

# Lasers and cutaneous fillers: possible complications

*Lasers e preenchantos: possíveis complicações*

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## ABSTRACT

The treatment of acne scars – a common dermatological complaint and cause of anxiety for patients – is challenging, usually consisting of multiple serial methods. The authors of the present article describe a case where hyaluronic acid cutaneous filling and fractional CO<sub>2</sub> laser were indicated, with an unusual complication occurring due to the short time interval between the applications of the techniques.

The article discusses the need for a close and frank physician / patient relationship aimed at containing patient anxiety as well as studies determining the optimal time interval between therapeutic approaches in the treatment of acne scars.

**Keywords:** acne vulgaris; laser therapy; physician-patient relations; hyaluronic acid; follow-up studies

## RESUMO

O tratamento das cicatrizes de acne, queixa dermatológica comum e motivo de ansiedade para os pacientes é desafiante, consistindo geralmente em múltiplas abordagens seriadas. Descreve-se um caso em que foram indicados preenchimento com ácido hialurônico e laser fracionado de CO<sub>2</sub>, tendo ocorrido complicação inusitada, devido ao curto intervalo de tempo entre a utilização das técnicas.

Discutem-se a necessidade de relação médico/paciente estreita e confiante para conter a ansiedade dos pacientes e de estudos que determinem o intervalo ideal entre as abordagens terapêuticas no tratamento das cicatrizes de acne.

**Palavras-chave:** acne vulgar; terapia a laser; relações médico/paciente; ácido hialurônico; seguimentos

## INTRODUCTION

Acne vulgaris is a prevalent inflammatory condition that can progress with permanent scarring. Multiple approaches were described according to the features of the lesion. For the distensible lesions, hyaluronic acid dermal fillers are the first line of treatment.<sup>1</sup> For the non-distensible lesions, of the renowned surgical techniques and chemical peels,<sup>2</sup> one of the most potent and effective option is ablative fractional CO<sub>2</sub> laser.<sup>3</sup>

These techniques can be combined and repeated in reports in the literature determining the intervals or number of sessions.

Hyaluronic acid is a polysaccharide that is a structural component of the skin, subcutaneous and connective tissues.<sup>4</sup> Restylane® (Galderma, São Paulo, Brazil), approved by the Food and Drug Administration (FDA) and indicated for the treatment of severe wrinkles and deep folds is one of the many brands of

## Case report

### Authors:

Bruna Sabatovich Villarejo Iosifovich<sup>1</sup>  
Bruna Melhoranse Gouveia<sup>2</sup>  
Maria Paulina Villarejo Kede<sup>2</sup>

<sup>1</sup> Post-graduate Dermatology Student at Universidade Federal do Rio de Janeiro (UFRJ) and dermatologist at Espaço Kede & Sabatovich – Rio de Janeiro (RJ), Brazil.

<sup>2</sup> Dermatologist at Espaço Kede & Sabatovich – Rio de Janeiro (RJ), Brazil.

### Correspondence:

Bruna Sabatovich Villarejo Iosifovich  
Rua General Venâncio Flores 305, sl.  
401 / Leblon  
22441-090 – Rio de Janeiro-RJ  
**E-mail:** bru\_villa@hotmail.com

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<sup>1,4</sup>-butanediol diglycidyl ether (BDDE)-crosslinked hyaluronic acid sold worldwide.

Ablative fractional CO<sub>2</sub> laser is intensely absorbed by water in the tissues, creates thermal phenomena in the structures that contain this element and leads to epidermal turnover and collagen stimulation, allowing for improvements in patients with photoaging, stretch marks and acne scarring. In regard to side effects, pain, edema, and erythema can be expected, which can last around 10 days, and also late phenomena such as hyperpigmentation, hypopigmentation and scars. Other possible complications include bacterial, fungal or viral infections, contact dermatitis to topical agents used for the procedure and pruritus.<sup>1</sup>

The objective of this study is to report an unusual complication resulting from the combined treatment of hyaluronic acid injections and fractional CO<sub>2</sub> laser in a patient with acne scarring.

A similar report was not found in the literature.

## CASE REPORT

Thirty-five-year-old female patient, phototype III, who had the habit of daily and intense sun exposure, with no comorbidities, on oral contraceptive pill, had acne since she was 15 years old. At 17 years of age, she underwent treatment with oral isotretinoin, with acne remission at the cumulative dose of 120mg/kg. When she was 20 years old, she started using oxandrolone 20mg/day three-monthly, and developed cyclic recurrence and remission of acne. She sought treatment for the scarring during the remission period. On examination, she had distensible and non-distensible scars in the malar regions (Figure 1). Ablative fractionated CO<sub>2</sub> laser (two monthly treatments) and hyaluronic acid filler injection (three monthly treatments) were indicated. Due to the patient's anxiety, the first CO<sub>2</sub> laser treatment was performed 5 days after hyaluronic acid injection. Immediately after laser treatment, performed with the usual potency and density, edema, erythema and dark crusts with exudate were observed, corresponding to the release of dehydrated hyaluronic acid (Figure 2). After 5 days the edema, erythema and exudate regressed, but the crusts and peeling persisted for another 8 days (Figure 3). Two weeks later, the patient had recurrence of acne, with pustular and erythematous lesions on the malar regions (Figure 4). Three months after the CO<sub>2</sub> treatment, she had complete remission of the condition (Figure 5).

## DISCUSSION

Acne is a common condition in adolescence, with high frequency (85%), being common spontaneous regression after 20 years of age.<sup>1</sup> The most relevant complications are skin scarring and psychosocial sequelae, usually persistent.<sup>2</sup> In this setting, acne can trigger psychodermatological conditions such as low self-esteem, social isolation 30µm. The laser acts generating heat and coagulation up to 85°C, carbonization above 85°C and vaporization at 100°C. It is likely that this heat transfer was responsible for the dehydration of the hyaluronic acid, creating darkened crusts as observed in the reported case.<sup>4</sup> Interestingly, there was complete regeneration of the tissue after 3 months,



**FIGURE 1:**  
Before treatment



**FIGURE 2:** Immediately after treatment



**FIGURE 3:**  
5 days after laser treatment

FIGURE 4: 15 days after CO<sub>2</sub> laserFIGURE 5: 3 months after CO<sub>2</sub> laser

what indicates that the crusts did not correspond to necrotic tissue, but probably to the hyaluronic acid deteriorated by heat. Post-inflammatory hyperpigmentation was not observed. This side effect was very common with the use of non-ablative fractional and depression. In one study, the 5 most reported symptoms were frequent picking of lesions, anxiety (88.3%), displeasure of having acne (70%), fear of acne never ceasing and dissatisfaction regarding physical appearance (63.3%). In the reported case, the patient had anxiety, and this psychodermatological condition incited the promptness of the medical consultation.<sup>5</sup>

There are studies in the literature that evaluate the use radiofrequency and pulsed light after injectable hyaluronic acid

treatment,<sup>3</sup> yet there are no citations regarding its association with CO<sub>2</sub> laser. The depth of penetration of the CO<sub>2</sub> depends on the amount of water in the tissue and reaches between 20 and 30µm. The laser acts generating heat and coagulation up to 85°C, carbonization above 85°C and vaporization at 100°C. It is likely that this heat transfer was responsible for the dehydration of the hyaluronic acid, creating darkened crusts as observed in the reported case.<sup>4</sup> Interestingly, there was complete regeneration of the tissue after 3 months, what indicates that the crusts did not correspond to necrotic tissue, but probably to the hyaluronic acid deteriorated by heat. Post-inflammatory hyperpigmentation was not observed. This side effect was very common with the use of non-ablative fractional CO<sub>2</sub> laser, but became rare with fractional laser use.<sup>2</sup>

We also highlight that the expected scarring with excessive cutaneous thermal ablation did not happen in this patient, confirming the hypothesis that the dark crusts corresponded to the heat action in the epidermis, superficial dermis and the hyaluronic acid that was previously injected into the skin.<sup>1</sup> In another study, hyaluronic acid (Restylane®, Sweden) was injected into pig skin and after 2 weeks the same area was treated with ablative laser. In the histopathology, they observed that there were no morphological changes in the hyaluronic acid but its duration decreased and its presence impaired laser efficacy.<sup>4</sup>

## CONCLUSION

Acne scarring treatment is challenging and at times disappointing, usually consisting in multiple sequential approaches. This determines the need of a close and reliable relationship between the physician and the patient to help with the patient's anxiety and sometimes frustration. On the other hand, there are no studies that determine the ideal interval between the therapeutic approaches in the treatment of these scars. Thus, in the setting of multiple interventions, it is crucial to establish protocols with planned steps and to respect the intervals in order to avoid complications as the one reported in this study.●

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## PARTICIPATION IN THE ARTICLE:

### Maria Paulina Villarejo Kede:

Execution of the procedures (filler injection and laser)  
Case report

### Bruna Sabatovich Villarejo Iosifovich:

Photos and literature review (introduction, discussion and references)

### Bruna Melhoranse Gouveia:

Patient's follow up  
Article review (discussion and references)