

Submental fat reduction with 1470nm diode laser and Endolifting® technique: case report

Abstract

Purpose: This study aims to present a clinical case of significant reduction in submental fat using the Endolifting® technique and the 1470nm diode laser, supported by an extensive literature review.

Case report: The ongoing quest for innovative and minimally invasive aesthetic procedures has propelled research in the field of aesthetic dermatology. Submental fat reduction, commonly referred to as a double chin, is a prevalent aesthetic concern that impacts facial harmony and the self-esteem of many patients. In this clinical case report, we introduce the application of the 1470nm diode laser in combination with the Endolifting® technique as a non-surgical alternative for double chin reduction. A 45-year-old patient with a prominent double chin performed a single treatment session. Following the treatment, a noticeable reduction in submental fat was observed, resulting in a more balanced and rejuvenated facial profile. The patient reported an enhancement in self-esteem and satisfaction with the outcomes.

Conclusion: This case report validates the effectiveness of the 1470nm diode laser and the Endolifting® technique in reducing double chin, showing it as an innovative, efficient, safe, and replicable approach for submental fat reduction.

Keywords: double chin, 1470nm diode laser, Endolifting®, facial fat reduction, facial harmonization

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Clinical case report

Initial Patient Assessment: A 45-year-old female patient, with prominent jowls and aesthetic dissatisfaction, was selected for this case report. The patient underwent a complete clinical evaluation, including medical history, physical examination and standardized photographs for initial documentation and comparison after 30 days of treatment. She was also duly informed about the procedure and, agreeing with it, she signed the informed consent form (TCLE).

Clinical case report: The patient underwent only one session of a combined treatment involving the 1470 nm diode laser with the DELIGHT 1470 equipment (from VYDENCE Medical) and the Endolifting technique® with 400 micron optical fiber and power ranging from 4 to 8 W, in continuous mode, patients received only one endolifting session to treat the mandibular and submental regions. The procedure was performed in a single session, in an outpatient setting, at Hospital Blanc in São Paulo-SP, Brazil, under local anesthesia. Prior to treatment, the patient received 1 tablet of Toragesic sublingually. The 1470 nm diode laser was applied in the submental region, directing the energy to the localized fat. The Endolifting Technique® was used to promote lipolysis and, simultaneously, provide additional structural support to the skin and underlying tissues, contributing to the reduction of sagging. The patient remained with a bandage for 4 days and, after that period, underwent 4 sessions of manual lymphatic drainage that were performed once a week in the treated region. In 30 days the patient returned for follow-up, clinical evaluations and photographic follow-up were performed to monitor the results and adjust the protocol, if necessary.

Results Evaluation: The effectiveness of the treatment was evaluated through clinical analysis and comparison of photographs before and after the procedure, a visible reduction of submental fat was observed in the patient. The photographs documented the improvement in the

facial profile, showing a more balanced and rejuvenated contour (Figure 1 - Figure 3). The patient reported significant satisfaction with the results, highlighting substantial improvement in her self-esteem and self-image.



Figure 1 Front view before, after 60 and after 180 days of the procedure.



Figure 2 Right side view before and after 60 and 180 days after the procedure.



Figure 3 Left side view before and after 60 and after 180 days of the procedure.

Introduction

The constant search for advances in the area of aesthetic procedures has driven technological innovation, resulting in increasingly effective and minimally invasive approaches to meet the aesthetic needs of patients. One of the main complaints of patients is submental fat, commonly known as jowls, which can significantly impact the self-image and self-esteem of individuals.¹⁻⁵

Several techniques have been developed to treat the double chin, from surgical approaches to non-invasive procedures. Traditional liposuction has been used to eliminate excess fat in this region, however, it often involves significant incisions and recovery time.^{1-3,6,7} In addition, the growing demand for less invasive procedures has driven the development of alternatives, such as the application of lipolytic agents, radiofrequency and high-intensity focused ultrasound (HIFU).^{1,3,4,5,8,9}

However, it is the advancement of laser technology that has gained prominence in the approach to the double chin. Among the most recent techniques, the use of the 1470 nm diode laser stands out, which has excellent properties for the precise and effective reduction of submental fat.^{4,5} The Endolifting technique, also known as Endolaser or Endolift, consists of using 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 of the intense production of collagen.^{4,5,7} Bare optical fiber can be used to overcome some inherent limitations when used to deliver energy from an infrared laser.^{10,7} The combination of this laser with the Endolifting technique® has shown promise, offering a less invasive approach and with remarkable results in the reduction of double chin and better postoperative recovery.^{1,3-5,11}

The evolution of lasers has played a crucial role in improving aesthetic treatments. The first lasers used in dermatology were predominantly high energy and carried significant risks of side effects.^{2-8,6,11,12} However, as technology has advanced, safer and more effective lasers have been developed. The introduction of Nd:YAG lasers brought an innovative approach to laser lipolysis.^{2,13} The search for a more precise and effective approach led to the development of the 1470 nm diode laser, which has shown promising results in reducing submental fat, presenting fewer risks and complications than previous approaches.^{1,3-5,8,10,11,14}

In this context, clinical studies have validated the effectiveness of the 1470 nm diode laser in combination with the endolifting technique

for reducing facial fat.^{1,3,5} For example, a pilot study carried out by Dias et al.,⁵ investigated the effectiveness of the 1470 nm diode laser in reducing the jowls using the endolifting technique, demonstrating remarkable results. Furthermore, the study by Longo et al.,³ and from Nilforoushzadeh MA et al.,¹ corroborate these findings by observing positive results in reducing sagging skin in the lower third of the face. The application of laser in the liposuction procedure promotes a decrease in the mechanical trauma to the surrounding tissues, which translates into less stimulus to the formation of fibrosis, with a decrease in bleeding due to the coagulation of blood vessels, favoring postoperative comfort, with less pain and with faster recovery. In addition, there is marked tissue retraction, both immediate and late, due to collagen stimulation, which becomes better evaluated after the third postoperative month.^{15,6}

The objective of this work was to review and present a clinical case based on the scientific literature regarding the use of the 1470nm diode laser in the process of reducing submental fat and improving facial harmony. In summary, technological advances in the area of aesthetic procedures have provided more effective and less invasive approaches to treating the double chin, with the 1470 nm diode laser being a promising option when combined with endolifting. The evolution of lasers over time has played a fundamental role in the improvement of aesthetic treatments, culminating in the development of this precise, effective, minimally invasive and reproducible approach for the reduction of submental fat.

Discussion

The incessant search for innovative and less invasive aesthetic procedures has significantly boosted research in the field of aesthetic dermatology. The reduction of submental fat, commonly known as jowls, characterized by the accumulation of fat in the submental region, is a common aesthetic concern that significantly affects facial harmony and can have a significant impact on individuals' self-esteem and self-image. The availability of therapeutic approaches that are in line with patients' expectations and offer satisfactory results has been a priority in the area of aesthetic dermatology.^{1-3,5}

Recently, jaw rejuvenation and methods of treating jowl fat have received a lot of attention. Nilforoushzadeh MA et al.,¹ conducted a study with 9 patients suggesting the Endolift laser as a procedure to reduce jowl fat in these patients. Treatment outcomes were measured by biometric assessment. The treatment was significantly effective, without side effects and pain and well tolerated by patients. This study demonstrates that the Endolift laser is a safe and effective non-surgical method for reducing the double chin, highlighting the feasibility, convenience and safety of the technique. The results showed that the Endolift laser can increase the thickness, density and elasticity of the skin in the jowl area.¹

Over the decades, various techniques have been developed to treat the double chin, ranging from traditional surgical procedures to innovative non-invasive solutions. Conventional liposuction, although widely used, is often associated with extensive incisions and a prolonged recovery period, which has led to the emergence of more convenient and less traumatic alternatives.^{1-8,12,13,16} The introduction of lipolytic agents, radiofrequency and high-intensity focused ultrasound (HIFU) 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.^{1,3,9,17} All individuals suitable for a traditional liposuction method can also be treated with laser lipolysis.²

The mechanism of action of laserlipolysis is selective photothermolysis. In this process, laser light is converted into thermal energy when absorbed by fat.^{2,3,6,17} Conducted by a flexible optical fiber, the laser energy is transmitted to the adipocytes, which absorb the energy, increase in volume and rupture.^{2,17} This technique requires a balance of local heating and tissue bulking. Non-invasive studies have shown that heating the dermis through the epidermis, limiting the surface temperature to approximately 40°C, correlates with a mild temperature dermatitis of 60°C to 70°C and results in collagen contraction with improved texture of the skin.¹⁷

The laser action time varies according to the area to be treated and tissue resistance.² The increase in the radiation power of the 1470nm wavelength laser contributes to the increase in the width of the ablation and coagulation zone.¹⁸ It should be said that the effect of laser action is caused not only by the characteristics of spectral radiation, power, but also by the optical properties of tissues. Therefore, the choice of operating parameters should be based on each individual case on the results of experimental studies performed on different biological tissues with various optical and mechanical properties.¹⁸

The choice of the 1470 nm diode laser as part of the therapeutic approach stems from its excellent properties for reducing submental fat. This specific wavelength was designed to selectively target adipose cells, minimizing damage to surrounding tissues and promoting lipolysis.^{1,3-8,11,16,19,20} The Endolifting technique, in turn, complements the laser effect by providing additional structural support, resulting in longer-lasting results and improvements in skin sagging.⁵ The procedure causes connective tissue remodeling and photobiomodulation, resulting in the 'skin tightening' effect. Skin sagging is reduced and surface wrinkles are smoothed out, resulting in a general tightness of the skin that is immediately visible and continues to progress over the next period.^{3-5,14,21}

Given this scenario, the approach presented in this case report, which combines the 1470 nm diode laser with the Endolifting technique, emerges as a promising and successful alternative for the reduction of the double chin, offering effective results and emotional improvements. The Endolifting technique is based on the concepts initially reported as endolaser or endolift, and consists of using a laser beam with a wavelength of 1470 nm emitted through an optical fiber inserted in the subdermal tissue to reduce fat and tone the skin through of neocollagenesis.^{5,8}

One of the notable aspects of this case report is the analysis of the psychological and emotional implications of the treatment. The patient reported not only a physical improvement in the appearance of her jowls, but also a noticeable increase in self-esteem and self-confidence. This approach, which considers both aesthetic aspects and emotional impacts, is essential to meet the comprehensive needs of patients seeking to improve their appearance. This case report highlights not only the physical results obtained, but also the positive psychological and emotional impacts reported by the patient. The satisfaction reported by the patient demonstrates how the combination of the 1470 nm diode laser and the endolifting technique can have a profound effect on the quality of life of patients, contributing to a more complete approach to aesthetic care.^{5,8} It is crucial to highlight that the approach with a 1470 nm diode laser and the Endolifting technique is in line with the contemporary trend towards less invasive and lower risk aesthetic procedures. Patients' demand for treatments that minimize discomfort, risks and recovery time has been a driving factor in the research and development of advanced alternatives.¹⁸ Combining these techniques presents a viable option for patients

who want effective results without the challenges associated with traditional liposuction.

Conclusion

In conclusion, this case report highlights the effectiveness and potential of the approach with a 1470 nm diode laser and the Endolifting technique for reducing the jowls. The results observed in the patient reinforce the consistency of previous research that also indicated the success of this approach in several facial regions.^{18,20,21} The visible reduction of submental fat, combined with the positive impact on the patient's self-esteem, highlights the clinical relevance of this technique. The combination of the 1470 nm diode laser and the Endolifting technique offers a promising and less invasive non-surgical alternative to conventional liposuction. 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 reduced risks associated with more invasive procedures. Progress in the area of aesthetic procedures not only offers more effective solutions for patients, but also positively impacts their quality of life and overall well-being. The treatment of jowls with a 1470 nm diode laser and the Endolifting technique exemplifies this evolution, highlighting how a technology-driven approach can improve patients' self-image, self-esteem and confidence, contributing to a global approach to aesthetic care.

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Conflicts of interest

Authors declare there is no conflict of interest.

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