Percutaneous collagen induction with needles in scars developed after automobile accidents: esthetical and functional correction

Indução percutânea de colágeno com agulhas em cicatrizes após acidentes automobilísticos: correção cosmética e funcional

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ABSTRACT

Introduction: The use of microneedling techniques has become increasingly important in the correction of scars.

Objective: To evaluate the results of percutaneous induction of collagen with needles in scars developed after automobile accidents.

Methods: A retrospective, descriptive and monocentric study analyzed medical records containing standardized photographs taken at baseline and 3 months after a single microneedling session, in 9 patients diagnosed with post-traumatic scars who were treated using the same protocol. Clinical and photographic evaluations of the treatment were performed by the investigator 3 months after the procedure according to a category scale (very good, good, reasonable, poor). Patient satisfaction questionnaires were also applied at this experimental timepoint.

Results: The clinical and photographic evaluation classified 5 patients as very good and 4 as good regarding the results achieved. All patients reported satisfaction with the outcomes.

Conclusions: The use of needle-induced percutaneous collagen yielded good esthetical and functional results in scars developed following accidental trauma. Adverse effects were not observed, which suggests that the described procedure has a good safety profile.

Keywords: therapeutics; accidents; cicatrix

RESUMO

***Introdução**: A utilização de técnicas com microagulhas vem adquirindo importância crescente na correção de cicatrizes.*

***Objetivo**: Estudo retrospectivo, descritivo e unicêntrico, avaliando os resultados da indução percutânea de colágeno com agulhas em cicatrizes desenvolvidas após acidentes automobilísticos.*

***Métodos**: Foram considerados registros em prontuários e fotografias padronizadas feitas antes e três meses depois de sessão única de microagulhamento, de nove pacientes com diagnóstico de cicatrizes pós-traumáticas tratados pelo mesmo protocolo. As avaliações clínica e fotográfica do tratamento, de acordo com escala de categorias – muito bom, bom, razoável, ruim –, foram realizadas pelo investigador três meses após o procedimento, quando também foram aplicados questionários de satisfação aos pacientes.*

***Resultados**: Na avaliação clínica e por meio de fotografias, o autor considerou cinco pacientes com resultados muito bons e quatro com resultados bons. 100% dos pacientes relataram satisfação com os resultados.*

***Conclusões**: Observam-se bons resultados cosmético e funcional em cicatrizes após trauma acidental com a utilização da indução percutânea de colágeno com agulha. Não se observaram efeitos adversos, o que nos permite sugerir que o procedimento apresentou bom perfil de segurança.*

***Palavras-chave**: terapêutica; acidente; cicatrizes*

Original Articles

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INTRODUCTION

There is an increasing trend in accidents involving automobiles that result in unsightly scars, often with functional impairment, leading to a strong impact on the quality of life of the victims.[1] These lesions are usually polymorphic, which usually require the association of techniques aimed at obtaining therapeutic gain. Secondary to the inflammatory injury, changes in the color, texture, elasticity and uniformity of the skin's surface occur – in block or isolatedly, on the face – in the epidermis, dermis and hypodermis. Some techniques and technologies have been used for the correction of post-traumatic sequelae with variable and, in some cases, unsatisfactory results.[2] The use of needles for correcting scarring lesions, initially proposed by Orentreich and Orentreich[3] as a subcutaneous incision, has been widely used in Dermatology. This treatment aims at releasing fibrotic fibers and replacing cicatricial collagen with new collagen, being also proposed for its variants, such as dermal tunneling (TD®), [4] whose principle is the same involved in the percutaneous induction of collagen with needles (IPCA®). In IPCA®, a polyethylene cylinder with an average of 190 embedded sterile stainless steel needles that pierce the epidermis and protrudes into the dermis without de-epithelializing the treated area, resulting in 2.5mm deep injuries according to the classification of Lima et al.[5] In the present article, the author proposes the use of IPCA® according to a standard protocol of treatment in a group of patients bearing scars resulting from accidents involving automobiles.

METHODS

The study was carried out in compliance with the ethical principles of the Declaration of Helsinki (2013 revision), retrospectively evaluating (from January 2014 to January 2017) the medical records of two women and seven men who had been treated at the Dermatological Surgery and Cosmiatry Ambulatory, Santa Casa de Misericórdia, in the Brazilian Northeast city of Recife. The patients had scars on the face and upper limbs that resulted from accidents involving automobiles and were all treated with the IPCA® technique.

The treatment was performed in a procedure room carefully prepared for surgical interventions. Following antisepsis with 2% chlorhexidine and anesthesia with 2% lidocaine solution without vasoconstrictor injected into the skin with flexible cannula 22G (1: 2 of 0.9% saline + 10% of the total volume in 8.4% sodium bicarbonate, aimed at neutralizing the lidocaine's low Ph., offering more comfort to the patient), the intervention was initiated. Next, a roller with 2.5mm-long micro-needles (Dr. Roller®, Mooham Enterprise Co. Gyeonggi-do, South Korea) was used to perform right-to-left, top-down and, finally, diagonal movements, producing linear bands with multiple micropunctures that up until a uniform pattern of purpura caused by deep injuries was obtained.[5] (Figure 1) All patients underwent one microneedling session according to the methodology described above, performed by the same physician. The patients' ages ranged from 23 to 41 years. Their Fitzpatrick phototype classification ranged from II to IV. The clinical and photographic evaluations of the treatment, rated according to a categorical scale (very good, good, reasonable and poor), were performed by the investigator three months after the procedure, when questionnaires aimed at assessing the patients' satisfaction were also applied. Shortly after the procedure, the patients received gauze and micropore adhesive tape dressings. No topical medication was applied after the intervention. The patients were instructed to remove the dressing under running water in the shower on the following day and to begin applying a skin regenerator up until the seventh day, when the use of a commercial SPF 60 sunscreen should be initiated.

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RESULTS

Based on the clinical and photographic evaluation, the author considered that 55% (5 patients) had very good results and 45% (4 patients) had good results. All patients (100%) reported satisfaction with the outcomes. Pain during the treatment was considered tolerable. In the postoperative period, none of the 9 patients reported discomfort or needed to use analgesics. With a significant reduction of edema and hematoma, resumption of professional activities took place between the seventh and the tenth day after the procedure. Complications such as infection and hypertrophic scars were not observed in this group. Two patients had mild transient postinflammatory hyperpigmentation, with total remission over a period of 20 to 30 days, secondary to the introduction of the use of a whitening

Figure 1: Upper limb of a patient immediately after the intervention; deep injuries.

Figura 2: Patient before and 90 days after the treatment.

cream during the night. Seven of the 9 patients who complained of some functional impairment resulting from retraction of the scars described substantial improvement after the treatment. One of these patients additionally reported a reduction of tearing and the end of the need of using eyewashes for ocular lubrication, which was routinely used after having been involved in a car accident (Figure 2). Of the patients evaluated, 7 have already completed 24 months of follow-up after undergoing the procedure, maintaining satisfactory outcomes.

DISCUSSION

Despite the many options currently available for the correction of scars, their treatment remains a major challenge.[6] This new approach is aimed at improving the cosmetic and functional gains in areas of often difficult intervention, such as the periorbital region. In the evaluated group, the outcomes were satisfactory and compatible with the author's and patients' expectations, allowing the suggestion for the inclusion of the proposed methodology in the therapeutic armamentarium used to treat polymorphic scars of patients who have suffered accidents involving automobiles. Pain and discomfort reported by the patients in the intra- and postoperative periods were compatible with those expected for this type of procedure. The absence of postoperative complications stimulates the author to expand the use of the methodology for treating other patients. The technique should be evaluated in other groups with a view to confirm the outcomes and conclusions offered by the present paper.

CONCLUSION

Good cosmetic and functional outcomes were observed with the use of IPCA® in scars produced by trauma involving car accidents. No adverse effects were observed, which allows the author to suggest that the procedure has a good safety profile.

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DECLARATION OF PARTICIPATION:

Emerson Vasconcelos de Andrade Lima: Participated in the preparation of the present paper, performed the technique, carried out the patients selection, performed photographic records and the follow up in the postoperative period.