



Photobiomodulation Therapy as an Adjuvant Treatment of Cervicofacial Liposuction Complications

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Received: August 22, 2022

Accepted: November 8, 2022

Published online January 29, 2023



Abstract

Introduction: Cervical suction lipectomy (CSL) procedures result in practically inevitable complications after the operation, such as facial edema and bruise. Photobiomodulation therapy (PBMT) can be used for analgesia, modulation of inflammatory processes, and improved tissue healing.

Case Report: We have reported two cases of patients in which this therapy was used to manage complications-related CSL. As they had already been medicated and still had these side effects, the PBMT was proposed for local analgesia, nerve repair, and modulation of the inflammatory process. Within 72 hours after a single PBMT session, there was an important reduction in the severity of all situations.

Conclusion: PBMT seems safe and effective in managing pain and edema-related CSL.

Keywords: Photobiomodulation; Low-power laser; Liposuction complications; Cervicofacial liposuction.

Introduction

A common complaint from patients presenting for facial cosmetic evaluation is the absence of a more defined cervicomental angle. Even though the filler can be used to define this angle, sometimes this absence of definition is related to an excess of fat, not only in the submental fat pad but also in the submandibular and jowls fat pads.¹ To solve that, cervical suction lipectomy (CSL) has been the technique that can deliver good results. This fat remotion can be considered simple since the fat is anatomically superficial and the skin is more supple.¹

The CSL can present complications with different degrees of severity. Although severe complications are rare, mild and moderate situations, such as facial edema and hematoma, are practically inevitable after the operation.² In any case, the remission of these complications is expected in approximately 2 weeks, and during this time, the use of the chin strap is highly recommended, although little was accepted by patients due to discomfort.²

The use of drugs (steroidal and no-steroidal anti-inflammatory, and analgesics) to control postoperative discomfort is common; however, all these medications may cause side effects in addition to the desired effect; therefore, photobiomodulation therapy (PBMT) as an alternative has been promising. Based on the already proven benefits of PBMT for analgesia, modulation of

inflammatory processes, and improved tissue healing,³ the present study reports two cases in which this therapy was used to manage complications-related cervicofacial liposuction.

Case Report

Two female patients (55 and 56 years old) were submitted to CSL in a private dental office. Both of them were medicated with antibiotics for 7 days, corticosteroids for 3 days, and pain relief when necessary. Also, 3 lymphatic drainage sessions were held during this postoperative period. Within 7 days of post-operative evaluation (Figure 1), pain, edema, hematoma, and paresthesia in the mandibular region were recorded.

On the clinical examination, for edema assessment, two trained surgeons performed three measurements as follows: (1) lower implantations of auricular pavilions by the submental region, (2) neck circumference, 4 cm below the lower ear pinna implementation, (3) neck circumference, 8 cm below the lower ear pinna implementation (Figure 1A). For this, a tape measure was used in centimeters. In addition, the presence or absence of paresthesia was questioned, and the pain was also evaluated according to the visual analog scale (VAS).⁴

Then, a session of PBMT was proposed for local pain relief, nerve repair, and modulation of the inflammatory process (Figure 1B). No further systemic or local drugs



Figure 1. Clinical Evaluation. (A) cervical edema assessment protocol, showing measurements 1, 2 and 3; (B) point distribution of PBMT; (C-E) Case 1: initial clinical presentation; (F-H) Case 2: initial clinical presentation; (I-K) Case 1: clinical presentation within 72 hours after the PBMT session, showing decreased edema and hematoma, with a more favorable clinical appearance; (L-N) Case 2: clinical presentation within 72 hours after the PBMT session, showing remission of edema and hematoma.

were administered. For that, a diode low-power laser Therapy EC[®] (DMC, São Carlos, SP, Brazil) device was used at 808 nm, in contact mode, with 100 mW of power, and 2 J per point. A total of 10 points were illuminated on the jaw base and 20 points on the cervical area (Table 1).

Within 72 hours, pain, edema, hematoma, and paresthesia in the mandibular region were evaluated again and the results are presented in Table 2 and Figure 1.

Discussion

In the current cases reported, PBMT resulted in an important clinical improvement in the patient's quality of life in less than three days. To the best of the authors' knowledge, this is the first case of the benefits of this phototherapeutic approach to cervicofacial liposuction complications.

Responsible for activating adenosine triphosphate production, the PBMT accelerates mitotic activity, increasing local microcirculation and neovascularization.⁵ According to the literature, this technique aims to activate the drainage and accelerate the process of nerve regeneration, resulting in less edema, return of sensitivity, and pain relief.^{6,7}

Thus, it has been shown that the use of PBMT inhibits the cascade of arachidonic acid and reduces the concentration of prostaglandin E2, cyclooxygenase 2, and histamine.⁵ Furthermore, it was observed that PBMT can accelerate the process of nerve regeneration, presenting an increase in the number of myelinated fibers and a better lamellar organization of myelin sheath, besides an improvement in electrophysiological function.⁸ Our results are in agreement with findings already reported for other dental and medical specialties, revealing that PBMT can also be a promising alternative for facial aesthetic procedures.⁵⁻⁸

It is worth mentioning that although conventional drug therapies are effective in managing such complications,

Table 1. Laser Parameters

Specifications	Unit
Type of laser	Diode
Emission mode	Continuous
Time on/Time off	-
Delivery system	Optical fiber
Wavelength	808 nm
Energy distribution - PBMT	60 J - total
Average power	1.1 W
Energy per point	2 J
Focus-to-tissue	In contact
Spot area at the tissue	0.028 cm ²
Beam divergence	No
Water irrigation	No
Air and aspirating airflow	No

Table 2. Pain, Mandibular Paresthesia, and Edema 7 Days After CSL

		Before PBMT	72 h After PBMT
Case 1	Pain (VAS)	2	0
	Paresthesia	yes	no
	1	52	25.5
	Edema (cm) 2	40	39.5
	3	39	38
Case 2	Pain (VAS)	4	0
	Paresthesia	no	no
	1	47	26
	Edema (cm) 2	39	38
	3	40	38

Abbreviations: CSL, cervical suction lipectomy; PBMT, Photobiomodulation therapy; VAS, visual analog scale.

the use of PBMT has important advantages such as having no adverse effects and being a non-invasive, simple, and low-cost technique, which is better accepted by patients.

Conclusion

On the basis of the cases reported, PBMT seems to be safe and effective in the management of pain and edema-related cervicofacial liposuction, although more studies are necessary.

Acknowledgments

The findings and conclusions of this case report are the responsibility of the authors.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Considerations

Informed consent was obtained from the patients for the publication of this case report.

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