

Endolifting® - the revolution in aesthetics: case report

Abstract

Objective: To present the innovative Endolifting® technique also known as Endolaser that became popular in Brazil. The technique uses a laser beam with a wavelength of 1470 nm emitted through an optical fiber inserted into the subdermal tissue in order to reduce subcutaneous fat and or tone the skin through neocollagenesis. Endolifting® meets the demand for innovative and less invasive aesthetic procedures, as it is a procedure that does not require incisions and sutures, with fast recovery time and natural and long-lasting results. The present study aims to present a clinical case of facial rejuvenation using the Endolifting® technique, supported by an extensive review of the literature.

Case report: Flaccidity and facial aging are relevant aesthetic complaints that affect the facial harmony and self-esteem of many patients. In this clinical case report, we present the application of the 1470nm diode laser in combination with the Endolifting® technique, as a non-surgical alternative for facial rejuvenation. A 59-year-old patient with a complaint of flaccidity and facial aging underwent two treatment sessions, with an interval of 90 days between sessions. After treatment, a more balanced and rejuvenated facial profile was observed. The patient reported improvement in self-esteem and satisfaction with the results.

Conclusion: This case report, based on the scientific literature, confirms the effectiveness of the 1470nm diode laser and the Endolifting® technique in facial rejuvenation, proving to be an innovative, efficient, safe and reproducible treatment for facial rejuvenation.

Keywords: endolifting®, endolaser, 1470 nm diode laser, lipolysis laser, endolift

Volume 8 Issue 2 - 2024

Layla Dias,¹ Carin Bogado²

¹Univale-Universidade Vale do Rio Doce

²Dentist-UFSM (Federal University of Santa Maria)

Correspondence: Layla Dias, Univale-Universidade Vale do Rio Doce, Tel 2034820722, Email laylata@hotmail.com

Received: April 22, 2024 | **Published:** May 07, 2024

Clinical case report

Initial patient assessment: A female patient, 59 years old, complaining of facial sagging and aesthetic dissatisfaction, was selected for this case report. The patient underwent a complete clinical evaluation, including medical history, Ysico examination and standardized photographs for initial documentation and comparison after 60 and 90 days of treatment. She was also duly informed about the procedure and, agreeing to it, signed the informed consent form (TCLE).

Clinical case report: The patient underwent two sessions of a combined treatment involving the 1470 nm diode laser with the Neolaser (NEOV) equipment and the Endolifting technique® with 400 micron optical fiber and power ranging from 3 to 8 W, of energy in subcutaneous fat for the treatment of the regions of the middle and lower thirds of the face and submandibular, in an outpatient setting. The Endolifting technique® was used to promote fat reduction in desired regions and, simultaneously, provide additional structural support to the skin and underlying tissues, contributing to the reduction of sagging. The patient used compression for 4 days and then underwent 4 drainage sessions manual lymphatic, once a week, in the treated regions. At 60 and 90 days, she returned to monitor the results and adjust the protocol if necessary.

Results assessment: The effectiveness of the treatment was evaluated through clinical analysis and comparison of photographs. The photos showed that the patient's facial profile improved, with a more balanced and rejuvenated contour.

The patient also reported significant satisfaction with the results, highlighting an improvement in her self-esteem and self-image (Figure 1 View right side) (Figure 2 Left side view) (Figure 3 Right 45° view) (Figure 4 Side view 45° left).



Figure 1 Right side view before, after 60 and after 90 days of the procedure.



Figure 2 Left side view before, after 60 and after 90 days of the procedure.



Figure 3 Right 45° view before and after 60 days of the procedure.



Figure 4 45° left view before and after 60 days of the procedure.

Introduction

Aging is a biological process inherent to every human being that occurs through the wear and tear of Ysico-metabolic structures.¹ Skin aging leads to inevitable structural changes, which become more visible through wrinkles, expression lines and sagging.² The increase in life expectancy is accompanied by greater concern about appearance and the concomitant search for less invasive aesthetic treatments to delay and minimize the signs of aging, without the need to reduce the current pace of life accelerated.^{2,14} Efforts to search for alternatives and new tools aim mainly to reduce downtime, reduce operator effort for the surgeon and assistant, reduce bleeding, promote skin tightening and facilitate the treatment of fibrous or reoperative areas.³ More and more patients are demanding an outpatient procedure that can achieve the same or similar results to lifting surgical, but not accompanied by the risks and potential complications associated with surgery.³⁻⁵

Until the beginning of the millennium it was difficult to realize how to obtain a good cosmetic result without

surgery. Only after the introduction of state-of-the-art fiber lasers were we able to really achieve excellent results.³⁻⁵ Apfelberg published between 1992 and 1996 the first studies on laser lipolysis.⁶⁻¹¹ Between 2000 and 2003, Goldman et al.,⁷ introduced the concept of 1064nm pulsed Nd:YAG system for laser lipolysis. His work founded the principles and current techniques behind laser lipolysis. This group was the first to demonstrate the effect of laser energy into the fat as well as the surrounding dermis, vasculature, glands apocryal and eccrine.^{3,7,9} In 2003, Badin et al.,⁸ supported these findings in a study titled "Laser Lipolysis: Flaccidity Under Control". These authors

demonstrated the histological changes after laser damage. Adipocyte membranes were ruptured, the blood vessels were clotted and the new collagen was reorganized. These histological changes were considered to correlate with the clinical response to removal of localized fat, less intraoperative bleeding, less bruising, as well as obtaining the skin tightening effect.^{3,7-11}

In recent years, the laser has become one of the most important innovations in medicine and surgery.^{3,4} It has several clinical indications, including aesthetic ones, thanks to devices and techniques that are now more easily reproducible, safer and minimally invasive.^{2,4,5} In 2006, with greater scientific basis, the North American FDA (Food and Drug Administration) approved laser lipolysis, since then, several studies have been published and contributed to a greater understanding of the technique and technological advancement.¹¹

In 2022, the Endolifting technique® arrived and became popular in Brazil, due to its excellent clinical results with the use of the 1470 nm diode laser in combination with the Endolifting Technique® for reducing facial fat.^{2,13,14} A Endolifting technique®, also known as Endolaser or Endolift, consists of the use of a laser beam with a wavelength of 1470 nm emitted through an optical fiber inserted into the subdermal tissue with the aim of reducing subcutaneous fat and toning the skin through the intense production of collagen,^{13,14} stands out among the many techniques proposed for assist in facial rejuvenation.² This fiber is inserted under the skin for the time necessary to deliver the laser energy directly to the subcutaneous layer, without the need to pass through the superficial layers of the skin (epidermis and dermis). This is one of the many advantages the procedure has over its counterparts, such as radiofrequency or transdermal lasers, which provide energy dispersion as well as causing increased pain.²⁻⁵

The technique Endolifting® is based on the classic concepts of laser lipolysis and concepts updated on the use of subcutaneous laser,^{2,13,14} whose mechanism of action is twofold: acoustic/mechanical and selective photothermolysis of the target tissue.⁴ By contacting directly the subcutaneous tissue, the energy released by the laser causes irreversible damage to adipocytes and thermal damage to dermal collagen fibers, stimulating neocollagenesis.^{7,11} It is the remodeling of collagen and photo bio-modulation of connective tissue, resulting in the 'skin tightening' effect.^{4,11} Skin sagging is reduced and superficial wrinkles are smoothed, resulting in an overall compaction of the skin that is immediately visible and continues to progress over time.^{2,4,5,13,14}

The objective of this work was to present the Endolifting technique® through a clinical case based on scientific literature as a safe and innovative alternative for aesthetic rejuvenation.

Discussion

The incessant search for innovative and less invasive aesthetic procedures has significantly boosted research in the field of aesthetic dermatology.¹⁴ The introduction of lipolytic agents, radiofrequency and high-intensity focused ultrasound has offered less invasive alternatives, however, the combination of the 1470 nm diode laser and the Endolifting® technique has emerged as a particularly promising option.¹³

Over the last 20 years, several scientific studies have published laser results in liposculpture.^{3,4,5} Goldman⁷ and Badin, et al.,⁸ carried out histological studies, showing positive effects such as the coagulation of small vessels in the fatty tissue, disruption of adipocytes, reorganization of the reticular dermis and coagulation of collagen in the fatty tissue. The effect of vessel coagulation would lead to less blood loss and less bruising. Coagulation of collagen and

reorganization of the dermis, effects already observed with other types of lasers, would help adequate tissue retraction.^{7,8}

Since the FDA approval of laser lipolysis in 2006, studies have continued to corroborate initial clinical observations of decreased adiposity, shorter recovery times and improved skin firmness.^{7,9,12} In 2006, the (FDA) demonstrated that approximately 50% of 2200 individuals reported superior 'skin tightening' after laser liposuction compared to patients treated with traditional liposuction.^{3-5,9-12,14-17} and furthermore, it established that the laser is more effective than other energies, such as radiofrequency or ultrasound, in destroying fat and tightening the skin.^{3,5,14}

Di Bernardo et al.,¹⁵ published a randomized study on the effects of laser lipolysis with a 1,064/1,320nm laser versus traditional liposuction on the abdomen of 10 patients, in which they concluded that laser-assisted liposuction has a statistically superior effect (54%) on retraction and tightening of the skin in the abdominal region when compared to liposuction alone. Goldman et al.¹⁶ published an evaluation of the 'skin strengthening' effect in 28 patients undergoing arm liposuction versus laser lipolysis with a 1,064nm laser, which achieved statically superior skin retraction of around 11.4%.

The main indication for laser lipolysis is body contouring through the liquefaction of localized deposits, as well as skin tightening through neocollagenesis. Laser lipolysis is indicated for any location that demonstrates unwanted fatty tissue and modest skin laxity.⁹ There are different types of laser that can be applied to the tissue subcutaneous and deep dermis with the aim of causing lipolysis and skin retraction.^{3,9} Goldman³ proposed that two properties should be considered when determining the effectiveness of laser lipolysis, given the wavelength and energy provided by a specific device.⁹ There is no consensus regarding the best and most specific wavelength for laser lipolysis, since the absorption coefficients of fat and collagen present great variability in relation to this parameter.¹¹ The fat in the subcutaneous cellular tissue has an optical absorption coefficient between 400 and 1,500 nm. The optical absorption coefficient of collagen is similar to that of water and therefore tends to increase with wavelength.¹⁷

In this context, there are different types of laser that are used in liposuction and their effects are diverse. Its action can vary according to the wavelength and the different materials it interacts with in the subcutaneous tissue, including collagen, fat and water.⁶ Its selective photothermolytic effect is mediated by subcutaneous chromophores receptive to specific laser wavelengths, which subsequently dictate the depth of penetration and scattering profile, with high absorption lasers providing localized effects, while low absorption lasers provide localized effects absorption provoke more diffuse responses.¹² The 1210 nm laser, for example, dissolves connective tissue and keeps adipose tissue intact. On the other hand, the 980 nm laser needs to greatly increase the tissue temperature and causes adipocytes to vaporize. The 1440nm laser, in turn, has an affinity for fat and water. This characteristic allows emulsification without the temperature being too high, thus reducing the risk of burns. In the case of the 1540nm laser, there is selectivity for adipose tissue to the detriment of the surrounding dermis and the interspace. In this way, energy is preferentially absorbed by fat.¹⁸

More recently, clinical studies have validated the effectiveness of the 1470 nm diode laser in combination with the Endolifting Technique® for fat reduction and facial rejuvenation.^{2,13,14} Dias et al.,¹³ published a pilot study in which they investigated the effectiveness of the 1470 nm diode laser in reducing double chin

with the Endolifting technique®, demonstrating remarkable results. In agreement with previously published studies, in which the effect of the 1470nm subcutaneous laser was evaluated in the treatment of wrinkles on the forehead, acne scars, upper eyelid and eyebrow ptosis, fat on the arm and under the abdomen, lower eye bag, sagging skin, fat on jowls.^{2-4,5,22-24} In this way, sagging areas of the face, neck and body can fully benefit from the intra-tissue laser to remodel the skin, stimulate neocollagenesis and, due to the 1470nm wavelength, interact selectively with the water in the skin, results in a visible and long-lasting 'life effect'.^{8,24}

The choice of the 1470 nm diode laser for the Endolifting technique®, compared to other wavelengths, is due to the fact that this wavelength is preferentially absorbed by water, but with lower tissue penetration and dispersion compared to shorter wavelength lasers. As a result, it induces a rapid and localized contouring effect, with less thermal impact sufficient to induce tissue hardening, with minimal scarring.^{2,4,5,13,14,22-24} Being ideal for reducing fat and promoting skin firmness, with less energy (Waw) and with consequent lower risk of damagethermal.⁵

This technique requires a balance of local and bulk tissue heating. Adipocytes tumescences were observed with the use of low laser energy, while the use of high energy demonstrated cytoplasmic retraction, destroyed membranes and coagulation of collagen and blood fibers; and when the energy used was even higher, carbonization of the fatty tissue was seen, involving fibers and membranes.¹¹ According to Mordon's mathematical analysis and additional thermoregulation studies, an internal temperature between 48 and 50°C must be reached for collagen denaturation and subsequent skin hardening. External temperatures between 38 and 41°C have been identified as safe and effective, not only for greater effectiveness, but also with the aim of avoiding burns due to excessive temperature.^{18,19}

It is well established in the literature that it is possible to obtain excellent results with the main objective of achieving skin remodeling and retraction, using laser energy.^{3,4,5,9} A Endolifting® technique is a safe and effective alternative to traditional facial and body lifting. The procedure is performed with local anesthesia, has shorter recovery time and risk of complications, in addition to promoting natural and long-lasting results.^{2,13,14}

Conclusion

In conclusion, this case report presents the innovative Endolifting® technique, the efficacy, safety and potential of the 1470 nm diode laser approach for facial rejuvenation. The results observed in the patient reinforce the consistency of previous research that also indicated the success of this approach in various facial and body regions. Facial rejuvenation, with the noticeable lifting and compaction of tissues, combined with the positive impact on the patient's self-esteem, highlights the clinical importance of this technique. Endolifting® offers a series of advantages over other aesthetic treatments, being a safe, effective procedure with long-lasting results. The combination of the 1470 nm diode laser and Endolifting® technique offers a promising and less invasive non-surgical alternative to conventional surgical lifting. The success of this approach is in line with the continuous evolution of aesthetic dermatology, where technological innovation aims to meet patients' expectations for effective results, emotional improvements and reduction of risks associated with more invasive procedures.

Acknowledgments

None.

Conflicts of interest

The authors declare no conflict of interest.

References

- Mita LL, SOUZA P. *Aging management*. São Judas Tadeu University Graduate in Dentistry. 2022.
- Dias L, Almeida D, Petry CB, et al. 1470nm diode laser: an innovative, efficient and safe rejuvenation technique. *Aesthetic Orofacial Science*. 2023;4(2):48–58.
- Goldman A. Submental Nd:Yag laser-assisted liposuction. *Lasers Surg Med*. 2006;38(3):181–184.
- Longo L, Dell'Avanzato R, Longo D. Endolift® and multi-wavelength laser photobiomodulation: a randomized controlled trial study on 96 subjects, treating skin laxity of the lower third of the face. *Laser Therapy*. 2022;29(1):115–120.
- Dell'Avanzato R, Dell'Avanzato G. Endolift®: lunch-time laser lifting with no downtime. *Aesthetic & Anti-Aging Medicine World Congress*. Monte Carlo, Monaco, 2021 Sep/133-139.
- Apfelberg DB, Rosenthal S, Hunstad JP, et al. Progress report on mulçer study of laser-assisted liposuction. *Aesthetic Plast Surgery*. 1994;18(3):259–264.
- Goldman A, Schavelzon DE, Blugerman GS. Laser lipolysis: liposuction using Nd:YAG laser. *Rev Soc Bras Cir Plast*. 2002;17:17–26.
- Badin AZ, Moraes LM, Gondek L, et al. Laser lipolysis: flaccidity under control. *Aesthetic Plast Surg*. 2002;26(5):335–339.
- McBean JC, Katz BE. Laser lipolysis: an update. *J Clin Aesthet Dermatol*. 2011;4(7):25–34.
- Senra AB. 10-year evaluation of laser lipolysis in 766 patients. *Rev Bras Cir Plást*. 2013;28(3):389–397.
- Tagliolawo S. Experience in laserlipolysis: series of 120 cases in the period 2004 to 2010. *Surgical & Cosmetic Dermatology*. 2011;3(4):282–287.
- hwp://fda.gov/consumer/update/liposuction082007.html.
- Dias L, Almeida D, Borges F, et al. Efficacy of the 1470 Nm diode laser in reducing facial fat with the endolifting technique: pilot study. *International Journal of Medical Sciences and Clinical Invention*. 2023;10(6):6788–6795.
- Dias L, Almeida D, Petry CB. Submental fat reduction with 1470nm diode laser and Endolifting® technique: case report. *J Dermatol Cosmetol*. 2023;7(3):104–107.
- DiBernardo BE, Reyes J, Chen B. Evaluation of the tissue thermal effects of 1064/1320nm laser-assisted lipolysis and its clinical implications. *J Cosmet Laser Ther*. 2009;11(2):62–69.
- Goldman A, Wollina U, de Mundstock EC. Evaluation of tissue tightening by the subdermal Nd:YAG laser-assisted liposuction versus liposuction alone. *J Cutan Aesthet Surg*. 2011;4(2):122–128.
- Pereira-Newo D, Montano-Pedroso JC, Aidar Ale, et al. Laser-assisted liposuction (LAL) versus traditional liposuction: systematic review. *Aesth Plast Surg*. 2018;42(2):376–383.
- Wassmer B, Zemmouri J, Rochon P, et al. Comparative study of wavelengths for laser lipolysis. *Photomed Laser Surg*. 2010;28(2):185–188.
- Morais, ALL. Tissue effects of different lasers in liposuction a systematic review. (2023).
- Mordon SR, Plot E. Laser lipolysis versus traditional liposuction for fat removal. *Exp Rev Med Devices*. 2009;6(6):677–688.
- Nilforoushzadeh MA, Heidari-Kharaji M, Fakhim T, et al. Efficacy evaluation of Endolift laser for treatment of nasolabial folds and marionewe lines. *Skin Res Technol*. 2023;29(10):e13480.
- Leclère FM, Alcolea JM, Vogt P, et al. Laser-assisted lipolysis for arm contouring in Teimourian grades I and II: a prospective study of 45 patients. *Lasers Med Sci*. 2015;30(3):1053–1059.
- Nilforoushzadeh MA, Heidari-Kharaji M, Fakhim T, et al. Efficacy of Endolift laser for arm and under abdomen fat reduction. *J Cosmet Dermatol*. 2023;22(7):2018–2022.
- Heller L, Menashe S, Plonski L, et al. 1470-nm Radial fiber-assisted lipo suction for body contouring and facial fat grafting. *J Cosmet Dermatol*. 2022;21(4):1514–1522.