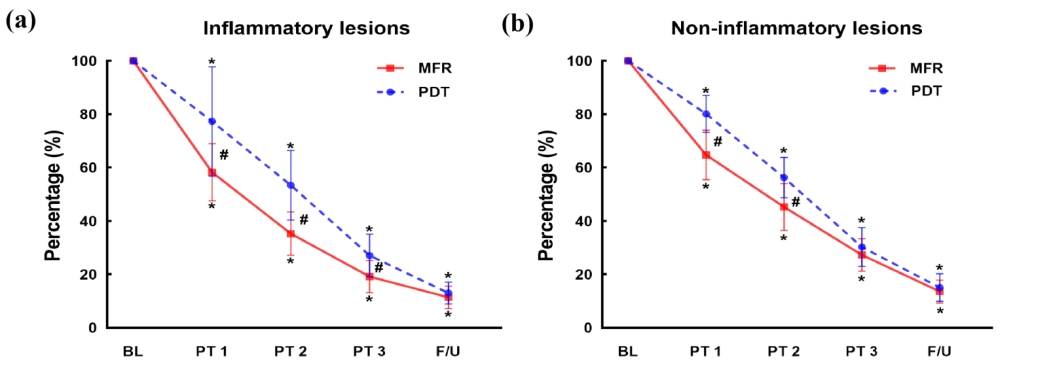
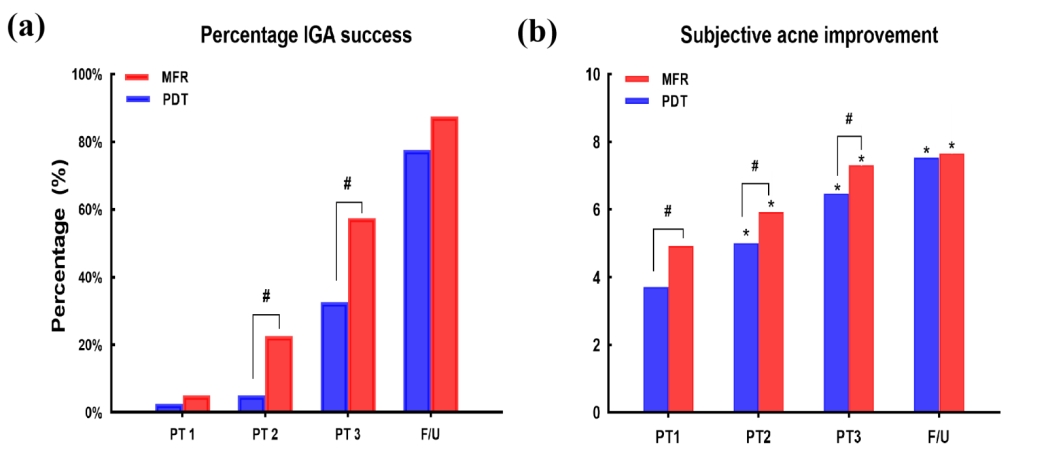


**Supplementary Figure 1:** The 3.5-mm-long needle with 1.5-mm insulation is inserted into the lesional follicular pore, and an electrical current is delivered to treat the acne.



**Supplementary Figure 2:** Percent change in (A) inflammatory acne lesion counts and (B) non-inflammatory acne lesion counts during the time window of treatment sessions and the final F/U. \**P* < 0.05 *vs*. BL; †*P* < 0.05 between MRF and PDT groups. BL: Baseline; F/U: Follow‐up; MRF: Single microneedle radiofrequency; PDT: Photodynamic therapy; PT: Post‐treatment.



**Supplementary Figure 3:** (A) Success rate based on the IGA of “clear” or “almost clear.” (B) Comparison of subjective treatment assessments. \**P* < 0.05 *vs*. PT1; †*P* < 0.05 between MRF and PDT groups. F/U: Follow‐up; IGA: Investigator Global Assessment; MRF: Single microneedle radiofrequency; PDT: Photodynamic therapy; PT: Post‐treatment.

**Supplementary Table 1: Baseline characteristics of the enrolled subjects (*n* = 80).**

|  |  |  |  |
| --- | --- | --- | --- |
| Items | **MRF group**  **(*n* = 40)** | **PDT group**  **(*n* = 40)** | ***P*-value** |
| Male, *n* (%) | 24 (60.0) | 21 (52.5) | 0.652 |
| Age (years, mean + SD) | 22.4 ± 3.4 | 23.8 ± 4.0 | 0.087 |
| Skin phototype (Fitzpatrick), *n* (%) |  |  |  |
| III | 33 (82.5) | 35 (87.5) | 0.531 |
| IV | 7 (17.5) | 5 (12.5) |  |
| Acne lesion counts (mean + SD) |  |  |  |
| Inflammatory lesion | 45.5 ± 7.1 | 46.7 ± 7.8 | 0.491 |
| Non-inflammatory lesion | 48.5 ± 11.7 | 50.1 ± 11.5 | 0.545 |
| Acne severity grade (IGA), *n* (%) |  |  |  |
| 3 | 28 (70.0) | 25 (62.5) | 0.478 |
| 4 | 12 (30.5) | 15 (37.5) |  |
| ECCA (mean + SD) | 93.4 ± 23.2 | 99.9 ± 21.9 | 0.201 |

IGA: Investigator Global Assessment; MRF: Single microneedle with radiofrequency; PDT: Photodynamic therapy; SD: Standard deviation.

**Supplementary Table 2: Safety profiles of the MRF and PDT treatment groups.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Items** | **MRF group** | **PDT group** | ***P*-value** |
| Pain (10-point VAS) | 4.9 ± 0.6 | 6.6 ± 0.9 | <0.05 |
| Erythema | 1.7 ± 0.5 | 2.6 ± 0.3 | <0.05 |
| Edema | 1.4 ± 0.5 | 2.4 ± 0.4 | <0.05 |
| Scaling and dryness | 0.8 ± 0.4 | 1.9 ± 0.5 | <0.05 |
| Scar formation (ECCA) | 96.3 ± 15.1 | 105.4 ± 16.0 | <0.05 |
| Pigmentary changes | 4/40 | 17/40 | <0.05 |
| Acneiform eruption | None | 13/40 | <0.05 |

MRF: Single microneedle with radiofrequency; PDT: Photodynamic therapy; VAS: Visual analog scale.