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A combination approach to treating acne scars in all skin types: carbolic CROSS, blunt bi-level cannula subcision, and microneedling

Abordagem combinada para o tratamento de cicatrizes de acne em todos os tipos de pele: CROSS com fenol, subcisão com cânulas em dois planos e microagulhamento

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ABSTRACT

Acne is a common condition that often results in scarring. We propose a novel treatment of acne scarring using: 1- chemical reconstruction of skin scars (CROSS), mainly with carbolic acid, 2- blunt bi-level cannula subcision, and 3- microneedling. A total of 139 patients were treated from 2017-2018, of which 89 (64%) were Fitzpatrick Skin Types IV-VI. This triple approach to treating acne scars resulted in consistent high satisfaction from patients and photographic evidence of improvement. A combination of CROSS (to stimulate neocollagenesis), subcision (to release dermal connective tissue tethering), and microneedling (to stimulate neocollagenesis) is effective for acne scar treatment.

Keywords: Acne vulgaris; Acne keloid; Cicatrix; Cosmetic techniques

RESUMO

A acne é uma condição comum que muitas vezes resulta em cicatrizes. Propomos um novo tratamento para as cicatrizes da acne usando: 1- reconstrução química de cicatrizes (CROSS), principalmente com fenol, 2- subcisão com cânula em dois níveis, e 3- microagulhamento. Um total de 139 pacientes foram tratados em 2017 e 2018, dos quais 89 (64%) eram de Fototipos de Fitzpatrick IV-VI. Esta abordagem tripla para o tratamento de cicatrizes de acne resultou em consistente alta satisfação dos pacientes e evidência fotográfica de melhoria. A combinação de CROSS (para estimular a neocolagênese), subcisão (para liberar as traves do tecido conjuntivo dérmico) e microagulhamento (também para estimular a neocolagênese) é eficaz para tratar as cicatrizes da acne.

Palavras-chave: Acne vulgar; Acne queiloide ; Cicatriz; Técnicas cosméticas

How I do?

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INTRODUCTION

Acne is a common multifactorial condition that affects up to 80% of girls and 90% of boys in the adolescence. Unfortunately, many people with acne end up developing scars – which causes cosmetic discomfort – with 30% of those affected considering this condition a major problem.¹ A number of medical and surgical approaches have been proposed for the treatment of these scars, including laser based resurfacing, chemical peels, radiofrequency, subcision, microneedling and others. Although various monotherapies may be useful, combined treatments can be more effective. In the present article, the authors propose a new treatment for acne scars using a multi-modality approach.

METHODS

A retrospective review was carried out with the medical records of all acne scar patients who were treated with combination therapies from January 2017 to December 2018. All patients were treated with a combination of three procedures: (i) chemical reconstruction of scars (Chemical Reconstruction of Skin Scars – CROSS), mainly with carbolic acid, (ii) blunt bi-level cannula subcision and (iii) microneedling. Each of these steps is described in more detail below.

Step 1) Carbolic CROSS: 88% carbolic acid was used to treat ice pick and box scars in a similar method to trichloroacetic acid (TCA) CROSS however with two main differences. Trichloroacetic acid CROSS was performed using 60–90% TCA applied with a toothpick into the middle of the scars, avoiding spillage onto the scar's shoulders. However, carbolic CROSS was performed with a very fine paint brush instead of toothpick due to the fact it was technically easier to fill the inside of these scars than with this method. In addition, the carbolic acid was allowed to spill slightly out onto the shoulder of the scar in order to soften the scar's shoulder and improve blending with unscarred skin. This was applied after degreasing with acetone and before applying local anesthesia for the subcision procedure.

Step 2) Subcision: The initial subgroup of patients underwent standard subcision performed with a Nokor 18 gauge needle. Indirect lighting was used to visualize the patients' elevated and atrophic scars, and to determine the area to be subscised. After marking, the area was tumesced with 1% lidocaine mixed with sodium bicarbonate in a 2:1 ratio, using a 3cc or 5cc syringe and a 1" 25 or 30 gauge needle. Approximately 18–24cc of this diluted lidocaine mixture was used per cheek. For subcision with Nokor, an 18-gauge needle was used to create multiple puncture sites.

Alternatively, a second subset of patients was treated with multilevel subcision using a 70mm, 18-gauge cannula, which only required one puncture site. This bi-level subcision was performed parallel to the skin, aiming directly underneath the skin and breaking up the scar tissue, or aiming more towards the dermal fat junction, breaking scar tissue and adhesions and producing audible cracking sounds while doing this. A slow piston movement was used, moving the cannula back and forth and in

a fanning pattern. During tumescence, the indents produced by the acne scar tethers were clearly visible. The goal was to achieve very little resistance in the subscised area.

Step 3) Microneedling: Microneedling was performed with the Collagen PIN® device (Induction Therapies, Louisville, US) aimed at triggering percutaneous collagen induction immediately after the subcision. This device uses a disposable tip with 36 needles and revolves at 1,200 RPM. The device was used with a stamping technique, holding the tip on the skin for approximately 2–3 seconds (effectively producing 400–600 needle punctures) before moving on to the adjacent skin. The endpoint was punctate bleeding, and as such, appropriate depth of the needling was varied according to both facial region (temples are thinner) and the individual patient's skin thickness. The needle depth was calibrated from 1.5–2.5mm deep in the cheeks and 0.5mm on the temples and forehead.

Further treatment of the patient included Aquaphor® (Eucerin, US) and / or hyaluronic acid gel (HA). After five days, some patients also used vacuum suction (over-the-counter sales device, popular on many blogs about acne scars) aimed at reducing tether reattachment.

RESULTS

A total of 139 patients were treated. Of those, 89 (64%) had Fitzpatrick IV–VI skin phototype. Shadow-lit before and after photos were used to assess changes, along with patient feedback on side effects and satisfaction level. Patients received on average two treatments each (range = 1–4). This triple approach to the treatment of acne scars resulted in consistently high patient satisfaction as well as photographic evidence of improvement (Video 1). Typical adverse events included hematomas (from the subcision), small crusts and desquamation (from the CROSS and microneedling), and edema (from the anesthesia and subcision). There were rare cases of post-inflammatory hyperpigmentation (PIH).

Subcisions carried out with the cannula caused much less bleeding and subsequent hematoma formation as compared to the Nokor subcision. In addition, the cannula based subcision could be performed safely in the temples and marionette regions. The Nokor needle was not used on the temples or on the marionette region, due to the risk of injuring the blood vessels, being therefore used only in the cheeks. Patients who had both Nokor and cannula subcision consistently reported experiencing less severe side effects after cannula subcision. Specifically, patients who underwent both types of subcision tended to develop hematomas after Nokor subcision but not after cannula subcision.



VIDEO 1: Procedural video including CROSS with carbolic acid, subcision with cannula and microneedling for treatment of acne scars.

The video is available on the Journal's website

DISCUSSION

The authors of the present study describe a technique that combines carbolic CROSS, subcision and microneedling for the treatment of acne scars. All patients experienced improvement in their acne scarring and were satisfied with the results.

Many patients had a history of ablative fractionated CO₂ resurfacing, having experienced little or no improvement from that single-modality treatment. This novel triple procedure is characterized by greater patient satisfaction, fewer adverse events and shorter healing time. In addition, the specific combination of procedures can be adjusted for each individual patient according to the required recovery time or skin tone and scarring patterns.²

Carbolic acid was chosen over ATA for the CROSS in the first step of this combined procedure due to the fact that ATA is a highly penetrating agent and may cause extensive scars. In contrast, carbolic acid is a vesicant, creating edema and then a very superficial vesiculation of the skin that lines the acne scar. This tends to lead to better results and lower risk of enlarged scars.³

For the second step of this combined procedure, a Nokor or cannula based subcision was specifically used to release papillary scars from the dermis and deeper tissues. This controlled destruction of fibrous scar tissue leads to trauma and regeneration of collagen in the area.⁴ Multiple passes may be required to completely release tethered icepick type scars.

Microneedling was used in the third step of this combined procedure. Previous clinical and histological studies have demonstrated the effectiveness of microneedling, specifically for boxcar and rolling scars. Histology shows an increase in the thickness of the epidermis, type I, III and VII collagen, elastin and tropoelastin after microneedling of acne scars. However, deep icepick or atrophic scars with tethered scarring below the skin did not respond as well as boxcar-type and rolling scars, probably due to the microneedling's inability to release these fibrous connections. Therefore, the addition of subcision in our triple combined treatment would resolve this limitation of microneedling by first releasing the fibrous connective tissue adhering to icepick-type scars.

CONCLUSION

This triple combination of procedures can be used to treat all skin types and can have greater efficacy and lead to adverse events that are less severe than those caused by the previous methods. Further studies are recommended. ●

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