Pearl Surgical

Croll technique: surgical reconstruction with localized laser in acne scars

Técnica de Croll: cirurgia de reconstrução com laser localizado em cicatrizes de acne

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ABSTRACT

Acne scars are a common however difficult to treat condition. There are a number of laser-based techniques for their correction; fractional CO_2 lasers are currently the most frequently used. In order to obtain good results, interventions can, however, become considerably aggressive. Therefore, we propose a new fractional CO_2 laser technique, performed only on acne scars. The objective is to optimize results with minimal side-effects. We have named it the CROLL Technique – in an analogy to the CROSS technique. We report 15 cases that were successfully treated using this technique.

Keywords: research and new techniques; laser therapy; cicatrix; acne vulgaris.

RESUMO

As cicatrizes de acne são comuns, mas de difícil tratamento. Existem várias técnicas utilizando lasers para sua correção, sendo os fracionados de CO_2 os mais usados atualmente. Entretanto, para se obter resultados significativos, o procedimento pode tornar-se muito agressivo. Propõe-se nova técnica de aplicação de laser de CO_2 fracionado exclusivamente sobre as cicatrizes de acne, denominada técnica de Croll, em analogia à técnica de Cross. O objetivo é otimizar os resultados e minimizar os efeitos colaterais. Nesse trabalho relatamos 15 casos bem-sucedidos com utilização da técnica de Croll na correção de cicatrizes de acne.

Palavras-chave: *pesquisa e novas técnicas; terapia a laser; cicatriz; acne vulgar.*

INTRODUCTION

Acne vulgaris has a high prevalence, occurring in approximately 80% of people at some time in their lives.[1-3] About 1% of patients develop permanent scars, which are frequently caused by serious nodular-cystic inflammatory acne, but can also result from more superficial inflammatory lesions or from a patient trying to squeeze a lesion. Scars can cause aesthetic as well as psychological damage.[2,3] Kadunc and Trindade classified acne scars into three types: hypertrophic (subtypes: keloidian, hypertrophic, papulous and bridges), dystrophic and depressed (subtypes: distensible and non- distensible). Non distensible depressed scars can be further sub-classified as superficial, medium or crateriform and deep (ice picks and tunnels).[4] The ther-

apeutic tools for treating acne scars include chemical peels, laser and other sources of light, cryotherapy, filling techniques, and surgical methods such as subcision and dermabrasion.[1,3] Treatments that employ technologies are becoming increasingly popular in the correction of scars. The controlled and partial removal of the epidermis and dermis promoted by ablative resurfacing using CO_2 lasers has always been considered by most authors as the gold standard for correcting ice pick or crateriform type scars. Due to the complications inherent to the method and the recovery time of at least 15 days, its use has declined over the years. With the introduction of fractional technology, CO_2 lasers are again the main treatment method for acne scars. [1, 5-9]

Resurfacing with ablative lasers creates small zones of cutaneous lesions in a grid pattern. The affected areas re-epithelize more quickly, and the risk of dyschromias and scars is lower. [1, 5] The energy level used in the equipment is inversely proportional to the number of sessions: high energy levels require fewer sessions, yet entail a higher rate of complications. Nevertheless, the requirement to avoid prolonged sun exposure, absenteeism and difficult post-operative care reduce patient adherence and hinder CO_2 fractional laser treatment. [1,5] In an attempt to overcome such limitations, we propose the localized use of fractional CO_2 laser, only on scars, with high intensity parameters. The objective coincides with that of the CROSS technique (Chemical Reconstruction of Skin Scars), which involves applying high concentrations of trichloroacetic acid only to scars when it cannot be applied to the whole face, thus optimizing results and minimizing complications.[10] In an analogy to the CROSS technique,[10] the method described in the present article was named CROLL: Cirurgia de Reconstrução com Laser Localizado (Reconstruction Surgery with Localized Laser).

METHODS

Patient (n = 15) with depressed acne scars (ice picks, crateriform, tunnels) were selected for treatment with the CROLL technique: fractional CO_2 laser applied only on the scars. The patients did not present comorbidities that contraindicated the procedure. A combination of 4% hydroquinone, 0.05% tretinoin and 0.01% fluocinolone acetonide (Vitacid Plus® Theraskin, SP, Brazil) was used for 30 days to prepare the skin before treatment. A 4% lidocaine topical anaesthetic (4% Dermomax cream®, Aché, SP, Brazil) was applied 30 minutes before the procedure. After cleaning the skin, fractional CO_2 laser was applied only on the scars. The spot to be chosen should have the shape that is more similar to that of the lesion , with a distance of 200 µm between points and a laser depth of 2000 µs. Following the procedure, patients were directed to use color sunscreens daily. If necessary (burning, crusts, prolonged erythema) we suggested the application of a combination of fusidic acid and betamethasone valerate (Verutex B®, Roche, SP, Brazil).

Figura 1 - CROLL Technique – Hexagonal spot size, 200 ìm distance between points, and 2,000 µs laser depth

CROLL TECHNIQUE

The localized technique consists of minimizing the equipment's spot and using the most convenient format (hexagon, circle, linear or matching the shape of the lesion), decreasing the distance between the points and increasing the depth of the shots (Figure 1). The objective is to perform a scanning of the epidermis.

RESULTS

The patients treated with this technique presented satisfactory results as soon as 30 days after one localized CO_2 laser session (Figures 2-7). The total number of sessions ranged from one to three. Patients with higher phototypes presented erythema and post-inflammatory hyperpigmentation, which faded up to 60 days. Hypopigmentation did not occur in any of the cases during the 24-month follow up period. All of the patients' scars improved, many disappeared, and the deepest scars became shallower.

DISCUSSION

For more than two decades, CO_2 laser has been applied in facial rejuvenation, rhytids, acne scars, blepharoplasties and in the surgical removal of lesions. Its use in ablative resurfacings declined in the 1990s due to complications such as hypertrophic scars, persistent dyschromias, risk of infection and prolonged recovery time.[1] With the need for less invasive treatments, fewer complications and faster recovery, the emergence of fractional technology caused a resurgence in the use of CO_2 lasers in dermatologic surgical treatments.

Current devices allow the practitioner to select from a range of energy levels from very light (for superficial treatments) to high (with results very similar to those obtained with conventional CO_2 laser). Results and complications also increase proportionally to the intensity of the therapy applied.[1,5,9]

Figure 2 - Patient 1, before treatment (ice pick and crateriform scars)

Figure 3 - Patient 1, 30 days after treatment

Figure 4 - Patient 2, before treatment (ice pick scars)

Figure 5 - Patient 2, 30 days after treatment

Although there is plenty of documentation confirming that the fractioning of ablative lasers has considerably decreased the associated adverse effects, aggressive therapy is needed to obtain significant results.[1,5,7-9] Patients with acne scars need on average six sessions of fractional CO_2 laser – usually performed in the whole face, or at least the entire affected area – in intervals of 30 or 60 days. In the most difficult cases (e.g., micro-grafts, excision and suture, tangential exeresis of bridges), treatment should be intense to obtain a response equal to surgical procedures. For example, decreasing the distance between points to at least 200 Ìm and increasing the depth of the laser to 2000 µs; such parameters can be selected on most of the devices. Such intense treatment leads to an increase in the incidence of side effects such as post-inflammatory hyperpigmentation, prolonged erythema, pain and absenteeism. Therefore the CROLL technique is proposed, which is a less invasive, localized application technique. The advantages of this technique, compared to the fractional CO_2 laser, applied to the whole face, are: topical anesthesia is sufficient; faster recovery; results with one, two or three sessions; fewer side effects; less discomfort; and improved patient adherence to the treatment. Additionally, CO_2 laser presents advantages over the CROSS technique itself: the laser's thermal effect promotes a larger retraction of the skin than the chemical aggression alone (the latter requiring six to eight sessions of trichloroacetic acid to obtain good results). The absorption of the acid is not homogeneous, and depends on the application device (capillary, nail, toothpick); it can cause an increase in the diameter and depth of the scar in cases when it infiltrates in the skin. In addition, this technique can be applied to all types of acne scars (ice picks, crateriform, dystrophic, hypertrophic, papulous, bridges and tunnels). In the latter, the laser can be used in the pulsed mode and, due to its cutting power: the lesion is incised and subsequently vaporized, allowing healing by secondary intention.

Figure 6 - Patient 3, before treatment

Figura 7 - Patient 3, after treatment

CONCLUSION

The localized laser application technique seems to be a good option for the treatment of acne scars, especially for patients who require effective treatments with reduced recovery time, few reactions and lower risks. More studies are necessary to precisely evaluate the improvement in percentage terms, however our study suggests good general satisfaction with the results obtained using this technique. ●

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