

(continued)	Reference (Year)	Study Design	Treatment Arm(s)	Reduction in Mean or Median Lesion Count	Complete Clearance	Cosmetic Outcome	Most Common AEs and Cosmetic Considerations
	Torezan et al ⁸² (2013)	Split-face study	<p>Scales and crusts were removed with curette prior to treatment:</p> <p>(A) 160 mg/g occluded MAL cream applied for 90 min before illumination with red light, 50 mW/cm², 37.5 cm² light dose on half of face (n=10);</p> <p>(B) immediately after MAL cream was applied, a disposable microneedling roller with 192 needles of 1.5-mm length and 0.1-mm width was passed 7–8 times in each direction until uniform erythema and pinpoint bleeding was achieved before receiving treatment arm A on opposite half of face (n=10)</p>	90 d PT: (A) 86%, (B) 90%	N/A	90 d PT: treatment arm B showed greater improvement in global assessment for mottled pigmentation, coarse wrinkles, fine lines, roughness, and sallowness	Erythema, edema, crusting, pain, and bacterial infection; mean time to resolution of AEs was 5 d with normal MAL-PDT and 10 days with microneedling-assisted MAL-PDT

Abbreviations: 5-FU, 5-fluorouracil; PT, posttreatment; N/A, not applicable; RD, randomized; DB, double-blind, vehicle controlled; PG, parallel group; MC, multicenter; PD, participant determined; TCA, trichloroacetic acid; DFS, diclofenac sodium; ID, investigator determined; IMG, imiquimod; IM, imidazole; SC, single center; AE, adverse event; AK, actinic keratosis; PR, prospective; Er:YAG, erbium-doped:YAG; PDT, photodynamic therapy; PC, placebo controlled; MAL, methyl aminolaurate; 5-ALA, 5-aminolevulinic acid; AFL, ablative fractional laser; FL, fractionated laser.