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# THE APPLICATION OF NEEDLE RADIOFREQUENCY FOR THE REDUCTION OF ACNE SCARS: A CASE REPORT

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**A** – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

**ABSTRACT**

**Background:** Acne fulminans can leaveunsightly scars that can have a detrimental effect on a person's ability to function in society, resulting in a deterioration in the overall quality of life of these patients. Scientific research shows that problems with self-esteemmay lower a person's quality of life, making them reluctant to interact with other people.This, in turn, may lead to depression and, in extreme cases, to suicide. For people who suffer from acne fulminans, this is an extremely serious problem.This is compounded by the fact that even if they spend much of their life fighting acne, ultimately successfully, they still may be left with the visual effects of the disease, like scars.

**Aim of the study:** The aim of the paper is to investigate how a series of six needle radiofrequency treatments will affect, and potentially shallow, the acne scars.

**Material and methods:** The analysis was conducted on the basis of an interview, photographic documentation of the patient and skin diagnosis using the NatiAnalyzer device. The case report was based on the medical history, photographic documentation and skin diagnosis (using the Nati Skin Analyzer), of a 28-year-old female patient who had suffered from acne fulminans during her adolescence. The effectiveness of the needle radiofrequency treatment was then analyzed.

**Case report:** A 28-year-old female patient who hadstruggled with skin eruptions caused by acne fulminans since the age of 15 underwent an examination. The lesions were located on her entire face which resulted in deep scars. The patient used a series of six needle radiofrequency treatments along with ampoules containing active ingredients. Treatments were performed once a month.

**Conclusions:** As evaluated using Goodman and Baron's scar scale, the scars appear to have shallowed. Additionally, the patient's self-esteem increased.

**KEYWORDS:** acne fulminans, scars, needle radiofrequency

## Background

Acne vulgaris is a problem that often affects young people. It appears in the form of not only blackheads, but also purulent eruptions, which in most cases develop on the face and back [1,2]. There are many potential causes. These include drugs, hormones, improper diet, improper skin care and genetic determinants [3].

In the beginning, an efflorescence called a blackhead often appears. The blackhead may changecolor and form, and turn into a purulent eruption. Acne fulminans usually affects men.However, regardless of gender, it appears with widespread purulent lesions, cysts, and redness of the skin [4].

Patients who experience discomfort due to the skin changes often start treatment on their own, at times using methods they have seen ontelevision, for example. However, while such methodsmay help for a short while, they can often cause additional harm, leading, ultimately, to an intensification of the problem. Therefore, it is extremely important to visit a dermatologist who can prescribe appropriately selected drugs (often is isotretinoin) [5–7].

Unfortunately, acne is not always cured without scars. The scars are often cylindrical and resemble deep valleys [8]. The skin has reduced elasticity in these places, asthe defects have replaced the connective tissue [9].

Long-term treatment anda lack of improvement may cause patients to have a decreased quality of life. Studies by Chilicka et.al. show that the quality of life

improves when skin efflorescence disappears and it gives a patient both greater confidence and a willingness to live [10].

## The aim of the study

The aim of the paper is to show how a series of needle radiofrequency treatments with the introduction of active substances helps to shallow acne scars.

## Material and methods

The patient underwent six treatments with ampoules containing sodium chloride, glucosamine sulphate (strengthening and firming), tocopherol, and ethylhexylglycerin (skin conditioning agent). After the treatment, the patient applied a mask on the skin to soothe the irritation. The mask contained glycerin, aloe and allantoin. Any contraindications, such as pregnancy, lactation, metal implants, presence of a cardiac pacemaker, epilepsy, diabetes, and cancer were excluded, to minimize the risk of complications.

The authors obtained written consent for performing the treatment and collecting photographic documentation, and also obtained consent from the Bioethical Commission at the Public Higher Medical Professional School in Opole (consent No. 6 / KO / 2017).

## Case report

The patient underwent acne treatment at the age of 15. At the time, her condition was deemed to have had a hormonal basis. She used zinc ointment, complexion tonics and gels, and tetracycline, which helped mitigate the effects. After a short period of time, the acne returned and there were twice as many spots as before the initial treatment. In 2013, the patient was treated successfully with isotretinoin. The acne never returned, however, deep scars remained in the skin. Cosmetic treatments including chemical peels, were not effective and did not alter the depths of the scarring (Fig. 1). The patient gave the authors of this paper permission to use her photos. The patient's recent treatment involved a series of puncture treatments and the application of active ingredients.

Figure 1. The front of the face before the series of treatments.

## Results

Goodman and Baron's scar scalewas used to assess the depth of the scars. The patient's skin condition was assessed at level 4, where the skin changes did not flatten even when manually stretched (Tab. 1). Before the treatment series, the patient reported problems with her quality of life. She claimed to see other people looking at her face with contempt. She felt rejected by society, and despite wearing make-up, she was unable to feel comfortable in her own skin.

Table 1. Assessment of atrophic scars according to Goodman and Baron's scale.

| Grade of scars | Appearance of skin |
|---|---|
| Grade 1 | Macular, edema or discoloration |
| Grade 2 | Mild atrophy is not visible at distances> 50 cm, easy to cover with makeup or a beard |
| Grade 3 | Moderate atrophy visible at distances> 50 cm; not easy to cover with makeup or a beard, changes flatten when manually stretched |
| Grade 4 | Severe atrophy, changes do not flatten when manually stretched |

A total of six treatments were performed in the series, with a monthly break to regenerate damaged and punctured skin. During the first three treatments, there was more puncturing due to the thickness and unsightly appearance of the skin. Nearthe end of the series, the skin became thinner and thinner.Therefore, the procedure had to be more delicate. As a result, the 1.5 mm needles were replaced with 0.5 mm needles. During the procedure, there was also localized bleeding, which had a positive impact on the remodelingof the skin and led to greater overall improvement. After the treatment, ecchymosis was visible in some places. It predominantly appeared on the forehead, where the skin is very thin. Redness lasted for a few days.

After the series of treatments, the patient's scars were evaluated once again. According to Goodman and Baron's scale, there was shallow scarring to grade 2, which indicatedthe needle radiofrequency treatments had given very good results (Fig. 2). The patient noticed a visible changein the quality of her skin; it had become more radiant and unblemished. She was no longer con-

Figure 2. The front of the face after the series of treatments.

cerned about interacting with other people anymore.On the contrary, she received positive feedback from others that her skin looked much better than before the treatments. She was able to feel comfortable.

## Discussion

Needle radiofrequency treatments are eagerly performed by cosmetologists in the fight against post-acne scars. However, it is also worth searching for alternatives and finding ways to combine methods, which can also produce spectacular effects.For example, a good combination method involvesusing acids that cause controlled inflammation and fractional mesotherapy.

The effectiveness of these two methods was confirmed in studies carried out before Chilicka et al. where exfoliation using 20% glycolic acid with fractional mesotherapy led to areduction in scarring from grade 3 to 2,according to Goodman and Baron's scale, in case of scars covering the face. The series includedeight treatments performed with the aforementioned methods alternating every second week. The study showed good results from the combination treatment, which also made the scars flatter and improved the overall structure of the skin [11].

At the time, there were 30 women and 19 men, all between the ages of 18 and 29,who were examined. In 2014, the BMC & Research Institute Karnataka carried out micropuncture research on 30 people. Four treatments were performed with a month-long interval between treatments on either side of the face. Vitamin C was introduced to the punctures on the right half of the face, while platelet-rich plasma was introduced to the left side. The piercing was done with 1.5 mm needles in three directions and repeated 4-5 times. After the treatment, the patient was given a skin preparation and the punctures were repeated. Platelet-rich plasma gave amazing results in 19% of the patients, while vitamin C gave good results in 7% of subjects [12].

After their research, Moetaz et al. also found that microcutting had a beneficial effect on improving the condition of the skin and making the post-acne scars more shallow [13].

According to a study by Elawar and Dahanconducted on a group of 19 patients with acne scars, fractional microneedle radiofrequency caused skin texture improvement (shallower scars), and pore size reduction [14].

## Conclusions

The application of needle radiofrequency, together with the application of active substances,achieved very good resultsfor the shallowing of post-acne scars. This therapy changed both the structure and visual appearance of the skin, and made the acne-based changes more shallow, as analyzed using Goodman and Baron's scale.

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