

# Evaluation of a simplified technique for the treatment of rhytids in the perioral and periorbicular regions with CO<sub>2</sub> laser

## Avaliação de uma técnica simplificada para tratamento de ríntides da região perioral e periorbicular com laser de CO<sub>2</sub>

### ABSTRACT

**Introduction:** The use of fractional ablative lasers has optimized the results of photorejuvenation treatments by decreasing the number of complications and reducing the post-procedure recovery time.

**Methods:** The authors evaluated a modification in the classic ablative resurfacing technique with CO<sub>2</sub> laser, in which the operator has visual control of the fractioning, allowing healthy skin to be left alone between treated areas. Nine volunteers (aged 38–73), with moderate to severe photodamage, received visual fractioning in the perioral (three sessions) and periocular regions (two sessions). Photographic evaluations were conducted by two non-medical professionals, the operator physician, and the patients.

**Results:** In the periorbicular region, four patients (44%) presented considerable improvement, and five (56%) moderate improvement. Of the four patients who underwent treatment of the perioral region, three (75%) reported considerable improvement and one (25%) reported moderate improvement. The photographic evaluation of the non-medical professionals was identical to patient-reported outcomes. In the physician's assessment for the perioral region, three (33%) presented considerable improvement and six (67%) had moderate improvement. For the periocular region, two presented moderate improvement and two had slight improvement. The skin fully recovered within 15–30 days, with erythema the most persistent symptom.

**Conclusion:** The technique is a good option for the improvement of perioral and periorbicular wrinkles.

**Keywords:** skin aging; laser therapy; CO<sub>2</sub> laser.

### RESUMO

**Introdução:** O avanço alcançado pelo conceito de fracionamento para lasers ablativos otimizou os resultados dos tratamentos para fotorrejuvenescimento diminuindo as complicações e o tempo de recuperação pós-procedimento.

**Métodos:** Avaliamos uma modificação da técnica clássica de resurfacing ablativo com laser de CO<sub>2</sub> que não possui a opção de fracionamento, em que o operador faz controle visual do fracionamento deixando áreas de pele sã entre as áreas tratadas. Nove voluntárias entre 38 e 73 anos, apresentando fotoenvelhecimento moderado ou grave foram submetidas à técnica nas regiões perioral e periocular. O laser foi aplicado com fracionamento visual em três sessões para a região periocular e duas sessões para a região perioral. Os resultados, avaliados através de fotografia por dois profissionais não médicos, pelo médico operador e pela opinião do paciente, foram classificados em: nenhuma melhora, melhora discreta, melhora moderada e grande melhora.

**Resultados:** As nove pacientes realizaram tratamento completo da região periorbicular e relataram: quatro (44%) grande melhora, e cinco (56%) melhora moderada. Das quatro pacientes que realizaram tratamento da região perioral três (75%) relataram grande melhora, e uma (25%), melhora moderada. A avaliação fotográfica dos profissionais não médicos foi idêntica à percepção das pacientes. Na avaliação do médico para região perioral três (33%) tiveram grande melhora, e seis (67%), melhora moderada; e para região periocular duas melhora moderada, e duas melhora discreta. A recuperação total da pele ocorreu entre 15 e 30 dias, sendo o eritema o sinal mais persistente.

**Conclusão:** A técnica mostrou-se boa opção para a melhora das rugas periorais e periorbiculares.

**Palavras-chave:** fotoenvelhecimento da pele; terapia a laser; laser de CO<sub>2</sub>.

## Original Article

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## INTRODUCTION

Nowadays, dermatologists are sought by increasingly demanding patients to treat photoaging. These patients look for "new" treatments and prioritize the best results. With the advent of innovative techniques and appliances, they also increasingly demand shorter recovery time so they can return to their usual activities.

While the perioral and periocular areas of the face are in high demand for treatment, since the formation of deep wrinkles is most commonly observed there, this area is difficult to handle.<sup>1,2</sup> The use of combined techniques, such as botulinum toxin injection followed by a more aggressive therapy aimed at remodeling the epidermis and superficial dermis –either using medium or deep peel techniques or technologies –is one of the treatment options with the most effective results.

CO<sub>2</sub> laser-based resurfacing still represents the gold standard in terms of therapeutic efficacy for moderate to severe photoaging. However, due to the complexity of the procedure, its inherent risks (post-procedure infection; sequelae such as scars; hypochromia etc), and the prolonged recovery time, other less aggressive techniques have been gaining ground over the past few years.

Therefore the author sought to develop a variation of the classic CO<sub>2</sub> laser application technique, derived from the modern concept of fractioning.<sup>2, 3</sup> In the new devices, the laser action does not cause the continuous and uniform ablation of the epidermis and superficial dermis, but rather generates "coagulation columns" leaving areas of healthy untouched (without treatment) skin, which allows faster and safer healing and recovery. Relying on this concept, we used the CO<sub>2</sub> laser, prioritizing wrinkles and their surroundings, leaving skin areas visibly untouched, aiming to optimize the balance between efficacy, safety, and downtime.<sup>2-6</sup>

## METHODS

Nine female patients aged 38-73 (mean = 57.1) were selected. All signed a free consent term, authorizing the publication of pictures. The degree of photoaging was classified according to the Wrinkle Assessment Scale (WAS), which classifies rhytids as: moderate to moderately deep; severe to deep (has well defined limits, but does not "bend" over itself); and extreme (very deep, with evident walls that "bend" over themselves). Patients should not have undergone dermatological surgical treatments for at least six months previously or had treatment with botulinum toxin for at least 12 months.

All nine patients underwent periocular treatment and four consented to the treatment of the perioral region. Five did not complete the treatment due to personal restriction to the anesthesia method.

Prior to the CO<sub>2</sub> laser procedure (Desys® - Desys S/A - Switzerland), topical anesthesia was applied. A cream containing 10% prilocaine and 10% lidocaine was applied in the periocular area, whereas in the perioral area infiltration anesthesia with tumescent solution (1ml 0.1% epinephrine, 40 ml 2% lidocaine,

10ml 10% sodium bicarbonate solution, and 1,000 ml 0.9% saline) was used in the upper and lower lip regions. The patients are shown in table 1.

The CO<sub>2</sub> laser parameters were the same for both areas. The laser shots were applied precisely on the wrinkles three times with 10%, 01Hz-3W, 5%, over and around the wrinkles with 3W01Hz and over the entire region of the upper eyelid and perioral with 3% 3W-01Hz in each session. The patients underwent three sessions in the periorbicular region, with an interval of two weeks between the first and second sessions, and six weeks before the third. In the perioral region, patients underwent two sessions with a six-week interval between them.

Post-procedure care included local cleaning with antiseptic soap 3x/day, application of sunscreen every 2 hours, and dexamethasone combined with topical gentamicin 3x/day until the skin healed. No oral medications were prescribed, however patients were instructed to use analgesics (paracetamol or dipyron) as needed. The wound was left open and without occlusive dressing during the procedure's two sessions and after the last session. The patients were photographed in all sessions before, during, and after the procedure with a Canon® digital camera and the Canfield® photographic positioning system.

The results were evaluated through photographic documentation by the physician who performed the treatment and two non-physician independent practitioners. The classification was subjective, according to a visual numeric scale of global improvement: 0) absence of improvement, 1) slight improvement, 2) moderate improvement, and 3) great improvement. The patients' subjective evaluation, without the aid of pictures, was also taken into account.

**Table 1: Case summary and initial evaluation**

Age	Treated area	WAS classification	Proposed number of sessions	Anesthesia
57	Periocular	Serious	3	Topical
49	Periocular	Moderate	3	Topical
54	Periocular	Moderate	3	Topical
46	Periocular	Moderate	3	Topical
38	Periocular	Moderate	3	Topical
68	Periocular	Extreme	3	Topical
	Perioral		2	Infiltrative
73	Periocular	Extreme	3	Topical
	Perioral		2	Infiltrative
69	Periocular	Extreme	3	Topical
	Perioral		2	Infiltrative
61	Periocular	Serious	3	Topical
	Perioral		2	Infiltrative

WAS = Wrinkle Assessment Scale

**RESULTS**

According to the WAS, four patients (44.5%) had a moderate degree of rhytids, two (22.2%) patients had a severe degree of rhytids, and three (33.3%) had an extreme degree.

The procedure was well tolerated by the patients, with only the formation of microcrusts on the treated region and slight erythema and edema, which in most cases improved within 8-11 days. Erythema was the most persistent side effect; total recovery took 15-30 days (Figure 1). None of the patients required analgesics after the procedure, and no infections or healing problems were reported.

All study patients completed the treatment proposed in the initial evaluation and were unanimous in stating that they would like to undergo more sessions for the treatment of the perioral region.

The evaluation of treatment (based on the patients' opi-

nions) and the photographic analysis (carried out by the applicator physician and two independent practitioners) are summarized in Table 2 and consolidated in Graphs 1 and 2.

After the end of the sessions, four patients reported great improvement and five reported moderate improvement in the periocular region. Three reported great improvement and one reported moderate improvement in the perioral region. These evaluations coincided with the two non-physician practitioners' ratings. In the physician's assessment, three patients presented great improvement and six had moderate improvement in the periocular region; two patients had moderate improvement, and two had mild improvement in the perioral region (Figures 1-5).

**DISCUSSION**

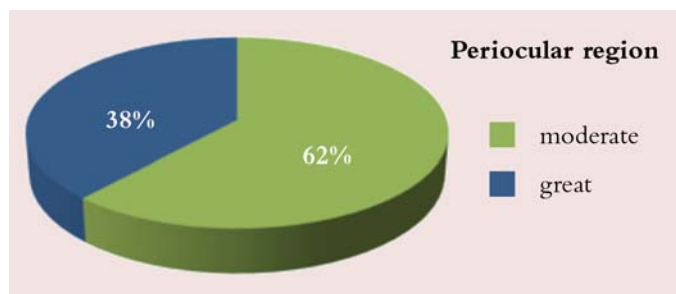
The author sought to develop a simplified technique based



**Figure 1:** Mild residual erythema and post-treatment outcome with moderate improvement



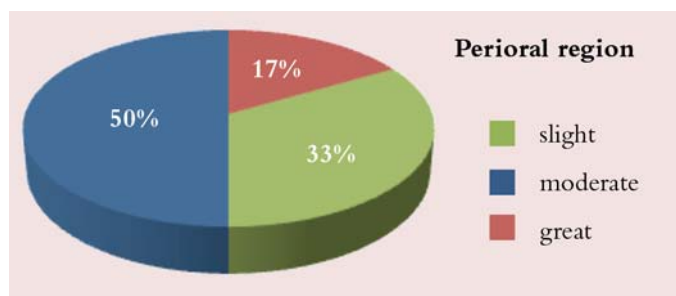
**Figure 2:** Periocular treatment with great improvement



**Graph 1:** Perception of improvement according to treated region



**Figure 3:** Periocular treatment with moderate improvement



**Graph 2:** Perception of improvement according to treated region



**Figure 4:** Periocular treatment with moderate improvement



**Figure 5:** Perioral treatment with slight outcome

on the method currently referred to as "fractioning" by applying CO<sub>2</sub> laser in the periocular and perioral regions, prioritizing wrinkles and their surroundings, while leaving areas of untreated skin between the applications untouched, which are visually controlled by the physician. The untouched areas allow faster and safer healing and recovery of the treated skin, using a device that is already mastered by dermatologists and well known for its effectiveness, but often underused in the treatment of crow's feet and perioral wrinkles. In the proposed application technique, the resurfacing of the skin is not carried out uniformly; the laser is administered in isolated islands separated by untouched skin. This method can be adapted with good results for the treatment of acne scars, as well as for the total face when no alternative is left to the physician due to highly demanding patients.

No dermatological-surgical procedure is devoid of risks or complications. Nonetheless, the proposed localized and rationalized approach in the treatment of perioral and periorbicular wrinkles is a good option for improvement, which minimizes complications and the difficulty of wound management after the procedure. It also allows performing a second session early on – and even a third or fourth session – with considerably favorable outcomes for patients seeking rejuvenation with shorter recovery times and an early return to normal activities. That is possible due to the formation of tiny crusts that improve within 8-10 days without edema and minimal post-operative diffi-

culty in caring for the skin. Two additional advantages are the absence of the need for sedation and surgical infrastructure, in a hospital environment, for carrying out the procedure and for removing the dressings, which means that an expanded team, time, and structure is not necessary.

Since the perioral region's skin type and muscle structure differ considerably from that of the palpebral area, the improvements obtained in the first were of slight and moderate degrees. The author believes that those outcomes can be enhanced with the prior use of botulinum toxin (injected at least two weeks before the laser procedure) and that a greater number of sessions can lead to a greater degree of improvement. The proposed method should also be able to reduce undesired scars and keloids, which are not infrequent after conventional treatment with deep peels, dermabrasion or resurfacing itself.

The proposed technique has also been carried out – cautiously – using other simpler devices (including radio frequency-based devices) that are common in most dermatology practices, or combined with chemical solutions, such as trichloroacetic acid, as described in some Brazilian Dermatology meetings.

## CONCLUSION

The author suggested repurposing less modern devices that, notwithstanding their recognized effectiveness and the applicator physicians' technical mastery, are often underutilized in daily practice, resulting in the ever more frequent need to upgrade and acquire new equipment.

CO<sub>2</sub> pulsed laser can be used with more conservative techniques and does not require injectable or deeper anesthesia (sedation/general anesthesia). In addition, the post-procedure period can be compared to that of less invasive techniques. Even with the continuous upgrade of equipment and the so-called fractional techniques, acquiring every new device – and disposing of older models – is simply not feasible. Therefore it is necessary to use all equipment to its full capacity, which is only possible when dermatology practitioners are always well informed about the latest technological developments. In the author's knowledge and experience, it is possible to obtain interesting results by diversifying and applying less aggressive techniques with already mastered devices. ●

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