

Supplementary Materials

Table S1: Excimer therapy treatment protocols of included studies

Author (Year)	Device	Frequency	Duration	Starting Dose	Dose Escalation Protocol	Concurrent Therapy
Dineshkumar (2025)	Excimer lamp (DermaIndia)	1×/week	6 months (24 sessions)	270 mJ/cm ²	Fixed	Topical tofacitinib 2%
Kakeji (2025)	Excimer laser	1×/week	18 months (6 months EL alone)	500 mJ/cm ²	Fixed	Delgocitinib (added at 6 mo)
Nagui (2025)	Excimer lamp	2×/week	12 weeks	300 mJ/cm ²	Increased by 100 mJ/cm ² per session	None
Tawfik (2025)	Excimer light (Excimal Elite)	2×/week	12 weeks	100–200 mJ/cm ²	Adjusted to erythema	Topical betamethasone valerate
Kalegowda (2024)	Excimer laser (Excimal Elite)	2×/week	12 weeks	50 mJ/cm ² below MED	Increased by 50 mJ/cm ² every two sessions	None
Khan (2024)	Excimer laser	2×/week	12 weeks	NR	NR	None
Mohammed (2024)	Excimer light (Excilite)	2×/week	3 months	50–100 mJ/cm ²	Adjusted according to erythema (±50 mJ/cm ²)	Tacrolimus (combo arm)
Rodríguez-Acosta (2024)	Excimer lamp (Exciplex)	1×/month	2–10 sessions	MED-based	Double-stacked 50 mW increments	Minoxidil + clobetasol
Murakami (2023)	Excimer laser	Every 3 weeks	15 months (+12 mo maintenance)	NR	NR	Delgocitinib
Thuangtong (2023)	Excimer laser	2×/week	12 weeks	200 mJ/cm ²	Increased by 50 mJ/cm ² every two sessions	ILCS
Di Filippo (2022)	Excimer lamp (Exciplex)	2×/week	5–67 sessions	50 mJ/cm ² below MED	Increased by 50 mJ/cm ² every two sessions	Variable; some with concurrent therapies
Kianfar (2022)	Excimer laser (XTRAC)	1×/week	12 weeks	100–200 mJ/cm ²	Increased by 100 mJ per session	None
Ramadan (2022)	Excimer laser (XTRAC)	1×/week	12 weeks	100–200 mJ/cm ²	Increased by 100 mJ per session	Minoxidil

Al Hamzawi (2021)	Excimer lamp (Exciplex)	2×/week	14–24 sessions	300 mJ/cm ²	Increased by 50 mJ/cm ² per session	IM triamcinolone
Elnagar (2021)	Excimer lamp (Exciplex)	2×/week	3 months	300 mJ/cm ²	Increased by 50 mJ/cm ² every other visit	None
Li (2020)	Excimer lamp (Derma)	2×/week	12 weeks	50 mJ/cm ² below MED	Adjusted to erythema	Minoxidil
Sirichotiyakul (2020)	Excimer lamp (Therabeam)	1×/week	12 weeks	150 mJ/cm ²	Increased by 50 mJ/cm ² per session until erythema	None
Al Hamzawi (2019)	Excimer lamp (Exciplex)	2×/week	12 weeks	150–200 mJ/cm ²	Increased by 50 mJ/cm ² per session	None
Fenniche (2018)	Excimer light (Excilite)	2×/week	3 months	50 mJ/cm ²	Increased by 50 mJ/cm ² every two sessions	Topical khellin
Arakawa (2016)	Excimer light (TheraBeam)	Every 2 weeks	>16 sessions	200 mJ/cm ² or 70% MED	Increased in 50 mJ/cm ² steps	None
Byun (2015)	Excimer laser (XTRAC)	2×/week	12 weeks	50 mJ/cm ² below MED	Increased by 50 mJ/cm ² per week	ILCS to non-study patches
Hsu (2015)	Excimer lamp (VTRAC)	2–3×/week	Median 37 sessions	50–100 mJ/cm ²	Increased by 50 mJ/cm ² per week	Prior therapies
Sanga (2015)	Excimer lamp	2×/week	≤8 weeks	300 mJ/cm ²	Increased by 100 mJ/cm ² per session	None
Ohtsuki (2013)	Excimer lamp (VTRAC)	Every 2 weeks	~17 sessions	150–200 mJ/cm ²	Increased by 50 mJ/cm ² every 2 weeks	Baseline therapies
Navarini (2011)	Excimer laser (XTRAC)	2×/week	6–16 sessions	MED-based	NR	None
Ohtsuki (2010)	Excimer lamp (VTRAC)	Every 2 weeks	8–10 sessions	150 mJ/cm ²	Increased by 50 mJ/cm ² every 2 weeks	Prednisolone (1 patient)
Al-Mutairi (2009)	Excimer laser (Talos)	2×/week	12 weeks	50 mJ/cm ² below MED	Increased by 50 mJ/cm ² every two sessions	None
Nisticò (2009)	Excimer light (Excilite)	1×/week	~12 sessions	150 mJ/cm ²	Adjusted as tolerated	None
Al-Mutairi (2007)	Excimer laser (Talos)	2×/week	12 weeks	50 mJ/cm ² below MED	Increased by 50 mJ/cm ² every two sessions	None

Aubin (2005)	Excimer light	1×/week	5–10 weeks	MED-based	Adjusted as tolerated	None
Gundogan (2004)	Excimer laser (Tuilaser)	Variable	11–12 sessions	300–600 mJ/cm ²	Increased as tolerated	None
Zakaria (2004)	Excimer laser (Talos)	2×/week	12 weeks	50 mJ/cm ² below MED	Increased by 50 mJ/cm ² every two sessions	None

NR = not reported; MED = minimal erythema dose; ILCS = intralesional corticosteroid; EL = excimer laser.

Table S2: Cochrane RoB 2.0 Risk of Bias Assessment (Randomized Controlled Trials)

Study (Author, Year)	D1	D2	D3	D4	D5	Overall Risk of Bias	Rationale
Elnagar (2021)	Low Risk	Some Concerns	Low Risk	Low Risk	Low Risk	Some Concerns	Open-label
Khan (2024)	Low Risk	Some Concerns	Low Risk	Low Risk	Low Risk	Some Concerns	Open-label
Kianfar (2022)	Low Risk	Low Risk	Some Concerns	Low Risk	Low Risk	Some Concerns	16% dropout, per-protocol analysis
Mohammed (2024)	Low Risk	Some Concerns	Low Risk	Low Risk	Low Risk	Some Concerns	Open-label
Nagui (2025)	Low Risk	Some Concerns	Low Risk	Low Risk	Low Risk	Some Concerns	Possible cross-contamination between patches
Ramadan (2022)	Low Risk	Some Concerns	Low Risk	Low Risk	Low Risk	Some Concerns	Open-label
Sirichotiyakul (2020)	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk	Blinded
Tawfik (2025)	Low Risk	Low Risk	Some Concerns	Some Concerns	Low Risk	Some Concerns	17% attrition, no ITT; assessor blinding unclear
Thuangtong (2023)	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk	Blinded

Domains: D1 = Randomization process; D2 = Deviations from interventions; D3 = Missing Outcome Data; D4 = Measurement of Outcome; D5 = Selection of Reported Result.

Table S3: ROBINS-I Risk of Bias Assessment (Non-Randomized Studies)

Study (Author, Year)	D1	D2	D3	D4	D5	D6	D7	Overall	Rationale
Li (2020)	Low	Low	Low	Low	Low	Low	Low	Low	Well-controlled, blinded
Al-Mutairi (2007)	Mod	Low	Low	Mod	Low	Mod	Low	Mod	Patch selection unspecified; possible differential co-intervention; unblinded
Al-Mutairi (Pediatric, 2009)	Mod	Low	Low	Mod	Low	Mod	Low	Mod	Patch selection unspecified; differential co-intervention; unblinded
Byun (2015)	Low	Low	Low	Mod	Mod	Mod	Low	Mod	2 dropouts, no ITT; unblinded assessment
Navarini (2011)	Low	Mod	Low	Mod	Low	Mod	Low	Mod	Unblinded split-scalp; no distinct control group
Sanga & Mittal (2015)	Low	Low	Low	Mod	Mod	Mod	Low	Mod	25% dropout (treatment-linked), no ITT; unblinded
Zakaria et al. (2004)	Low	Mod	Low	Mod	Low	Low	Low	Mod	Enrollment criteria unspecified; co-intervention abstinence unverified
Hsu (2015)	Ser	Mod	Low	Mod	Low	Mod	Low	Ser	Mixed design, only 5/17 had split-lesion control

Mod = moderate, Ser = serious; Domains: D1 = Confounding; D2 = Selection of participants; D3 = Classification of interventions; D4 = Deviations from intended interventions; D5 = Missing data; D6 = Measurement of outcomes; D7 = Selection of the reported result.

Table S4a: JBI Critical Appraisal for Case Reports

Study (Author, Year)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Risk Rating	Key Concern
Dineshkumar (2025)	Y	Y	Y	Y	Y	Y	Y	Y	Low	Fully-reported
Fenniche (2018)	Y	Y	Y	U	Y	Y	Y	Y	Low	Consecutive inclusion unclear
Gundogan (2004)	Y	Y	Y	Y	Y	Y	Y	Y	Low	Fully-reported
Kakeji (2025)	Y	Y	N	Y	Y	Y	Y	Y	Low	Current condition not independently described
Murakami (2023)	Y	Y	Y	Y	Y	Y	N	Y	Low	Adverse events not reported
Ohtsuki (2010)	Y	Y	Y	U	U	U	Y	Y	Moderate	Consecutive inclusion, complete inclusion, and demographics unclear

Y = Yes, N = No, U = Unclear; Criteria: Q1 = Demographics; Q2 = History & timeline; Q3 = Current condition description; Q4 = Diagnostic tests and results; Q5 = Intervention description; Q6 = Post-intervention outcomes; Q7 = Adverse events; Q8 = Takeaway lessons and clinical relevance. Yes = criterion met; No = criterion not met; Unclear = insufficient information to judge.

Table S4b: JBI Critical Appraisal for Case Series

Study (Author, Year)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Risk Rating	Key Concern
Al Hamzawi (2019)	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Low	Consecutive inclusion unclear
Al Hamzawi (2021)	U	Y	Y	U	Y	Y	Y	Y	Y	Y	Low	Inclusion criteria vague
Di Filippo (2022)	Y	Y	Y	U	Y	Y	Y	Y	Y	U	Low	No formal statistics
Kalegowda (2024)	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Low	Consecutive inclusion unclear
Rodríguez-Acosta (2024)	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Low	Consecutive inclusion unclear
Arakawa (2016)	N	Y	Y	N	N	Y	Y	Y	Y	N	Moderate	11/65 eligible included, no stated criteria
Aubin (2005)	Y	U	Y	U	Y	N	N	U	U	U	Moderate	AA subgroup demographics not isolated
Nisticò (2009)	Y	N	Y	U	N	Y	N	Y	Y	N	Moderate	Unvalidated outcome, 37.5% attrition
Ohtsuki (2013)	Y	Y	Y	U	Y	Y	Y	Y	U	N	Moderate	No formal statistics, site unnamed
Zhang (2019)	N	N	U	N	N	U	N	U	Y	N	High	Incidental n=3 subgroup, no criteria/statistics

Y = yes, N = no, U = unclear; Criteria: Q1 = Inclusion criteria defined; Q2 = Condition measured in a standard, reliable way; Q3 = Valid methods used to identify the condition; Q4 = Consecutive inclusion of participants; Q5 = Complete inclusion of participants; Q6 = Clear reporting of demographics; Q7 = Clinical information clearly reported; Q8 = Follow-up outcomes reported; Q9 = Site or setting demographics described; Q10 = Statistical analysis appropriate and clearly reported. Yes = criterion met; No = criterion not met; Unclear = insufficient information to judge.