR CONTRIBUTIONS

MAN and TF, EB, MS, NNN and SR performed the research. MAN designed the research study. MH-K and NNN collected the data.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

All patients were provided with a complete explanation of the study purpose, design, and possible results and informed consent was gained from all the patients.

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