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A Case Report on the Therapeutic Approach of Micro Needling in the Management of Acne Scars

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ABSTRACT:

Atrophic acne scars, a complication of acne vulgaris, presents a great struggle before dermatologists as there is no standard treatment option available for its cure. Several therapeutic modalities like peeling, different types of lasers and others have been in use nowadays. The minimally invasive procedure known as micro needling is one such modality that involves repeated puncturing of skin with sterile microneedles in order to break the dermal collagen that holds the scar tissue together. Several recent reports indicate the efficacy of micro needling, particularly derma roller as well as fractionated microneedle radiofrequency for managing atrophic acne scars. In this case report, a 20-year-old female coming to the O.P.D of Department of *Amraz-e-jild wa zohrawiya*, Faculty of Unani Medicine, Aligarh Muslim University, Aligarh with atrophic ace scars (icepick, rolling and boxcar) on both cheeks. The patient was treated with micro needling once a week for a period of 8 weeks. The results were assessed on Qualitative Scarring Grading System, Cardiff Acne Disability Index as well as photographs of the patient. A significant amount of reduction was observed in the scars at the end of the study, the details of which are discussed in full length paper.

KEY WORDS: Acne vulgaris, Atrophic Acne scars, Derma roller, Micro needling.

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INTRODUCTION:

Acne vulgaris, being a multifactorial disease of the pilosebaceous unit, affects people of all ages, although its prevalence is highest in the peripubertal population, where 80% of all teens may be diagnosed with acne.[1,2,3,4] Clinical lesions include papules, pustules, open and closed comedones, and nodules with variable degrees of inflammation and depth.[2,3] A significant inflammatory reaction causes textural changes in the superficial and deep dermis in certain patients, which leads to post-acne scars.[5,6] Atrophic acne scars are usually a chronic consequence of acne which influences mental and physical well-being of sufferer. These scars, further classified into ice pick, boxcar, and rolling scars, are caused by the breakdown of collagen in the dermis.[7,8] People who have extensive acne scars are more likely to be depressed and to have an introverted personality.[9] There are several methods which have been used to treat post acne scars which include topical

preparations such as retinoids, chemical peeling, laser, derma abrasion, needling, tissue augmenting agents and, subcision, derma abrasion, PRP, fat transplantation, focal TCA application and various combination therapy.[10,11,8]

Micro needling is a therapeutic modality which has been in great use in the present scenario and serves as a procedure that is affordable, effective, and doesn't need patients to refrain from their regular activities.[7] Moreover it can be done on all skin types and is considered to have lesser risk of post inflammatory hyperpigmentation compared to other procedures. This procedure has been found to be relatively painless, basic and minimally invasive. It is an excellent alternative in atrophic acne scars as it breaks the collagen bundles in the superficial layer of dermis with subsequently inducing more collagen without completely de- epithelializing the skin which is commonly seen in some ablative procedures.[8] This technique involves puncturing the skin many times with needle-based devices.

The typical derma roller has a 12 cm long handle and a drum-shaped device that is 2 cm broad and has 192 tiny needles of various sizes (0.25-3 mm in length).[12] The idea of micro needling is to intentionally damage the skin with a derma roller with a certain needle size. This results in superficial bleeding, which starts a healing cascade and releases certain growth factors. Additionally, neovascularization and neo collagenesis are started by the migration and proliferation of fibroblasts. [12,13]

CASE STUDY:

A 20-year-old female presented with post acne scar distributed on both cheeks came to OPD of *Amraz-e-jild wa zohrawiya*, AMU. The patient gave history of severe acne in her adolescence on both cheeks which later converted to atrophic acne scars. The physical examination of the patient revealed several types of atrophic scars like icepick, rolling and boxcar distributed on both cheeks with a slight predominance on upper part of both cheeks (Fig-1). The patient was treated with several steroids and retinoid treatment in the past by local quacks. The patient gave no history of any active acne in the past 15 days. The nature of the study and the procedure was explained clearly to the patient and a written informed consent was obtained from her before the initiation of the treatment.

The patient was subjected about 2 months of treatment (8 sessions at 1 week interval). The face was thoroughly cleaned with normal saline. A topical anesthetic gel (lignocaine 2%) was applied at the treatment site for 45 minutes. Derma roller of needle size 0.5 mm was used. The treatment area was rolled in vertical, horizontal and diagonal applying minimal pressure until uniform bleeding was found over the scar areas (Fig-2). The skin was stretched at the site of deep-seated scars. After treatment the area was cleaned with a sterile saline solution. The patient was advised to avoid sun exposure and use sunscreen during daytime.

After micro needling a remarkable reduction in atrophic scar was observed in both cheeks (Fig-3). The number of all types of acne scars; icepick, rolling and boxcar scars were reduced significantly after 8 weeks. Apart from this a notable amount of complexity and elasticity of skin was observed withing 6 weeks of treatment. The improvement in the acne scars was assessed on qualitative scarring grading system[14] and Cardiff acne disability index [15] as shown in table 1 and table 2. The notable improvement is depicted in the before and after treatment photographs .

Table 1. Count of different types of acne scars before and after micro needling

Atrophic acne scar count	Before treatment	After treatment
Rolling scars	30	8
Boxcar scars	38	10
Iceprick scar	82	21

Table 2. Assessment parameter before and after micro needling

Assessment parameters	Before treatment	After treatment
Cardiff acne disability index	13	6
Qualitative scaring grading	Moderate (3)	Mild (2)

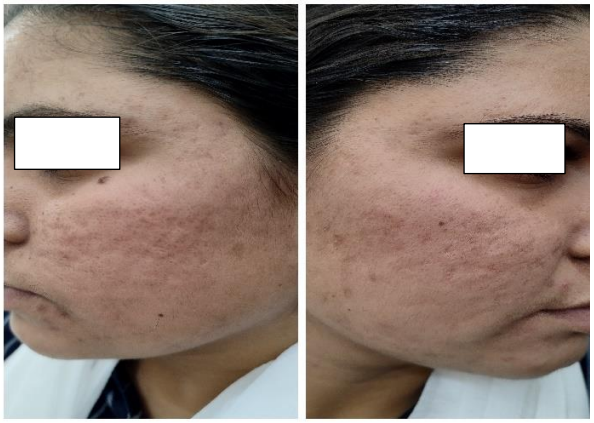

Fig1.Photograph before treatment

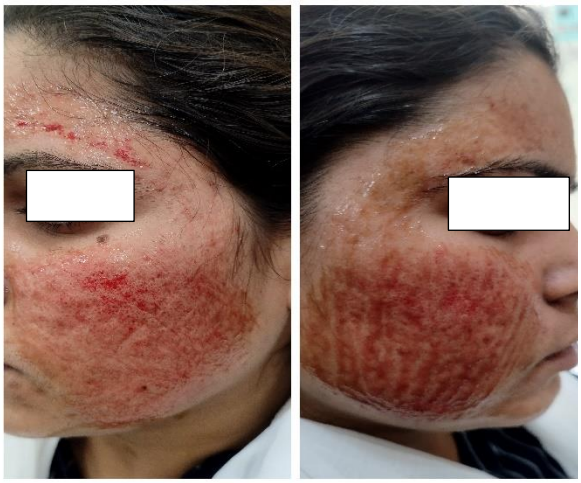

Fig 2. Photograph During the treatment

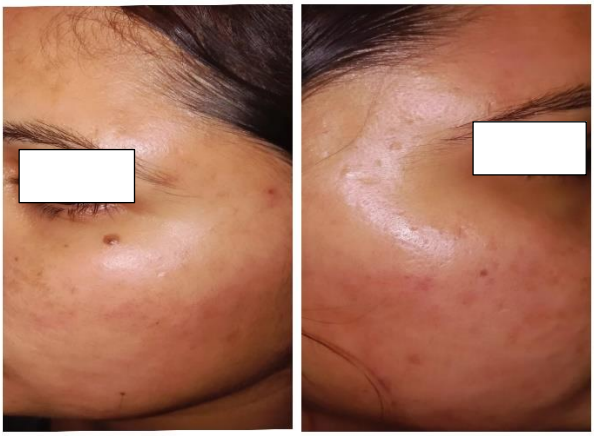

Fig 3. Photograph after the treatment

DISCUSSION:

Acne scars are usually the result of tissue loss or enhanced tissue growth. These scars can be further differentiated into icepick, rolling and boxcar scars. They result from loss of collagen later to the inflammatory process of acne. No standard therapy or treatment protocol have yet been established. Several treatment modalities like punch techniques, dermabrasions,

peelings, subcision, cutaneous fillers, having low success rate; whereas ablative lasers that are quite costly with greater recovery time possess higher success rate.[9]

Micro needling, in this context, stands out as a procedure that is affordable, effective, and doesn't need patients to refrain from their regular activities. This procedure uses needle-based devices to repeatedly puncture the skin. The process involves using needles, a tattoo gun, or a derma roller to pierce the skin.:

The aim of the dermarolling technique is to produce numerous small lesions in the papil lary dermis. This causes a cascade of growth factors and cytokines to be released, primar ily interleukin 1 alpha, 8 and 6, TNF alpha, a nd macrophage stimulation factor, which causes neo collagenesis, dermal vasodilation, neo angiogenesis and keratinocyte migration. [9,12] Following the trauma from the needles, there are three distinct stages of the healing process. In the injury phase, growth factors including TGF alpha and beta, platelet derived growth factor, and connective tissue growth factor, are released by platelets and neutrophils, which then act on keratinocytes and fibroblasts. The formation of type III collagen, elastin, glycosaminoglycans, and proteoglycans occurs after angiogenesis, epithelization, and fibroblast proliferation in the second phase, also known as the healing phase, during which neutrophils are replaced by monocytes. Additionally, monocytes release the fibroblast growth factors TGF alpha and beta. The formation of the fibronectin matrix, which occurs around 5 days after the injury, enabling the deposition of collagen just below the basal layer of the epidermis. The early-predominant type III collagen (maturation phase) is substituted by collagen of type I which is more resilient and lasts longer. [9,11]

In the present case study, it was found that micro needling showed moderate to high improvement in all types of atrophic acne scars (icepick, rolling and boxcar), as well as skin complexity, elasticity and rejuvenation and the skin looked more fine and smoother.

CONCLUSION:

Micro needling has emerged as an excellent therapeutic modality for atrophic acne scars, along with notable improvement in the texture of skin and regression of atrophic scars, representing satisfactory clinical outcomes, with no significant post-procedure serious complication. Besides this, the micro needling helps in improved quality of life of patients and increased personal satisfaction.

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