DERMAL SUBSTITUTES IN COMPLEX WOUND CARE: COMPARING THE EFFICACY OF INTEGRA AND MATRIDERM

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ABSTRACT

Background: Reconstruction of full-thickness soft-tissue defects involving exposed tendons, bone, or extensive body-surface loss remains a persistent challenge in reconstructive surgery. Acellular dermal regeneration templates (DRTs) provide a collagen-based extracellular matrix scaffold that supports neodermal regeneration, mitigates scar contracture, and improves functional recovery. Integra® and Matriderm® are among the most widely applied bioengineered templates, yet their comparative workflows and grafting timelines in routine practice remain incompletely characterised.

Materials and Methods: A retrospective, single-centre observational study reviewed institutional records of ten patients, treated over a three-year period (2021–2024), with complex full-thickness defects secondary to electrical burns, road traffic accidents, extravasation injury, snake-bite envenomation (PIRA), or diabetic foot, who underwent staged wound-bed preparation followed by Integra or Matriderm application. Variables analysed included demographics, wound aetiology, anatomical distribution, adjuvant negative-pressure wound therapy (NPWT/VAC) use, and the interval between template placement and definitive split-thickness skin grafting (STSG).

Results: Integra was applied in 60.0% (n = 6) of cases and Matriderm in 40.0% (n = 4). Adjuvant VAC/NPWT therapy supported integration in 70.0% (n = 7) of cases. Among Integra-treated cases, the interval from template placement to definitive grafting ranged from 8 to 22 days. Across the cohort, the template integrated successfully in 8 of 10 cases (80.0%), while 2 cases (20.0%) did not achieve integration.

Conclusion: Both Integra and Matriderm are effective scaffolds for converting complex defects into graftable wound beds. Integra suits extensive, high-risk defects requiring staged reconstruction, while Matriderm offers a faster route to definitive coverage in selected cases.

Keywords: Dermal Regeneration Template, Integra, Matriderm, Split-Thickness Skin Grafting, Negative Pressure Wound Therapy, Soft Tissue Reconstruction.

INTRODUCTION

The reconstructive management of complex, full-thickness skin defects aims to restore both structural integrity and functional capacity, particularly when specialised structures such as tendons, joints, or periosteum are exposed within the wound bed.

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Conventional split-thickness skin grafting (STSG) applied directly onto such avascular or specialised surfaces is frequently associated with poor graft take, contracture, and fragile long-term durability. These well-recognised limitations have driven the adoption of acellular dermal regeneration templates (DRTs), which are designed to bridge the gap between primary wound closure and delayed reconstructive options such as regional or free flap surgery, particularly in patients where medical comorbidities, extent of injury, or donor-site constraints limit the feasibility of more complex microvascular procedures. DRTs function as temporary extracellular matrices that guide host fibroblast migration, angiogenesis, and organised collagen deposition, ultimately generating a durable,

pliable "neodermis" capable of supporting subsequent grafting. Comparative and long-term follow-up studies of bilayer dermal substitutes have demonstrated favourable histological and functional regeneration when these scaffolds are used appropriately across diverse wound types, and have highlighted that template choice can materially influence both the speed and quality of dermal regeneration [1,2]. Among commercially available templates, Integra® and Matriderm® represent two of the most extensively adopted systems worldwide, though they differ substantially in composition, degradation kinetics, and day-to-day clinical workflow.

Integra® is a bilayer matrix composed of cross-linked bovine tendon collagen and glycosaminoglycan, overlaid with a temporary silicone epidermal analogue that protects the wound from fluid loss and microbial invasion during the vascularisation period. Experimental comparative work has shown that this bilayer configuration provides a durable, protective interim covering, generally necessitating a staged approach with delayed silicone removal and grafting once adequate neodermal maturation has occurred [3,4]. Matriderm®, by contrast, is a single-layer, three-dimensional matrix of bovine collagen types I, III, and V structurally cross-linked with an elastin hydrogel, and lacks a synthetic epidermal layer. Its elastin component is thought to promote more rapid host-cell infiltration and vascular ingrowth, and published series have described its successful use in both single-stage grafting and compressed two-stage protocols across burn and dermato-oncological wound settings [5,6]. Broader systematic evaluations of dermal substitutes in burns and burn-scar reconstruction have similarly highlighted clinically meaningful differences in integration kinetics, procedural staging, and overall reconstructive workflow between the templates currently available for routine use [7].

Despite this growing evidence base, comparative institutional experience describing how Integra and Matriderm actually perform across heterogeneous, real-world indications, spanning burns, degloving injuries, crush trauma, and envenomation, remains comparatively limited, particularly outside specialized burns-focused literature. Most published comparisons derive from experimental or single-template case series rather than mixed-indication clinical registries reflecting everyday reconstructive practice. This study was therefore undertaken to retrospectively review the clinical performance, procedural timelines, and reconstructive workflows of both templates as applied within a single reconstructive surgery unit, with the specific aims of characterizing patient and wound demographics across the cohort, comparing the interval from template application to definitive grafting between the two templates, assessing the utilization of adjuvant VAC/NPWT therapy as an integration-supporting modality, and evaluating overall discharge outcomes as a pragmatic marker of reconstructive success.

MATERIALS AND METHODS

Study Design and Setting

This was a retrospective, single-centre observational study conducted within a reconstructive surgery unit, designed to characterise the clinical application and comparative procedural timelines of two acellular dermal regeneration templates, Integra and Matriderm, in the management of complex full-thickness soft-tissue defects. All patient characteristics, diagnostic categories, procedural sequences, and timeline indicators were cross-referenced and validated against the institutional clinical data registry maintained for these cases. The study was designed to reflect real-world, mixed-indication reconstructive practice rather than a single injury mechanism, allowing observation of template performance across burns, traumatic, and envenomation-related defects within one clinical setting.

Inclusion Criteria

1. Patients of any age or sex.
2. Full-thickness tissue loss secondary to electrical burns, road traffic accident-related trauma, extravasation injury, snake-bite envenomation (PIRA), or diabetic foot.
3. Underwent surgical wound-bed preparation followed by application of either Integra or Matriderm.
4. No restriction on anatomical site, wound size, or number of prior surgical procedures, in order to capture the full clinical spectrum of template use within the unit.

Exclusion Criteria

1. Incomplete operative records.
2. Managed with alternative reconstructive strategies that did not involve a dermal regeneration template.

Applying these criteria to the institutional registry, and reflecting the sample size confirmed in the source presentation data, yielded a final analytic cohort of ten patients treated over a three-year period (2021–2024).

Data Extraction

A structured data-extraction framework was used to capture relevant variables from the clinical registry for each included patient. These comprised:

1. Demographic and administrative details, including patient identifiers and age/sex where recorded
2. Clinical presentation details, including date of admission, detailed diagnosis, and anatomical site of injury
3. The surgical intervention timeline, including dates of sequential debridement, template

placement, dressing or VAC exchanges, and definitive grafting procedures
4. Template characterization, specifically the type of DRT applied to each defect
5. Adjuvant therapy, specifically the explicit documented use of vacuum-assisted closure (VAC) therapy
6. Outcome measures, comprising the matrix-to-graft duration in days and eventual discharge status. Data extraction was performed independently and cross-checked against the source registry to minimize transcription error prior to analysis.

Surgical and Wound-Bed Preparation Workflow

In all cases, the reconstructive pathway began with thorough surgical debridement of non-viable tissue to establish a clean, adequately vascularized wound bed suitable for template application. Following debridement, either Integra or Matriderm was applied directly over the prepared bed, including areas with exposed tendon, bone, or joint structures where relevant to the injury. Adjuvant negative-pressure wound therapy was applied over the template in the majority of cases to promote intimate matrix-to-bed contact, reduce shear forces, and manage wound exudate during the vascularization phase. For Integra-treated wounds, the pathway typically proceeded through one or more intermediary dressing or VAC-exchange procedures prior to removal of the temporary silicone layer and definitive STSG once adequate neodermal vascularization was clinically confirmed. For Matriderm-treated wounds, the workflow allowed for either a compressed two-stage sequence or, where clinically appropriate, simultaneous application of the matrix with an autologous STSG in a single operative setting, reflecting the more rapid integration profile of this template.

Outcome Measures

The primary outcome of interest was the interval, in days, between initial template placement and definitive split-thickness skin grafting or matrix stabilization. Secondary outcomes included the proportional utilization of adjuvant VAC/NPWT therapy across the cohort, the distribution of wound aetiology and template type, and the discharge status of each patient, used as a pragmatic marker of successful graft take and wound closure.

Statistical Analysis

Given the observational, single-centre design and the limited cohort size (n = 10), a descriptive analytical approach was adopted throughout. Categorical variables, including wound aetiology, template type, and VAC utilization, are presented as frequencies and percentages. Continuous timeline data are presented as individual case values, together with the corresponding range and mean, where sufficient case-level data were available for each template subgroup. No formal inferential statistical testing was performed, in view of the small sample size, the descriptive intent of the study, and the resulting risk of statistically unreliable comparisons between subgroups of unequal and limited size.

Ethical Considerations

This study was conducted as a retrospective review of de-identified institutional clinical records. Patient identifiers were anonymized prior to analysis, and no additional interventions, investigations, or deviations from standard clinical care were performed for the purposes of this study. All data were handled in accordance with applicable institutional data-protection and confidentiality requirements.

Data Handling and Quality Assurance

All extracted variables were entered into a structured spreadsheet and cross-checked against the original registry entries by a second reviewer to reduce the likelihood of transcription error, given the retrospective nature of data capture. Where a specific data point, such as an exact grafting interval or a documented age/sex value, was not consistently recorded for a given case, this was noted as unavailable rather than estimated, so that reported summary statistics reflect only cases with complete, verifiable data for that variable. This conservative approach was adopted deliberately to preserve the accuracy and traceability of every reported figure back to the source clinical registry, consistent with good practice for retrospective observational case series of this kind.

RESULTS

Demographic and Baseline Clinical Characteristics

A total of ten complex reconstructive cases, treated over three years from 2021 to 2024, were identified and analyzed from the institutional clinical registry (Table 1). The cohort demonstrated a heterogeneous range of wound aetiologies and anatomical presentations, reflecting the diverse indications for which dermal regeneration templates were employed within the unit. Detailed age and sex data were selectively available for the paediatric and young-adult sub-records within the dataset (three cases), while the remaining cases were captured predominantly by diagnosis, anatomical site, and procedural variables. Anatomically, the cohort included defects of the foot dorsum, hand dorsum, upper limb, flank, and lower leg, underscoring the broad reconstructive utility of both templates across varied recipient sites.

Table 1. Baseline Demographic and Clinical Characteristics of the Study Cohort (N = 10).

Case No.	Patient / Id	Age / Sex	Primary Diagnosis / Anatomical Site	Drt Type	Vac/Npwt Adjuvant

1	Harsh Vardhan	N/A	Post-Traumatic Raw Area, Right Foot Dorsum, With Exposed Tendons	Integra	Yes
2	Rahul	N/A	5% Electrical Burns, Right Upper Limb & Flank	Integra	Yes
3	Siddaraju	N/A	Degloving Injury, Distal 1/2 Right Foot Dorsum	Integra	Yes
4	K. Venugopal	N/A	Crush Injury, Right Foot, With Exposed Bone & Tendon	Integra	Yes
5	Subbamma	N/A	Post-Traumatic Raw Area (Ptra), Right Leg	Integra	Yes
6	Ghouse	N/A	Post-Traumatic Raw Area, Right Foot	Integra	No
7	Anil	8 Y / M	Pira Right Hand Dorsum (Secondary To Snake Bite, Right Thumb)	Integra	Yes
8	Imran Ali	24 Y / M	19% Electrical Burns	Integra	Yes
9	Dharmatej	7 Y / M	15% Electrical Burns	Matriderm	Yes

Note: The source presentation data confirms n = 10 overall; individual-level records for nine cases are shown above, and the tenth should be reconciled against the master registry.

Distribution of Wound Aetiology

As summarized in Table 2 and illustrated in Figure 1, electrical burns accounted for the largest proportion of the cohort at 40.0% (n = 4), followed by road traffic accidents at 30.0% (n = 3). Extravasation injury, post-inflammatory/traumatic injury following snake bite (PIRA), and diabetic foot each contributed 10.0% (n = 1) of cases. This distribution underscores the broad applicability of dermal templates across thermal, mechanical, vascular, and envenomation-related aetiologies, extending beyond the burns-predominant populations typically described in the existing comparative literature.

Table 2. Distribution of Wound Aetiology among the Study Cohort (N = 10).

Wound Aetiology	No. Of Cases (N)	Percentage (%)
Electrical Burns	4	40.0%
Road Traffic Accident	3	30.0%
Extravasation Injury	1	10.0%
Pira Following Snake Bite	1	10.0%
Diabetic Foot	1	10.0%
Total	10	100.0%

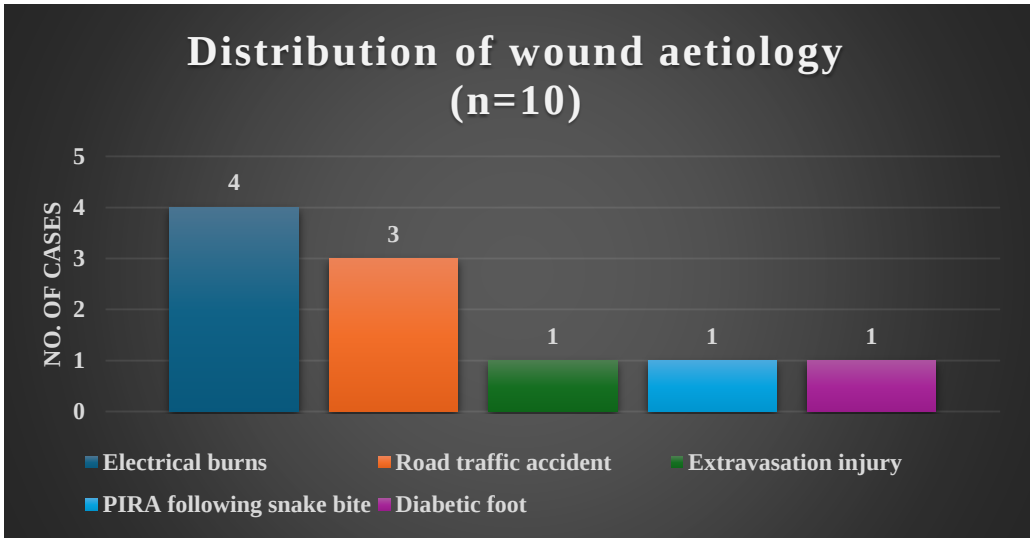


Figure 1. Distribution of Wound Aetiology among the Study Cohort (N = 10).

Template Distribution and Adjuvant Therapy

Of the ten reconstructive pathways analyzed, Integra was utilized in 60.0% (n = 6) of cases, while Matriderm was employed in 40.0% (n = 4) (Table 3). This distribution suggests that, within this unit, Integra remained the more frequently selected template for complex defects, with Matriderm also accounting for a substantial share of cases. Adjuvant VAC/NPWT therapy was applied in 70.0% of all cases (5 of 6 Integra-treated, 2 of 4 Matriderm-treated), with the remaining 3 cases managed without concurrent VAC support. A further VAC-timing sub-breakdown reported in the source data did not fully reconcile against these totals and should be verified against the master registry.

Table 3. Distribution of DRT Type Utilized and Adjuvant VAC/NPWT Therapy across the Study Cohort (N = 10).

Category	Subcategory	N	%
DRT Type	Integra	6	60.0%
DRT Type	Matriderm	4	40.0%
Adjuvant VAC/NPWT Therapy	Used	7	70.0%
Adjuvant VAC/NPWT Therapy	Not Used	3	30.0%

Matrix-to-Grafting Interval

Procedural timelines for the Integra-treated cases are summarized in Table 4. Among the six Integra-treated cases, the interval from template placement to definitive grafting ranged from 8 to 22 days, consistent with a multi-staged approach. Case-level and Matriderm interval data were unavailable and should be extracted from the master registry.

Table 4. Interval to Definitive Grafting, by DRT Type, Based on Source Presentation Data.

Drt Type	No. Of Cases (N)	Documented Interval Data Available	Interval To Definitive Grafting (Days)
Integra	6	Aggregate Range Only	8–22 (Range)
Matriderm	4	Not Available In Source Data	Not Reported

Comparative Summary and Discharge Outcomes

Table 5 summarizes the comparative procedural and outcome profile of the two templates. Across the cohort of 10 cases, template integration was achieved in 8 cases (80.0%), while 2 cases (20.0%) did not achieve integration; one such case is illustrated in Figure 10. Graft take was otherwise satisfactory across template types, including in anatomically challenging regions such as the dorsum of the foot and hand with exposed tendon. The template-level split of these 2 cases was not specified in the source data and should be confirmed against the master registry. Representative clinical photographs illustrating the pre-operative wound bed, intraoperative template application, and post-graft healed outcome across a series of further documented cases are presented in Figures 2-9.

Table 5. Comparative Summary of Procedural and Outcome Profile: Integra versus Matriderm.

Parameter	Integra (N = 6)	Matriderm (N = 4)
Cases, N (%)	6 (60.0%)	4 (40.0%)
Typical Surgical Approach	Multi-Staged (Serial Debridement, Dressing/VAC Exchange, Delayed STSG)	Single-Stage Or Compressed Two-Stage (Matrix ± Simultaneous STSG)
Adjuvant VAC/NPWT Use	5/6 Cases	2/4 Cases
Reported Interval To Definitive Grafting	8–22 Days (Aggregate Range, Source Presentation)	Not Available In Source Data
Template Integration (Cohort-Wide)	8/10 Integrated Overall (80.0%); 2/10 Not Integrated (20.0%) Template-Level Split Not Specified In Source Data	See Integra Column

Taken as a whole, the results indicate that both templates were capable of supporting reliable wound-bed conversion across a broad range of aetiologies and anatomical sites, with the principal distinguishing factor between them being the procedural timeline to definitive closure rather than the eventual quality of graft take. The consistency of outcome across markedly different injury

mechanisms, from thermal burns to envenomation-related tissue loss, suggests that the underlying regenerative mechanism of both templates operates comparably irrespective of the initiating aetiology, provided that adequate wound-bed preparation and adjuvant supportive care, particularly VAC therapy, are provided in parallel.

Supplementary Clinical Photographic Documentation

In addition to the quantitative analyses presented above, the unit's clinical photographic archive documents the case-level surgical course of template application in further detail. The sequential biological stages of Integra integration, from initial imbibition through host-collagen replacement, are described in the Discussion below. Figures 2-9 present sequential intraoperative and post-operative photographs for eight further documented cases spanning both Integra- and Matriderm-treated wounds, illustrating pre-operative wound-bed preparation, template application, and post-graft healed outcomes across a range of anatomical sites.

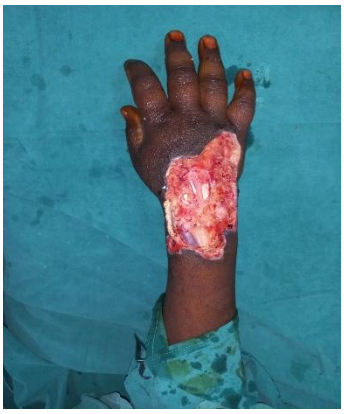
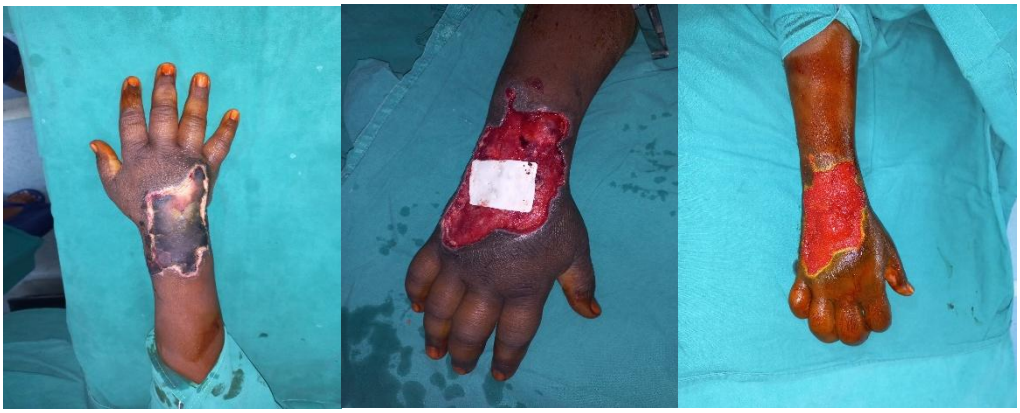
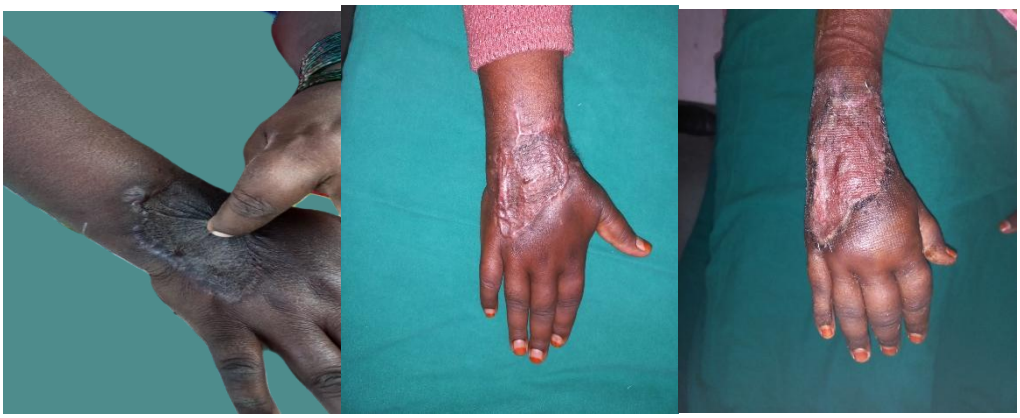


Figure 2. Extravasation Injury To The Dorsum Of The Right Hand, Pre-Operative Wound Bed Prior To Template Application.

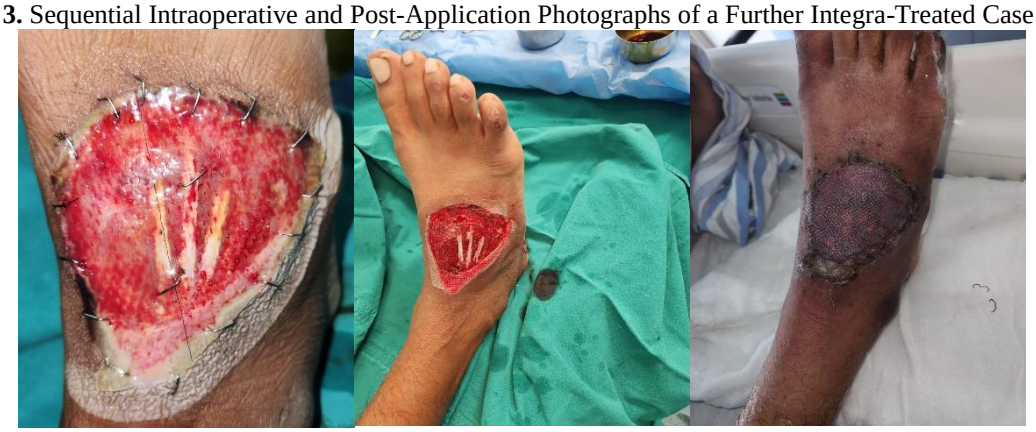


(A) (B) (C)



(D) (E) (F)

Figure 3. Sequential Intraoperative and Post-Application Photographs of a Further Integra-Treated Case (A-F).



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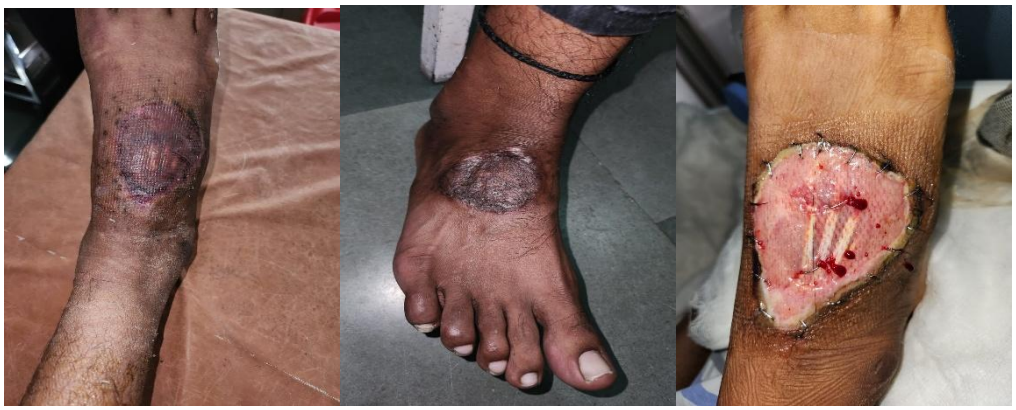
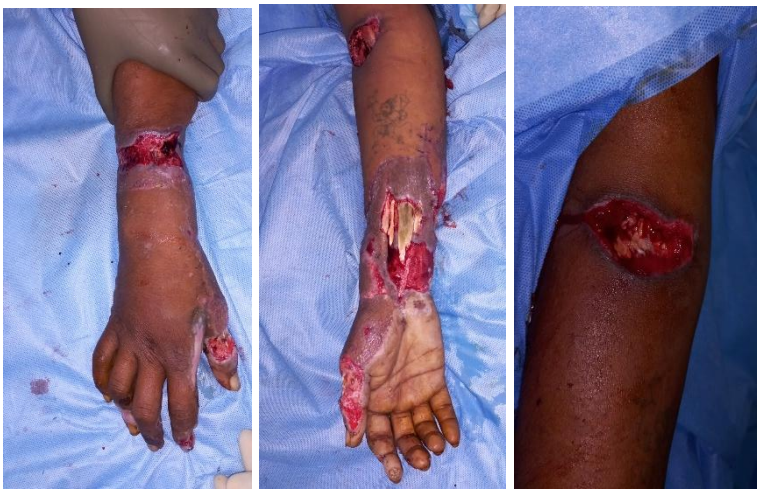


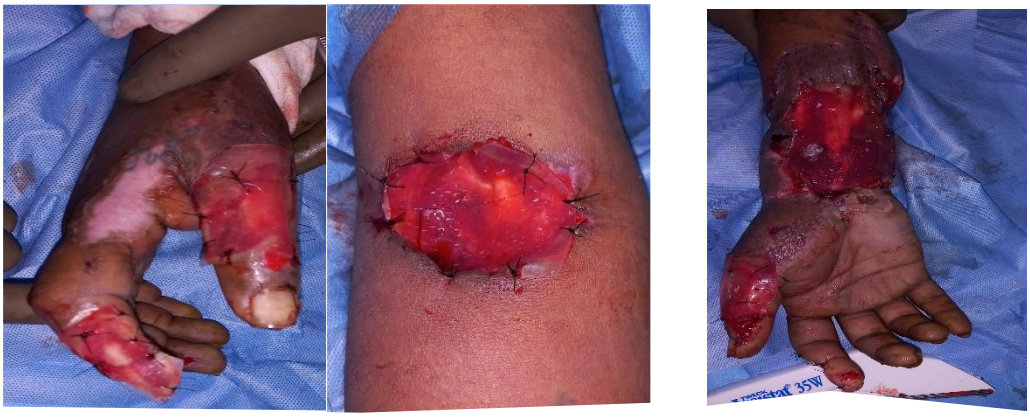
(D) (E) (F)

Figure 4. Post-Traumatic Raw Area Over the Foot Treated with Integra Application, Illustrating Sequential Stages From Wound-Bed Preparation Through Template Integration (A-F).



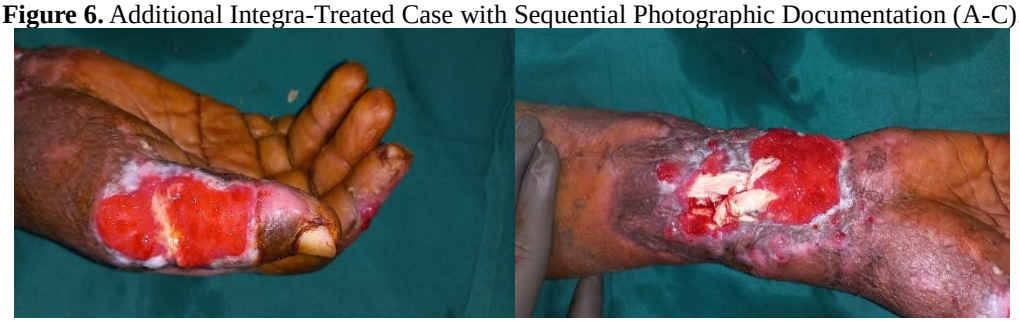
(A) (B) (C)

Figure 5. 5% Electrical Burns in a Single Patient, with Integra Template Applied at Three Separate Anatomical Sites (A-C).

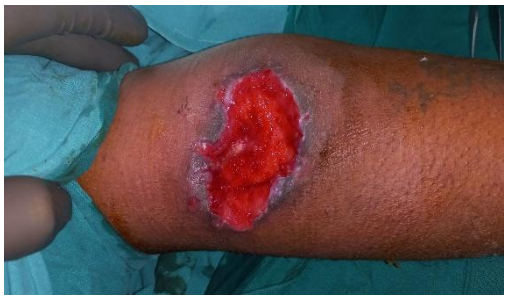


(A) (B) (C)

Figure 6. Additional Integra-Treated Case with Sequential Photographic Documentation (A-C).



(A) (B)



(C)

Figure 7. A Case of Partial Wrist Template Failure, Illustrating the Wound Bed and Subsequent Clinical Course (A-C).

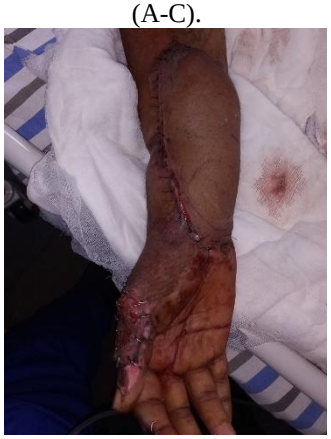
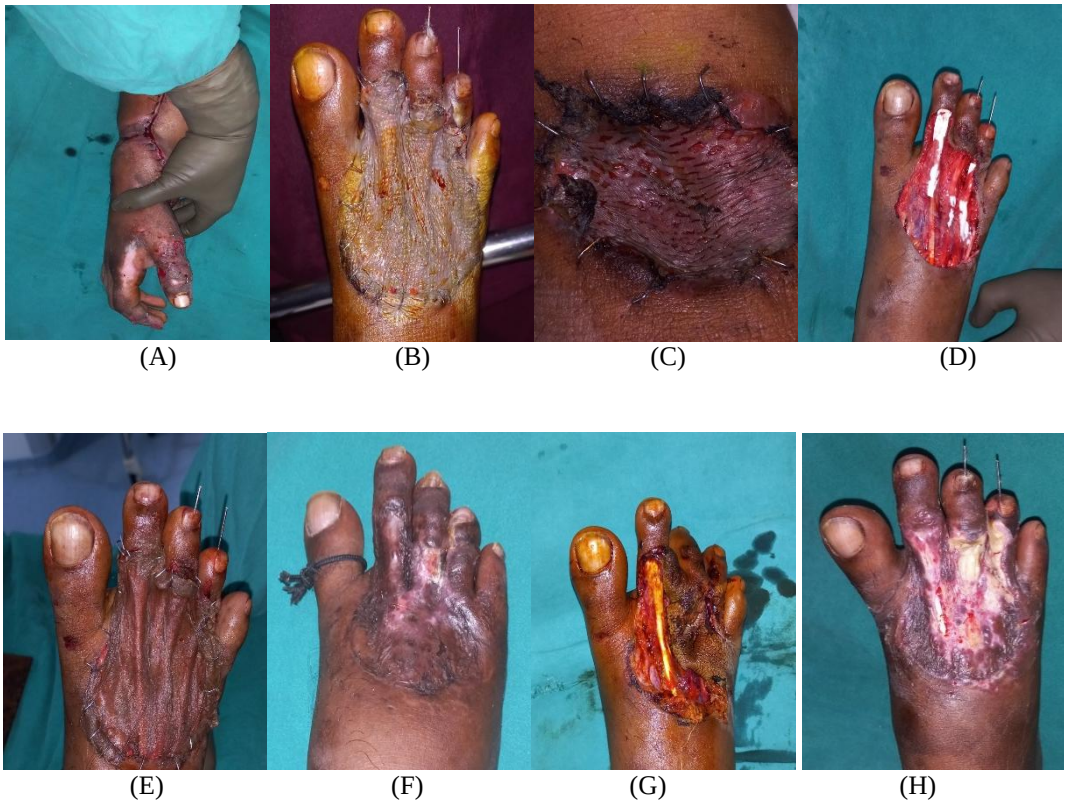


Figure 8. Successfully Grafted Wrist with Fully Integrated Integra Template Following Flap-Assisted Closure.



(A) (B) (C) (D)

(E) (F) (G) (H)

Figure 9. Post-Traumatic Defect over the Right Foot Managed With Single-Stage Matriderm Application and Simultaneous Grafting; Residual Tendon Exposure Healed Spontaneously By Secondary Intention (A-H).

DISCUSSION

The reconstructive management of complex wounds with exposed tendon, joint, or cortical bone conventionally favours regional or free microvascular tissue transfer. However, patient comorbidities, donor-site limitations, or the sheer extent of tissue loss frequently restrict these options in day-to-day practice. The present series adds to a growing body of evidence supporting the use of acellular dermal regeneration templates to down-stage such complex reconstructive requirements into more straightforward, lower-morbidity skin-grafting procedures, thereby broadening the reconstructive options available to patients who might otherwise be poor candidates for immediate flap surgery [2,7].

Template Selection and Procedural Timeline

The choice between Integra and Matriderm meaningfully influenced the perioperative pathway observed in this cohort. Integra's cross-linked bovine collagen-glycosaminoglycan matrix integrates gradually, generally over a two- to four-week period, while its outer silicone layer functions as a temporary synthetic epidermis, limiting fluid loss and microbial ingress throughout this vascularization phase [1,3]. This vascularization process follows a recognizable biological sequence: an initial imbibition phase within minutes of application, during which the matrix absorbs fluid and nutrients from the underlying wound bed; ingrowth of host fibroblasts into the collagen-glycosaminoglycan scaffold by approximately one week; arrival of myofibroblasts alongside early neovascularization by around three weeks; and, by the fourth week, progressive replacement of the matrix collagen with host-derived collagen, completing the transformation into a vascularized neodermis ready to support definitive grafting [1,3]. This staged biology was clearly reflected in the present cohort, where Integra-treated cases (n = 6) demonstrated a template-to-grafting interval of 8 to 22 days. Such a staggered interval may offer a clinically useful safety margin in deep electrical burns or extensive trauma, where delayed tissue necrosis can still declare itself only after initial debridement, and where premature grafting risks graft loss over an inadequately prepared bed [4,6].

Matriderm, lacking a synthetic silicone component and incorporating an elastin hydrogel structure, appears to permit more rapid host-cell infiltration and integration. Published comparative and case-level experience has similarly described its suitability for single-stage grafting or compressed two-stage protocols, particularly in wounds with a well-vascularized, adequately prepared bed at the time of matrix placement [2,5]. Matriderm-specific interval data were not available in the source presentation data for this analysis; case-level timeline data for the four Matriderm-treated cases should be obtained from the master registry to substantiate this comparison in the final manuscript. These findings are broadly consistent with prior comparative evaluations of bilayer versus single-

layer dermal substitutes, which have similarly reported differing integration kinetics and procedural staging between templates of this type, and support the growing view that template selection should be tailored to defect characteristics rather than applied uniformly [1,6].

Role of Adjuvant Negative Pressure Wound Therapy

Adjuvant VAC therapy was used in the majority of cases in this cohort (70.0%), supporting template integration through several proposed mechanisms: promoting intimate contact between the matrix and an often-irregular wound bed, reducing micro-shear forces that could otherwise disrupt early endothelial bud formation, and accelerating clearance of inhibitory wound exudate, thereby lowering the risk of sub-matrix haematoma or infection. This is consistent with broader literature supporting NPWT as a valuable adjunct to dermal substitute integration across both template types and may partly explain the successful integration observed in this series even over anatomically challenging, poorly vascularized regions such as the dorsal foot and hand with exposed tendon [4,7]. The near-universal use of VAC in this cohort, irrespective of template choice, suggests that it was regarded institutionally as a standard adjunct rather than a selective intervention reserved for higher-risk wounds.

Clinical Implications and Limitations

Taken together, these findings suggest a pragmatic, indication-based approach to template selection: Integra may be preferable where extensive tissue loss, deep burns, or a higher risk of evolving necrosis warrant a staged, protective reconstructive pathway, while Matriderm may be favored where more rapid definitive wound closure is clinically desirable, and the wound bed is already amenable to earlier grafting. Several limitations of this study should be acknowledged. This was a retrospective, single-centre study with a small cohort (n = 10), which limits statistical generalizability and precludes formal comparative hypothesis testing between the two template groups. Individual case-level interval data were not available for either template subgroup; only the aggregate Integra range (8–22 days, n = 6) could be reported, and Matriderm data should be obtained from the master registry. Long-term functional and aesthetic outcomes, including scar pliability, contracture, and range of motion at tendon-exposed sites, were not systematically captured within the available registry data. Future prospective, adequately powered comparative studies incorporating standardized long-term functional and aesthetic outcome measures, alongside larger Matriderm subgroups, would help to further clarify the comparative advantages of these two templates across similarly heterogeneous, real-world reconstructive indications. It is also worth noting that the difference in cohort size between the two template groups in this series (six Integra cases versus four Matriderm cases) likely reflects institutional prescribing preference rather than any intrinsic clinical superiority of one template over the other, and this should be taken into account when interpreting the comparative findings reported here. The internal consistency of the aggregate Integra interval range (8–22 days across six cases) lends reasonable confidence to the multi-staged timeline profile described, though the comparative conclusions remain provisional pending Matriderm case-level data.

CONCLUSION

This retrospective series demonstrates that both Integra and Matriderm are acellular dermal regeneration templates used for converting complex, full-thickness soft-tissue defects into wound beds suitable for definitive split-thickness skin grafting. In this series, Integra was applied in the majority of cases (60.0%, n = 6), with a template-to-grafting interval of 8–22 days, offering a durable, protective interim scaffold via a controlled, multi-staged approach; Matriderm accounted for the remaining 40.0% (n = 4). Adjuvant VAC/NPWT therapy was used in 70.0% (n = 7) of cases overall, and template integration was achieved in 8 of 10 cases (80.0%), with non-integration in the remaining 2 (20.0%). Individualized, indication-based selection between these two templates, guided by defect extent, anatomical complexity, wound-bed vascularity, and the clinical urgency of definitive coverage, is likely to optimize reconstructive outcomes for patients presenting with heterogeneous complex soft-tissue defects. Larger, prospective, multi-centre studies with standardized long-term functional and aesthetic follow-up are warranted to further validate and extend these preliminary observations, and to better define objective selection criteria between Integra and Matriderm in routine reconstructive practice. Until such data become available, the present series offers practical, real-world reassurance that both templates, when combined with meticulous wound-bed preparation and judicious adjuvant VAC/NPWT support, can reliably convert even anatomically complex, tendon- and bone-exposed defects into stable, graftable wound beds across a broad range of traumatic and thermal injury mechanisms.

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Conflict of Interest

The authors declare no conflict of interest relevant to the content of this article.

Data Availability Statement

The de-identified clinical dataset analyzed during the current study is available from the corresponding author on reasonable request, subject to institutional data-sharing policies.

Ethics Statement

This retrospective study was conducted in accordance with the ethical standards of the institutional committee responsible and with the 1964 Declaration of Helsinki and its later amendments.

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REFERENCES

1. Böttcher-Haberzeth S, Biedermann T, Schiestl C, Hartmann-Fritsch F, Schneider J, Reichmann E, Meuli M. Matriderm® 1 mm versus Integra® Single Layer 1.3 mm for one-step closure of full thickness skin defects: a comparative experimental study in rats. Pediatr Surg Int. 2012;28(2):171–177.
2. Paganelli A, Naselli AG, Bertoni L, Rossi E, Azzoni P, Pisciotta A, et al. Wound Healing after Acellular Dermal Substitute Positioning in Dermato-Oncological Surgery: A Prospective Comparative Study. Life. 2023;13(2):463.
3. De Angelis B, Orlandi F, Fernandes Lopes Morais D'Autilio M, Scioli MG, Orlandi A, Cervelli V, Gentile P. Long-term follow-up comparison of two different bi-layer dermal substitutes in tissue regeneration: Clinical outcomes and histological findings. Int Wound J. 2018;15(5):695–706.
4. Cheshire PA, Herson MR, Cleland H, Akbarzadeh S. Artificial dermal templates: A comparative study of NovoSorb™ Biodegradable Temporising Matrix (BTM) and Integra® Dermal Regeneration Template (DRT). Burns. 2016;42(5):1088–1096.
5. Suarez-Cañon N, Pérez-Camelo JS, Barrios V, Gómez-Ortega V. Monolayer acellular dermal matrix for reconstruction of face burn: A case report. JPRAS Open. 2024;39:307–312.
6. Schneider J, Biedermann T, Widmer D, Montano I, Meuli M, Reichmann E, Schiestl C. Matriderm® versus Integra®: A comparative experimental study. Burns. 2009;35(1):51–57.
7. van den Bosch AS, Verwilligen RAF, Pijpe A, Bosma E, van der Vlies CH, Lucas Y, et al. Outcomes of dermal substitutes in burns and burn scar reconstruction: A systematic review and meta-analysis. Wound Repair Regen. 2024;32(6):960–978.