

Thesis Title	A Comparative Study of Fractional Radiofrequency Microneedle and Sublative Bipolar Radiofrequency Treatment in Acne Scars
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ABSTRACT

BACKGROUND: Fractional radiofrequency technology plays a major role for the treatment of acne scars today. It provides fractionated ablation with minimal disruption to skin and thus remodeling of collagen tissue. Since 2011, sublative bipolar radiofrequency (SBR) treatment has become popular for improving the appearance of facial skin, reducing scars, treating textural irregularities and wrinkles. Fractional radiofrequency microneedle (FRM) device is a new technology which claims to be more-selective for heating the dermis at accurate depth, through small needles at its tip.

OBJECTIVE: To compare the clinical efficacy and side effects of the fractional radiofrequency microneedle with those of the sublative bipolar radiofrequency device in treatment of acne scars.

MATERIALS AND METHODS: Seventeen volunteers with atrophic acne scars were enrolled. They received three split-face sessions of treatment every four weeks, one side with FRM, and the opposite side with SBR device. Clinical improvement of acne scars was evaluated at 1 and 3 months after the last treatment. Other parameters measured by cutometer and sebumeter had been recorded. Side effects were recorded after each treatment session. Satisfaction scores were surveyed after 4 month post-treatment.

RESULTS: Seventeen volunteers enrolled in the study without discontinuation. Acne grades at follow-ups were statistically reduced from the baseline. FRM's grades between before and after treatment at one and three months were statistically different with $p=0.001$ and <0.001 , correspondingly. There were statistical significance on SBR's grades at one month ($p<0.001$) and three month ($p=0.002$). This study showed that the face using FRM had more passive behavior of the skin to force (firmness) than SBR's at 1-month follow-up ($p=0.004$). No statistically change in sebum production between baseline and follow-ups. All volunteers indicated more pain and all bleeding in FRM side; more burning sensation and all burning smell in SBR side. Their common immediate side effects were erythema and swelling; hyperpigmentation and acne occurrence at follow-ups. After four months, volunteers had most scores for improvement of acne scars as "satisfied" for FRM and "somewhat satisfied" for SBR with no statistic difference between them. Eight volunteers gave higher satisfaction scores for FRM side; three people gave higher scores for SBR side; and six people gave equal scores for both sides.

CONCLUSION: Both FRM and SBR treatment can be effective treatments for acne scars. Cutometer found more firmness of the skin in FRM side at 1 month follow-up. Sebumeter found no difference in sebum production. They had some common temporary side effects. Longer follow-ups for next studies should be done with comparative studies for different levels of RF energy in future.

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Keywords: RF/Fractional Radiofrequency Microneedle/Sublative Bipolar
Radiofrequency/Acne scars