

1064-nm Picosecond MLA vs. 1927-nm Fractional Thulium for Atrophic Acne Scars

Prospective, Randomized, Evaluator-Blinded, Split-Face Study

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1. Study at a Glance

Design	Population	Picosecond Arm	Thulium Arm
Prospective, randomized, split-face; single center; evaluator blinded	35 Asian patients with symmetric facial atrophic acne scars	PicoCare 450; 1064 nm Nd:YAG + MLA; 450 ps; 1.0–1.2 J/cm²; 7 mm; 2 passes	Lavieen; 1927 nm sub-ablative fractional thulium; 1200–1800 µs; 10 W; 2 passes

2. Executive Summary

This 2026 randomized split-face study compared two very different fractional laser strategies for atrophic acne scars: a 1064-nm picosecond Nd:YAG laser delivered through a microlens array (P-MLA) and a 1927-nm sub-ablative fractional thulium laser (FTL). Thirty-five patients completed three treatment sessions at four-week intervals, with final assessment 12 weeks after the last treatment.

The central efficacy finding is nuanced. Both sides improved significantly on the ECCA acne-scar scale, and the magnitude of ECCA improvement was not significantly different between treatments. However, blinded physicians assigned a modestly but statistically higher Global Aesthetic Improvement Scale (GAIS) score to the picosecond-treated side. The clearest practical separation was not scar-score reduction, but treatment experience and recovery: the picosecond side had less procedural pain, substantially less crusting, shorter crust duration, and lower erythema and melanin indices at final follow-up.

For a buyer or clinician, this is therefore not a simple 'picosecond wins' study. It supports comparable scar-severity improvement from both tested protocols while suggesting a meaningful comfort-and-downtime advantage for the specific 1064-nm PicoCare 450 MLA protocol. The authors explicitly warn that the results are platform-specific and should not automatically be generalized to all 1064-nm picosecond or 1927-nm thulium systems.

3. Treatment Protocols

Parameter	1064-nm P-MLA	1927-nm FTL
Platform	PicoCare 450 (WONTECH)	Lavieen (WONTECH)
Pulse duration	450 ps	1200–1800 µs
Fluence / power	1.0–1.2 J/cm²	10 W
Spot / scan	7 mm; 2–7 Hz	0.8 mm scan density
Overlap / passes	10%; 2 passes	10%; 2 passes
Clinical endpoint	Mild erythema + pinpoint petechiae	Mild erythema + edema
Schedule	3 sessions, 4 weeks apart	3 sessions, 4 weeks apart

4. Key Efficacy Findings

Outcome	1064-nm P-MLA	1927-nm FTL	Interpretation
ECCA baseline	102.86 ± 47.47	101.43 ± 44.89	Comparable baseline severity
ECCA at 3 months	86.86 ± 47.42	85.57 ± 50.54	Both improved; no significant between-side difference
Within-side ECCA change	p < 0.001	p < 0.001	Significant improvement for both
Blinded physician GAIS	2.83 ± 1.272	2.57 ± 1.243	P-MLA higher; p = 0.037
Patient satisfaction	2.66 ± 1.142	2.80 ± 0.901	No significant difference; p = 0.317

Buyer-facing interpretation: The validated scar-severity endpoint (ECCA) does not establish superior scar reduction for either modality. The blinded GAIS assessment favored P-MLA, but the numerical difference was relatively small. The more conspicuous advantage for P-MLA appeared in tolerability and recovery.

5. Safety, Comfort & Downtime

Measure	P-MLA	FTL
Pain VAS, mean $\pm$ SD	5.37 $\pm$ 2.545	6.06 $\pm$ 2.634 (p = 0.028)
Crusting	40.00%	91.43%
Median crust duration	2 days	4 days
Pruritus	85.71%	42.86%
Pinpoint bleeding / petechiae	34.29%	0%
Vesicles or pustules	0%	14.29%
Hyperpigmentation	2.86%	8.57%

The picosecond treatment was not free of adverse effects. Petechiae or pinpoint bleeding occurred in roughly one-third of P-MLA-treated sides, and pruritus was more common on that side. Conversely, FTL produced much more frequent crusting, longer crust duration, and vesicles or pustules in 14.29% of treated sides. Reported post-inflammatory hyperpigmentation was uncommon and resolved during follow-up.

6. Objective Skin Measurements

At final follow-up, melanin index was significantly lower on the P-MLA side than the FTL side (30.80 ± 4.15 vs. 32.07 ± 3.16 ; p = 0.007). Erythema index was also lower on the P-MLA side (12.47 ± 2.56 vs. 13.70 ± 3.47 ; p = 0.037). Transepidermal water loss returned to baseline in both groups and did not differ between sides at final follow-up.

7. How the Authors Explain the Difference

The authors attribute the differing recovery profiles to the treatment mechanisms. The P-MLA approach uses focused picosecond energy to produce laser-induced optical breakdown (LIOB) and localized micro-vacuoles, whereas the 1927-nm thulium laser relies more heavily on water absorption and photothermal coagulation. This mechanistic explanation is biologically plausible and consistent with the observed recovery pattern, but the study did not include histopathology; therefore, it did not directly prove the proposed cellular or molecular mechanism.

8. Important Limitations

- Small sample: 35 patients completed the study.
- Single-center Asian population, limiting generalizability to other populations and skin phototypes.
- Only three treatment sessions with a 12-week post-treatment follow-up.
- No histopathological or molecular analysis to directly compare remodeling mechanisms.
- The two arms differed in wavelength, pulse domain, energy-delivery architecture and tissue interaction; this study does not isolate pulse duration as the causal variable.
- Results are specifically tied to PicoCare 450 and Lavieen. The authors caution against extrapolating them to all devices sharing the same wavelengths.

9. PLBG Evidence-Based Takeaway

Both tested platforms improved atrophic acne scars. On the ECCA scar-severity scale, neither treatment demonstrated superior improvement. The 1064-nm PicoCare 450 microlens-array protocol did, however, receive a higher blinded GAIS score and produced less pain, substantially less crusting and shorter recovery than the 1927-nm Lavieen protocol. The most defensible takeaway is therefore **comparable scar improvement with a more favorable treatment-experience and downtime profile for the tested picosecond protocol**—not universal superiority of picosecond technology.

10. Evidence / Editorial Rating

Dimension	PLBG assessment
Study design	Strong — randomized, split-face, evaluator-blinded
Direct clinical relevance	High — head-to-head treatment comparison
Efficacy signal	Balanced — both effective; ECCA comparable; GAIS modestly favored P-MLA
Tolerability / downtime signal	Meaningful advantage for tested P-MLA protocol
Generalizability	Moderate-to-limited — 35 patients, single center, Asian population, specific devices
Platform extrapolation	Not justified beyond PicoCare 450 vs. Lavieen protocols tested

11. Source & Transparency

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Editorial note: This PLBG summary is an independent evidence synopsis. Numerical values and treatment parameters are taken from the published study; interpretive statements are deliberately limited to what this trial supports.