

Comparative study between blepharopeeling and fractional CO₂ laser in the treatment of periorbital rejuvenation

Estudo comparativo entre blefaropeeling e laser fracionado de CO₂ no tratamento do rejuvenescimento periorbital

ABSTRACT

Introduction: Complaints about wrinkles and flaccidity in the periocular region are frequent. Blepharopeeling, associated with the Baker-Gordon formula, and the application of ablative fractional CO₂ lasers are considered effective options in the treatment of the periocular region.

Objective: To compare the techniques, recovery process and results of blepharopeeling and fractional CO₂ lasers in the periorbital region.

Methods: Comparative split-face study of patients with dermatochalasis and moderate rhytids. Blepharopeeling was applied on the right side of the face, and the fractional CO₂ laser was used on the left side of the face. Results were assessed through photographic analysis, measurements of the superior palpebral fold and clinical improvement.

Results: Patients (n=11) demonstrated clinical and photographic improvement using both methods. The recovery time was longer for the phenol peeling. No significant differences were observed in the measurements of the superior palpebral fold.

Conclusion: While both therapeutic modalities were found to be effective in the treatment of periorbital aging, blepharopeeling produced greater clinical improvement of palpebral flaccidity.

Keywords: phenol; laser therapy; eyelids; skin aging.

RESUMO

Introdução: A queixa de rugas e flacidez na região periocular é freqüente. O blefaropeeling utilizando a fórmula de Baker-Gordon e a aplicação de laser fracionado ablativo de CO₂ fracionado são consideradas opções efetivas para o tratamento dessa região.

Objetivo: Comparar as técnicas, a recuperação e os resultados finais das duas modalidades terapêuticas.

Material e Métodos: Estudo comparativo de hemi-faces em pacientes com dermatocálase e ríntides moderadas. Realizou-se no lado direito blefaropeeling e, no esquerdo, laser fracionado de CO₂, cujos resultados foram avaliados por fotografia, medidas do sulco palpebral superior e melhora clínica.

Resultados: Foram incluídas 11 pacientes no protocolo. Verificou-se melhora clínica e fotográfica com ambos os métodos. O tempo de recuperação foi maior com o peeling de fenol. As medidas do sulco palpebral superior não mostraram diferenças significativas.

Conclusões: Ambas as modalidades terapêuticas são efetivas no tratamento do envelhecimento periorbital. O processo de recuperação o blefaropeeling foi mais demorado. Clinicamente a melhora da flacidez palpebral foi superior com o blefaropeeling.

Palavras-chave: fenol; terapia a laser; pálpebras; envelhecimento da pele.

Original article

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Received on: 27/04/2010
Approved on: 15/06/2010

This study has been conducted at the Mogi das Cruzes University (UMC) – Mogi das Cruzes (SP), Brazil.

Conflicts of interest: none
Financial support: none

INTRODUCTION

Complaints about wrinkles and flaccidity in the periocular region are frequent, implying a robust demand for the development of effective and affordable treatments. The treatment of the periorbital region must be precise and delicate, due to the thin skin in that area and the need to preserve ocular function and the natural expression of the eyes.

A number of therapies have been proposed, with the usual association of two or more surgical and/or non-surgical modalities for the optimization of results.¹⁻³ In the prevention of palpebral aging and in more trivial cases, creams containing retinoic acid, alpha-hydroxy acids, antioxidants and moisturizers are used.^{4,5} Serial superficial peelings, medium peelings, non-ablative fractional lasers and ablative lasers combined with botulinum toxin are used for intermediate alterations.^{4,5} Severe cases of palpebral aging, with large areas of flaccidity and pseudo-herniations of the orbital fat, require surgery (blepharoplasty), which is considered the gold standard for treating the condition. CO2 ablative lasers or phenol peelings can be used in high-risk patients or in those who are reluctant to have surgery. The appropriate selection of the patient and the correct evaluation of the severity of the aging are crucial to determining the best therapeutic option.^{1,3,4}

Peelings are an effective treatment for wrinkles. The procedure performed on the superior eyelid – where phenol is used in the Baker-Gordon formula, complemented by 88% phenol applied to the rest of the periorbital region – has become known as blepharopeeling, since it addresses both the flaccidity and the wrinkles of this region.^{5,6} The phenol's chemical properties promote the remodelling of the collagen and elastic fibers.^{2,5,6}

The high-energy pulsed CO2 ablative laser has been proven to be effective and safe in improving both periorbital wrinkles and flaccidity. This technology promotes the vaporization of the damaged epidermis and the partial ablation of the superior dermis, with a variable degree reversible thermal lesion for the deeper tissues. The dermal remodelling results from the substitution of the damaged collagen and elastic tissues for another, new and organized, improving the appearance of the wrinkles. The use of high fluencies and the application of additional passes promotes a tissular contraction of around 38%, greatly improving the cutaneous flaccidity.^{4,7}

The phenol peeling associated with the blepharopeeling technique and the application of ablative fractional CO2 lasers are regarded as effective options for the treatment of this region. Although some studies refer to their isolated therapeutic effects, this is the first study to directly compare the techniques, recovery process and results of these two therapeutic modalities.

MATERIALS AND METHODS

This study compared the effects of the two treatments (on opposite sides of the face) on patients with moderate flaccidity and rhytids; they had Fitzpatrick phototypes I-IV and no comorbidities. The protocol was

conducted at the Mogí das Cruzes University's Medical

School Dermatology Service, with the prior approval of its Ethics and Research Committee. The patients signed a term of free and informed consent.

Previous topical treatments were not recommended. Patients were instructed to use Acyclovir (1g/day), starting two days before until ten days after the procedure, as prophylaxis for herpes simplex. After the administration of bilateral infiltrative anesthesia in all the periorbital region with 2% lidocaine, the blepharopeeling was performed on the right side of the face according the following technique: after pinching and marking the excess skin in the superior eyelid, the Baker-Gordon formula (3mL of 88% phenol, 2mL of distilled water, 8 drops of Septisol, and 3 drops of croton oil) was applied without occlusion in the demarcated area with the aid of a semi-wet cotton swab; any excess solution near the corners of the eyes was removed with dry cotton swabs. For the remaining periorbital area, 88% phenol was applied with a semi-wet cotton swab until a homogeneous whitening was achieved. The complete left palpebral region was evenly treated with fractional CO2 laser (UltraPulse® ActiveFXT/DeepFXT, Lumenis Inc., Santa Clara, CA). The first pass was conducted with the DeepFXT handpiece (250hz, energy 10mJ, size 6, density 10%, pulse 1 and format 2), followed by a second pass with the Active 3-6-2 handpiece (grid 125hz, energy 125mJ, size 6, density 10%, pulse 1).

An ophthalmic ointment (Epitezan®, Allergan, São Paulo, Brazil), topical Vaseline, and analgesic (Lisador®, Farmasa, São Paulo, Brazil) were used in the 24 hours following the procedure.

Results were evaluated through digital photographic control, with statistical analysis of the measure of the superior palpebral crease before the procedure, 20 days after, and 120 days after. (Figure 1). This measure was taken by drawing a straight line from the central superior palpebral point (starting in the crease), to the superior eyelid ciliary border. The analysis employed a linear model, comparing the previous and subsequent measurements of each eye. Six dermatologists who originally did not take part in the study made the clinical evaluation, analyzing the improvement (or absence of) wrinkles, flaccidity



Figure 1 - Measures of the superior palpebral creases before and 120 days after treatment

Table 1 – Superior palpebral fold measure distribution before, 20 days after, and 120 days after treatment

Days	Right eye						Left eye					
	n	mean	Standard deviation	Median	Min.	Max.	n	mean	Standard deviation	Median	Min.	Max.
0	11	0.22	0.21	0.12	0.01	0.75	11	0.29	0.25	0.20	0.09	0.78
20	11	0.26	0.18	0.20	0.01	0.67	11	0.30	0.19	0.28	0.01	0.56
120	9	0.22	0.14	0.25	0.04	0.46	9	0.22	0.13	0.21	0.03	0.42

and texture of each treated area. The estimate of the relative risk (odds ratio) indicated the chance of occurrence of the positive, minor/important evaluations, among the treatments associated with each side of the face.

RESULTS

Patients (n=11) were females aged 41-72. Table 1 displays the distribution of the measures of the superior palpebral creases before and after treatment on each side. Patients reported more pain during the laser application than the peel, but found that the recovery from blepharopeeling was longer and more painful.

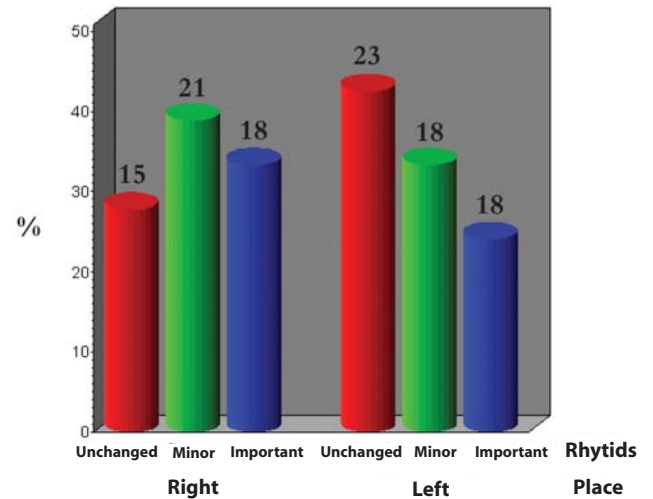
The standard deviation indicated a great variability in difference between the mean values observed. Table 2 displays the tests for the adjusted model's type 3 fixed effects. Only the initial measure was found to be significant (p <0.0001), meaning that the measurement of each eye before treatment is responsible for the variation in the subsequent measures. The correlations between Place/Time, Time and Place/Eye were not significant, with p values of 0.3931, 0.5771 and 0.4779, respectively.

The dermatologists' clinical evaluation concluded that blepharopeeling was significantly more effective, presenting p values of 0.0029, 0.0081 and 0.0026, for rhytids, texture and flaccidity, respectively. Blepharopeeling was 1.8 times (confidence interval 95%: [1.2; 2.7]) more likely to obtain minor/important improvement evaluations for flaccidity than laser treatment (Table 3, Graphs 1, 2 and 3; and Figure 2).

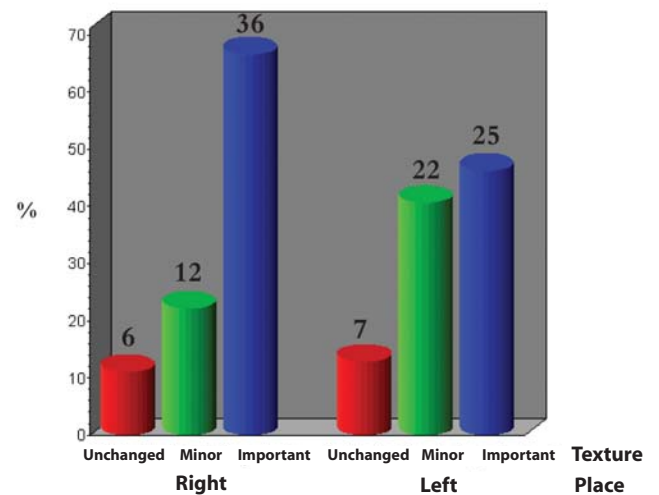
DISCUSSION

Blepharopeeling is safe and effective in the treatment of palpebral flaccidity. The benefits of the Baker-Gordon formula in rejuvenation are already known: it induces the reorganization of the medium reticular dermis' collagen and elastic fibers, which become more rigid and compact.^{6,10-13}. The fact that the

skin of the palpebral region is thin enhances the treatment's effectiveness due to its higher sensitivity to the reorganization of collagen after the chemical peeling.^{2,14-16} In addition, the method promotes the improvement of the general appearance of the wider periorbital region.^{17,18} The ablative fractional CO2 laser



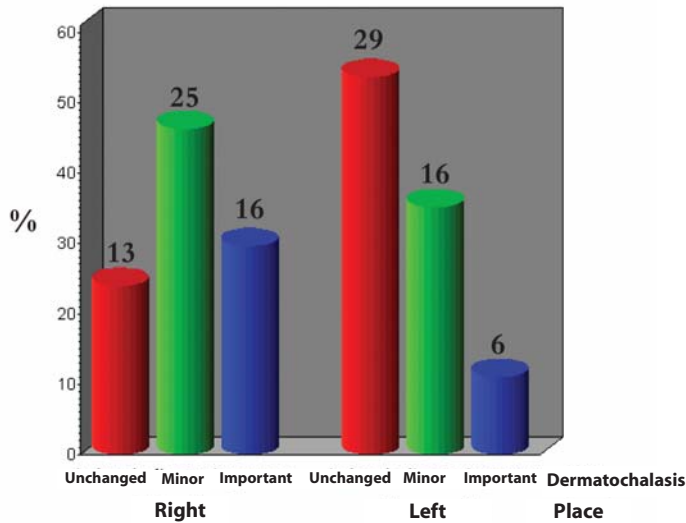
Graph 1 - Evaluation of the rhytids degree according to treatment



Graph 2 - Evaluation of texture according to treatment

Table 2 – Type 3 fixed effects statistical tests

Effect	d.f. Num.	d.f. Den.	F Value	Pr > F
Initial measure	1	19	41.35	< 0001
Place/Eye	1	19	0.52	0.4779
Time	1	19	0.36	0.5771
Place * Time	1	19	0.76	0.3931



Graph 3 - Evaluation of dermatochalasis degree according to treatment



Figure 2 - Detail of the improvement in the texture of rhytids in both sides. Pre-treatment pictures are above, and pictures of 120 days post-treatment are below. (Right side of the face: blepharopeeling. Left side of the face: CO2 laser)

technique is also safe and effective in significantly improving periorbital flaccidity and rhytids.²⁷⁻³¹ This treatment allows the controlled vaporization of the tissue without inflicting thermal damage to the adjacent skin, thus reducing the risk of inadequate healing and permanent depigmentation.^{5,19-21} Moreover, it is capable of stimulating collagen production in addition to reorganizing the dermis' elastic fibers.²²⁻²⁶

The measurement of the superior palpebral creases was used to evaluate palpebral flaccidity. In the present study, in spite of the fact that six patients presented an increase in those measurements, there was no significant correlation between treatment and time, meaning that time had no significant effect on the treatment outcome for the measurements taken. Likewise, there were no significant effects for the individual variables of treatment or time. That lack of significance is due to the small sample size, and the great variability in the measurements observed – both on an individual basis and among patients. This suggests that the difference, in case it exists, is smaller than the capacity of the test to measure them. In light of this analysis,

there is no evidence that the treatments present different effects over time. Although it was not possible to objectively determine the degree of improvement in flaccidity due to the interference of a great number of variables, the subjective analysis carried out by the dermatologists demonstrated that both procedures are effective in improving wrinkles, flaccidity and texture in the periorbital region, and that blepharopeeling was more effective, but not significantly so.

Larger studies should be conducted to compare the efficacy of these two treatments. One area of further study could be whether the use of higher levels of energy would improve the results of the laser compared to blepharopeeling.

CONCLUSION

When comparing the effectiveness of the two treatments in periorbital rejuvenation, both were shown to be effective and safe alternatives to blepharoplasty. Blepharopeeling is a low-cost procedure that requires a longer recovery time, but is superior to ablative fractional CO2 laser treatment. ●

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