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A Comprehensive Analysis of Moist Versus Non-Moist Dressings for Split-Thickness Skin Graft Donor Sites: A Systematic Review and Meta-Analysis

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ABSTRACT

Background and Aims: This systematic review and meta-analysis evaluate the efficacy of moist versus non-moist dressings for split-thickness skin graft (STSG) donor sites, focusing on time to healing, pain management, and adverse events to guide clinical practice.

Methods: A comprehensive literature search was conducted across databases including Ovid/MEDLINE, Embase, Cochrane CENTRAL, Cochrane Database of Systematic Reviews, and Scopus up to November 28, 2023. The study adhered to PRISMA guidelines. Eligible randomized controlled trials (RCTs) were assessed for quality using the Newcastle-Ottawa Scale and Cochrane risk-of-bias tool, with meta-analysis performed using the DerSimonian and Laird random-effects model.

Results: Out of 464 identified studies, 16 RCTs involving 1129 patients were included. Moist dressings such as Tegaderm, Hydrocolloid, Alginate, polyurethane, and hydrofiber showed a faster mean time to healing compared to non-moist dressings like Mepitel and paraffin-impregnated gauze. Hydrocolloid dressings were particularly effective in accelerating wound healing. Additionally, moist dressings were associated with lower pain levels during dressing removal and had comparable rates of adverse events.

Conclusion: The evidence strongly supports the use of moist dressings, particularly Hydrocolloid, for STSG donor site coverage. These dressings promote faster healing and superior pain management. The study highlights the need for further research to address existing limitations and refine recommendations for optimal wound care interventions.

1 | Introduction

Split-thickness skin grafts (STSGs) play a pivotal role in the reconstructive ladder, often chosen for addressing burn injuries, traumatic wounds, and chronic lesions. Comprising the epidermis with varying depths of the underlying dermis, STSGs extend benefits beyond mere wound coverage. They contribute to accelerating healing in burns and other wounds, as well as correcting scar contractures. The quest for an ideal STSG donor-site dressing revolves around its ability to promote healing, ensure painless removal, resist infection, offer ease of application, and maintain cost-effectiveness. In the diverse landscape of available wound dressings, they can be broadly classified into moist varieties (e.g., Tegaderm, Hydrocolloid, Alginate, polyurethane, hydrofiber) and non-moist alternatives (e.g., paraffin gauze, Mepitel). The primary distinction lies in the moisture-

Abbreviations: IQR, interquartile range; LoE, level of evidence; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-analyses; RCT, randomized controlled trial; SRMA, systematic review and meta-analysis; STSG, split-thickness skin graft; TTH, time to healing; VAS, visual analog scale.

Summary

Successful wound healing is paramount in clinical practice, and our article addresses the critical choice of dressing materials for split-thickness skin graft (STSG) donor sites. Employing a comprehensive meta-analysis of 16 randomized controlled trials involving 1129 patients, we demonstrate that moist dressings consistently lead to faster healing times and reduced pain compared to non-moist alternatives.

retaining capability of moist dressings, preventing exudate desiccation, while non-moist dressings lack a barrier to contain extracellular fluid within the wound.

The evolution of wound dressings has undergone a significant transformation from the traditional approach, which focused on maintaining dry and firm wound environments. In 1962, George Winter introduced the revolutionary concept of moist healing, challenging the conventional notion [1]. Subsequent investigations, such as Barnett's demonstration with semipermeable film, underscored the crucial role of a moist environment in wound healing [2]. The benefits of a moist environment have been well-established, with proven enhancements in the migration rate of epidermal cells and the facilitation of wound closure [3]. This approach has found successful application in diverse wounds, including burns, pressure ulcers, and diabetic foot ulcers. Moreover, studies highlight the effectiveness of moist dressings in recalcitrant wounds, demonstrating their capability in necrotic tissue removal [4] and the promotion of keratinocyte migration over the wound surface [5, 6]. Moist wound dressings also contribute to the presence and function of nutrients, growth factors, and other soluble mediators in the wound microenvironment [7].

Despite the benefits offered by moist wound dressing, non-moist adherent dressings (e.g., Mepitel or petrolatum gauze) are also commonly applied to the donor site because moist dressings tend to be labor-intensive for both the patient and the caregiver due to a higher rate of drainage from the site and the need for caregiver intervention before healing.

As a result, a consensus on the choice of STSG donor-site wound dressing is notably absent in clinical practice. Surgeons often make this decision based on personal preference, lacking a clear evidence-based consensus from the existing literature.

Over the last two decades, conflicting conclusions have arisen from four systematic reviews comparing various donor-site dressings [8–11]. The 1998 review highlighted transparent film as a favorable choice, demonstrating one of the fastest healing rates, a low infection rate, minimal pain, and cost-effectiveness [8]. In contrast, the 2003 review concluded that moist wound-healing products confer distinct clinical advantages over non-moist alternatives in managing STSG donors [9]. However, the 2009 review found no definitive evidence favoring wet dressings over dry ones [10]. Recent reviews, conversely, suggest that patients treated with moist dressings consistently experience significantly lower pain levels at all time points compared to those with non-moist dressings [11].

While quantitative analyses of pain scores exist, previous studies have not included a quantitative analysis of time to healing (TTH). In the interim, new dressings have entered the market, and higher quality comparative studies have been conducted, necessitating a systematic review and meta-analysis (SRMA). Such an analysis is crucial for providing a head-to-head comparison of moist versus non-moist dressings, considering disparate outcomes such as TTH, pain, and adverse events. Therefore, this study aims to offer a comprehensive summary of the latest evidence guiding the choice of wound dressing for STSG donor sites.

2 | Method

2.1 | Research Protocol and Search Question

Our investigation into the effectiveness of moist versus dry dressings on STSG donor sites was structured using the PICO (problem, intervention, comparison, outcome) search protocol framework. The primary focus of our study is the mean time required for healing (either complete epithelialization or achieving 90% epithelialization). Secondary outcomes include the mean pain score during the removal of wound dressings and the occurrence of adverse events, including infection rates and hematoma. This study strictly adheres to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) reporting guidelines [12], follows the recommendations put forward in the "Guidelines for Reporting of Statistics for Clinical Research in Urology" [13], and is registered with PROSPERO (CRD42022376165).

2.2 | Eligibility Criteria

Our analysis includes studies comparing the mean time required for the complete healing of STSG donor site wounds. It compares moist dressings, such as hydrocolloid, Tegaderm, Aquacel, and Kaltostat, against non-moist dressings like Xeroform and paraffin-impregnated gauze. Excluded from consideration are single-group studies, case reports, basic science experiments, and studies involving animals or cadavers. Additionally, conference abstracts lacking full-length articles are not included.

2.3 | Search Strategy and Study Selection

The strategy for searching electronic databases is detailed in Table 1. We conducted a comprehensive search using controlled vocabulary and keywords in Ovid/MEDLINE, Embase, Cochrane CENTRAL, Cochrane Database of Systematic Reviews, and Scopus for randomized clinical trials (RCTs) up to November 28, 2023. Two reviewers (C.Y.H. and H.Y.C.) independently assessed titles, abstracts, and full-text articles. Any discrepancies were resolved through discussion and, when necessary, consultation with a third reviewer (C.H.T. or C.H.C.).

2.4 | Data Collection and Quality Assessment

Two independent reviewers (S.H.W. and C.Y.L.) compiled data in a preplanned Excel spreadsheet (version 16.80; Microsoft), covering study characteristics, patient demographics, outcomes, and funding sources. Pain intensity, measured on a 0–10 visual analog scale (VAS), and TTH in days were standardized. The

TABLE 1 | Search strategy.

#	Searches
1	Skin transplantation/
2	((stsg) OR (skin graft) OR (split) OR (thickness) OR (skin) OR (graft)).ti,ab,hw,kw.
3	1 or 2
4	Transplant Donor Site/
5	((donor site wound) OR (donor) OR (donor site)).ti,ab,hw,kw.
6	4 or 5
7	((moist dressing) OR (hydrogel) OR (hydrofiber) OR (foam) OR (polyurethane) OR (alginate) OR (hydrocolloid) OR (Transparent Film) OR (Aquacel) OR (Tegaderm) OR (OPSITE) OR (silver) OR (cellulose) OR (Duoderm)).ti,ab,hw,kw.
8	((dry dressing) OR (non-moist dressing) OR (Xeroform) OR (paraffin-impregnated gauze) OR (gauze) OR (mepitel)).ti,ab,hw,kw.
9	3 and 6 and 7 and 8

Newcastle-Ottawa Scale and Cochrane risk-of-bias tool assessed the quality of included studies. In cases where standard deviation data were unavailable, it was obtained from a standard error, confidence interval, *t* statistic, or *p*-value that relates to a difference between means in two groups, or the interquartile range (IQR) was divided by 1.35 as an approximate standard deviation [14].

2.5 | Statistical Analysis

We adhered to the Statistical Analyses and Methods in the Published Literature (SAMPL) guidelines [15]. Meta-analysis was conducted by C.Y.H. and V.B.H.S for all dichotomous and continuous variables, including time to complete or 90% epithelialization, mean pain score during wound dressing removal, and adverse events such as infection rate and hematoma. The "Hedges G" statistic was used to compute the difference size between moist dressing and control (non-moist dressing) outcomes. A negative Hedges' g indicates faster healing with moist dressing compared to the control group. Given the diversity in study population and design, the DerSimonian and Laird random-effects model, using the Mantel-Haenszel method for interstudy heterogeneity, was employed. Confidence intervals were set at 95%, and statistical significance was determined at *p*-values less than 0.05. Heterogeneity was gauged using the I^2 statistic. For outcomes with over 10 studies, funnel plots were generated to assess publication bias (available in Figure A1). Sensitivity analysis, achieved by removing individual studies, did not alter conclusions for any outcomes. JASP 0.18.1 software was used for meta-analysis and plot production. The results were presented in accordance with the CONSORT 2010 statement [16]. Ethical approval was not required for this SRMA, as all analyses were based on data from previously published studies. No new data were collected from participants specifically for this study, and all data sources were publicly available and anonymized.

3 | Results

In this SRMA, a comprehensive search initially identified 464 studies. After the removal of 100 duplicates, the remaining 364 studies underwent title and abstract screening. Subsequently, 47 studies proceeded to full-text screening, and 45 were deemed eligible for inclusion, with 16 studies making it to the meta-analysis. The study designs comprised 15 randomized controlled trials (RCTs) and 1 allocated controlled trial, with sample sizes ranging from 20 to 288 participants (Figure 1). Among the 1129 total patients, 834 received moist dressing for STSGDSW coverage, while 656 received non-moist dressings, considering some patients received both dressings in different wound regions.

The assessment of study quality is illustrated in Figure 2A,B. In 13 out of the 16 studies, there was satisfactory adherence to all five methodological criteria, indicating a low risk of bias. However, three studies raised concerns about bias due to their non-randomized design. In one study, patients were allocated to receive either moist or non-moist dressing for STSG donor site wounds, while the other two studies did not provide details about the randomization process. The Newcastle-Ottawa Scale of the included studies are reported in Table 2.

All studies entailed head-to-head comparisons of moist dressing to non-moist dressing, with subgroup analyses focusing on hydrofiber, polyurethane, alginate, hydrocolloid, and transparent film dressings. Demographically, the moist wound dressing group consisted of 65.8% males and 34.2% females, while the control group (non-moist dressings) had 72.03% males and 27.97% females. Statistical summaries revealed that the moist wound group had a mean age of 49 years, a mean wound area of 121.56 cm^2, a wound complication rate of 6.48%, and a mean healing time of 14.06 ± 7.18 days. In comparison, the control group had a mean age of 44 years, a mean wound area of 132.58 cm^2, a wound complication rate of 7.84%, and a mean healing time of 13.88 ± 8.47 days. Geographically, the studies were distributed across Asia [5], the United States [5], and Europe [6], with two studies conducted in the IS and funded by the US Army Medical Research and Materiel Command and NIGMS. The main characteristics of the included studies are reported in Table 3.

Regarding outcomes, the TTH analysis, encompassing 16 trials with 1129 patients, indicated a higher odds of faster mean wound healing rate (odds ratio [OR], −1.05; 95% CI, −1.61 to −0.49; $p < 0.001$) in the moist wound dressing group (Figure 3A). Pain on wound dressing removal or average pain score, examined in eight trials with 655 patients, revealed a lower odds of pain (OR,

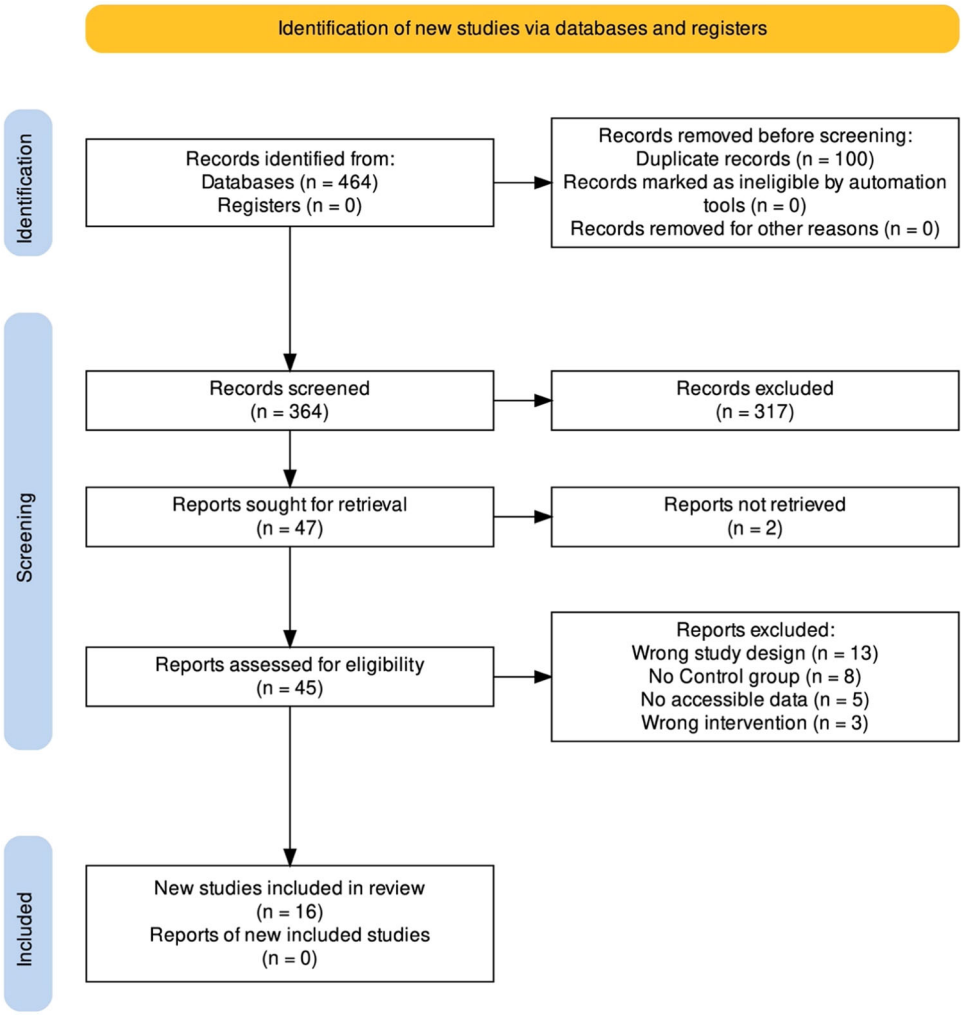

FIGURE 1 | Flow diagram of study selection.

−2.81; 95% CI, −4.10 to −1.53; $p < 0.001$) in the moist group (Figure 3B). The complication rate, assessed in 12 trials with 925 patients, demonstrated a similar complication rate (OR, −0.14; 95% CI, −0.68 to 0.39; $p = 0.602$) of both groups (Figure 3C).

Furthermore, a subgroup analysis specific to hydrofiber, polyurethane, alginate, hydrocolloid, and transparent film dressings was performed. Only hydrocolloid showed a higher odds of faster healing time (OR, −0.65; 95% CI, −0.89 to −0.42; $p < 0.001$) while hydrofiber, polyurethane, alginate, and transparent film dressings demonstrated a similar healing time (Figure 4).

4 | Discussion

The application of meta-analysis in this study represents a robust methodology for synthesizing findings from multiple studies with similar designs, thereby enhancing the overall sample size. This approach not only minimizes potential errors but also contributes to a more comprehensive understanding of the subject matter. Meta-analysis is particularly valuable for synthesizing evidence, providing a quantitative overview that strengthens the reliability and generalizability of study conclusions.

In terms of literature collection and evaluation, the meta-analysis included data from 16 articles, involving a total of 1129 patients. A meticulous and comprehensive literature search spanned various databases, including PubMed, Cochrane Library, Embase, Science Direct, and Web of Science. This broad search strategy ensures the inclusion of a diverse range of studies, bolstering the overall robustness of the meta-analysis. The study's commitment to a high-quality assessment is evident through the use of the risk of bias tools, a critical step in ensuring the reliability and validity of the synthesized evidence. By employing such rigorous methods in literature collection and evaluation, the meta-analysis aims to establish a solid foundation for drawing meaningful conclusions regarding the subject under investigation.

Based on our comprehensive analysis, adverse events were found to be statistically insignificant. However, significant advantages were observed for moist dressings over non-moist dressings in terms of both TTH and pain management. Consequently, we strongly recommend the use of moist dressings for STSG donor site coverage. Our subgroup analysis, specifically focusing on hydrofiber, polyurethane, alginate, hydrocolloid, and transparent film dressings, consistently revealed a trend toward faster healing in the moist group. Notably, hydrocolloid stood out by reaching statistical significance in

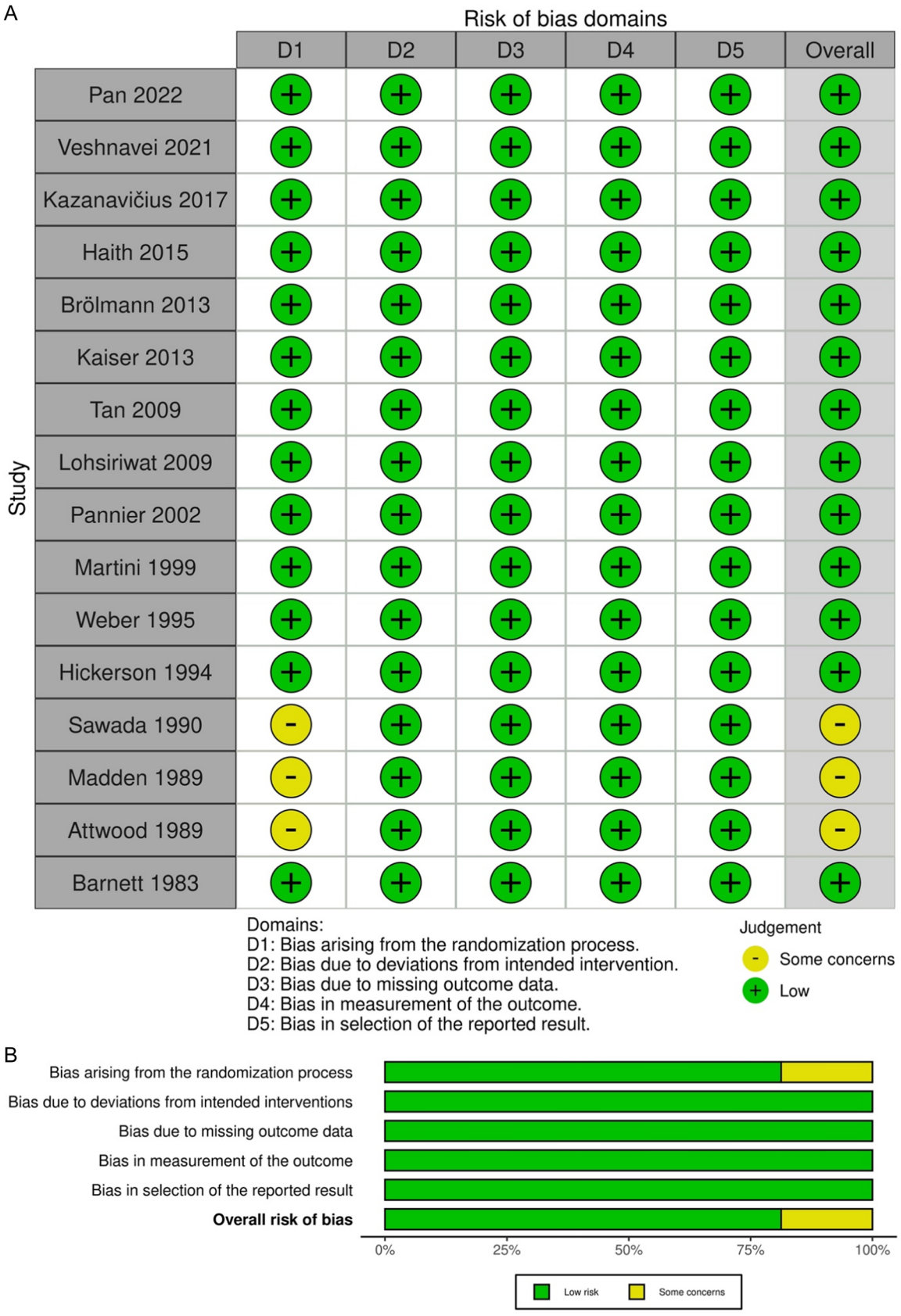

FIGURE 2 | (A) Risk of bias traffic light plot. (B) Risk of bias summary plot.

TABLE 2 | The main characteristics of the included studies.

References	Specific type of moist dressing	*N*	Age	Man	Country	Funded	TTH-moist	TTH-dry	Donor site position	Defect type	Thickness (mm)
Pan et al. [17]	Hydrofiber	87	Not specified	Not specified	China	None	10.55	11.19	Not specified	Burn	Not specified
Veshnavei [18]	Silver nylon	100	38.1	80	Iran	None	13.2	16	Thigh	Burn	Not specified
Kazanavičius et al. [19]	Polyurethane Foam, film	97	59.55	48	Lithuania	None	11.3	14.76	Thigh, arm	Variable	0.3
Haith et al. [20]	Hydrofiber	29	41	17	US	U.S. Army Medical Research and Materiel Command	17.6	15.2	Thigh	Burn	0.25
Brölmann et al. [21]	Hydrofiber, hydrocolloid, alginate, film	288	60.68	198	Netherland	None	26.3	28.5	Thigh	Variable	0.3
Kaiser et al. [22]	Alginate	30	76	15	Switzerland	None	18.1	15.4	Thigh	Variable	Not specified
Tan et al. [23]	Hydrocolloid	23	44	Not specified	Singapore	None	9.6	11.9	Thigh	Burn	Not specified
Lohsiriwat and Chuangsuwanich [24]	Hydrofiber	21	48	11	Thailand	None	7.9	11.2	Thigh	Not specified	Not specified
Pannier et al. [25]	Alginate	67	4.5	Not specified	France	None	10	11	Not specified	Burn	0.3
Martini et al. [26]	Polyurethane foam	50	59.6	22	Italy	None	5.64	9	Thigh	Not specified	Not specified
Weber et al. [27]	Polyurethane foam	68	62.8	49	US	None	20.6	19.3	Thigh	Not specified	0.375
Hickerson et al. [28]	Hydrocolloid	38	33.2	Not specified	US	None	7.9	10.2	Not specified	Burn	0.36
Sawada et al. [29]	Silicone gel sheet	10	29.1	8	Japan	None	6.7	12.9	Variable	Variable	0.3
Madden et al. [30]	Hydrocolloid	58	36.4	46	US	NIGMS	7.4	12.6	Not specified	Burn	0.2
Attwood [31]	Alginate	130	Not specified	98	UK	None	7.184	10.56	Variable	Variable	Not specified
Barnett et al. [2]	Film	23	Not specified	Not specified	US	None	6.8	10.5	Variable	Burn	0.35

TABLE 3 | Newcastle-Ottawa Scale of included studies.

Included studies	Newcastle Ottawa Quality assessment scale								Total number of stars
	1	2	3	4	5	6	7	8	
Pan 2022	A*	A*	A*	B	A*	A*	A*	A*	7
Veshnavei 2021	A*	A*	A*	B	A*	A*	A*	A*	7
Kazanavičius 2017	A*	A*	A*	B	A*	A*	A*	A*	7
Haith 2015	A*	A*	A*	B	A*	A*	A*	A*	7
Brölmann 2013	A*	A*	A*	B	A*	A*	A*	A*	7
Kaiser 2013	A*	A*	A*	B	A*	A*	A*	A*	7
Tan 2009	A*	A*	A*	B	A*	A*	A*	A*	7
Lohsiriwat 2009	A*	A*	A*	B	A*	A*	A*	A*	7
Pannier 2002	A*	A*	A*	B	A*	A*	A*	A*	7
Martini 1999	A*	A*	A*	B	A*	A*	A*	A*	7
Weber 1995	A*	A*	A*	B	A*	A*	A*	A*	7
Hickerson 1994	A*	A*	A*	B	A*	A*	A*	A*	7
Sawada 1990	A*	A*	A*	B	A*	A*	A*	A*	7
Madden 1989	A*	A*	A*	B	A*	A*	A*	A*	7
Attwood 1989	A*	A*	A*	B	A*	A*	A*	A*	7
Barnett 1983	A*	A*	A*	B	A*	A*	A*	A*	7

terms of accelerated wound healing. This underscores the potential efficacy of hydrocolloid, reinforcing the overall recommendation for moist dressings in the context of STSG donor site coverage. However, the subgroup analyses were based on a relatively small number of studies. There were insufficient studies of sufficient quality to make any judgment between the performance of hydrocolloid and other moist wound-healing products. In light of this, caution is warranted in making definitive conclusions about the superiority of hydrocolloid for STSG donor site coverage.

In a 1998 review assessing wound dressings for STSG donor sites, those creating a moist healing environment—such as calcium alginates, transparent films, and hydrocolloids—demonstrated superior healing rates, averaging around 9.43 to 9.54 days. In contrast, gauze dressings exhibited longer healing times, ranging from 10.95 to 12.79 days [8], a finding that aligns compatibly with our own results.

The 2003 systematic review led by Rick Wiechula aligns seamlessly with the goals of our meta-analysis, offering valuable insights. The robust conclusions of Wiechula's review, notably highlighting the substantial superiority of moist wound-healing products compared to non-moist options concerning both healing outcomes and infection risk [9], strongly resonate with the findings of our study.

Voineskos' 2009 systematic review of skin graft donor-site dressings, with a focus on pain, infection rate, and healing rate, provides valuable insights that align with the objectives of our study. The challenges highlighted in comparing moist and non-moist dressings, such as the heterogeneity of included articles, the use of over 50 different dressings in the non-review articles, and highly variable definitions and measurements of outcomes [10], mirror the complexities we may encounter in our own research.

Although Voineskos concluded that it remains unclear which dressing type is superior across various aspects, the consistent observation that moist dressings, irrespective of study design, are associated with less pain and better healing rate [10]. This shared observation reinforces the significance of considering moist dressings as a favorable option in wound care, emphasizing their potential benefits in terms of patient comfort and healing outcomes. These findings are compatible with the direction of our study, suggesting a potential consensus in the literature regarding the positive impact of moist dressings on pain management and wound healing.

The 2018 Serebrakian review provides compelling evidence that aligns well with the objectives of our study. The quantitative analysis on pain intensity, involving data from 21 articles, revealed that patients with moist dressings consistently experienced significantly lower pain levels at all time points compared to those with non-moist dressings [11]. This meta-analysis not only emphasizes the importance of considering pain reduction as a crucial outcome but also supports the notion that moist dressings contribute to a more comfortable patient experience. Furthermore, the identification of moist dressings' superiority in terms of both pain reduction and wound healing outcomes [11] serves as a significant point of compatibility with our study.

Autologous back-grafting represents a promising alternative to artificial wound dressings in certain clinical situations. This method involves reapplying over-harvested skin back onto the donor area, leveraging the inherent advantages of the skin's anatomy and cellular composition for enhanced healing. STSG

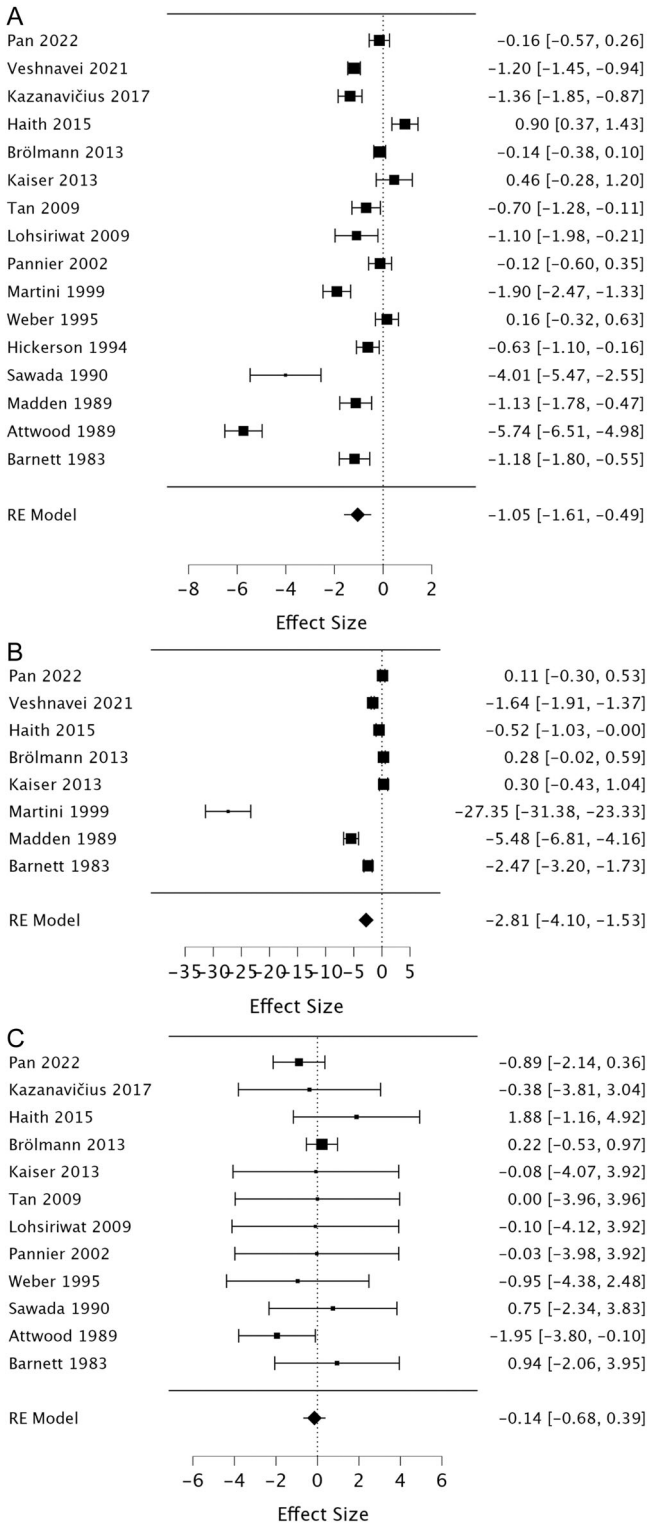

FIGURE 3 | (A) Forest plots of time to healing. (B) Forest plots of pain on wound dressing removal. (C) Forest plots of complication rate. M-H, Mantel-Haenszel.

include not only the dermis and the basal layer of the epidermis but also adnexal structures, which house stem cells critical for the wound healing process. This composition enables the graft to expedite healing more effectively than conventional dressings by leveraging the regenerative capacity of these stem cells [32]. The potential benefits of autologous back-grafting are

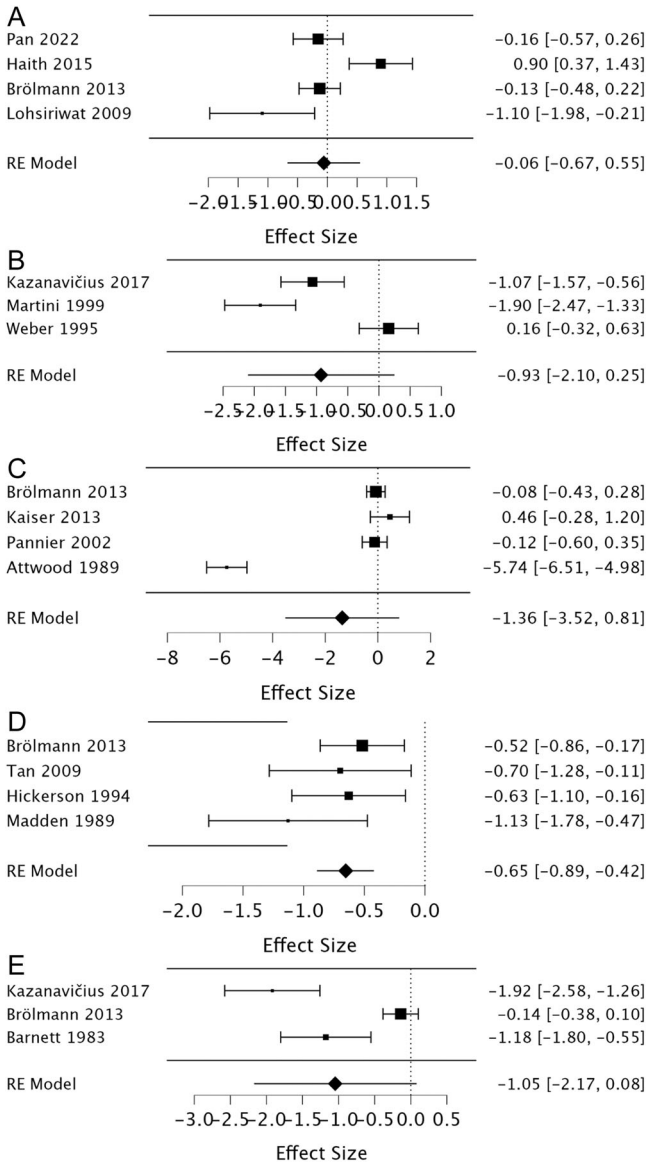

FIGURE 4 | (A) Forest plots of time to healing of hydrofiber dressing versus non-moist dressing. (B) Forest plots of time to healing of polyurethane dressing versus non-moist dressing. (C) Forest plots of time to healing of alginate dressing versus non-moist dressing. (D) Forest plots of time to healing of Hydrocolloid dressing versus non-moist dressing. (E) Forest plots of time to healing of Transparent film dressing versus non-moist dressing. M-H, Mantel-Haenszel.

significant, as highlighted in various publications that discuss the application of autologous skin to hasten healing and mitigate pain at donor sites [33, 34]. Faster healing times and reduced risks of hypertrophic scarring and donor site morbidity are among the noted advantages. A notable study by Chiu et al. in 2022 demonstrated these benefits, particularly emphasizing improved healing times and scar formation in elderly patients through the immediate regrafting of over-harvested skin on STSG donor sites [35]. This technique not only accelerates re-epithelialization but also diminishes pain and curtails the likelihood of hyperplastic scar formation. However, there are considerations to bear in mind when employing autologous back-grafting. One of the method's limitations is the requirement for an additional large skin graft donor area, which may

not be feasible or desirable in all patients. Furthermore, esthetic concerns arise from the use of meshed skin grafts, which can lead to a net-like appearance of the healed skin that some patients find unappealing.

Our study stands out by exclusively incorporating RCTs, elevating the level of evidence to LoE I compared to previous reviews and meta-analyses that included observational studies, enhancing the robustness of our findings. Additionally, our analysis encompasses a diverse set of studies from different countries, providing a global perspective and increasing the generalizability of our results.

While previous reviews hinted at the trend favoring moist wound dressings for faster healing, reduced pain, and fewer adverse events, they lacked a quantitative assessment of TTH. Our study addresses this gap by conducting the first SRMA that quantitatively measures and compares the TTH of moist wound dressings versus non-moist wound dressings. By incorporating newer RCTs, we contribute novel insights and bridge the existing gap in the literature, providing a more comprehensive understanding of the efficacy of moist wound dressings in STSG donor site healing.

The study is not without limitations, and several factors should be considered when interpreting the results. Blinding was a significant challenge, as the nature of wound treatment made it impractical to blind nurses, patients, or assessors, potentially introducing bias. Variations in wound characteristics and patient populations across the included studies may have influenced the results, limiting generalizability.

Establishing the clear superiority of specific subtypes of moist dressing regarding healing time, pain, and infection rate proved challenging, highlighting the need for further research in specific clinical contexts. Heterogeneity among included articles, especially in the use of various specific dressing materials, made direct comparisons difficult, complicating efforts to draw definitive conclusions about optimal dressing choices for wound care. Variations in outcome definitions and measurements across studies may have introduced inconsistencies, impacting the overall interpretation of results. Considering these limitations, caution should be exercised when applying the study findings, and future research should aim to address these challenges for a more comprehensive understanding of wound care interventions.

5 | Conclusion

In this extensive SRMA, we aimed to clarify the selection of dressing materials for STSG donor sites. The significance of this choice in clinical settings extends beyond mere wound coverage, encompassing the promotion of optimal healing, pain reduction, and infection prevention. Our study, which involved a thorough examination of 16 RCTs covering 1129 patients, offers valuable insights into the comparative effectiveness of moist and non-moist dressings.

The consistent findings from our research indicate that moist dressings such as Tegaderm, Hydrocolloid, Alginate, polyurethane, and hydrofiber result in a faster mean TTH when compared to non-moist dressings like Mepitel and paraffin-impregnated gauze. This conclusion remains valid across diverse patient populations, various wound types, and different geographical locations. The benefits associated with moist dressings extend beyond expedited healing, including lower levels of pain during dressing removal and comparable rates of adverse events, such as infection and hematoma.

Author Contributions

Chun-Yee Ho: conceptualization, data curation, formal analysis, investigation, methodology, project administration, software, writing–original draft, writing–review and editing. **Hsuan-Yu Chou:** validation, visualization, writing–original draft. **Szu-Han Wang:** data curation, formal analysis. **Ching-Yu Lan:** data curation, formal analysis. **Victor Bong-Hang Shyu:** data curation, formal analysis. **Chih-Hao Chen:** supervision; writing–review and editing. **Chia-Hsuan Tsai:** conceptualization, project administration, resources, writing–review and editing.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data supporting the findings of this study are available within the article and its supplementary materials. All data used in this meta-analysis were extracted from publicly available published studies. Detailed data extraction sheets, statistical analysis scripts, and other relevant materials can be made available upon reasonable request to the corresponding author.

Transparency Statement

The lead author Chia-Hsuan Tsai affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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Appendix
Figure A2, Figure A3

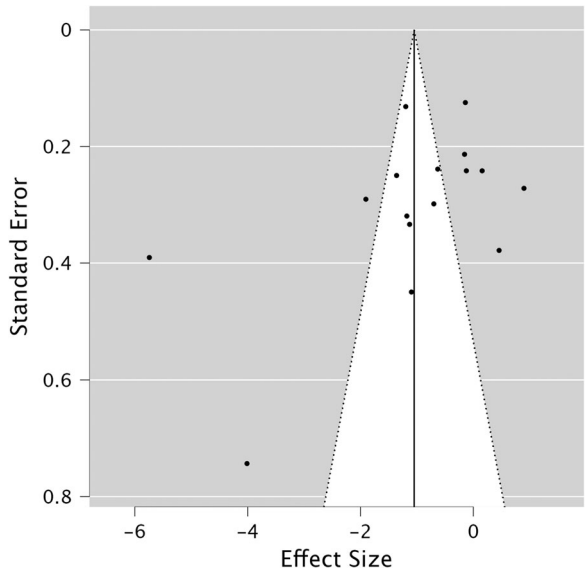

FIGURE A1 | Funnel plot for time to healing (TTH) from 16 trials (1129 patients).

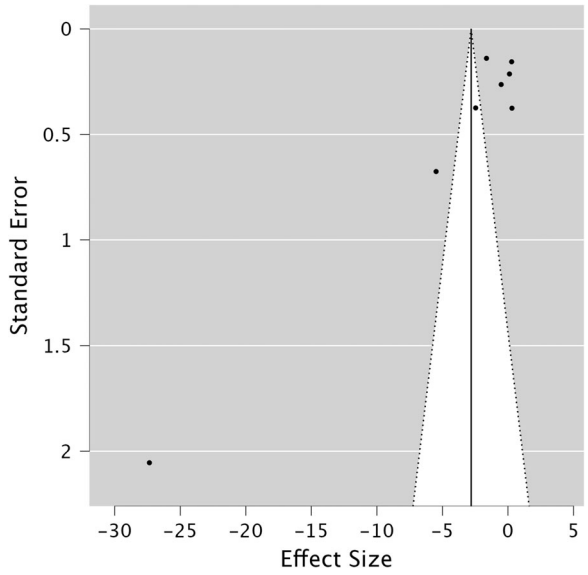

FIGURE A2 | Funnel plot for pain on wound dressing removal or average pain score from eight trials (655 patients).

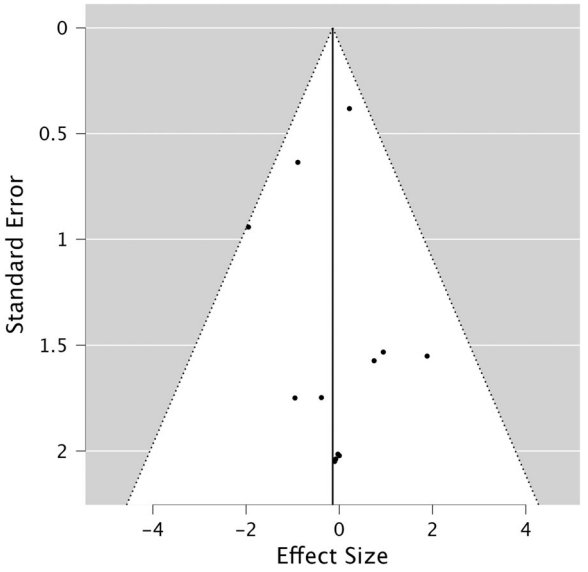

FIGURE A3 | Funnel plot for complication rate from 12 trials (925 patients).