Supplementary Table S3 — Risk-of-Bias / Methodological Quality Assessment

Manuscript: The Meek Micrografting Technique in Burn Wound Reconstruction: A Systematic Review of Technical Evolution and Clinical Outcomes (*Surgeries*, MDPI, ID 4502865)

1. Instrument assignment by study type

Study (ref.)	Design (as reported)	Assigned instrument
Rijpma et al. 2025 [3]	Intra-patient randomized controlled trial	Cochrane RoB 2 (intra-patient/cross-over adaptation)
Rijpma et al. 2022 [6]	Systematic review (retained for contextual discussion only; not among the 15 included publications)	AMSTAR-2
Haug et al. 2024 [7]	Systematic review and meta-analysis (retained for contextual discussion only; not among the 15 included publications)	AMSTAR-2
Lee et al. 2019 [18]	Comparative study (Meek vs STSG)	MINORS – comparative (12 items)
Noureldin et al. 2022 [5]	Comparative study (Meek vs mesh)	MINORS – comparative (12 items)
Wang et al. 2023 [20]	Comparative study (Meek vs microskin grafting)	MINORS – comparative (12 items)
Zhang et al. 2024 [10]	Case-control (Meek ± PRP)	MINORS – comparative (12 items)
López-Contreras et al. 2026 [12]	Retrospective cohort (Meek vs STSG)	MINORS – comparative (12 items)
Hu et al. 2022 [19]	Retrospective (two-stage vs one-stage Meek)	MINORS – comparative (12 items)
Munasinghe et al. 2016 [15]	Retrospective case series, single arm	MINORS – non-comparative (8 items)
Almodumeegh et al. 2017 [16]	Retrospective case series, single arm	MINORS – non-comparative (8 items)
Lee et al. 2018 [17]	Case series, single arm (pediatric)	MINORS – non-comparative (8 items)
Tapking et al. 2024 [9]	Case series, single arm	MINORS – non-comparative (8 items)
Wilson et al. 2025 [11]	Case series, single arm (only primary case-series data extracted)	MINORS – non-comparative (8 items)

*Refs. **4** (Quintero et al., narrative technique review), **13** (Meek 1958, original technical description), and **14** (Kreis et al. 1993, technical modification report) are historical/technical descriptions rather than outcome studies and are not assigned a formal risk-of-bias instrument; they inform Table 1 (technical evolution) only, consistent with standard systematic-review practice.*

2. RoB 2 — Rijpma et al. 2025 (the randomized controlled trial) [3]

Domain	Judgement	Basis
Randomization process	Low risk	Intra-patient (within-subject) randomization of wound sites per a prospectively published protocol [23]; this design inherently balances patient-level confounders between arms.
Deviations from intended interventions	Some concerns	Deviations from the intended interventions and any crossovers are not reported in sufficient detail in the trial report.
Missing outcome data	Some concerns	Completeness of the 3-month follow-up and losses to follow-up are not reported in sufficient detail in the trial report.
Measurement of the outcome	Some concerns	Graft take/wound outcomes and scar quality were assessed with a mix of objective instruments (cutometer, dermaspectrometer) and a subjective observer scale (POSAS); blinding of the treating team to allocation is not possible in a surgical trial, and blinding of scar raters is not stated.
Selective reporting	Low risk	Prospectively registered protocol with pre-specified outcomes [23], published prior to the results paper, reduces risk of selective outcome reporting.

Overall	Some concerns	Driven mainly by insufficiently reported deviation and missing-data domains and non-blinded intraoperative/graft-take assessment, which are largely unavoidable in surgical RCTs; the intra-patient design and pre-registration are notable strengths.

Note: the trial was conducted in a mixed wound population that included non-burn wounds. Its overall estimates are therefore treated as indirect evidence for the burn-specific synthesis, and the 1:3 expansion-ratio subgroup is treated as exploratory.

3. AMSTAR-2 — systematic reviews retained for contextual discussion [6,7] (not included in the synthesis)

Item	Rijpma et al. 2022 [6]	Haug et al. 2024 [7]
Protocol registered before conduct	Not explicitly stated	Not explicitly stated
Adequacy of literature search	Adequate (4 databases: PubMed, Web of Science, Google Scholar, Cochrane Library; 1958–2021; 1529 records screened).	Adequate (4 databases: EMBASE, PubMed, Google Scholar, MEDLINE; up to Dec 2022; 1678 patients pooled).
Justification for excluding individual studies	Not provided in the available data	Not provided in the available data
Risk-of-bias assessment of included studies	Performed (Chambers criteria utilized; evidence rated predominantly as poor quality).	Not explicitly detailed
Appropriateness of meta-analytical methods	Not applicable (narrative synthesis performed without quantitative pooling).	Appropriate (quantitative pooling performed for key outcomes: mean TBSA, graft take, and length of stay).
Overall confidence	Low	Low

Note: the appraisal above is restricted to the AMSTAR-2 domains relevant to the use made of these two reviews in the present work. Both reviews were retained for contextual discussion only and did not contribute patient-level outcome data to Table 2 or to the primary clinical synthesis.

4. MINORS — comparative studies (12-item scale, max 24)

The 12 MINORS items are: (1) clearly stated aim, (2) inclusion of consecutive patients, (3) prospective data collection, (4) endpoints appropriate to study aim, (5) unbiased assessment of the endpoint, (6) follow-up period appropriate to the aim, (7) loss to follow-up ≤5%, (8) prospective calculation of sample size, (9) adequate control group, (10) contemporary groups, (11) baseline equivalence of groups, (12) adequate statistical analyses. Each item scores 0 (not reported), 1 (reported but inadequate), or 2 (reported and adequate). All 12 items were scored for every comparative study on the basis of the full-text publications.

Study	Item-level scores (items 1–12, full-text assessment)	Total (max 24)	Main methodological limitations
Lee et al. 2019 [18]	1 = 2; 2 = 1; 3 = 0; 4 = 2; 5 = 1; 6 = 2; 7 = 1; 8 = 0; 9 = 2; 10 = 1; 11 = 1; 12 = 2	15/24	Retrospective data collection; no blinded endpoint assessment; no prospective sample-size calculation
Noureldin et al. 2022 [5]	1 = 2; 2 = 2; 3 = 2; 4 = 2; 5 = 0; 6 = 2; 7 = 1; 8 = 0; 9 = 2; 10 = 2; 11 = 2; 12 = 2	19/24	No blinded endpoint assessment; no prospective sample-size calculation
Wang et al. 2023 [20]	1 = 2; 2 = 1; 3 = 0; 4 = 2; 5 = 0; 6 = 1; 7 = 1; 8 = 0; 9 = 2; 10 = 2; 11 = 1; 12 = 2	14/24	Retrospective data collection; no blinded endpoint assessment; limited follow-up reporting; no sample-size calculation
Zhang et al. 2024 [10]	1 = 2; 2 = 1; 3 = 0; 4 = 2; 5 = 0; 6 = 1; 7 = 1; 8 = 0; 9 = 2; 10 = 2; 11 = 1; 12 = 2	14/24	Retrospective case-control design; no blinded endpoint assessment; no sample-size calculation
López-Contreras et al. 2026 [12]	1 = 2; 2 = 2; 3 = 0; 4 = 2; 5 = 0; 6 = 1; 7 = 0; 8 = 0; 9 = 2; 10 = 2; 11 = 1; 12 = 2	14/24	Retrospective data collection; loss to follow-up not reported; no blinded endpoint

			assessment; no sample-size calculation
Hu et al. 2022 [19]	1 = 2; 2 = 2; 3 = 0; 4 = 2; 5 = 0; 6 = 1; 7 = 1; 8 = 0; 9 = 2; 10 = 1; 11 = 1; 12 = 2	14/24	Retrospective data collection; no blinded endpoint assessment; no sample-size calculation

5. MINORS — non-comparative case series (8-item scale, max 16)

Items 1–8 as above (no control-group items apply). All eight items were scored for every study on the basis of the full-text publications.

Study	Item-level scores (items 1–8, full-text assessment)	Total (max 16)	Main methodological limitations
Munasinghe et al. 2016 [15]	1 = 2; 2 = 2; 3 = 0; 4 = 2; 5 = 0; 6 = 1; 7 = 0; 8 = 0	7/16	Retrospective data collection; loss to follow-up not reported; no blinded endpoint assessment; no sample-size calculation
Almodumeegh et al. 2017 [16]	1 = 2; 2 = 2; 3 = 0; 4 = 2; 5 = 0; 6 = 1; 7 = 0; 8 = 0	7/16	Retrospective data collection; loss to follow-up not reported; no blinded endpoint assessment; no sample-size calculation
Lee et al. 2018 [17]	1 = 2; 2 = 1; 3 = 0; 4 = 2; 5 = 0; 6 = 2; 7 = 1; 8 = 0	8/16	Retrospective data collection; consecutive inclusion not clearly stated; no blinded endpoint assessment; no sample-size calculation
Tapking et al. 2024 [9]	1 = 2; 2 = 2; 3 = 0; 4 = 2; 5 = 0; 6 = 1; 7 = 1; 8 = 0	8/16	Retrospective data collection; no blinded endpoint assessment; no sample-size calculation
Wilson et al. 2025 [11]	1 = 2; 2 = 2; 3 = 0; 4 = 2; 5 = 0; 6 = 2; 7 = 1; 8 = 0	9/16	Retrospective data collection; no blinded endpoint assessment; no sample-size calculation

Summary: across the non-randomized studies, the median MINORS score was 8 of 16 (range 7–9) for the non-comparative series and 14 of 24 (range 14–19) for the comparative studies. The recurrent methodological weaknesses were retrospective data collection, the absence of blinded endpoint assessment, and the lack of a prospective sample-size calculation. All item-level scores are based on the assessment of the full-text publications by two reviewers — including the translated full text for the Chinese-language report [10] — with disagreements resolved by consensus.